

EMPOWER HUMAN LIFE

Through Sustainable Energy and Chemicals

ENERGY

INNOVATION

Empower
toward Tomorrow

CHEMICAL



CONTENT

004	Financial Highlights	094	Organizational Structure
006	Message from the Board of Directors	096	Executives
010	Audit Committee Report	100	Assets and Shareholders Information and Management Structure
013	Corporate Governance Committee Report	122	Risk Factors and Corporate Risk Management
016	Nomination and Remuneration Committee Report	128	Internal Controls
018	Risk Management Committee Report	133	Corporate Governance Report
020	Thaioil and Subsidiaries' Vision, Mission, and Strategies	160	Thaioil and Subsidiaries' Social Responsibility
022	Summary of Business Achievements in 2018	162	Corporate Information
028	Milestones of 2018	170	Thaioil and Subsidiaries' Business Structure
037	Market Review 2018 and Market Outlook	172	Revenue Structure
050	Production Process, Process Development, Quality, Security, Safety & Occupational Health and Environment Management	174	Management's Discussion and Analysis of Financial Position and Operating Results
064	Future Projects	180	Connected Transactions
068	Human Resources and Organization Development	187	Board of Directors' Responsibility for Financial Reporting
074	Board of Directors	188	Financial Statements



To enrich stakeholders' well-being and deliver sustainable returns built upon innovation, technology and resilient portfolio, with top-class management and accountable corporate governance.

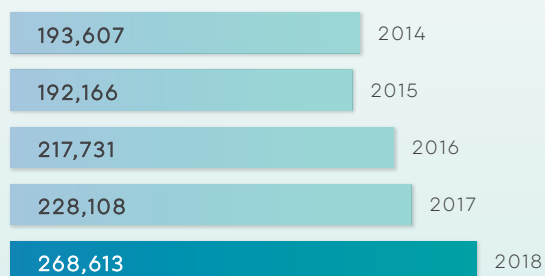


FINANCIAL HIGHLIGHTS



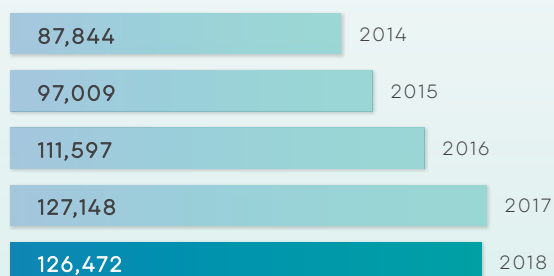
Total Assets

268,613 Million Baht



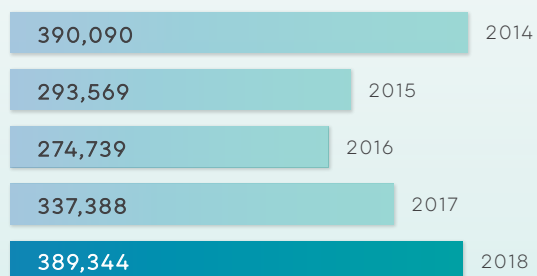
Total Equity

126,472 Million Baht



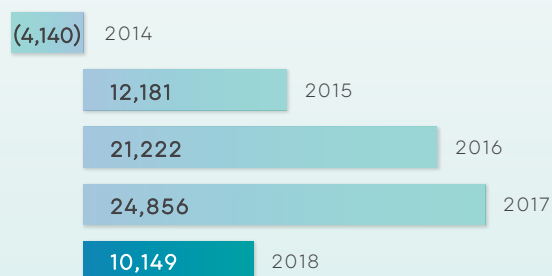
Sales Revenue

389,344 Million Baht



Net Profit

10,149 Million Baht



		2018	2017	2016	2015	2014 ⁽¹⁾
Operating Results						
Sales Revenue	Million Baht	389,344	337,388	274,739	293,569	390,090
EBITDA	"	20,239	36,925	32,675	25,492	2,651
Net Profit/(Loss)	"	10,149	24,856	21,222	12,181	(4,140)
Basic Earnings/(Loss) per Share	Baht	4.97	12.18	10.40	5.97	(2.03)
Financial Position						
Total Assets	Million Baht	268,613	228,108	217,731	192,166	193,607
Total Liabilities	"	142,141	100,960	106,134	95,157	105,763
Total Equity	"	126,472	127,148	111,597	97,009	87,844
Financial Ratios						
Interest Coverage Ratio	Times	5.1	11.2	9.4	7.4	0.7
Current Ratio	"	4.3	3.8	3.4	5.0	2.7
Net Debt to Equity Ratio	"	-	-	0.1	0.2	0.4
Return on Equity	Percent	8.3	21.7	21.3	13.9	(4.7)
Return on Assets	"	4.2	11.4	10.5	6.5	(1.9)
Stock Data						
Annual Average						
Daily Closing Stock Price	Baht/Share	86.88	84.23	66.70	53.50	50.40
Market Capitalization	Million Baht	177,238	171,832	136,070	109,141	102,817
Dividend Payment	Baht/Share	2.65 ⁽²⁾	5.25	4.50	2.70	1.16
Dividend Yield ⁽³⁾	Percent	3.1	6.2	6.7	5.0	2.3
Book Value	Baht/Share	59.66	59.91	52.38	45.28	40.88

Note:

⁽¹⁾ Thaioil and Subsidiaries have adopted new and revised Thai Financial Reporting Standards 10 (TFRS 10) on Consolidated Financial Statements, effective for Annual Accounting periods beginning on or after January 1, 2015, resulting in a restatement on Statements of Financial Position as of December 31, 2014, as well as the Statement of Income and the Statement of Cash Flows as of December 31, 2014.

⁽²⁾ Including the interim dividend for 2018 half-year results at the rate of 1.50 Baht per share paid on September 28, 2018, and the remaining dividend of 1.15 Baht per share is to be proposed to the 2019 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



Thosaporn Sirisumphand

Professor Dr. Thosaporn Sirisumphand
Chairman of the Board

Atikom Terbsiri

Mr. Atikom Terbsiri
Chief Executive Officer and President

Dear Shareholders

The year 2018 can be defined as a crucial year for Thailoil and Subsidiaries, with much more progress made and clarity achieved in business directions and plans. Notably, the 2018 shareholders' meeting approved the Clean Fuel Project (CFP) investment. This strategic investment project addressed market demand and trends, and enhanced Thailoil's competitiveness, in parallel with benefit contribution for Thailand through job creation and economic drive. The Board of Directors (the Board) wishes to take this opportunity to express our heartfelt gratitude for your constant trust and support to this project.

Vision for Ongoing and More Challenging Corporate Goals

The Board and the executives have a strong conviction that, with the potential of CFP which is now clarified and significantly progressing, Thailoil will successfully achieve its original vision, "A leading fully integrated refining and petrochemical company in Asia Pacific", by 2023, the year the CFP project is targeted to complete. Therefore, to ensure the corporate-driving management's clear and relentlessly challenging scope of goals, the Board has approved the reformed vision for future business execution: **"Empower Human Life through Sustainable Energy and Chemicals"**. This connects with and focuses on Thailoil's 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"**.

"Empower Human Life through Sustainable Energy and Chemicals". This connects with and focuses on Thailoil's 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".

Operational Approach with Maximum Efficiency

The global economy in 2018 was fragile and sensitive due to the impacts of the trade war between the US and China, which have sent numerous ripples and volatility to the refining sector. Oil prices in the first three quarters of the year were bullish, particularly around the third quarter, only to plummet toward the year-end, as did the Gross Refining Margin. However, due to Thailoil's prudent cautious and maximum efficiency-oriented business management approach, both on profit increase and cost control, consistently implemented whether uncontrollable business environment is favorable or unfavorable, Thailoil and Subsidiaries successfully maintained healthy performances under this year's volatile business circumstances, with a net profit of THB 10.149 billion.

Approaching Challenging Future with a Solid Foundation

One foremost success of this year is Thailoil's agreement with the Treasury Department, leading to the signing of a new land lease ending in 2052, which has not only clarified long-term business and boosted the confidence of all stakeholders, but has also created energy security, generated high income, and contributed healthy returns to Thailand.

Besides the CFP, other investment projects have progressed in accordance with investment budgets. Most of these projects involved the improvement and development of infrastructure and refining process support to increase Thailoil's competitiveness and accommodate CFP. The projects include TOP Crude Oil Tank, Jetty Expansion Project, Thailoil Sriracha Buildings Project, and the application of digital technology to various work procedures and processes. Once these projects are completed, they would contribute to Thailoil's competitiveness. Thailoil is fully prepared to support the projects through the structuring of project management as well as the highly successful issuance and offering of bonds in a favorable market situation, which echoed investors' confidence and favorable views of Thailoil and Subsidiaries.

Business Success under Corporate Governance Principles and Socio-Environmental Responsibility

One of the Board's crucial missions is to cultivate and maintain the corporate culture that values compliance with Thailoil's Good Corporate Governance and Code of Conduct, along with other executions to achieve business goals. Throughout the year 2018, several activities were staged, including the initiation of a project to recognize employees who exemplify ethical conduct (referred to as honorable "Palung Akanee"); the upgrading of risk assessment concerning the environment, society, and corporate governance in the supply chain through the "ESG Plus Verification" in collaboration with key business partners; and the announcement of a legal compliance policy.

Energy conservation, environmental preservation and safety are constantly included in Corporate Key Performance Indicators (KPIs), resulting in our safety statistics being among the world leaders. Moreover, Thailoil has strictly operated in accordance with its Environmental Master Plan and commands projects designed to raise energy efficiency in processes, which reduce energy consumption and greenhouse gas emission; Thailoil also extends research and development program for green products. Finally, with the policy to bond and live with surrounding communities, Thailoil has throughout the year run activities and social projects to improve communities including educational, hygienic, religious, and customs-related activities. The Company has also proactively communicated to ensure the communities' proper knowledge and understanding of Thailoil and Subsidiaries' projects, leading to the high satisfactory level of community engagement results in a study conducted by an independent advisory company.

For research and innovation aspect, Thailoil has researched and recently initiated tangible and practical innovations including the Motor Operating Valve Protection (MOV) and K-2 Gate Valve Device. Both of which have been commercialized.

From Pride to Corporate Propelling Force

Thailoil takes pride in acclamations from globally renowned entities and institutions, with recognitions and awards in various fields this year-notably the membership certification of Dow Jones Sustainability Indices (DJSI) for six years consecutively; Sustainability Awards of Honor, and Best Company Performance Awards from the Stock

Exchange of Thailand (SET). These are proofs of Thailoil's business operation approaches marked by a balance in economic, social, and corporate governance aspects, of which Thailoil's directors, executives and staff are proud. We are ready and prepared to drive Thailoil forward through future challenges to ensure benefits of shareholders and stakeholders, to contribute to national energy security, and to drive the national economy.

The Board of Directors, the executives, and all staff are highly grateful to all shareholders for your constant support to Thailoil. In return for your trust, we remain committed and dedicated to do our best to ensure Thailoil's sustainable achievement of even more success.



AUDIT COMMITTEE REPORT



Ms. Chularat Suteethorn
Chairman of the Audit Committee

Dear Shareholders

Appointed by the Board of Directors (the Board), the current Audit Committee (AC) consists of three independent directors, chaired by Ms. Chularat Suteethorn, with Associate Professor Dr. Pasu Decharin and Mr. Chen Namchaisiri as members. All of whom command expertise and experience in economics, accounting and finance, business management, auditing, engineering, energy industry, and petroleum and petrochemical industry. This year, the committee's composition changed with the resignation of Mrs. Suvimol Chrityakierne, who completed her term at the 2018 Annual General Meeting of Shareholders (AGM), and the resignation of General Thanakarn Kerdnaimongkol, effective as from May 1, 2018. The AC composition and qualifications, as well as the directors' qualifications, were considered suitable for reviewing of financial statements' credibility against requirements of the Office of Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET).

The AC independently performed its duties as assigned by the Board and in accordance with its charter while

conforming to SEC and SET's requirements and Best Practices Guidelines for Audit Committees. This year, the AC held seven meetings, including consultations with the executives, the internal auditor, and the external auditor.

In addition, the AC held one non-executive meeting with the external auditor to independently analyze auditor's performance, the internal control system relating to financial statements audit, cooperation from the executives and Corporate Internal Audit Department, audit plans, as well as the external auditor's report.

This year, performance highlights are as follows:

1. Financial Statements:

The AC cooperating with the external auditor and relevant executives, reviewed the quarterly and annual financial statements for Thailoil, both separate and consolidated financial statements. The AC also reviewed the information disclosure and emphasized Key Audit Matters (KAMs) in the external auditor's report. In this regard, the Committee

inquired and reviewed the credibility of estimated figures, the executives' assumptions requiring discretion, disclosure of financial information, and the impacts of financial reporting standards transformation. This is to ensure that financial statements comply with legal requirements and financial reporting standards, and are accurate, creditable, and useful for financial statements users. The external auditors audited financial statements and provided unqualified opinions.

2. Connected Transactions:

In reviewing Connected transactions or those posing potential conflicts of interest with Thailoil and Subsidiaries under SET and SEC's announcements, the Committee concluded that Thailoil and Subsidiaries had observed regular business practices, exercising fairness and sensibility for the maximum benefit of Thailoil and its shareholders. All transactions had secured the approval of the executives or the Board before their execution.

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

The AC valued managing practices for systematic corporate governance, transparent transaction, as well as related legal and regulatory compliance. The Committee reviewed the efficiency and effectiveness of corporate governance, risk management, and internal control systems by cooperating with the executives and the external auditor. It also examined the report of the risk management results prepared by Corporate Strategic Risk Section and Corporate Internal Audit Department; report on legal and regulatory compliance from Corporate Compliance Department; and report on internal audit outcomes from Corporate Internal Audit Department. Moreover, the Committee ensured that Thailoil monitored

draft legislation under deliberation that could affect the Company so as to be prepared before its promulgation, focusing on proactive approaches by joining relevant discussions and expressing its views before the official promulgation, as well as reviewing and communicating complaint-handling and whistleblowing measures to ensure its clarity and suitability. The AC also recommended the application of online training to drive the awareness of internal control through regular training together with tangible assessment. Finally, the Committee stressed ongoing system development. In addition, the AC valued the Three Lines of Defense together with Integrated Governance, Risk Management, and Compliance (GRC) for proactive prevention integration through the implementation of the SAP GRC system. This system screens and continually monitors irregularities and prevents fraud, covering Procure to Pay, IT General Control, Order to Cash, and Payroll processes. The AC enclosed outcomes of SEC's internal control system adequacy assessment stating Thailoil commands a suitable and adequate internal control system.

4. Internal System Audit Oversight:

Besides reviewing strategic plans, annual and long-term audit plans and executions, audit outcomes, and following up the improvement of significant matters, the AC drove for the development and upgrading of Thailoil's internal audit through its assurance and advice, proactive approach, manpower preparedness, and relentless personnel development to assure that they are capable of efficient and effective audit execution. The Committee also advocated the application as well as the development of technology used in auditing to accommodate swift changes in the Digitalization Age; ensured internal audit's quality assesment; and advocated personnel's

certification acquiring to ensure true professionalism and to be able to keep pace with changes of professional internal audit standards. Finally, the Committee appraised the annual performance of Vice President-Corporate Internal Audit.

5. Appointment of the External Auditor for 2019:

In selecting the external auditor, the AC considered performance outcomes, experience, independency, audit fees, and compliance with SEC and SET's announcements. It nominated to the Board PricewaterhouseCoopers ABAS Ltd. (PwC) as well as the audit fees for the Board's review before tabling to the 2019 Annual General Meeting of Shareholders for approval.

In summary, this year the Audit Committee undertook its duties as assigned by the Board and in accordance with its charter utilizing diverse expertise, and prudence with independency while providing creative comments and advice. It concluded that Thail and Subsidiaries value efficient and effective business operation, prepare credible and material financial statements aligning with financial reporting standards, and complete the disclosure of connected transactions with potential conflicts of interest and adequate information. The AC also concluded that Thail and Subsidiaries command a sound corporate governance process, an adequate and suitable risk management and internal control; and that it fully comply with related laws and regulations.

The Audit Committee has always received excellent cooperation from the Board of Directors, the executives, the external auditor, and all relevant units.

February 8, 2019

On behalf of the Audit Committee



(Ms. Chularat Suteethorn)

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 and a code of conduct are part of the core mission to which Thailoil always committed. They are considered crucial factors that drive the organization toward sustainable success and toward the acceptance, both at national and international levels, as a business entity with a good standard of business management in line with good corporate governance. To this end, the Board of Directors (the Board) appointed the Corporate Governance Committee (CGC) to take charge of forming policies, supervising, monitoring, and promoting compliance with corporate governance and a code of conduct to implant a strong corporate culture.

The Committee consists of three directors, chaired by Police General Aek Angsananont, with Mr. Yongyut Jantararotai and Mr. Kanit Si as members. During 2018, five meetings were held with all members of a given period present at each meeting and fully performed their duties indicated in the CGC Charter. The outcomes of the performance were regularly reported to the Board with highlights as follow:

1. Development of Guidelines and Rules for Corporate Governance

Thailoil benchmarked its current practices on corporate governance against Corporate Governance Code for Listed Companies 2017 (CG Code 2017) by the Office of the Securities and Exchange Commission (SEC), and discovered that most of the current practices corresponded with such code. However, there was a matter found not aligning with CG Code 2017, which was already incorporated as an additional CG practice. This matter concerns the minimum meeting attendance of the Board members, requiring “members of the Board to take responsibility for their regular presence at the meeting. Each Board member is obliged to have at least 75% attendance of all meetings arranged during the year”. The additional practice was presented to the Board for acknowledgement and effective on April 1, 2018.

2. Supervision, Promotion, and Monitoring of Compliance with the Corporate Governance Policy, the Anti-Corruption Policy, and the Code of Conduct

The Committee endorsed Thailo's annual development plan on corporate governance, code of conduct, anti-corruption, and stakeholders treatment, which is to be implemented by the executives under the CGC recommendations. The Committee monitored plan implementation, covering communication with all staff and stakeholders, implantation of "integrity" in corporate culture, and fair and equitable treatment of stakeholders. Some of the CG activities initiated in 2018 included launching the project to recognize employees who exemplify ethical conduct (referred to as honorable "Palung Akanee"); hosting PTT Group CG Day 2018 with companies in PTT Group to enhance staff awareness of good corporate governance and the code of conduct; announcing Thailo's anti-corruption goal echoing partners and customers' intentions; as well as initiating the upgrading of risk assessment concerning the environment, society, and corporate governance in the supply chain through the "ESG Plus Verification" in collaboration with key business partners to encourage their sustainable development following Thailo's practice.

In addition, the CGC provided advices and recommendations on major business plans that directly involve corporate governance, such as the preparation of 2018 Annual General Meeting of Shareholders. The Committee also agreed on Thailo's announcement on allowing shareholders to propose meeting agenda and nominate candidates for directorship, as well as the endorsement of the Board's 2017 performance assessment result and 2018 performance assessment form.

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

The Committee endorsed the CSR development plan, which covers community affairs, social development at the national level, and sustainable development (SD) plan. In addition to the CSR activities, continuously organized in the refinery neighborhood, involving education, public health, religion, culture and tradition, and the environment, Thailo in 2018 initiated a skill development project for the underprivileged in the surrounding communities by giving support through Sarn Palung Social Enterprise Co., Ltd. (PTTSE) (an entity under PTT Group) on opening **Café Amazon for Chance** at Laem Chabang Hospital. The café is to hire hearing-impaired people residing in Sriracha to work at the shop, whose official opening is planned in 2019. Moreover, Thailo joined PTT Group in running a **Pracharath Project on education** to continuously develop school executives and promote young-generation teachers' leadership. The project has been expanded to four more schools around the refinery, totaling ten schools. Under this Pracharath project, a sub-project called **Light for a Better Life** was initiated to leverage knowledge and experience in electrical engineering of Thailo's personnel for the schools' infrastructure development to prevent fire hazard.

Regarding sustainable development in 2018, Thailo remained a DJSI membership for the sixth consecutive year as a result of business management improvement. Clearer framework of sustainability **achievement measurements** have been established to better align with the new corporate vision, while the **Energy Improvement Plan** was created, resulting in less energy consumption and less greenhouse gas emissions. The Energy Improvement

Plan is considered a support for the Low Emission Support Scheme (LESS) under Thailand Greenhouse Gas Management Organization (Public Organization).

Due to the strong determination to exhibit standards for corporate governance and the code of conduct, Thailoil, assessed against Corporate Governance Report of Thai Listed Companies, was rated as one of the leading entities both national and international levels. The Company has also been recognized by a sustainability rating institute at the global level. Thailoil's corporate governance has been ongoing in parallel with social responsibility and sustainability management founded on the cooperation of directors, the executives, and all employees. The Corporate Governance Committee is convinced that Thailoil will not only achieve sustainable growth, but will also earn global recognition, thus be able to create benefit for stakeholders under the code of conduct, which will consequently benefit the country as a whole.

January 16, 2019

On behalf of the Corporate Governance Committee



(Police General Aek Angsanonont)

Chairman of the Corporate Governance Committee

Thai Oil Public Company Limited

NOMINATION AND REMUNERATION COMMITTEE REPORT



Air Chief Marshal Suttipong Inseepong
Chairman of the Nomination
and Remuneration Committee

Dear Shareholders

Recognizing the influencing roles of directors in supervising and driving the organization toward success, Thailoil has always been aware of the significance of the nomination and remuneration process, which must be appropriately executed and comply with the corporate governance principles. The Board of Directors (the Board), therefore, appointed the Nomination and Remuneration Committee (NRC) to work as designated by NRC processes and rules on the nomination of candidates with proper qualifications to assume directorship and the highest executive position of Thailoil. The Committee also selects directors for Board-Committee. Moreover, the NRC considers types and criteria for directors' remuneration, which is to be proposed to the Board and shareholders' meeting, as required by law.

As indicated in NRC Charter, the Committee consists of at least three directors, most of whom are to be independent. The current Committee is chaired by Air Chief Marshal Suttipong Inseepong (Independent Director), with Ms. Chularat Suteethorn (Independent Director) and Mr. Auttapol Rerkpiboon as members.

During 2018, the Committee completed all duties designated in the NRC Charter with a total of five meetings. All NRC members serving at different periods attend all meetings (details appear on page 111)

The 2018 highlights of the NRC performance are as follows:

1. Sought and nominated experts with qualifications indicated in Corporate Governance and Code of Conduct Manual for directors' appointment whose process and execution must be in line with corporate governance before tabling for the Board's or the shareholders' approval, as required by law. To this end, the Directors' Pool of the State Enterprise Policy Office and the director list of Thai Institute of Director Chartered Director were exploited in conjunction with other related factors including the overall composition of the Board and the individual qualifications of director to fit the Company's size, nature, and business complexity and diversity. The scrutinized qualifications include education, expertise, skills, experience, specialized

competencies related to Thailoil's businesses, and independency as defined by corporate criteria.

2. Sought and nominated directors for four Board-Committees consisting of the Nomination and Remuneration Committee, the Audit Committee, the Corporate Governance Committee, and the Risk Management Committee, before tabling for the Board's consideration and appointment of such directors to fill the vacancies upon directors' resignation or term completion.
3. Reviewed the Board's remuneration for the year 2018 and sought its approval in line with the process required by law. The consideration of remuneration was made of the appropriateness and performances against their roles and responsibilities, which were also in accordance with Thailoil's overall performance. The Board's remuneration and compensation were also benchmarked with that of peer companies in the same industry (energy/petroleum/petrochemical), with the overall business environment considered.
4. Encouraged and supported Thailoil to allow minor shareholders to propose agenda and nominate candidates for directorship. The announcement of which was made at least three months ahead of the 2019 Annual General Meeting of Shareholders through Thailoil's website.
5. Ensured the conduct of orientation and the distribution of helpful documents or manuals for new directors
6. Assessed the performance of Thailoil's Chief Executive Officer and President as well as considered the adjustment of the salary before tabling for the Board's consideration and approval.

7. Assessed the NRC performance and reported the outcomes to the Board for acknowledgment.

January 17, 2019

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

To achieve business goals while promoting confidence and credibility among investors and stakeholders, this year the Risk Management Committee (RMC) made utmost efforts to support the Board of Directors (the Board) on supervising the corporate risk management. The current Committee consists of the knowledgeable, competent, and experienced directors with mastery of the business as follows:

- | | |
|--------------------------------|----------|
| 1. Mr. Auttapol Rerkpiboon | Chairman |
| 2. Mr. Noppadol Pinsupa | Member |
| 3. Ms. Phannalin Mahawongtikul | Member |
| 4. Mr. Atikom Terbsiri | Member |

Performance Outcomes of 2018

The RMC defined and reviewed the corporate risk management framework and policy, as well as processes indicated in the Risk Management Committee Charter, efficiently providing recommendations on suitable approaches for risk management in line with strategic directions and business plans. It also constantly and efficiently supported and improved risk management practices throughout the corporation on a par with international standards to forge a corporate culture. This year, the Committee held seven meetings with the following highlights:

1. Endorsed Thail's risk appetite, risk profile, mitigation plan, Key Risk Indicators (KRIs) and the revision of corporate risk management plan
2. Endorsed the oil hedging framework, as well as target prices, before tabling for the Board's approval
3. Endorsed risk management plans of the following key projects before tabling for the Board's approval:

- 3.1 Risk management plan for Clean Fuel Project (CFP)
- 3.2 Risk management plan for the issuance and offering US dollar bonds in support of CFP construction through Thailoil Treasury Center Co., Ltd.
- 3.3 Risk management plan for the investor for the Energy Recovery Unit (ERU)
- 3.4 Liability management scope under the Global Medium-Term Note (GMTN) program
- 3.5 Investment management approach for Global Power Synergy Plc's Helium Project and the guidelines for Thailoil and Thailoil Power Co., Ltd. to endorse such project
- 3.6 Risk management plan for Thailoil's Corporate Venture Capital (CVC) Project
- 3.7 Risk management plan on guidelines for restructuring the ethanol business phase 2 (Project Diet)
4. Endorsed the appointment of the secretary to RMC
5. Monitored and advised on the Q1/2018 - Q4/2018 corporate risk management outcomes
6. Monitored and advised on the outcomes of oil hedging for Q4/2017, January-February 2018, and Q1-Q4/2018
7. Monitored ongoing projects' risks and provided recommendations on risk management updates on Jetty Expansion Project, Thailoil Sriracha Buildings Project, TOP Crude Oil Tank, IDEA Project for basic infrastructure on the refinery compound
8. Acknowledged the RMC performance for 2018

The Risk Management Committee concluded that this year Thailoil has developed its corporate risk management system to embrace all aspects of risks and commanded continual risk management practices in line with prevailing circumstances. The RMC meetings were arranged regularly to promptly review key and urgent risks, rendering Thailoil and Subsidiaries' risk management effectiveness. Thailoil indeed commanded key corporate risk management practices that have proved efficient and suitable, with risks controlled within indicated risk appetite.

November 16, 2018

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 57 years of excellence in the energy business, Thailoil and Subsidiaries have refined knowledge and long-accrued experience so as to remain an organization with high potential for production, marketing, and management in the energy industry and in pursuit of proudly becoming a centenary entity.

This year, as a strategic-focused organization, Thailoil and Subsidiaries reviewed its vision and business directions to assure that Thailoil and Subsidiaries have all the strategies ready and prompt for coping with the changing internal and external factors. The Board of Directors passed a resolution approving the reformation of Thailoil's Vision, Mission and Strategies to better suit current as well as future situations as follows:

VISION

Empower 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 sustainability of the economy, society and environment.

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 new Vision and Mission, Thaioil and Subsidiaries set business goals to enhance operating efficiency and sustainable growth through three key strategies as follows:

01 Strengthen the Core

Strengthen the Core with a focus on Thaioil's field of expertise - the energy, consisting of two businesses as follows:

Refinery Business; to enhance the strength in becoming a leading refinery and petrochemical company in the region and to support national energy security with emphasis on fostering competencies on cost competitiveness and top-quartile returns

Power Business; to support power security and generate secure income for Thaioil and Subsidiaries

02 Value Chain Enhancement

Build Capacity for Value Chain Enhancement to extend its value chain from petroleum refining to diversified and high-value petrochemical business, consisting of four businesses as follows:

Petrochemicals; focusing on value chain expansion to downstream businesses from expansion of the refining business to olefins and aromatics through the development of specialty and new chemical products to meet market demand

Solvent and Chemical Distribution; to become a leading chemical distributor of the Asian region with a focus on more product diversification, business coverage expansion, and business partnership creation

Specialty Products; investing more in specialty products in line with evolving industrial trends to meet consumers' demand

Marine Transport; to enhance security in the transport of Thaioil and Subsidiaries' crude oil and products with long-term cost competitiveness

03 Seed the Options

Seed the Options for new opportunities in innovation consisting of two businesses as follows:

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

New Businesses; to increase its proportion of new businesses in innovation through investment in Venture Capital Funds and direct investment in start-ups, including the development of Research and Development in innovation and commercialization to promote growth, increase revenue, reduce costs, and increase returns from projects in pursuit of goals.

To achieve these strategies, Thaioil and Subsidiaries have also prepared strategies to become a high-performance organization, focusing on human resources development and deployment of innovation and technology to strengthen overall corporate competency, and preparing for the development of core competencies: operational and project excellence, commercial excellence, value chain and logistics excellence, leadership, agility, innovation, and process improvement with digitalization.

SUMMARY OF BUSINESS ACHIEVEMENTS IN 2018



1. Performance Representing Perseverance and Operational Excellence amid a Volatile Global Economy

The year 2018 involved one of Thairoil and Subsidiaries' combined efforts; another year in which we focused on proactive management amid a volatile and challenging global economy. To elaborate, the economies of Europe and Japan were stagnant, due to inert demand. While the economies of the US, China, Thailand and the ASEAN region continued their growth due to private consumption and industrial sector. Notably, the US-China trade war and conflicts in the Middle East, contributed to steep rises in oil prices early in the year until early fourth quarter, when it plunged through the yearend with climbing supply in the US. Although the Organization of Petroleum Exporting Countries (OPEC) and non-OPEC countries reached an agreement to cut capacities late in the year in pursuit of an equilibrium of the crude oil markets, the investors were still concerned about fluctuating and unstable condition of economy. This squeezed crack spreads, resulting in Thairoil and Subsidiaries' Accounting Gross Refining Margin (Accounting GRM) of 4.3 USD per barrel. For aromatics, despite new capacities in the market, with less than full capacities in operation incorporating with high demand, the aromatics industry was more desirable this year. For lube base oil, the country saw a slowdown due to new market capacities and lower demand for lube base oil. This resulted in Thairoil and Subsidiaries' Accounting Gross Integrated Margin (Accounting GIM) of 6.6 USD per barrel. The net profit for Thairoil and Subsidiaries this year stood at THB 10.149 billion.

Amid the volatility of the oil market and refining industry, Thairoil and Subsidiaries remained committed to its business focus on operational excellence, a key corporate culture evident in its operational effectiveness, operational availability, operation and supply chain management in all businesses, and inventory management. These factors elevated Thairoil and Subsidiaries to the top tier among global refineries, particularly in steadily decreasing energy intensity index (EII), and successful maintenance of cost competitiveness. Thairoil boasted 113% refinery utilization, superior to other refineries in Thailand and the region. Thairoil and Subsidiaries, moreover, continued to cultivate commitment among all employees on safety as the core operating value, evident in an outstanding total recordable case frequency (TRCF), in comparison with leading companies of the industry group, both domestic and international levels.

In addition, customer focus and proactive price risk management were in place. Thairoil and Subsidiaries remained Thailand's leading refinery, with 30%



Refinery Boasted
Refinery Utilization

113%



Total Recordable Case Frequency
(TRCF)

Outstanding

market share of total demand for petroleum products. Thailoil and Subsidiaries, therefore, managed its operating cash cost to only 1.92 USD per barrel, lower than leading peer industrial entities.

2. Sustainable Energy Business Management with International Standard, Evident in Continued Dow Jones Sustainability Indices (DJSI) Membership in the Emerging Markets for the Sixth Consecutive Year; SET Sustainability Awards of Honor and Outstanding Sustainable Business Management for the Fourth Consecutive Year; and Membership of the SET THSI Index

To address changing global trends and intense competition, Thailoil revised its Sustainability Master Plan covering economy, environment, society, and corporate governance throughout its supply chain. The Company emphasized on the safeguard of business value, and the extension and development of business value with stakeholders' cooperation focusing on the creation of sustainable value for long-term mutual growth of the business and stakeholders.

Thailoil and Subsidiaries' economic success was made by their commitment to corporate governance principles, that is systematic, fair, transparent, clear, and auditable, evident in the "Palung Akanee" Project in recognition of employees who exemplify ethical conducts; the enhancement of risk assessment concerning the environment, society, and corporate governance in the supply chain through the ESG Plus Verification Project, implemented together with 12 major business partners; the encouragement of respect for human rights and anti-corruption principles in corporate level; and the cultivation of communication and understanding on environmental impacts on communities due to Thailoil and Subsidiaries' major projects. These projects reflect business transparency, and social

responsibility, as well as support the improvements for quality of life.

For energy, environment, and safety, Thailoil prudently and safely operated under its Environment and Safety Master Plan to sustain capacity expansion in its production sites. This year, Thailoil and Subsidiaries undertook a project on effectiveness of energy consumption that cut energy consumption by 562,075 gigajoules, while lowering direct greenhouse gas emissions by 32,151 tons of carbon dioxide equivalent per year. In addition, Thailoil and Subsidiaries extended its research and development work on green products, including Cyclopentane 80 to replace Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs), which are used in the foam industry for wall insulation, and are contributors to the greenhouse gas phenomenon.

Additionally, Thailoil and Subsidiaries valued human resource development, namely its stewardship of workplace quality, safety, and occupational health; established career development and opportunities, both general and specific; and boosted employees' competencies to accommodate transition to a digital society under the Digital Transformation Master Plan. For additional details, please refer to the 2018 Sustainability Report.

3. Performance Excellence in Production and Integrated Management

Thailoil and Subsidiaries focus on group integration management covering refining, aromatics, lube base oil, and Linear Alkyl Benzene (LAB) businesses, to connect process units with co-planned productions and distribution. This integration management resulted in maximum operating efficiency with capability for higher values and quality products than single refineries in responses to market demands. These businesses were connected with the power business, transportation of petroleum and petrochemical

products, and the solvent business to strengthen the entire supply chains of Thairoil and Subsidiaries.

Thairoil and Subsidiaries' major business strategy in 2018 was to increase margin improvement through key projects such as Hydrocarbon Management Review Project, with benefits mainly from refining unconventional crude from new supply sources; process improvement to increase high-value products; energy consumption improvement; increase in the market share in Thailand and ASEAN; Orchestra Project to integrate operating cost management covering the leverage of proactive purchasing strategies to establish bargaining power in hiring and purchasing, and the control of operating expenses; and Symphony Project which yields enhancement of surplus cash on hand and tax planning.

4. Proactive Market Strategy and Risk Management

Thairoil and Subsidiaries valued marketing strategy management; the keys to success are cordial relations with domestic and international customers, high-quality products that meet standards, on-time delivery, availability and variety of products, quick and precise services and solutions, and integrated safety standards throughout the supply chain to deliver products to customers. These successfully drove its domestic sales ratio to 86% and increased product sales after the expansion to the ASEAN markets.

Thairoil and Subsidiaries valued every development and improvement to meet customers' demands. This year, Thairoil and Subsidiaries have constantly improved and implemented Digitalization to bolster customer service efficiency, along with the management of Jetty Scheduling System (JSS) to optimize the management of vessel transport. This provides the customers with recent information and essential reminders through mobile phone applications. Moreover, Thairoil has developed its

Commercial Excellence program, designed to set up a commercial data hub which would benefit the customers and the Company itself. These programs contribute to Thairoil's 2018 customer engagement score of 96%.

Furthermore, Thairoil and Subsidiaries' solvent market expansion, both domestic and international, represented another success in 2018. The expansion focused on solvent market in Myanmar and Northern Vietnam, aiming to become a chemical distributor, with the commercial operation of a new distribution center of TOP Solvent (Vietnam) LLC. (TSV), and the increase of other high-value products to satisfy market needs. This year, TSV managed to sharply add sales in the Northern Vietnam. Meanwhile, TOP Solvent Co., Ltd., has extended its exports to the United Kingdom, the Netherlands, South Africa, and Tanzania.

For risk management, Thairoil and Subsidiaries were aware of risks related to its business, and so adopted a proactive risk management. The approach demanded close monitoring of all internal and external uncertainties that could affect businesses and investments both short-term and long-term through effective risk management on business strategies, projects execution, and governance, along with oil hedging and foreign exchange risk management tools to prevent and reduce impacts from such risks.

5. Successes of Projects and Relentless Work under Strategic Plan

Thairoil and Subsidiaries represent a strategy-focused organization and constantly review business strategies. The 2018 review proved challenging, responding to high market volatility, competition, and dynamic business surroundings. The reviewed strategies, therefore, needed to be clear to achieve Thairoil and Subsidiaries' vision to **Empower Human Life through Sustainable Energy and Chemicals.**



This year, Thailoil and Subsidiaries successfully executed six key projects:

1. Signing of a new 30-year land lease (2022-2052) with the Treasury Department
2. Jet Fuel Distribution System Efficiency Improvement Project, designed to raise PTT Group's flexibility and lower transportation costs
3. TSV's Solvent Distribution Center Project to accommodate soaring demand for products in Vietnam and enhance competitiveness potential for market and product sales channels expansion
4. A project to extend the solvent and chemical business to target countries, so far successfully extending exports to the United Kingdom, the Netherlands, South Africa, and Tanzania
5. TOP Maritime Service Co., Ltd.'s financial restructuring, designed to accommodate prevailing oil and gas exploration and drilling demands

6. Corporate Venture Capital (CVC) Investment for greater investment flexibility; to this end, Thailoil set up a new unit to pursue and select venture capital funds related to applied sciences and engineering, a business group of the Company's interest. Today, Thailoil has invested in one venture capital fund.

The ongoing projects include Clean Fuel Project (CFP), designed to enhance competitiveness potential by improving process efficiency and adding value to environmental-friendly products. For instance, construction of an upgrading unit that converts fuel oil into more diesel and jet fuels, with capacity growth from 275,000 to 400,000 barrels per day, providing Thailoil greater flexibility while being able to process crude oil of greater variety-resulting in greater economies of scale and crude oil cost reduction. The CFP project received the approval for the investment of USD 4.825 billion at the Extraordinary Meeting of the Shareholders No. 1/2561 in August 2018. Also, Thailoil signed a contract with an Engineering, Procurement and

Construction (EPC) contractor; at present it is preparing construction plans in 2019, with commercial operations due in 2023.

Other ongoing projects on logistics and utilities consist of a project to fabricate crude tanks to accommodate legally-required oil reserves and provide production flexibility. Another project is the Jetty Expansion Project designed to increase work safety and reduce port congestion. The Jetty Expansion Project is crucial to Thailoil's future distribution and logistics. The ongoing projects also include the IDEA Project for basic infrastructure on the refinery compound and the Thailoil Sriracha Building Project, designed to enhance safety of employees and to accommodate future expansions. In addition, Thailoil and Subsidiaries are investigating business expansion opportunities and joint investment with business allies in ASEAN member countries, which typically boast high growth of petroleum and petrochemical demands.

With their long-term sustainability strategy, Thailoil and Subsidiaries strategically managed their investment portfolios and increased the proportion of new businesses to fit the dynamic industry and future energy consumption patterns. Projects initiated by support functions including human resource development, finance, budgeting, socio-environmental responsibilities, and research and innovation, are also developed. This year, Thailoil and Subsidiaries commercialized three research and development innovations: namely, the Cyclopentane 80, the Motor Operating Valve Protection (MOV), and the K-2 Gate Valve Device.

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

In addition to becoming a high-performance organization, top executives of Thailoil and Subsidiaries are fully committed to good governance, social and environmental

responsibilities, and sustainable development through business processes and various activities. These have earned Thailoil and Subsidiaries widespread acceptance from business and industry sectors.

Moreover, Thailoil and Subsidiaries are aware of and value the safety of employees, operators, and communities surrounding their operating sites. As a result, Thailoil's safety statistics maintained at the leading global position. Thailoil and Subsidiaries are fully confident that sustainable growth can be achieved only with parallel achievement on environment, community, and public development under good governance and ethical management.

This year's key sustainability projects included the "Café Amazon for Chance" Project at Laem Chabang Hospital under the operation of Sarn Palung Social Enterprise Co., Ltd.; "Bandith Rak Thin" (graduates love hometown) Scholarship Project; the Trauma and Emergency Building of Laem Chabang Hospital; "CONNEXT ED" leadership development project under the Pracharath Project, which includes STEM training activities, Light for a Better Life project, and first-aid training to cultivate knowledge for children.

Thailoil and Subsidiaries are determined to apply their expertise and skills in energy leadership accrued over half a century, coupled with operational and corporate governance excellence as well as responsibility for society, environment, and communities, and creation of stakeholders' utmost satisfaction, to strengthen the businesses for the better of the Thai society and the public as a whole.

All of the above achievements and strong commitments awarded Thailoil and Subsidiaries numerous recognitions given by many international leading organizations as shown under "Milestones of 2018".

MILESTONES OF 2018

02

FEBRUARY

RobecoSAM Sustainability Award 2018

Thaioil proudly maintained its Gold Class position for the fifth consecutive year in the Oil & Gas Refining & Marketing Industry from RobecoSAM Sustainability Award 2018. Compared to all invited companies in the same category, Thaioil was the only company ranked with the highest score.



Successful Inter-Company Loan Restructuring

TOP SPP Co., Ltd. successfully completed the refinancing of a Thaioil and Subsidiaries' inter-company loan worth THB 8.5 billion, so that it is consistent with the electricity business structure. This was to increase the efficiency of funding and loaning capital, after the completion of power plant construction, as well as funding preparation for Thaioil and Subsidiaries to support its future projects.



Successful TOP Solvent (Vietnam) LLC. Fund Acquisition

TOP Solvent (Vietnam) LLC. successfully entered into long-term loan agreement with Siam Commercial Bank Plc, Ho Chi Minh City Branch, amount approximately USD 13.7 million with ten-year tenor to invest in the construction of a Solvent Distribution Center in Vietnam. This loan agreement was considered the first long-term agreement of Thaioil and Subsidiaries in Vietnam.

03

MARCH

Labix's Official Introduction of New Products

Labix Co., Ltd. inaugurated sales of two new solvent products, namely 3040WC and WS3060. The 3040WC is used in the thinner, natural rubber, and bitumen industry; whereas the WS3060 is used as solvent for the mining industry.

Executive of the Year Award 2018 - Energy

Mr. Atikom Terbsiri, Chief Executive Officer and President, was honored with an Executive of the Year Award 2018 - Energy in the "Million Seeds of Virtue in Gratitude of the Land" Project, organized by the Foundation for Thai Society in collaboration with the Local Development Institute. These awards are recognitions for those who successfully led organizations and demonstrated visible dedication in creating maximum benefit for economic, social, political, and national development.



Thailand ICT Excellence Awards 2018

Thaioil received an Outstanding Business Enabler Project Award at the Thailand ICT Excellence Awards 2018 through the submission of TOP Data Communication Center (TOP DCC) Project. The TOP DCC is an automated system for dissemination of sales data between Thaioil and customers to timely meet their demands. Additionally, the TOP DCC is a pilot project toward future commercial excellence.



04

APRIL



The 2018 Annual General Meeting of Shareholders (AGM)

Thaioil held its 2018 AGM on April 11, 2018, which was very well attended by shareholders. Performance results, business plans, and business status were fully reported, and detailed questions were well addressed. Shareholders actively participated in decision-making on important issues apart from the Board of Directors' authorizations. This reflected operating transparency and bolstering shareholders' confidence alike.

Environmental Governance Award 2017

Sak Chaisidhi Co., Ltd. received the Environmental Governance Award in the category of "Green Star Award" and "Gold Star Award", presented by the Industrial Estate Authority of Thailand to organizations that had maintained outstanding governance for six years consecutively.

05

MAY



Best Cash Management Solution Award

Thaioil and Siam Commercial Bank Plc jointly received the Best Cash Management Solution Award, presented by the Asset Magazine, a leading financial and investment magazine in Southeast Asia at the Asset Triple A Treasury, Trade, Supply Chain and Risk Management Awards 2018.

06

JUNE



Asia's Best CEO Award and Best IR Award

Thaioil received two excellence awards from the Asian Excellence Award 2018, organized by Corporate Governance Asia, a leading publication of Hong Kong and Asia as follows:

- >> Asia's Best CEO - Investor Relations Award for the second consecutive year, determined from selected corporate CEOs who efficiently managed business operations, toward sustainable growth, in parallel with the execution of fair treatment of all stakeholders; thus leading to become a reliable organization, widely accepted nationally and internationally.
- >> Best Investor Relations by Company Award for the fifth consecutive year, based on outstanding performance on investor relations, including transparent information disclosure and equitable treatment of all stakeholders.



Successful Liability Management

Thaioil and Thaioil Treasury Center Co., Ltd. succeeded in Liability Management by issuing foreign debentures to repay existing foreign loans under the Global Medium-Term Note (GMTN) program, the most efficient loan program for Thaioil and Subsidiaries in cost and availability for operations and business growth in the future.

07

JULY

The Asset Asian Awards 2018

Thaioil and Subsidiaries were honored with two awards at the Asset Asian Awards 2018:

- >> Thaioil and TOP SPP Co., Ltd. received The Asset Triple A Asia Infrastructure Awards 2018 under the Power Deal of the Year Thailand category, for their efforts in the completion of their inter-company loan refinancing worth THB 8.5 billion, echoing Thaioil and Subsidiaries' capability to integrate business management and financial acumen for stability.
- >> Thaioil received The Asset Triple A Asia Infrastructure Awards for 2018 under the Power Deal of the Year-Highly Commended Thailand category, for its role, as a shareholder, by issuing debentures worth THB 5 billion for Global Power Synergy Plc. This issuance at the right time enabled efficient management of the cost of funds.

2018 Shareholders' Site Visit Program

Thaioil organized shareholders' site visits twice this year on July 2 and 4, each with 100 participants. The site visit is an annual program developed to promote in-depth understanding of Thaioil and Subsidiaries' business and enhance confidence for the investment, echoing operating transparency and executives' vision toward sustainable growth.



Money & Banking Awards 2018

Thaioil was voted as the Best Public Company of the Year 2018 - Resources Group at the Money & Banking Awards 2018, organized by the Money & Banking magazine. The acclaim was given to listed companies with excellent overall performance this year against four criteria: market capitalization, profitability, returns on investment, and investment liquidity.

08

AUGUST

Extraordinary General Meeting of Shareholders No. 1/2018

Thaioil held the Extraordinary General Meeting of Shareholders No. 1/2018 on August 27, 2018 to consider and approve the Clean Fuel Project (CFP), which considered as an asset acquisition.



CSR-DIW Continuous Award 2018

For the 11th year, Thaioil was honored with a “CSR-DIW Continuous Award” in 2018 by the Department of Industrial Works for the promotion of CSR and sustainable businesses with local communities. The award reflects Thaioil’s consistent and continuous demonstration of high performance in CSR for society, communities, and stakeholders, in accordance with Department of Industrial Works’ criteria.

PTT Group CG Day 2018

Thaioil, synergizing with PTT Group, organized the 10th PTT Group CG Day under the theme, “Born to Be Real”, which utilized digital technology in its communication process. This event designed to promote and encourage executives and employees to apply corporate governance principles to their operations. It reflected the “true nature” of PTT Group with determination to develop into a CG 4.0 entity under the national strategy. PTT Group CG Day has been annually organized by companies within PTT Group.



09

SEPTEMBER

Alpha Southeast Asia's
12th Annual Best FI Awards and
8th Annual Corporate-II Awards 2018

For the seventh consecutive year, Thaioil was recognized with a “Strongest Commitment to Sustainable Energy in Southeast Asia Award”, organized by Alpha Southeast Asia Magazine during its 12th Annual Best FI Awards & 8th Annual Corporate-II Awards 2018. In addition, two national level awards were granted, including:

- >> Best Senior Management IR Support
- >> Best Strategic Corporate Social Responsibility for five years consecutively.



10

OCTOBER

Certificate of Honor on Greenhouse Gas Emission Reduction under TGO's 2018 "Roi Duangjai Ruam Jai Lod Lok Ron" Campaign

Thaioil earned a certificate of honor under the Low Emission Support Scheme (LESS) at the 2018 "Roi Duangjai Ruam Jai Lod Lok Ron" (One Heart Combat Global Warming) campaign, organized by Thailand Greenhouse Gas Management Organization (Public Organization) (TGO). The certificate was given to exemplary business entities.



Sixth Consecutive Year Certified DJSI Membership

Thaioil successfully maintained its membership certification of Dow Jones Sustainability Indices (DJSI) by RobecoSAM, an official assessor of DJSI. The 2018 certification honored Thaioil with Oil & Gas Refining & Marketing Industrial Group of the Emerging Markets Membership for the sixth consecutive year. This certification bolstered international confidence in Thaioil's business operations efficiency under an unfavorable global economy by maximizing benefit for all stakeholders through the framework of good governance and sustainable business development.

MEMBER OF
Dow Jones Sustainability Indices
In Collaboration with RobecoSAM

SET Sustainability Awards 2018 and Thailand Sustainability Investment (THSI) Recognition

Thaioil was honored with two sustainability awards at the SET Sustainability Awards 2018 event, hosted by SET as follows:

- >> Sustainability Awards of Honor, the most outstanding award presented only to a company continuously winning the sustainability awards and selected only from a group of outstanding listed companies with leading sustainable business conduct
- >> Thailand Sustainability Investment (THSI) Awards 2018, granted only to listed companies chosen in THSI 2018, known as "Sustainable Stocks". The screening was done by SET under international standards. Investors perceive shares of these companies as high in quality with long-term high returns

Interim Dividend Payment

On September 28, 2018, Thaioil paid the 2018 interim dividend of 1.50 Baht per share for 2,040,027,873 shares, totaling THB 3.06 billion.



11

NOVEMBER

TOP ASEAN PLCs Award

Thaioil was recognized as “TOP ASEAN PLCs (TOP 11 - 30)” at the 2nd ASEAN Corporate Governance Award 2018, which honored listed companies in the ASEAN region for its commitment to continuously implementing good corporate governance principles in business.

SET Awards 2018

Thaioil received three awards at the SET Awards 2018, an event organized by SET and the Money & Banking magazine, as follows:

- >> Best Company Performance Awards of listed companies with more than THB 100 billion market capitalization
- >> Outstanding CEO Awards
- >> Outstanding Investor Relations Awards



Thailand Corporate Excellence Awards 2018

Thailand Business Management Association and Sasin Graduate Institute of Business Administration of Chulalongkorn University honored Thaioil with an Outstanding Award for Leadership Excellence at the Thailand Corporate Excellence Awards 2018. In addition, Thaioil won an Outstanding Award for Sustainable Development/ CSR Excellence for the second consecutive year.



Best Energy Corporate Governance - Thailand 2018

Thaioil was honored as the Best Energy Corporate Governance - Thailand 2018, from the UK's Capital Finance International (cfi.co) magazine. The award echoed Thaioil as a company with outstanding business practices and internationally-accepted corporate governance practices.

Issuance and Offering of 1-Billion-USD Debentures

Thaioil Treasury Center Co., Ltd. issued and offered unsecured and unsubordinated debentures to foreign institutional investors, in which Thaioil was the guarantor for a total amount of USD 1 billion, divided into 10-year debentures worth USD 400 million carrying a coupon of 4.625% p.a. and 30-year debentures worth USD 600 million carrying a coupon of 5.375% p.a. Such issuance and offering was completed on November 20, 2018.

12

DECEMBER

Board Visit and Monitoring of Key Projects

The Board of Directors (the Board) visited Thailoil and Subsidiaries to monitor the progress of key investment projects, including the Clean Fuel Project (CFP), TOP Crude Oil Tank Project, Jetty Expansion Project, and Thailoil Sriracha Buildings Project. The Board was welcomed by Thailoil's executives team.



IR Magazine Awards & Conference-South East Asia 2018

Thailoil received a "Best IR in Energy Sector-South East Asia" at the IR Magazine Awards & Conference - South East Asia 2018, hosted by IR Magazine, an international media house providing information and knowledge, as well as research on investor relations.

The 2018 Sustainability Report Award

Thailoil obtained the 2018 Best Sustainability Report Award at the Sustainability Report Award 2018, an annual event organized by the CSR Club of Thai Listed Companies Association (TLCA) and co-sponsored by SEC, SET, and Thaipat Institute. The award promoted the enhancement of practices of transparent disclosure and completeness of information.



Awards/Certificates in 2018



01. Dow Jones Sustainability Indices (DJSI) 2018 Membership Certificate (6th Consecutive Year) in Oil & Gas Refining and Marketing Industrial Group of the Emerging Markets
02. Gold Class Certificate from RobecoSAM Sustainability Award 2018 in Oil & Gas Refining & Marketing Industry for the fifth consecutive year
03. Best Company Performance Award, Outstanding CEO Award, and Outstanding Investor Relations Award from SET Awards 2018
04. Sustainability Award of Honor and Thailand Sustainability Investment Award (THSI) from SET Sustainability Awards 2018
05. The "TOP ASEAN PLCs (TOP 11 - 30)" at the 2nd ASEAN Corporate Governance Awards 2018
06. Outstanding Award for Leadership Excellence and Outstanding Award for Sustainable Development/CSR Excellence at the Thailand Corporate Excellence Awards 2018
07. The Best Energy Corporate Governance - Thailand 2018 Award from the UK's Capital Finance International (cfi.co) magazine
08. The Strongest Commitment to Sustainable Energy in Southeast Asia Award from Alpha Southeast Asia Magazine
09. Best Public Company of the Year 2018 Award, Resources Group, at the Money & Banking Awards 2018, organized by the Money & Banking magazine
10. The 2018 Best Sustainability Report Award at the Sustainability Report Awards 2018
11. Executive of the Year 2018 Award in Energy industry in the "Million Seeds of Virtue in Gratitude of the Land" Project
12. Two Asset Triple A Asia Infrastructure Awards 2018 under the Power Deal of the Year Thailand category and under the Power Deal of the Year-Highly Commended Thailand category from the Asset Asian Awards 2018
13. Outstanding Business Enabler Project Award at the Thailand ICT Excellence Awards 2018

MARKET REVIEW 2018 AND MARKET OUTLOOK

Market Review 2018

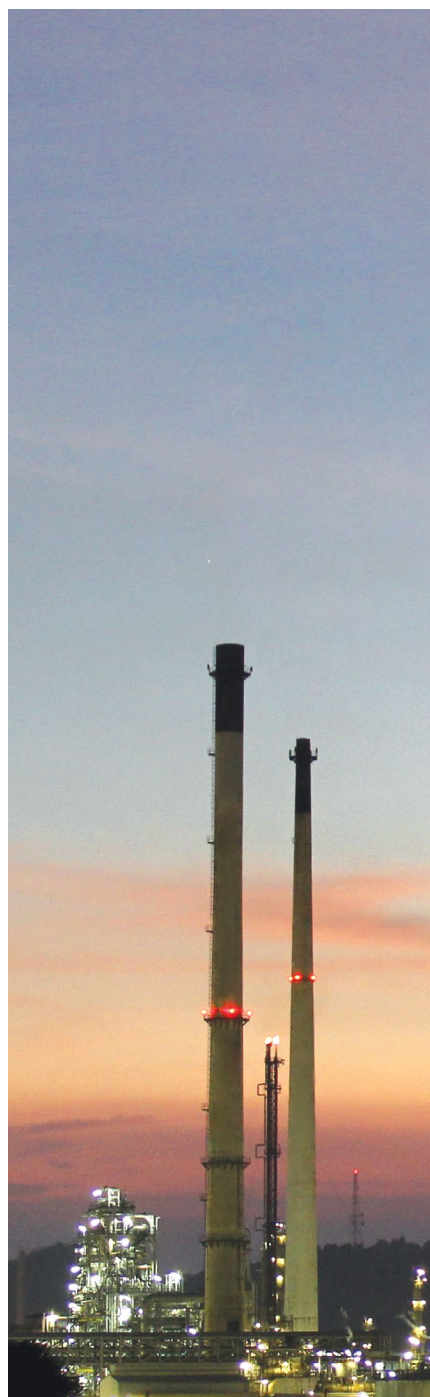
Global Market and Economic Review

In 2018 October Report, the International Monetary Fund (IMF) projected 2018 world economic growth at 3.7 percent, or maintaining at a high level of 2017 economic growth at 3.7 percent. The main driver was the continuous growth of the emerging economies at 4.7 percent - particularly from India's economy, where the growth a phenomenally increased more than 7.3 percent, due to higher domestic investment and private consumption. Brazil's economy also expanded more than 2.4 percent, driven by higher private consumption. Middle-East economic growth was higher following the oil price recovery and higher non-oil investment in Saudi Arabia. China, on the other hand, has been facing an economic slowdown affected by the ongoing US-China trade war and economic structural reform to shift from export-oriented and offshore direct investment toward domestic consumption.

The group of advanced economies recorded a decent growth rate of 2.4 percent, slightly higher than 2017 economic growth at 2.3 percent. This higher growth rate was supported by economic expansion of more than 2.9 percent in the US after several stimulus programs. However, the Federal Reserve Bank (Fed) started implementing contractionary fiscal policy, after four interest rate hikes, resulting 2018 federal funds rate at 2.5 percent.

Crude Oil and Refining Industry

The 2018 average crude price was approximately 69.7 USD per barrel, rising from 53.1 USD per barrel in 2017, due to continuous production cuts by both OPEC and non-OPEC countries, from early 2017 to May 2018 and leading to a crude oil shortage. The rising crude oil price was also supported by Iran and Libya's lower production and exports. Iran's production and export cut resulted from the economic sanctions imposed by the US starting from November 2018. Later, OPEC and non-OPEC countries reached the agreement in June 2018 to raise oil production by 1 million barrels per day, leading to sudden pressure on crude oil price in Q4/2018. This is to



compensate the reduction of export after Iran's economic sanctions. Additionally, the US oil production increased from around 10 million barrels per day in early 2018 to around 11.7 million barrels per day in November 2018. Moreover, the US announced temporary waivers for eight countries importing crude oil from Iran during the first 180 days after the reimposing of all Iran sanctions. The US-China trade war also put pressure on crude oil demand, evident in the lowering of 2018 crude demand projection by International Energy Agency (IEA) from 1.4 to 1.3 million barrels per day.

The 2018 refining industry slowed down from the previous year, affected by increasing crude oil price, and a global gasoline oversupply following refinery's increase of production to address higher diesel and jet fuel demand. In addition, the increase of light crude oil supply led to more gasoline output; on the other hand, the gasoline demand decreased following the raise of crude oil price. The diesel and jet fuel market improved from the previous year due to higher demand following global economic growth.

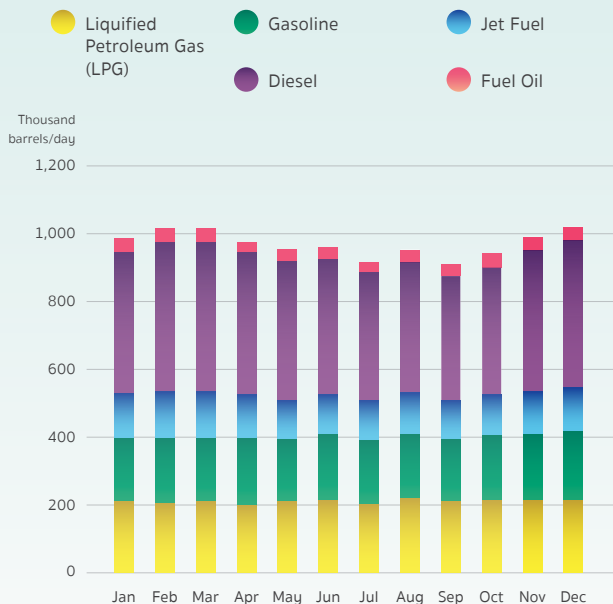
Domestic Market for Petroleum Products

The Office of National Economic and Social Development Board (NESDB) estimated Thailand's 2018 economic growth at 4.2 percent - higher than the 3.9 percent in 2017 - derived from higher export to all major export markets in nearly all categories of goods, in line with continuously higher demand in all international markets following the global trade recovery. Tourism sector also contributed to Thailand's 2018 economic growth, evident in higher revenue from foreign tourists especially from China, ASEAN and European countries. It was estimated that 38 million tourists would have visited Thailand, equivalent to 7 percent increase from 35.5 million tourists

in 2017. Moreover, the export automotive parts and spare, petroleum products, and agricultural products increased, as well as private consumption especially automobile sales, rising from 871,650 in 2017 to 1,039,158 units (accumulated from January-December 2018), equivalent to 19.2 percent increase. This contributed to Thailand's economic growth.

Although the retail prices of petroleum products were highly volatile following global market movements, the domestic demand for petroleum products expanded at 2.6 percent following economic growth especially in the tourism industry. Gasoline consumption increase to 3.3 percent, particularly for gasohol 95 due to a lower

Domestic Demand for Petroleum Product,
January-December 2018



Source : Department of Energy Business (DOEB), Ministry of Energy

price gap between gasohol 95 and gasohol 91. The demand for gasohol E85 increased due to a wider price gap between gasohol E20 and gasohol E85. The demand for diesel also increased by 1.5 percent following the economic growth. More flights to accommodate higher tourist arrivals – especially from China and the EU – led to higher demand for jet fuel by 5.4 percent. The demand for fuel oil went up by 4.5 percent supported by bunker fuel growth although the demand for fuel oil in the industrial and power generation sectors continued to drop.

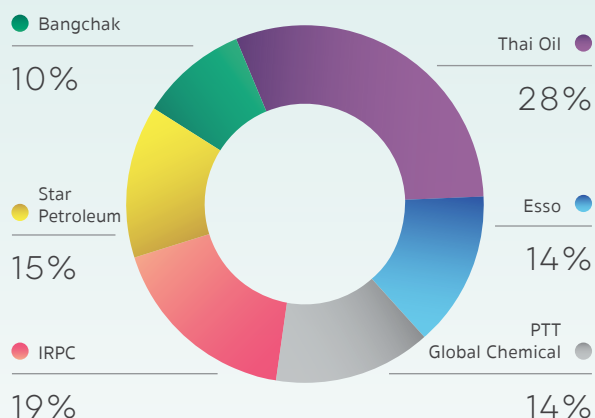
Average domestic refining output was 1,058,845 barrels per day during January to December 2018, an increase from 1,021,450 barrels per day in 2017 due to fewer

annual shutdowns compared to previous year. Thail's domestic market share was the largest at 28 percent.

Aromatics Market

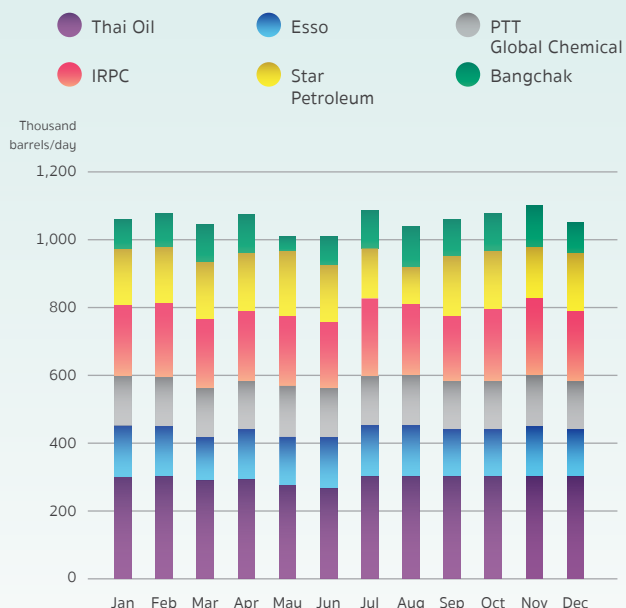
The 2018 paraxylene market improved from the previous year due to higher demand resulting from China's ban on plastic waste for recycling import first implemented in 2018 along with the continuously higher demand for polyester used in textiles. This led to 2018 projection of demand for paraxylene increase at 4.0 million tons per year while the supply growth at only 2.2 million tons per year. Moreover, the two new paraxylene plants that start operating in 2018, were unable to perform their maximum capacity due to technical problems, resulting in supply

Share of Refining Output
January-December 2018



Source : Department of Energy Business (DOEB), Ministry of Energy

Domestic Refinery Production
January-December 2018



Source : Department of Energy Business (DOEB), Ministry of Energy

shortage in Q3/2108 and paraxylene market growth in 2018. The aforementioned new paraxylene plants involved Saudi Arabia plant with capacity of 1,340,000 tons per year, operating in April 2018, and Vietnam plant with capacity of 700,000 tons per year, operating in July 2018.

The benzene market softened in 2018 compared to 2017 despite higher crude prices and higher demand for benzene at 1.6 million tons per year compared to benzene supply growth at 1.3 million tons per year. This was due to the US-China trade war causing a slowdown of downstream products including plastic and styrene monomer, particularly in the latter half of 2018. Moreover, because of an oversupply of benzene following accelerated paraxylene production by aromatics plants to offset the shortfall caused by Saudi Arabia and Vietnam paraxylene plants failing to perform their maximum capacity, the benzene market weakened considerably in the Q3/2018-Q4/2018. At the same time, lower benzene imports from China due to high inventory of domestic benzene, and lower demand for styrene monomers and phenol caused by Saudi Arabia and Vietnam's new benzene capacity, diverting from projection, contributed to slow recovery of benzene market.

Lube Base Oil and Bitumen Market

The lube base oil market weakened in 2018 from 2017 due to the higher pressure from additional supply in the Asian region. The additional supply involved Saudi Arabia's Luberef with the Group II lube base oil capacity of 720,000 tons a year commissioning in March 2018; Bright Stock's production expansion of 170,000 tons per year in August 2018; the resumption from maintenance of Japan's TonenGeneral in April 2018 with the capacity of 360,000 tons per year after the fire hazard incident in January 2017; and the supply increase of the Group II and Group III lube base oil in China. At the same time, the overall supply loss from plant shutdowns during 2018 totaled 1,484,000 tons, decreased from 2,166,000 tons in 2017, pressuring lube base oil market with oversupply. Moreover, the global demand growth for lube base oil dropped from 0.5 percent in 2017 to 0.3 percent in 2018 due to declining vehicle use caused by higher crude oil price.

For bitumen market, even though the price increased following higher crude oil price, and the supply in Malaysia dropped in July 2018 due to a refinery's fire hazard of petroleum tanks, the Asian bitumen market in 2018 soften compared to the previous year. Another reason why bitumen supply dropped was that some





producers in Singapore, South Korea, and Thailand increased the production of fuel oil instead, due to much wider gap between fuel oil and crude oil price for Q3/2018 onwards. However, the bitumen demand in the region slightly increased due to an economic slowdown especially that of China. The year-round inclement weather especially the heavy storm over a lay period in Indonesia pressured the demand for bitumen for road construction, while overall bitumen inventory was still in a high level. This evidently softened the bitumen market in 2018.

Linear Alkyl Benzene (LAB) Market

The 2018 Linear Alkyl Benzene (LAB) market grew from 2017. This was supported by higher crude oil price, especially during Q3/2018 to early Q4/2018 when the crude oil price increased significantly, while the Asian

regional demand grew in line with economic and population growth. The LAB market growth was also supported by no new capacity in the region while supplies from India and South Korea shrunk after increased plant shutdowns. Nevertheless, the average spread between LAB and feedstock became narrower compared to previous year due to significantly weakening currencies after the US Fed fund rate increase. This led to India's limitation of LAB import growth despite the fact that India is one of the major LAB importers in the region.

Solvent Market

Despite the domestic economic recovery led by tourism and service industry growth, the 2018 solvent market remained stagnant due to oversupply in real estate sector, and a slowdown in automotive industry. The demand growth of residential and industrial painting

as well as other solvent products declined; while the Chinese government launched an anti-dumping policy against certain solvent products to support their own solvent producers, leading to lower solvent imports into China with a resulting drop in exports from China. This resulted in both Chinese and non-Chinese producers exporting more to the ASEAN market instead leading to many new distributors or importer. At the same time, the increasingly harsh competitiveness has diminished some leading companies' capability and role to strive in the business. Moreover, some producers were forced to reduce their production due to lower domestic and regional demand. However, Sak Chaisidhi Co., Ltd., a Thaioil subsidiary producing hydrocarbon solvent product group, successfully managed to maintain its production while able to introduce new products for petrochemical industry substituting the lower amount of other products.

The lower-than-expected demand for industrial-grade solvent resulted in an oversupply, causing local producers of toluene-xylene-white spirit (TXW) to lower their production and domestic sales, and to export more to balance supply and demand.

With the aforementioned factors, domestic and international price competition of solvent products became more violent and intense than in 2017, especially in the last quarter of the year 2018, when domestic economic growth apparently weakened. This was evident in a slowdown in the tourism sector despite high season, especially Chinese tourist arrivals were lessened due to the insurgency in Southern Thailand. Moreover, the price of agricultural products such as rice, rubber, and palm remained flat. This lowered the consumption rate, importing the production sector and leading to a stagnant solvent market growth.

Petroleum Transportation Industry

The 2018 market of crude oil, petroleum and petrochemical products transportation began to recover from the previous year. This resulted from the recovering economic conditions as well as the lower petroleum product price. Moreover, the increase in imports of neighboring countries led to higher demand for petroleum and petrochemical products transportation. However, freight rates for very large crude carrier (VLCC) dropped in the early 2018 due to a new supply in the market. These freight rates, however, were still higher than that in late 2017. The reason of which is that US has imposed economic sanctions on Iran causing higher inventory in Iran. In addition, some VLCCs were out of operation and sold as scrap, since the installation of equipment required by International Maritime Organization (IMO) standards, was not worth the investment. On the other hand, the demand for crew boats to support crude oil exploration and production remained continuously low after the announcement of Thailand's 21st petroleum concession was postponed to late 2018, resulting in lower demand for offshore supporting vessels as well as crew boats.

Ethanol Market

Thailand's 2018 ethanol demand for gasohol production continued to rise to 4.2 million liters a day - a 5.6 percent increase from 2017 - in line with the continuously increasing demand for gasoline following the consumer-satisfied price of petroleum product, contributed by crude oil price remaining low and state-driven incentivized measures, relating to the price gap among gasohol of various grades. More E20 and E85-compatible vehicle models, and increasing number of gas stations, selling E20 and E85 were also factors, supporting higher ethanol consumption.

The domestic supply of ethanol was surplus. The reason was that the 2018 inventory increased to 68.1 percent compared to 2017. In addition, the ethanol production from molasses increased, due to lower molasses prices which was caused by a hike of sugar cane amount in milling process at 135 million tons, 45.2 percent higher than that in 2017. This was due to a proper rainfall yielding a number of sugar cane.

The 2018 ethanol price decreased slightly from 2017 since the demand was able to maintain its level despite the oversupply. Nevertheless, the ethanol price was pressured by the 40.4 percent increase of molasses which is used to produce ethanol.

Power Industry

Driven by economic growth particularly from tourism, exports, and private investments, 2018 total power consumption increased from that of 2017.

The total domestic power installed in 2018 was capacity at 43,433.25 megawatts (MW): 37.87 percent of which was from the Electricity Generating Authority of Thailand (EGAT) and the remaining 62.13 percent from other producers, with 20.02 percent of the total capacity from private small power producers (SPPs). However, the actual total generating capacity from EGAT accounted to 34.06 percent while the remaining 65.94 percent purchased from private power producers. Natural gas remained the major source of power generation, and the domestic peak power consumption in 2018 was recorded in April at 34,317 MW.

2019 Market Outlook

Global Market and Economic Review

The IMF has projected 2019 global economic growth at 3.65 percent (published in October 2018 report). This results from economic growth in both developed and developing countries. The advanced economies are expected to grow by 2.1 percent from 2018 due to the US continuous economic growth, supported by increasing domestic consumption following the expansion of labor market and higher private investments. On the other hand, the developing economies are projected to grow by 4.7 percent from 2018, especially India, where economic growth is expected to exceed 7.4 percent after a series of economic measures to continuously incentivize domestic investments amid consistently growing domestic private consumption. Nevertheless, China's economic growth rate is expected to slow down from 6.6 percent in 2018 to 6.2 percent in 2019, following macro economic restructuring shifting from industrial investments and exports to higher domestic consumption.

Risks posed on 2019 economic growth are projected as follows: 1) the ongoing US-China trade war despite some progress in negotiations; 2) the tightening money markets from possible higher interest rate following the continuous Fed fund rate hikes; and 3) geopolitical conflicts, particularly in the Korean Peninsula and the Middle East.

Crude Oil and Refining Industry

Crude Oil Market

The average Dubai crude oil price is expected at 55-65 USD per barrel supported by the strong demand growth of 1.4 million barrels per day as forecasted in the IEA November 2018 report following steady global economic growth. The crude oil supply is projected to increase with

a limited rate, after both OPEC and non-OPEC producers have agreed on production cut during the first half of the year 2019 totaling 1.2 million barrels per day, to help stabilize the crude oil price. This agreement, however, exempts Iran, Venezuela, and Libya due to their internal political instability. Even though eight countries were granted temporary waivers allowing them to import crude oil from Iran during the first 180 days after Iran had been imposed with US economic sanctions since November 2018, production and export of crude oil from Iran has continuously decreased. Moreover, Canada has reduced their production by 0.3 million barrels per day, or 8.7 percent of their total production capacity, until its inventory is reduced to a level consistent with the capacity of its crude pipeline system, followed by a continuous production decrease of 0.1 million barrels per day until end of 2019. These production cuts gradually help increase the crude oil price.

Nevertheless, the 2019 crude oil price still has to constantly face risk factors. Firstly, the US production capacity is expected to increase by more than 1.2 million barrels per day after four projects of oil pipeline connecting the Permian basin to the Gulf of Mexico complete in the latter half of 2019, raising the pipeline capacity from 3.3 to 4.4 million barrels per day. Secondly, OPEC and non-OPEC producers may opt not to extend the production cut period beyond the end of the existing agreement in June 2019, leading to a hike of the total global crude oil production. Finally, the crude oil demand is likely to be less than projected due to the uncertain global economy and impacts from the ongoing US-China trade war despite progress in negotiations, exacerbated by the continuous US Fed funds rate increases causing a slowdown of US consumption and investment.

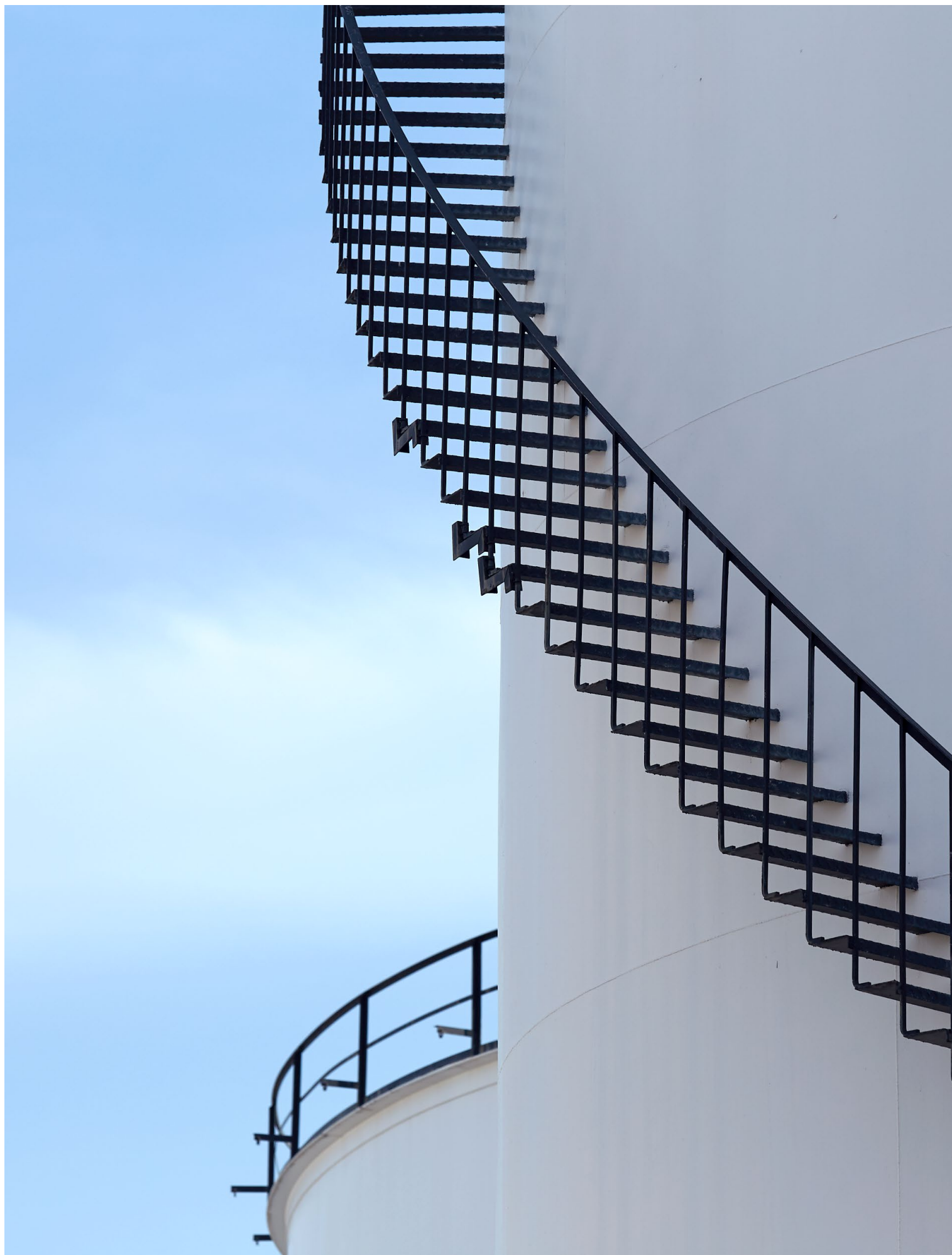
Refining Market

According to the IEA November 2018 report, the 2019 refining market is projected to grow with support from the demand growth of petroleum products at 1.4 million barrels per day - higher than the estimated global new net capacity of 0.8 million barrels per day. The 2019 new refining capacity comes from Malaysia, China, and Saudi Arabia's refineries, which are expected to start commissioning in Q2/2019, Q3/2019, and Q4/2019 respectively. The demand for petroleum products is projected to increase supported by higher demand for diesel and jet fuel corresponding to the global economic growth. Moreover, the spread of diesel and jet fuel over crude oil is to constantly increase due to the enforcement of IMO new convention effective from January 2020, leading to higher demand for diesel (bunker fuel) by the late 2019. However, the gasoline market is expected to be pressured by the supply which is increased more than that of demand. Moreover, the fuel oil market is expected to slow down due to the IMO's new convention enforcement as well.

Domestic Market for Petroleum Products

In November 2018, NESDB projected Thailand's 2019 economic growth at 4.2 percent based on expanded household consumption, higher public and private investments, and tourism growth. However, the growth of such major economic driver as export is expected to slow down at 4.6 percent and import growth at 6.5 percent.

The petroleum consumption in 2019 is expected to grow at 2.4 percent, a slowdown from 2018 growth of 3.4 percent. Considering the demand for each type of petroleum product, the growth of gasoline, diesel, jet fuel, and



fuel oil is expected at 3.8, 3.1, 3.7, and 0.6 percent respectively. While LPG consumption is projected a 1.1 percent negative growth.

Aromatics Market

The 2019 paraxylene market is to be pressured by additional supplies from several new Asian production plants: Fujian Fuhai Line 2 in China (capacity of 800,000 tons per year), Hengli in China (capacity of 2,250,000 tons per year); PetroRabigh plant in Saudi Arabia (capacity of 1,340,000 tons per year); Nhgi Son plant in Vietnam (capacity of 700,000 tons per year); TPPI plant in Indonesia ((capacity of 550,000 tons per year). The latter three plants have started operating in 2018 and are expected to produce more constantly in 2019. From a global perspective, the effective paraxylene production capacity in 2019 is to increase by 3.3 million tons per year, while global demand is projected to grow by 1.4 million tons, leading to a negative growth from 88% in 2018 to 87% in 2019.

The 2019 benzene market is expected to weaken, with an increase of total capacity of 1.2 million tons from all the new plants commissioning in 2018 continuing to operate at full capacity during 2019. Additional production is to come from China and South Korea, including Hengli plant (capacity of 650,000 tons per year) and Fujian Fuhai Line 2 (capacity of 115,000 tons per year). Meanwhile, demand for benzene is likely to grow by 1.5 million tons, slightly higher than the total additional supply. The US-China trade war, however, could significantly affect decisions to trade benzene and other downstream products cross-continent. Moreover, the hike of paraxylene spread over feedstock in Q3/2018 and Q4/2018, causing producers to increase the production which leads to the

oversupply of benzene (derived from paraxylene production process), driving the market to become sluggish. It takes months to manage the oversupply and to stabilize the market. In addition, only two new downstream plants in China and South Korea, producing such downstream product as styrene monomer, are to be commissioned in 2019, with a total capacity of 280,000 tons per year. These new plants can slightly support the growth of the benzene market.

Lube Base Oil and Bitumen Market

The 2019 lube base oil market is projected to be on a par with 2018. This results from higher supply by Group II and Group III lube base oil plants (total capacity of 3.4 million tons per year), comprising of Hengli (capacity of 600,000 tons per year); ExxonMobil (capacity of 500,000 tons per year); Lub-rref Bangladesh (capacity of 50,000 tons per year); and Hainan (capacity of 1 million tons per year). This additional supply inevitably leads to more competitive pricing. However, the demand for lube base oil continues to increase following global economic growth. The global consumption of Group I lube base oil is expected expand to 40 percent of overall lube base oil consumption. Most of the lube base oil demand comes from heavy machine industry and marine transportation industry.

The 2019 bitumen market is projected to remain stable from 2018 due to the additional supply expected at the end of the year. Affected by the enforcement of the new IMO convention certain fuel oil producers are likely to shift their production to bitumen instead resulting in more supply. However, the bitumen demand is projected to increase, following each country's development plan with the focus on infrastructure and utility development

including the road construction and repair.

Linear Alkyl Benzene (LAB) Market

The 2019 LAB market is projected to grow in line with the global economic growth and continuously increasing population - more people, more detergent consumption. Without additional plants in the near future, the demand for LAB in the Asian and Middle East regions is projected to continually grow.

Solvent Market

The Bank of Thailand and economic research centers agree on the projection of Thailand's 2019 domestic economic growth resulting from higher public and private investment. The solvent market can be described by product group as follows:

>> Similar to 2018 situation, the 2019 hydrocarbon solvent (HCS) market is expected surplus from East Asian countries including China, South Korea, Japan, and Taiwan. With the ongoing US-China trade war, Chinese exports are likely to flow into the ASEAN countries to compensate the export to the US, causing higher competition in the market. Greater production capacities from South Korea, Japan, and Taiwan since late 2018 has also driven the market into oversupply and affected the prices of HCS solvents along with traders' profits. The markets in South Asia, the Middle East, and Africa depend vary with the feedstock price in European market. European raw material prices in 2018 were lower than that in East Asian countries, encouraging European traders to export to and compete with the East Asian traders. Moreover, the euro currency is weaker than the currency in some East Asian countries,

resulting in East Asian's more competitiveness against European traders. The Asian market can still maintain its attractiveness, with the impressive economic growth as seen in India, Indonesia, and Myanmar. Thus, industrial-grade HCS demand is expected to rise corresponding to each country's economic growth.

The 2019 domestic market is expected to experience greater price competition, due to the same demand as 2018 and increasing imports - especially from China, South Korea, and the US - caused by the US-China trade war. Some domestic HCS producers have expanded their production capacities, leading to an oversupply of some products. Furthermore, the domestic market price of some certain products are lower than the international market price due to higher supply over demand. Traders, thus, push for more exports of such products instead of domestic sales because of more profit and less price competition.

>> For the toluene-xylene-white spirit (TXW) market, the price competition has become less intense, resulting from the balance between demand and supply, successfully managed by domestic producers controlling the distribution volumes of toluene and xylene as in previous years. However, the paraxylene demand and supply in the world market pose impacts on the domestic market; when the paraxylene demand and price maintain at a high level, the toluene and xylene supply decreases. In 2019, it is expected that there will be more paraxylene production from China, Saudi Arabia, and Vietnam, leading to an increasing amount of toluene. However, China's economic slowdown results in lower demand for toluene. Therefore, instead of exporting to China, traders are likely to turn to other

markets, such as the ASEAN market, resulting in greater market competition.

- >> The chemical solvent (ChemSol) group is expected to face the oversupply, especially given the overflow from China. Many more producers from China have started trading negotiation with ASEAN traders. Also, there are traders newly entering into export business and ready to enter into annual trading contracts. This suggests that more Chinese exports are coming to ASEAN, leading to greater price competition in 2019 compared to previous year. Moreover, all Chinese exports have been supported by government tax subsidies to expand their international markets to replace the US market, as the US-China trade war can be more intense.
- >> For other products, including specialty and cleaning products, the market is projected to continuously grow - especially in the manufacturing industries of food ingredients, pharmaceuticals, and cosmetic ingredients. These industries are likely to enjoy more handsome growth rate than others. The food ingredient industry is considered Thailand's most significant export due to competitive strengths, including raw materials, labor, and processing technologies for agricultural products. With the government support for small and medium enterprises (SMEs) to become Smart Farmers and Smart SMEs, Future Food was created as one of the projects for SMEs. The concept is to understand future trend of food and be able to capture the market, shifting from raw-material export to high value-added food industry. The products of which include food for patients and the elderly; food base on religious requirements; functional food; or food for health. This food and supplement industry is expected

to grow by more than 5 percent; the major markets are ASEAN, Japan, and China, respectively.

Petroleum Transportation Industry

The 2019 market of crude oil, petroleum, and petrochemical products transportation - especially for small vessels - is projected to slow down due to several shutdowns of domestic refineries. However, the demand for these small vessels is expected to grow continuously in line with regional and global economic growth. Meanwhile, VLCC demand and supply have been balanced and stabilized. Therefore, VLCC freight rates are expected to maintain at the same high level as that in the late 2018, despite more new carriers entering the market. This is because the same number of carriers are to be out of operation due to the enforcement of IMO convention, relating to the use of low-sulphur fuel oil and the installation of the ballast water management system, not worth the investment for old vessels. Moreover, with the increased on US crude oil exports following higher crude oil prices, the market demand for VLCC is expected to increase. The announcement of Thailand's 21st Petroleum Concession leading to the decommission of existing rigs, as well as possible expansion of exploration and production, contribute to the gradual growth of crew boats.

Ethanol Market

The 2019 domestic demand for ethanol is projected to grow continuously, supported by the government policy encouraging the consumption of gasohol with higher proportion of ethanol by widening the price gap between gasohol 95 and gasohol E20, and between gasohol E20 and E85. The increasing number of gas stations selling gasohol E20 and E85 is another contributing factor driving domestic ethanol demand.

The domestic supply of ethanol is projected to rise from 5.59 million liters per day in 2018 to 6.08 million liters per day in 2019. The increase resulted from two new cassava-based ethanol production plants with a combined capacity of 0.39 million liters per day, and one new molasses-based plant with a production capacity of 0.10 million liters per day.

The 2019 ethanol price is expected to decline due to the remaining low price of molasses following the movement of raw sugar prices in the world market, and the high domestic inventory of molasses. The cassava price is also expected to decline, compared to previous year, due to higher supply which is caused by farmer growing more cassava during the price-souring period. In addition, the

tight cassava supply in neighboring countries is expected to resolve, leading to higher cassava supply in the region.

Power Market

The domestic demand for power is projected to continuously grow in 2019. The new investment of SPPs 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.

The Ministry of Energy is developing the 2018-2037 master power development plan (PDP) to be in line with the changing power consumption. The 2018 PDP draft is expected to be promulgated in early 2019.

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



Total Refining Capacity
310,000
barrels/day

Production Process and Process Development

This year's total refining capacity of crude oil and other feedstock was 310,000 barrels per day, representing 113% the nameplate capacity. Meanwhile, Thai Lube Base Plc (TLB) and Thai Paraxylene Co., Ltd. (TPX) respectively commanded production capacities of 225,000 tons per year (or 84% of the nameplate capacity) and 745,000 tons per year (or 89% of the nameplate capacity). Producing precursors of cleaning agents, Labix Co., Ltd., produced 124,000 tons per year of Linear Alkyl Benzene (LAB) (or 104% of the nameplate capacity).

For overall optimization, Thaioil and Subsidiaries operated under a joint-production plan, with all activities during the year summarized as follows:

Thai Oil Plc

- >> Received a certificate of honor under the Low Emission Support Scheme (LESS) Project for its efforts on increasing energy efficiency and reducing greenhouse gas emission from Thailand Greenhouse Gas Management Organization (Public Organization)
- >> Improved productivity by implementing the profitability improvement project, cost management project (Orchestra Project) and cost of funds management

project (Symphony Project), resulting in a profit of 1.40 USD per barrel (equivalent to THB 5.234 billion in total revenue), substantially beyond the goal. Notable achievements included the identification and allocation of new crudes at suitable prices and qualities, process improvement, energy conservation, and oil loss improvement.

>> Implemented energy conservation and oil loss prevention by pursuing over 15 efficiency improvement projects, leading to energy saving of 17.8 MW, while successfully surpassing the Solomon's Energy Intensity Index target. The savings in energy cost totaled around THB 172 million a year. Outstanding moves included:

- Managed the efficiency of steam turbine power generation by increasing operating rate of higher-efficiency turbines and shutting down lower-efficiency ones;
- Adjusted the temperature for the reactor in the Continuous Catalyst Regeneration Platformer Units-1/2;
- Improved the cleaning procedure of sheet-type heat exchangers at the Crude Distillation Unit-3;
- Decreased the lighter-component extraction capacity of the Gasoil Hydrodesulphurization Units-2/3;
- Improved the efficiency of power generation with water fog sprays into the air intake of the gas turbine generator;
- Improved the efficiency of the furnace by reducing excess air at the furnace of the Sulfur Recovery Unit-5.

>> Shut down for maintenance and replaced catalysts at the Gasoil Hydrodesulphurization Unit-3 within a shorter timeframe, resulting in the catalysts lasting 25% longer

>> Shut down for maintenance of the Crude Distillation Unit-1 and the Fluidized Catalytic Cracking Unit, resulting in distillation efficiency improvement in product quality and energy conservation

>> Replaced catalysts in the Fluidized Catalytic Cracking Unit to produce more volumes of high-quality gasoline and reduce the coke generated on catalysts

>> Improved planning of heat exchanger cleaning at the Crude Distillation Units-1/2

>> Mixed anti-foulants with crude oil and applied at the Crude Distillation Unit-3 to sustain high efficiency of the heat exchangers, reduce fuel consumption at the furnace, reduce the frequency of heat exchangers cleaning, and increase the refining efficiency

>> Replaced catalysts at the Continuous Catalyst Regeneration Platformer Unit-1, resulting in more aromatics production and reduced energy consumption. In addition, new methods have been used simultaneously in catalysts replacement. Such methods have been used in ongoing production, resulting in no adversary impact on the efficiency of the operational availability.

>> Operated the Hydrocracking Unit-2 continuously through the year, resulting in full production efficiency and better operational availability than the plan. This is a result of deep bed filtration to trap small sediments before entering reactors since the date of catalyst replacement and top bed catalyst replacement in 2017.

>> Reduced the conversion of the Hydrocracking Unit-2 to increase hydrowax used as a feedstock for Fluidized Catalytic Cracking Unit, enabling the production unit to accept more deep-cut waxy from the High Vacuum Unit. This effort is considered cost reduction.

- >> Fed long residue into the High Vacuum Unit-2/3 all year long to increase the volume of feedstock of the Hydrocracking Unit-1/2, resulting in full production efficiency
- >> Selected and used appropriate refinery fuels, based on crude oil prices and the fuel price structure to consistently minimize energy costs
- >> Developed and implemented Terminal Automation Management (TAM), the innovation that has been firmly used commercially to create maximum satisfaction for customers and reduce the time spent on product distribution by the order checking system, with quick and accurate truck sequencing and truck location tracking
- >> Improved the process of mixing additives with gasoline and diesel fuel to meet customer satisfaction and increase domestic sale
- >> Proceeded with a project to fabricate five crude oil tanks for a total volume of 250 million liters for refining security and accommodation of rising domestic product sale. The construction is due for completion and service by 2019.
- >> Proceeded with the Jetty Expansion Project to ease the current congestion at the port, while enhancing product distribution capacity for bigger tanker sizes. The project is due for completion and commercialization by 2019.

Thai Lube Base Plc

- >> Purchased and used a new long residue that is more cost-effective, resulting in production cost reduction
- >> Produced more bitumen in special grade to meet the needs of domestic and international customers

- >> Studied on increasing energy efficiency and had a plan to improve production processes and saving more energy costs, to be realized in 2019.

Thai Paraxylene Co., Ltd.

- >> Increased production efficiency, resulting in 100.6% operational availability, beyond the goal. In addition, extended production time of the ED Sulfolane Unit, allowed postponement of the planned maintenance shutdown.
- >> Increased the utilization rate of aromatics from 83% in 2017 to 89% in 2018 by importing mixed xylenes and toluene, and starting the PxMax production unit to increase the output of paraxylene, which has a higher market value
- >> Duly adjusted the quantity of the extract used in the Parex unit, resulting in higher energy efficiency.

Labix Co., Ltd.

- >> Successfully commissioned production as planned and maintained 100% operational availability
- >> Successfully improved and controlled production processes to increasing the catalyst efficiency for longer service. As a result, the LAB yield increased.
- >> Continued implementing projects to lower energy consumption, including decreasing the distillation pressure of the kerosene unit and the stripper
- >> Purchased more n-Paraffin to increase the capacity of the precursor for LAB
- >> Improved the lorry loading station for distributing mollex raffinate, and began commercial production in March 2018.

Thaioil Power Co., Ltd.

- >> Successfully achieved a higher utilization rate of generators than planned
- >> Undertook planned maintenance of power plant machinery, including combustion chamber inspection and hot-gas path inspection for plant reliability and machinery efficiency at optimal levels. The effective maintenance planning contributed to its completion quicker than plan.
- >> Measured heat rates of gas turbine generators and regularly cleaned the compressors to maintain good fuel consumption per production rate, resulting in higher efficiency of gas turbine generators beyond the target
- >> Consistently controlled NO_x emission to lower than target. For environmental protection, the NO_x emission reduction target is continuously increased.

TOP SPP Co., Ltd.

- >> Achieved a higher utilization rate than planned and controlled the efficiency of gas turbines better than the goal
- >> Shut down gas turbine generators as planned to conduct combustion chamber inspection, a measure designed to ensure the reliability of gas turbine generators. The effective maintenance planning contributed to its completion quicker than plan.
- >> Managed the power and steam units for maximum results to meet customers' needs by improving the steam turbine generator of Project No. 2 to generate higher-pressure steam

- >> 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 the power generating units of both projects, commanded higher PES indices than expected. As a result, TOP SPP benefited from having the highest fuel saving (FS).
- >> Established measures to achieve energy conservation and cost reduction goals:
 - Increased the usage cycles of the mineral removal unit in the boiler feed water to reduce the quantity of chemicals used in the regeneration process;
 - Reduced excess low-pressure steam used in the oxygen removal unit for the boiler feed water, making it possible to reduce imported low-pressure steam.

Refining Performance Assessment

Through the year, Thaioil and Subsidiaries successfully maintained its oil refining capability at an excellent level, satisfactorily maximizing plant utilization. Its efficiency in energy consumption under Solomon's Energy Intensity Index was superior to the goal. These performances confirmed Thaioil's commitment to continuously improving and developing its refining potential to maintain its leadership in Asia Pacific.

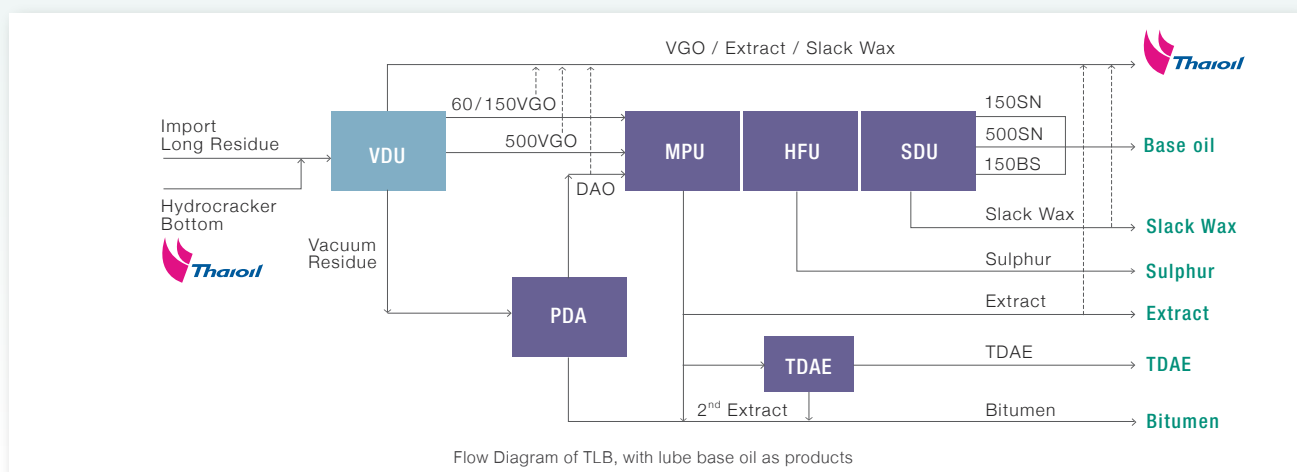
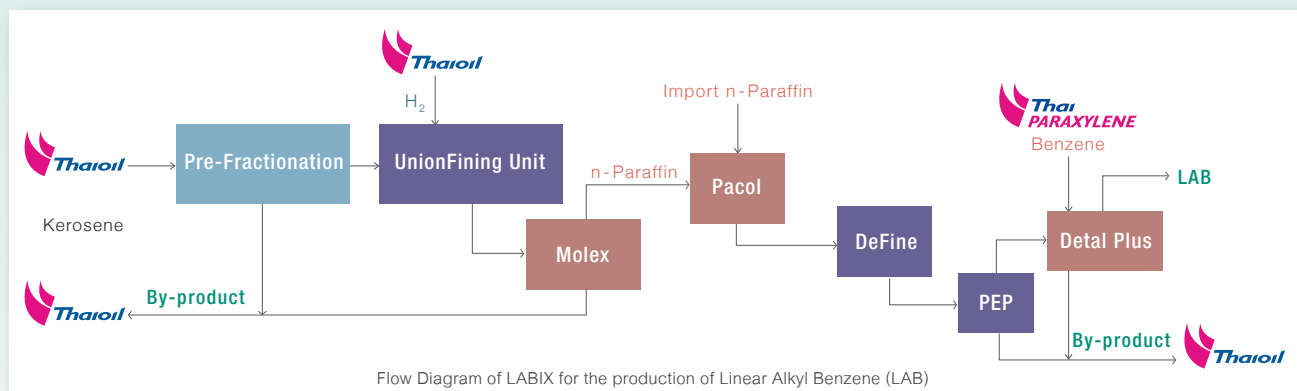
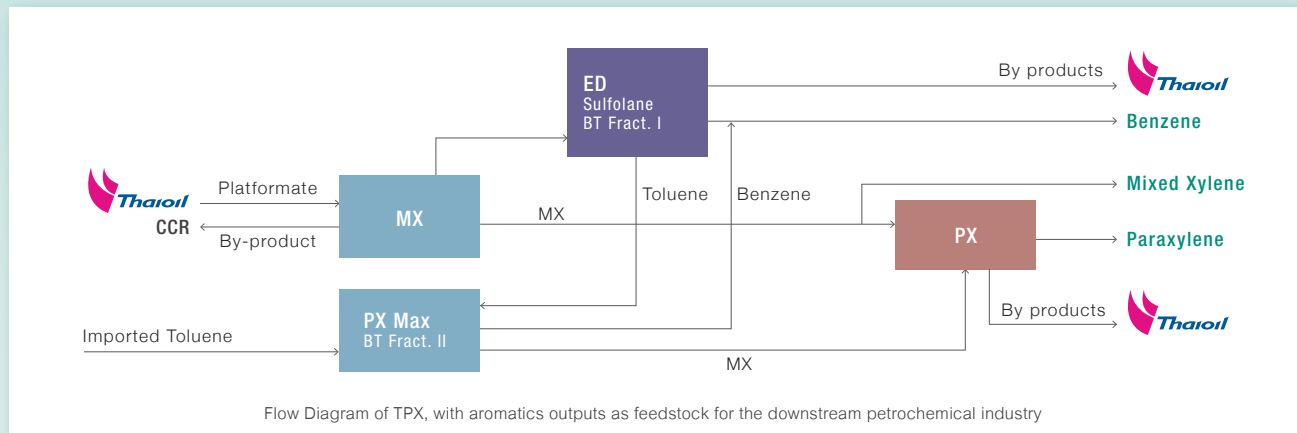
The diagram illustrates the complex process of refining crude oil and long residue into various petroleum products. The process begins with two main feedstocks: **CRUDE** and **LONG RESIDUE**.

CRUDE is processed through a series of distillation columns (CDU-1, CDU-2, CDU-3) and then through various treatment units (HDT-1, HDT-2, HDT-3, CCR-1, CCR-2, CCG HDS, KMT, HVU-1, HVU-2/DC, HVU-3, TCU, FCCU, HMU-1, HMU-2, HCU-1, HCU-2, HDS-2, HDS-3, ADIP, SRU-3/4, SRU-5) before being converted into products such as **FUEL GAS**, **LPG**, **PLATFORMATE**, **GASOLINE**, **GASOHOL**, **JET**, **KEROSENE**, **BIO-DIESEL**, **DIESEL**, **FUEL OIL**, and **SULPHUR**.

LONG RESIDUE is processed through a series of distillation columns (HVU-1, HVU-2/DC, HVU-3, TCU, FCCU, HMU-1, HMU-2, HCU-1, HCU-2, HDS-2, HDS-3, ADIP, SRU-3/4, SRU-5) before being converted into products such as **BIO-DIESEL**, **DIESEL**, **FUEL OIL**, and **SULPHUR**.

The diagram shows a highly integrated process with numerous interconnections between units, indicating a complex and efficient refining operation.

Flow Diagram of Thailoil Refinery



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

Thaioil and Subsidiaries have adopted an integrated operations and management standard 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-GET-BEST-PLUS main strategy for driving management within Thaioil and Subsidiaries in pursuit of Operational Excellence. Below are the integrated management systems in place:

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

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

>> Produce quality goods and services in response to customers' needs to meet their satisfaction under standard management systems and in compliance with

laws and regulations, as well as applicable standards and specifications

- >> Formulate a systematic risk management plan to minimize operating risks, including physical, chemical, biological, and psychosocial risks to prevent incidents that may negatively impact businesses, cause injuries or illnesses to operators, communities, and other stakeholders. This also protects lives, properties, environment and corporate information by providing the awareness of security threats and relevant risk levels.
- >> Define business plans and targets, and implement them to control and reduce potential impacts on business processes under international practices involving water, air, sound, heat, garbage, waste, greenhouse gas (GHG) emissions, energy management and conservation, and product life-cycle assessment under programs designed to review, monitor, and evaluate results for continuous improvement
- >> Allocate adequate resources and IT support to comply with policies and operations through design, procurement, and services with due regard for efficiency and continuous improvement of quality, security, safety, occupational health, environment, energy management and social responsibility, as well as the proper use of labor and the workforce
- >> Promote continuous development, reviews, and updates of policies and operating procedures to keep up with changes in business laws, technological advancement, energy consumption and conservation, and prevailing environmental and social circumstances
- >> Promote and nurture awareness among all stakeholders of the importance of maintaining and improvement of quality, security, safety, occupational health, environment, energy management, and corporate

social responsibility through communications with all employees as well as further extension to the public.

Moreover, Thailoil and Subsidiaries initiated a Safe White Green Strategy to enhance and raise awareness and leadership on work safety and extend the Safe White Green initiative to QSHE roll-out activities under a more proactive approach. They also launched operating plans with an emphasis on accessibility and campaigns on raising awareness of safety, quality, environment, and security of operators and operating areas, together with extension to worker participation under work conditions and work environment. Thailoil and Subsidiaries are fully committed to bringing in more management systems for sustainable development.

To this end, there was regular reporting to executives regarding these activities, including the annual management

review to establish improvement plans and yearly operation plan, and to communicate to employees for effective implementation.

Security Management

Thailoil and Subsidiaries enforce strict security measures to safeguard Thailoil and Subsidiaries' personnel, properties, information, and reputation from security threats and safety, while 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 corporate social responsibility to prevent adversary impacts related to security threats to society, economy, politics and natural disaster as follows:

>> Review security threat assessment. Thailoil defines and reviews operating plans on security measures for threats.



The Company also creates information networking and coordinates with the public and private sectors, as well as external support. Security drills are organized for emergency response teams to evaluate and improve plans for maximum effectiveness.

- >> Supervise and promote best security and safety practices stated in the Security and Safety Handbook for Employees of Thaioil and Subsidiaries to ensure employees' safety at work and at home
- >> Manage security through the Safe White Green strategy for a White (drug-free) Workplace. All suppliers and contractors are invited to take part in policy formulation, planning of security programs, promoting of activities to prevent drugs and all other illegal substances, as well as security violation.

At Thaioil and Subsidiaries, the corporate security strategy is designed and managed under the Defense in Depth approach, dividing areas of responsibility into zones with specific sets of security measures, control systems, and operational management systems for internal zones or areas within Thaioil and Subsidiaries' facilities. For external zones or zones surrounded by adjacent communities and other business entities, a different set of security measures is applied, including coordination of security strategy and activities with public security agencies, such as Chonburi's Disaster Prevention and Mitigation Unit, the Royal Thai Navy (First Naval Base, Sattahip), the Royal Thai Army (14th Military Circle, Chonburi), Laem Chabang Provincial Police Station, and the Air and Coastal Defense Command.

Occupational Health and Safety Management

At Thaioil and Subsidiaries, a business goal is to be an accident-free organization for contractors 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 management of emergencies and crises. A specific unit takes direct charge of controlling and driving all activities under the work plan. Executives and employees have been assigned to join a committee on occupational health, safety, and environment (SHE Committee); more than 50% of the committee must represent 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. This year, revision was made to safety and occupational health management systems, risk assessment for potentially severe incidents, work permits, and high-risk work processes that could cause severe accidents. Procedures, pre-work safety inspection forms, and risk assessment were developed. These were communicated to relevant parties, leading to efficient and effective execution. Performance analysis and systematic learning from major accidents were carried out. Thaioil and Subsidiaries also prepared work procedures and conducted proactive inspection of compatibility and determination of proactive indicators to track and monitor alignment with the required procedures. Finally, high-level executives constantly reviewed safety outcomes.

Since the safety culture represents success in such goal achievement, Thaioil and Subsidiaries valued and launched a project to develop and constantly upgrade work safety awareness and maturity through the Safe White Green strategy, which was extended to QSHE Roll Out activities. These activities were rotated among sites and project areas under construction to campaign for operators' awareness while encouraging their participation under day-to-day activities and site environment.

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

- >> Showed commitment to instilling of safety awareness, ranging from the Board by assigning high-level executives to present case studies and significant safety issues from inside and outside the Company at the Board meetings to promote continual safety development and improvement of safety measures
- >> Campaigned for employees and contractors to learn from incidents as well as best practices. They reviewed and improved safety in process and emergency response management to prevent the crisis incidents, while developing emergency and crisis management practices in pursuit of international standards.
- >> Campaigned for the workforce to submit potential incident reports (PIRs) with a focus on unsafe acts and unsafe conditions, both considered as preventive measures
- >> Developed and updated the safety and occupational health management system with specific sets of risks at hand
- >> Organized executives site visits led by the CEO/President and high-level executives during regular work periods and the major turnaround to provide morale and support to all operators and demonstrate corporate commitment and support to work safety and good safety leadership practice.
- >> Revised the management and development of work plans to develop and upgrade process safety management for Thailoil and Subsidiaries on a par with international standards with a focus on preventing severe incidents. As a result, Thailoil and Subsidiaries have successfully conducted sustainable business and become a safety organization throughout its supply chain.
- >> Identified and assessed risky areas with potential loss of primary containment (LOPC) at each site. The Company defined control and preventive measures together with LOPC inventories for continual monitoring of these measures' effectiveness and prevention. Thailoil also inspected process safety, analyzed, and proposed remedies and prevention of recurrence. Finally, executives held monthly reviews of process safety performance.
- >> Extended the scope of health risk assessment to sites of Labix Co., Ltd. and TOP SPP Co., Ltd., including office buildings beyond the refining units.
- >> Assessed health performance indicators under the criteria and guidelines of the International Association of Oil and Gas Producers (IOGP), which regarded as an international standard. This year, Thailoil and Subsidiaries scored 3.70 out of 4.00.
- >> Developed 12 Life-Saving Rules and communicated them to employees and contractors for implementation
- >> 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 marine transfers. To this end, 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 ensure that Thailoil and Subsidiaries continue their management and control of severe risks at manageable levels.

Environmental Management

Dow Jones Sustainability Indices (DJSI) scores are instrumental to environmental management. Thailoil and Subsidiaries successfully maintained their operational excellence and work performance in

environmental management under the operating framework of the Environmental Master Plan. In 2018, a new five-year Environmental Master Plan was revised for 2017-2021.

A Triple Bottom Line approach has been adopted by Thailoil and Subsidiaries to develop and balance its management policy on society, the environment, and the economy. A five-year Environmental Master Plan for 2017-2021 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 its desire to excel in environmental management. The Environmental Master Plan leverages more than 57 years of work experience and includes nine various development facets.

1. Governance Structure

Thailoil and Subsidiaries have adopted the principles and application of ISO 14001:2015 to steer and develop environmental management. Incorporated with the Eco-Industry Framework, Global Reporting Initiative (GRI), and DJSI, the integrated approach was further applied to include all stakeholders' aspects through the ISO 26000 CSR standard under the CSR-DIW project.

2. Technical Procedures

Thailoil and Subsidiaries have developed and improved all elements of Environmental Standard Specifications as operating guidelines to incorporate perception by various stakeholders, including laws, authorized state agencies, international organizations, and best practices. This operational excellence is used as an operating scope ranging from feasibility studies, extension conceptual design, construction, to commission, all under environmental management criteria. The outcomes reduce environmental impacts, minimize the use of

resources, and efficiently address the needs and expectations of all stakeholders.

3. Climate Strategy

Natural resource conservation is of utmost importance to Thailoil and Subsidiaries, particularly fuels and energy; both of which are considered as upstream resources for the environment and the economy. An Energy and Loss Committee (E&L) engaged in energy management planning, monitoring and evaluation, and continuous improvement. The plan is to drive Thailoil and Subsidiaries to become one of the 1st quartile refineries in Asia Pacific and to dramatically reduce GHG emissions.

After their successful participation as a pilot industry under the Carbon Footprint Project with the Federation of Thai Industries and the Thailand Greenhouse Gas Management Organization (Public Organization), Thailoil and Subsidiaries under its Environmental Master Plan (2017-2021) cooperate with PTT Innovation Institute in conducting a project on Life-Cycle Assessment (LCA). Investigation of individual products' carbon footprints is important since they represent impacts of the ongoing climate change. The findings will be applied to process improvement for greater efficiency, while a study is made to set goals for GHG reduction to accommodate the driving of GHG management in various forms by the Company and the public sector.

4. Water Resource Management

A systematic water resource management is vital to minimize the risk of water shortage for production processes, and to avoid possible conflicts with local communities on water usage. This systematic management provided auditable information on water usage for the public. Under the development scope to sustainably increase the efficiency of water management, the principle of 3Rs (Reduce, Reuse and Recycle) has been adopted. A Water Resource Management Master Plan was

initiated to guide adequate resource allocation. Thailoil and Subsidiaries, together with the PTT Group Water Committee – Eastern Region, conducted risk assessment and set control measures regarding water shortage including a desalination unit to reduce water resource utilization and increase the capability to manage water resources. Furthermore, Thailoil and Subsidiaries have conducted many studies to increase its capability and stability in water resource management, including a raw water pipeline project, and construction of a water reservoir equipped with new pumping system. Thailoil and Subsidiaries also studied ways to improve flood management inside and outside Thailoil and Subsidiaries' premises by developing a master plan of both preventive projects and control measures, including a public drainage improvement project and a rainwater drainage to sea project.

5. Eco-Efficiency Performance

In addition to full compliance with preventive and mitigation measures and conditions stated in the Environmental Impact Assessment (EIA) report and environmental regulatory controls and legislation, Thailoil and Subsidiaries have taken additional steps for their processes toward environmental quality:

- >> **Air Pollution** – The management process covers the entire range of work and activities from the designing stage to maintenance planning, control of sulfur contents in fuels at sources; selection of low emission fuel instead of high emission fuel; selection of tools and equipment and clean processes; selection of high-efficiency combustion technology with low nitrogen oxide (NO_x) emission, including Ultra-Low NO_x Burners and emission control of air, and detection of impurities.
- >> **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 24-hour monitoring Chemical Oxygen Demand (COD) in water.
- >> **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. In addition, Thailoil and Subsidiaries added value to spent catalysts by way of metal recovery to ceramic pigment. To this end, Thailoil and Subsidiaries are committed to zero waste to landfill by 2020.



Selection of low-emission energy fuel proportions



24-hour monitoring Chemical Oxygen Demand (COD)



Committed to zero waste to landfill by 2020

In addition, the Life-Cycle Assessment (LCA) have been studied to evaluate impacts on the use of Thailoil and Subsidiaries' products on the environment. Detailed studies efficiently identify specific sources of impacts on the environment through the production line, leading to the analytical ability to reduce such impacts.

6. Biodiversity

As a responsible corporate citizen for the habitat and natural resources surrounding the refinery, Thailoil and Subsidiaries continuously develop monitoring and tracking mechanisms for environmental impacts, including studies on the baseline and sensitive areas of the marine ecology. These studies have been fully integrated with existing assessments and tailor-made for specific uses on environmental and biodiversity prevention and mitigation. This year, Thailoil and Subsidiaries completed the study on resource sensitivity index of natural resources in the upper Gulf of Thailand.

7. Supplier and Contractor Program

Management of suppliers and contractors is crucial to the sustainable businesses of Thailoil and Subsidiaries, and demonstrates responsibility for the public and the environment, realizing that impacts could be caused by their suppliers and contractors. Thailoil and Subsidiaries have defined and developed practical guidelines for suppliers and contractors concerning the environment and society. All suppliers and contractors are encouraged to comply with the requirements of Thailoil and Subsidiaries and constantly participate in the Safe White Green program together with the CSR-DIW project to demonstrate their responsibility to society. An idea of integrated and joint Procurement and Contract Department was floated to provide consistent procedures for all suppliers and contractors to follow to better manage the entire supply chains. This project is being developed.

8. Environmental Audit

Through the effective implementation of ISO 14001:2015 framework along with continuous improvement for years, no major corrective action (NC major = 0) was identified by the environmental audit, conducted by the Management System Certification Institute (Thailand). Thailoil and Subsidiaries are also pursuing its environmental management under the GRI guidelines, including audits, assurance, and reporting on both the environmental management system and environmental operating performance 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 transfer efficiency.

9. Management Information Solutions

For sustainable operation management and monitoring purpose, Thailoil and Subsidiaries have been developing an Environmental Database Center to manage all environmental data, including the environmental dashboard. The center consists of air quality measurement and monitoring, industrial waste management, incident management, and sustainability management. The central system enhances analytical work, project improvement, and communication with communities and the public sector in support of Thailoil and Subsidiaries' operations. This year, Thailoil and Subsidiaries successfully launched a database system called TOP Green Tracking EIA Monitor Web Application for reporting the findings of environmental control measures, monitoring and follow-up. A Green Track Program was developed to increase the efficiency in identifying potential sources of environmental issues, enabling prompt counter-measures. This is an important feature to meet stakeholders' satisfaction and foster their engagement for sustainable growth of Thailoil and Subsidiaries.

Environmental Education and Training for Employees

Thaioil and Subsidiaries have defined their code of conduct on communities, society, and the environment by refraining its employees in engaging in activities that are considered harmful to natural resources and the environment, and continuously nurturing their awareness on social and environmental responsibilities. Under this commitment, Thaioil and Subsidiaries clearly defined practical guidelines for education and training to employees on environmental conservation, and assigned Quality Management Department to take charge of designing and developing the curricula, 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 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

Investment strategies of Thailoil and Subsidiaries underlie the corporate vision, mission, and strategies that were upgraded in 2018 for strong and sustainable business growth. Therefore, Thailoil's investment focuses on **empowering human life through sustainable energy and chemicals**. Investment to raise Thailoil's competitiveness has been made in businesses of its expertise to increase product values while reducing business risks. Such investment included expansion of production capacities, increase in efficiency and competitiveness, and introduction of new products to satisfy consumers' demand. Thailoil has extended its investment to countries with economic potential, such as ASEAN countries, to embrace new business opportunities. The Company also pays attention to logistics and infrastructure improvement, as well as business model adjustment and opportunity for investment in new business. Moreover, Thailoil focuses on investment plans that in line with dynamic market conditions to create highest benefit for the organization and stakeholders.

Ongoing Projects

Clean Fuel Project (CFP)

To improve production processes and raise competitiveness in response to higher demand in Thailand and countries in the ASEAN Economic Community, where imports of petroleum products are continuously increasing, Thailoil launched CFP, aiming for value-added and environmentally friendly products. CFP included the construction of an upgrading unit that converts fuel oil into more diesel and jet fuels with capacity growth from 275,000 to 400,000 barrels per day, providing Thailoil greater flexibility to process crude oil of greater variety, resulting in greater

economies of scale and crude oil cost reduction. CFP also benefits national energy security and can drive the country's economy in the long term.

The CFP project received the approval for the investment of approximately USD 4.825 billion at the Extraordinary General Meeting of Shareholders No.1/2018. Thailoil signed a contract with an Engineering, Procurement, and Construction (EPC) contractor in October 2018, and is currently on process of preparation aligned with the 2019 construction plan. The commercial operation is due by 2023. To alleviate the investment commitment, investor for the Energy Recovery Unit. Should the Company be able to find such investor, the total investment would be reduced to not more than USD 4.174 billion.

TOP Crude Oil Tank

To increase flexibility in refining management for business continuity; and to accommodate the reserves, Thailoil decided to construct five more crude oil tanks on its premises adjacent to PTT Plc's Khao Bo Ya LPG Terminal. The investment on TOP Crude Oil Tank Project is approximately THB 2.424 billion.

The tanks are now under construction along with installation of pipelines and related systems. The tank are expected to start accommodating the fuel reserves in Q1/2019.

Jetty Expansion Project

To reduce port congestion and to enhance product distribution capacity, Thailoil executed the project to expand Jetties 7 and 8 to accommodate product delivery of up to 50,000 deadweight tonnage (DWT) from 5,300 DWT. The project provides greater flexibility and efficiency to product distribution, resulting in maximum benefit to



Capacity Growth

400,000

barrels/day



Expand Jetties 7 and 8

50,000

deadweight tonnage (DWT)

customers. The jetty expansion will also accommodate the distribution of new products, supporting Thaioil's future business growth. The investment on Jetty Expansion Project is approximately THB 3.830 billion.

Jetties 7 and 8 are now under construction, with commercial operation due in late 2019.

Thaioil Sriracha Buildings Project

To optimize the use of space on the refinery premises, to increase safety for employees, and to be prepared for future business expansion, Thaioil initiates the project to relocate its office buildings, product test laboratories, and engineering and warehouse building, from the process area. The new buildings are divided into zones consisting of the main entrance, office buildings, product test laboratories, and engineering and warehouse buildings.

The investment on Thaioil Sriracha Buildings Project is approximately THB 2.740 billion.

Currently, the construction of the engineering and warehouse buildings has now been completed and started operating since September 2018. The construction of laboratories and office buildings are still on process, with completion planned in Q2/2019 and Q4/2019 respectively.

IDEA Project for Basic Infrastructure on Refining Compound

To reorganize and optimize the use of space on the refinery premises and to ensure enough space for future projects, Thaioil executed the project to improve basic infrastructure on the former office buildings site. The project covers the dismantling of the former refinery office building, the product test laboratories, and the maintenance and warehouse buildings. Meanwhile, new



infrastructure has been constructed and installed, including reservoir, a high-voltage power system, and a communication system. The investment on IDEA Project for basic infrastructure on refinery compound is approximately THB 1.048 billion.

This project is on process with due completion in 2019.

Corporate Venture Capital (CVC) through TOP Ventures

In 2018, Thailoil's Board of Directors pass the resolutions to approve the establishment of a unit to pursue and select investments in the form of Corporate Venture Capital (CVC), which serves as a search engine for new business opportunities, and a support for Thailoil and Subsidiaries' expansion into new S-Curve businesses. The business of which focus on 1) Manufacturing Technology - to enhance production and management capacity, 2) Green and Human Technology - to enhance environmental conservation and the human life quality, and 3) Hydrocarbon Disruption Technology - to prepare for impacts on long-term petroleum consumption.

During the year, Thailoil has invested one venture capital fund related to applied science and engineering, which addressed all of the target industries mentioned above. Thailoil is now considering more investment in the future.

Projects under Feasibility Studies

Specialty Products

Thailoil has initiated a strategic plan on business expansion, moving away from commodity products to specialty products, by not only adding higher value to existing products but also expanding to new niche markets. To this end, Thailoil carried out studies on product development, which encourages the value addition to existing commodities, both light-end and heavy-end products, and the manufacture of specialty products. This is to address the demand for specific products of new groups

of customers in the downstream industry including food, pharmaceuticals, cosmetics, solvents, rubber products, and cleaning agents.

Thailoil Marine's Fleet Expansion

Thailoil Marine Co., Ltd. (TM) strives to be the leader of large vessel fleets in PTT Group and in Asia Pacific, to support the expansion of energy, petroleum, and petrochemical markets, both domestically and internationally. TM plans to improve and expand the tanker fleet to meet customers' demand, as well as to extend the business to emerging markets overseas, which serves as a strong platform for future business growth of both Thailoil and Subsidiaries and PTT Group.

Investment in Green Business

Continue the sustainable business, Thailoil and PTT Group jointly conducted a study of Bio-Business to create balance among financial returns, value creation, and attempted greenhouse gas reduction to consequently lower environmental impacts. The study also covered the feasibility ethanol production expansion through Thailoil Ethanol Co., Ltd. to satisfy the expected increasing demand.

Other Business Opportunities

Under the current competitive environment, business expansion and new business development in line with industrial megatrends and technological evolution are essential to bolster Thailoil's competitiveness, particularly in areas of future energy consumption. It is, therefore, crucial for Thailoil to study and identify investment potential in domestic and international markets. The plan also includes identification of joint ventures and Mergers and Acquisitions (M&As), emphasizing on businesses that provide synergistic opportunities, add value to existing structures, and strengthen Thailoil's business value chain to attain the leading position with sustainable growth.

HUMAN RESOURCES AND ORGANIZATION DEVELOPMENT



Human Resource Development

Thaioil and Subsidiaries' employees are vital force in driving business success. We believed that business success depends on the quality of its employees; thus having a firm conviction in our brand promise, "Refining Values", by modernizing its human resources (HR) management system, in line with changing business contexts to secure and develop its employees to be competent, and conscientious with organizational awareness. This will drive the organization to become a High-Performance and Healthy Organization toward sustainable growth.

In 2018, Thaioil and Subsidiaries focused on systematic HR development, both capacity and capability, to accommodate future business expansion such as personnel preparedness to support the Clean Fuel Project (CFP) with comprehensive and scenario-based manpower planning, together with the 4-B Recruitment Strategy namely: Build - recruitment and development of newly graduated employees; Buy - recruitment of high potential and experienced employees; Borrow - recruitment of personnel under specific timeframe (temporary); and Bring-in employees in collaboration with PTT Group and other groups in the petroleum and petrochemical industry. This HR strategy enabled Thaioil to recruit experienced and ready-to-work employees to support CFP Project implementation in the Engineering, Procurement and Contract (EPC) phase as well as normal operations. As a result, Thaioil and Subsidiaries nominated 86% of the recruitment target under the plan to support CFP Project implementation in the EPC phase.

Thaioil and Subsidiaries also set up an international HR system to accommodate CFP's employees assigned overseas under a standard management system throughout the assignment period as follows:

- >> **Pre-assignment** which includes manpower planning, nomination, and cross-cultural training program
- >> **Relocation** of the employees and families, and documentation moves for immigration
- >> **On-going assignment** such as remuneration payment, performance management, and career development
- >> **Post-assignment** to prepare the employees who completed their overseas terms and reassigned to original units and to enhance employee engagement

Human Capital Index

99%

Recruitment for CFP in the EPC phase

86%

The planning and preparedness in capacity and capability, as well as HR management system, resulted in efficient recruitment of employees of required quality to implement CFP under the 2018 work plan.

However, besides manpower preparedness to accommodate CFP, Thail and Subsidiaries prepared more staff for other future investments, such as a new-generation development project to support business growth in the digitalization era. Digital technology was applied to make learning process more interesting and as means to increase the efficiency of HR development, such as Micro Learning, Augmented Reality (AR) Learning, and use of the Gamification technology to make learning fun, with quick and modern experience. As a result, learning of the employees in 2018 was more efficient, with lower training and instructor costs, while the Human Capital Index was as high as 99%, a 14% rise from the previous year.

In addition, Thail and Subsidiaries have organized employers' well-being promotions and various of engagement projects, including a health campaign for better health awareness; the Mindful Development Project to apply religious teachings in daily and working life; "Palung Akanee" project to recognize employees who exemplify ethical conduct, which in turns create awareness on the compliance with the good corporate governance principles.

Many challenges anticipated in 2019 necessitated prompt actions for workforce readiness. These challenges included intensified competition for high-potential personnel in the labor market, demand for a larger workforce of high quality to support future business expansion, and replace employees due to retirement within 10 years. Operating

plans were prepared to cope with these challenges through the following HR strategies:

1. Hire to Retire – technologically upgrade of the human resources management system to support current and future businesses, with emphasis on the Digitization and Technology Policy such as IoT Platforms, Big Data Analytics, and Artificial Intelligence to assist the HR management system. The projects included:

- >> **Anytime Learning** – to provide employees with learning opportunities through advanced, assorted, and accessible learning media via computer and mobile phones, such as Micro Learning, AR Learning, e-learning and Web-based Learning in virtual classrooms
- >> **Employee Portal** – a self-service at finger tips access to personnel services via online application such as requests for permissions for leave, overtime work, and access to personal information
- >> **Rhino Bot (Chatbot)** – for access information on employees' welfare and benefits via a mobile phone application
- >> **Wellbeing@TOP** – to elevate employees' mental, health, financial, social and work life well-being, in which employees can take part in activities via a mobile phone application at any time and place

2. To elevate employees' continued learning experience from Hire to Retire through projects like AGILE Digital Learning Experience, which apply digital technology to preparation of assorted and advanced learning media to cope with different needs of different generations (Gen Z, Gen Y, Gen X, Baby Boom) as follows:

- >> **A (Attract)** : to attract and motivate high-potential employees to join the organization through granting academic scholarships to students and technical knowledge transfer in cooperation with academic institutions
- >> **A (Adapt)** : to assist new employees to adapt themselves and start their work with efficiency through basic education and corporate culture learning
- >> **G (Groom)** : to elevate employees' competencies and promote better performance through development packages: GREAT and DANCE⁺ and academic scholarships
- >> **I (Inspire)** : to enhance competencies of leaders and high-potential employees for business growth through intense development, including Dynamic Career Management, Mobility Development, and GREAT Leader Development
- >> **L (Lifelong Learning)** : to make employees feel they are an essential part of the organization and create sustainable employee engagement through the Digital Learning Platform and the Mindful Development program
- >> **E (Exit)** : to deliver core values and transfer Thail's good impressions to employees (Employee Value Propositions) through Gen-2-Gen Knowledge Transfer and employees' well-being development to be prepared for future retirement.

3. To upgrade the one-stop HR service structure in response of rapid changes in business needs and increase service capability up to professional standards through role changing, in becoming 1) a business partner for the line managers, 2) shared service center for all employees, and 3) center of excellence to turn strategies into more efficient implementation.

**High Performance
and Healthy
Organization**



Organization Development

Many external challenges including global oil price volatility, pressure from environmental laws to protect society and the community, dynamic development of electric vehicles, and the rapid increase in digital application to business operations, necessitated prompt actions to cope with challenges. Corporate competence development is therefore vital to foster its capability for intense competition with higher efficiency. The outcomes of organization development are summarized as follows:

1. Organization Design and Strategic Workforce Planning

Thaioil reviewed and designed a Macro Organization Structure to tangibly accommodate its innovation and digitalization strategies for concrete process improvement and revised its organization structure for transparent and fair monitoring, control, and implementation, in compliance with the Governance, Risk Management and Compliance (GRC) scope and approach as well as structural design for CFP during the EPC phase to maintain its competitiveness on a par with its competitors in the same industry.

2. Digitization Mindset and Awareness

Various businesses were compelled to adapt themselves to cope with changes leading up to the digital age. Thaioil also launched the Odyssey Project to become a digital company by 2021. Digital technology was applied to all sectors and resulted in dynamic changes covering the foundation, work processes, and the process to deliver values to customers. Campaigns were held to culture employees' understanding and awareness of the benefits in applying digital technology to their work, such as PTT Group & Thaioil Digital Day. This event designed to share knowledge and experiences in technological

application in the industry. Odyssey Official was initiated as a communication channel and exchange of views on digital technology as well as an opportunity for employees to participate in the digitization mindset and awareness activities. Presentation of achievements of the pilot project (Quick Win) and the technology feasibility project (Proof of Concept) were also initiated under the Company's vision, strategy and digitization master plan.

3. The Readiness of Critical Knowledge through G2G

Data analysis showed an uptrend of retiring employees within the next decade, with a large number of new recruits and a wide gap of knowledge transfer. Hence, Thaioil compiled all critical and essential knowledge of all business units into a Knowledge Architecture Map with all significant and essential knowledge in work performance, which was linked to functional competency to elevate the development of its employees' competency. In addition, in realizing the G2G Critical Knowledge transfer, Thaioil loaded and put all the knowledge in storage in the KM Portal, shared folders, the intranet, and others for systematic data search.

4. Leaders Drive Culture Focusing on i-TOP Core Values

Thaioil set its organization culture and display of its i-TOP core values (Integrity, Teamwork and Collaboration, Ownership and Commitment, Professionalism) through all its employees. All executives are required to take part in a Management Workshop to drive corporate value creation, in line with its vision and business directions. Supporting Energizers Group pushed for the implementation of i-TOP. Moreover, Thaioil has organized a "Palung Akanee" project to recognize employees who exemplify ethical conduct.



BOARD OF DIRECTORS



PROFESSOR DR. THOSAPORN SIRISUMPHAND

Director (Non-Executive)
and Chairman of the Board
Age 58 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: 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 Director (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

Working Experience in the 5 Preceding Years

2002 - 2013	Secretary General, the Public Sector Development Commission
2013 - 2014	Secretary General, the Higher Education Commission
2014 - Sep 30, 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 (6)

- >> Secretary General, the National Economic and Social Development Council
- >> Director and Chairman of Corporate Governance Committee, the Bank of Thailand
- >> Member of Chulalongkorn University Council
- >> Member of Council of State
- >> Director, Creative Economy Agency (Public Organization)
- >> President, Chulalongkorn University Preparatory School Alumni Association Under His Royal Patronage

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 -



MS. CHULARAT SUTEETHORN

Independent Director (Non-Executive),
Chairman of the Audit Committee
and Member of the Nomination and Remuneration Committee
Age 64 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: 8 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: 8 months)
- >> Member of the Audit Committee (Appointed on April 27, 2018: 8 months)
- >> Chairman of the Audit Committee (Elected on May 10, 2018: 7 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 Director (FND 28/2006)
- >> Financial Statements for Director (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)
- >> Advance 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 Development 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 Procedured 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

Working Experience in the 5 Preceding Years

2010 - 2014	Director and Chairman of the Investment Committee, Deposit Protection Agency
2011 - 2012	Inspector General, Ministry of Finance
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)

- >> Independent Director, Chairman of the Audit Committee and Member of the Nomination and Remuneration Committee, Thai Oil Plc
- >> Director, MFC Asset Management Plc

2. Public Company

- None -

3. Limited Company

- None -

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 -



MR. CHEN NAMCHAISIRI

Independent Director (Non-Executive)
and Member of the Audit Committee
Age 62 Yrs.

Director Term Duration

>> Independent Director (Non-Executive) (Elected on April 7, 2017: 1 year 8 months)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on April 27, 2018: 8 months)

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)
>> Directors Certification Program (DCP 138/2010)
>> Diploma Examination Program (EXAM 30/2011)

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 (2)

>> Independent Director and Member of the Audit Committee, Thai Oil Plc
>> 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)
>> Member of the National Legislative Assembly
>> Director, National Science and Technology Development Agency (NSTDA)

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 -

**ASSOCIATE PROFESSOR DR. PASU DECHARIN**

Independent Director (Non-Executive)

and Member of the Audit Committee

Age 50 Yrs.

Director Term Duration

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

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on April 27, 2018: 8 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
- >> Doctor of Philosophy 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)

Other Trainings

- >> Executive Development Program (EDP), Class 3,
Thai Listed Companies Association (TLCA)
- >> Leadership Development Program (LDP), Class 6,
Thai Listed Companies Association (TLCA)

Working Experience in the 5 Preceding Years

- | | |
|----------------|--|
| 2004 - 2011 | Assistant to the President for Strategy, Chulalongkorn University |
| 2007 - 2011 | Head of Commerce Department,
Faculty of Commerce and Accountancy,
Chulalongkorn University |
| 2011 - Present | Dean, Faculty of Commerce and Accountancy,
Chulalongkorn University |

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

- >> Independent Director and Member of the Audit Committee, Thai Oil Plc
- >> Independent Director and Member of Audit Committee,
Krungthai Car Rent and Lease Plc
- >> Independent Director and Member of Audit Committee,
Siam Commercial Bank 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 (2)

- >> Dean, Faculty of Commerce and Accountancy, Chulalongkorn University
- >> 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 -



AIR CHIEF MARSHAL SUTTIPONG INSEEPONG

Independent Director (Non-Executive)
and Chairman of the Nomination and Remuneration Committee
Age 61 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:
1 year 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: 1 year 8 months)
- >> Chairman of the Nomination and Remuneration Committee
(Elected on May 17, 2017: 1 year 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

Working Experience in the 5 Preceding Years

- | | |
|---------------------|---|
| Oct 2012 - Sep 2013 | Director of Operations, The Royal Thai Air Force |
| 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 (2)

- >> Member of the National Legislative Assembly
- >> Supreme Court Judge

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. AUTTAPOL RERKPIBOON**

Director (Non-Executive),
Chairman of the Risk Management Committee
and Member of the Nomination and Remuneration Committee
Age 53 Yrs.

Director Term Duration

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

Board-Committee Term Duration

- >> Member of the Nomination and Remuneration Committee
(Appointed on September 28, 2018 and effective from October 1, 2018: 3 months)
- >> Member of the Risk Management Committee
(Appointed on September 28, 2018 and effective from October 1, 2018: 3 months)
- >> Chairman of the Risk Management Committee
(Elected on October 11, 2018: 3 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)

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

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

- | | |
|---------------------|---|
| May 2011 - Oct 2013 | Executive Vice President,
Commercial & International Marketing, PTT Plc |
| 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 ANGSAANONT

Independent Director (Non-Executive)
and Chairman of the Corporate Governance Committee
Age 63 Yrs.

Director Term Duration

>> Independent Director (Non-Executive) (Elected on April 7, 2017: 1 year 8 months)

Board-Committee Term Duration

>> Member of the Corporate Governance Committee
(Appointed on May 26, 2017: 1 year 7 months)
>> Chairman of the Corporate Governance Committee
(Elected on June 21, 2017: 1 year 6 months)

Education

>> Bachelor of Law (1st Class Honor), Ramkhamhaeng University
>> Master of Law, Chulalongkorn University
>> Barrister, 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)

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
>> 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 1st 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,
Organized by 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

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
>> Independent Director and Member of the Audit Committee,
TWZ Corporation Plc

2. Public Company (1)

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

3. Limited Company

- None -

4. Other Organizations/ Institutions (3)

>> Member of the National Legislative Assembly
>> Member of Committee of Property Management Office,
Thai Red Cross Society
>> Member of Ramkhamhaeng University Council

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. YONGYUT JANTARAROTAI**

Director (Non-Executive)

and Member of the Corporate Governance Committee

Age 59 Yrs.

Director Term Duration

- >> Director (Non-Executive) (Elected on April 2, 2014: 3 years)
- >> Director (Non-Executive) (Re-elected on April 7, 2017: 1 year 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: 1 year 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)

Other Trainings

- >> Civil Service Executive Program, Class 59,
Office of the Civil Service Commission
- >> National Defence Course, Class 52, 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

Mar 18 - Oct 2013	Director, Office of the Minister, Ministry of Energy
Nov 2013 - Nov 16, 2014	Assistant for Permanent Secretary, Ministry of Energy
Nov 17, 2014 - Sep 2015	Deputy Director General, Department of Alternative Energy Development and Efficiency, Ministry of Energy
Oct 2015 - Sep 2017	Inspector General, Ministry of Energy
Oct 2017 - Oct 7, 2018	Deputy Permanent Secretary, Ministry of Energy
Oct 8, 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 (1)	
>> Director General, Department of Alternative Energy Development and Efficiency, Ministry of Energy	
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. KANIT SI

Independent Director (Non-Executive)
and Member of the Corporate Governance Committee
Age 69 Yrs.

Director Term Duration

>> Independent Director (Non-Executive) (Appointed on January 26, 2018
and effective from February 1, 2018: 11 months)

Board-Committee Term Duration

>> Member of the Corporate Governance Committee
(Appointed on April 27, 2018: 8 months)

Education

>> Bachelor of Engineering, (Gold Medal), Chulalongkorn University
>> Master of Business Administration (MBA) (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)

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

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 Member of the Corporate Governance 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 (2)

>> Director, Bangkok Industrial Gas Co., Ltd.
>> 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 -

**MR. NOPPADOL PINSUPA**

Director (Non-Executive)

and Member of the Risk Management Committee

Age 54 Yrs.

Director Term Duration

- >> Director (Non-Executive) (Appointed on September 25, 2015 and effective from October 1, 2015: 7 months)
- >> Director (Non-Executive) (Re-elected on April 7, 2016: 2 year 8 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 8 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 Director (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
- >> Seminar: "Anti-corruption: Leadership Role of the Board"
- >> 2018 PTIT Special Lecture: The Dawn of a New Energy Era & The Transition to High Noon

Working Experience in the 5 Preceding Years

2012 - 2014	Executive Vice President - Natural Gas Vehicle, PTT Plc
2015	Senior Executive Vice President, Global Power Synergy Plc
Oct 2014 - Sep 2015	President, Global Power Synergy Plc
Oct 2015 - Present	Senior Executive Vice President - Gas Business Unit, PTT Plc

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

- >> Director and Member of the Risk Management Committee, Thai Oil Plc
- >> Senior Executive Vice President - Gas Business Unit, PTT Plc

2. Public Company

- None -

3. Limited Company (1)

- >> Director and Chairman of the Board, PTT Global LNG Co., Ltd.

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 -



MS. PHANNALIN MAHAWONGTIKUL

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

Director Term Duration

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

Board-Committee Term Duration

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

Education

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

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

- None -

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 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)

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 - Present	Chief Financial Officer (Act.), PTT Plc

Current Positions

1. Listed Company (2)

>> Director and Member of the Risk Management Committee, Thai Oil Plc
>> Chief Financial Officer (Act.), PTT 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. SUCHALEE SUMAMAL**

Director (Non-Executive)

Age 60 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

- | | |
|-----------------|---|
| 2010 - 2013 | Director Petroleum and Petrochemical Policy Bureau,
Ministry of Energy |
| 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 (2)**

- >> Director, Thai Oil Plc
- >> Director, Member of Human Resources and Remuneration Committee,
Ratchaburi Electricity Generating Holding Plc

2. Public Company

- None -

3. Limited Company

- None -

4. Other Organizations/Institutions

- None -

5. State Enterprise

- None -

% of Shareholding in Thairoil

- 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 57 Yrs.

Director Term Duration

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

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

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 - Present	Senior Executive Vice President, Downstream Business Group Alignment, PTT Plc

Current Positions

1. Listed Company (2)

>> Director, Thai Oil Plc
>> Senior Executive Vice President,
Downstream Business Group Alignment, PTT Plc

2. Public Company

- None -

3. Limited Company (1)

>> Director, PTT Energy Solutions 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. ATIKOM TERBSIRI**

Director (Executive), Member of the Risk Management Committee,
Chief Executive Officer and President, and the Secretary to the Board of Directors
Age 56 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: 8 months)

Board-Committee Term Duration

- >> Member of the Risk Management Committee
(Appointed on September 26, 2014 and effective from October 1, 2014: 4 years 3 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

Working Experience in the 5 Preceding Years

2011 - 2013	Senior Executive Vice President, PTT Plc Secondment to IRPC Plc as President
2013 - Sep 2014	Senior Executive Vice President - Petrochemicals & Refining Business Unit, PTT Plc
Oct 2014 - Present	Senior Executive Vice President, 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
- >> Senior Executive Vice President, PTT Plc

2. Public Company (1)

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

3. Limited Company (7)

- >> 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 Solvent Co., Ltd.
- >> Director and Chairman of the Board, TOP Solvent Co., Ltd.
- >> Director and Chairman of the Board, Thailoil Marine Co., Ltd.

4. Other Organizations/Institutions (10)

- >> Member of Trustee (as Company representative), Petroleum Institute of Thailand
- >> Director, Power of Innovation Foundation
- >> Director, Power of Learning Foundation
- >> Member of Council, Vidyasirimedhi Institute of Science and Technology
- >> Executive Director, Thailand Energy Academy
- >> Executive Director, Thailand Swimming Association
- >> Director, Thai Listed Companies Association
- >> Director, The Federation of Thai Industries
- >> Chairman, Petroleum Refining Industry Club, The Federation of Thai Industries
- >> Member, Backdoor Listing Transaction Committee, The Stock Exchange of Thailand

5. State Enterprise

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



MR. SARUN RUNGKASIRI

Director (Non-Executive), Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee
(Resigned from Directorship: January 1, 2018)
Age 61 Yrs.

Director Term Duration

>> Director (Non-Executive) (Elected on April 7, 2016: 1 year 8 months)

Board-Committee Term Duration

- >> Member of the Nomination and Remuneration Committee
(Appointed on April 8, 2016: 1 year 8 months)
- >> Member of the Risk Management Committee
(Appointed on April 27, 2016: 1 year 8 months)
- >> Chairman of the Risk Management Committee
(Elected on May 11, 2016: 1 year 7 months)

Education

- >> Bachelor of Engineering (Industrial Engineering), Chulalongkorn University
- >> Master of Science (Management), Polytechnic Institute of New York, USA

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

- >> Company Secretary Program (CSP 8/2004)
- >> Directors Certification Program (DCP 61/2005)
- >> Finance for Non-Finance Director (FND 19/2005)

Other Trainings

- >> The Joint State-Private Sector Course, Class 23, National Defense College
- >> Top Executive in Industrial Development and Investment, Class 1, Institute of Business and Industrial Development
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 5, Thailand Energy Academy
- >> Thirty Fourth Oxford Energy Seminar, St. Catherine's College, Oxford University, United Kingdom
- >> NIDA-Wharton Executive Leadership Program 2009, The Wharton School of the University of Pennsylvania, USA
- >> Seminar: "Anti-corruption: Leadership Role of the Board"

Working Experience in the 5 Preceding Years

2008 - 2009	Executive Vice President, Corporate Communication & Social Responsibility, PTT Plc
2009 - 2010	Executive Vice President, Commercial & International Marketing, PTT Plc
2010 - 2011	Executive Vice President, Retail Marketing, PTT Plc
2011 - 2013	Senior Executive Vice President, Oil Business Group, PTT Plc
Oct 2013 - Sep 2017	Chief Operating Officer, Downstream Petroleum Business, PTT Plc
Oct 2017 - Dec 2018	Consultant, PTT Plc

Current Positions

1. Listed Company (1)	
>> Consultant , 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 -

**MRS. SUVIMOL CHRITYAKIERNE**

Independent Director (Non-Executive) and Member of the Audit Committee
(Completed the term in the 2018 Annual General Meeting of Shareholders)
Age 67 Yrs.

Director Term Duration

>> Independent Director (Non-Executive) (Appointed on January 22, 2016 and effective from February 1, 2016: 2 years 2 months)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on January 22, 2016 and effective from February 1, 2016: 2 year 2 months)

Education

>> Bachelor of Accountancy, Chulalongkorn University
>> Master of Accountancy, Chulalongkorn University

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

>> Director Certification Program (DCP 92/2007)
>> Audit Committee Program (ACP 36/2011)
>> Advanced Audit Committee Program (AACP 27/2017)
>> Ethical Leadership Program (ELP 10/2017)

Other Trainings

>> Training Course on Tax Law, Class 1, Institute of Judicial Officer Development
>> Certified Professional Internal Auditor of Thailand, Class 1, Institute of Internal Auditor of Thailand
>> Balanced Scorecard Course, Faculty of Commerce and Accountancy, Chulalongkorn University
>> Academic Seminar: "Money Laundering in Dairy Life that We Must Have"
>> Seminar "PTT Group AC Forum 2017: Infinite AC Challenge"
>> Lecture "Resource Revolution: Another Chapter in the 4th Industrial Revolution"
>> Seminar: "Key Audit Matters"
>> New Paradigm Leader, Transparency & Anti-Corruption, Class 1/2018

Working Experience in the 5 Preceding Years

2010 - Present Managing Director, DIA International Audit Co., Ltd.

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

>> Independent Director and Chairman of the Audit Committee, Khonburi Sugar Plc
>> Independent Director and Member of the Audit Committee, Global Power Synergy Plc
>> Independent Director and Member of the Audit Committee, TEAM Consulting Engineering and Management Plc

2. Public Company

- None -

3. Limited Company (4)

>> Managing Director, DIA International Audit Co., Ltd.
>> Executive Director, DIA Audit Co., Ltd.
>> Director, 75 C P E Co., Ltd.
>> Director, Yong Som Jai Co., Ltd.

4. Other Organizations/Institutions (6)

>> Committee, the Federations of Accounting Professions
>> Accounting Standards Committee, the Federations of Accounting Professions
>> Academic Matter Committee, Alumnus Association-Faculty of Commerce and Accountancy, Chulalongkorn University
>> Committee Member, Foundation to Support the Development of Academic Law-Faculty of Law, Chulalongkorn University
>> Director and Treasurer, Yong Somjai Santiwattana Foundation
>> Independent Director and Chairman of the Audit Committee, Thai Investors Association

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 -



GENERAL THANAKARN KERDNAIMONGKOL

Independent Director (Non-Executive),
Member of the Audit Committee and Member of the Corporate Governance Committee
(Resigned from Directorship: May 1, 2018)
Age 62 Yrs.

Director Term Duration

>> Independent Director (Non-Executive) (Elected on April 7, 2016: 2 years)

Board-Committee Term Duration

>> Member of the Audit Committee (Appointed on April 27, 2016
and resigned from the position of Member of the Audit Committee
on May 16, 2017: 1 year 1 month)
>> Member of the Corporate Governance Committee
(Appointed on May 26, 2017: 1 year)
>> Member of the Audit Committee
(Appointed on November 24, 2017: 5 months)

Education

>> Bachelor of Science, Chulachomklao Royal Military Academy

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

>> Director Certification Program (DCP 227/2016)
>> Boards That Make a Difference (BMD 4/2017)

Other Trainings

>> Officer Basic Course
>> Officer Advanced Course
>> Mandatory Course, Class 65, Command and General Staff College
>> Executive Relationship Development Course, Class 13
>> National Defence Course, Class 52, National Defence College
>> Internal Audit Course for Executives, Comptroller General's Department,
Ministry of Finance

Working Experience in the 5 Preceding Years

Oct 2011 - Mar 2015 Director, Army Internal Audit Office
Apr 2015 - Mar 2016 Deputy Chief of Executive Committee to the Commanders,
The Royal Thai Army
Apr - Sep 2016 Army Special Qualified General, The Royal Thai Army

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

**MRS. SRIWAN EAMRUNGROJ**

Director (Non-Executive) and Member of the Risk Management Committee

(Resigned from Directorship: October 1, 2018)

Age 61 Yrs.

Director Term Duration

- >> Director (Non-Executive) (Appointed on September 25, 2015 and effective from October 1, 2015 and completed the term in the 2016 Annual General Meeting of Shareholders: 7 months)
- >> Director (Non-Executive) (Re-elected on April 7, 2016: 2 year 6 months)

Board-Committee Term Duration

- >> Member of the Risk Management Committee (Appointed on December 15, 2017 and effective from January 1, 2018: 9 months)

Education

- >> Bachelor of Engineering (Mechanical Engineering) (2nd Class Honors) Chulalongkorn University
- >> Master of Business Administration, Thammasat University

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

- >> The Board's Role in Mergers and Acquisitions (M&A 1/2011)
- >> Director Certification Program (DCP 160/2012)
- >> Director Accreditation Program (DAP 145/2018)

Other Trainings

- >> The Strategy Challenge (TSC) Program, Class 2010, IMD Business School, Switzerland
- >> INSEAD Business School, Class 2010, INSEAD Executive Education, France
- >> Advance Management Program (AMP), Class 183/2012, Harvard Business School, USA
- >> Strategic Marketing Management Program, Class 2014, Stanford Graduate School of Business, USA
- >> The Executive Program in Energy Literacy for a Sustainable Future, Class 8, Thailand Energy Academy
- >> Capital Market Academy Leader Program, Class 25, Capital Market Academy

Working Experience in the 5 Preceding Years

- | | |
|---------------------|---|
| 2011 - Sep 2015 | Executive Vice President, PTT Plc
Secondment to PTT Global Chemical Plc as Executive Vice President, Marketing Commercial and Supply |
| Oct 2015 - Sep 2018 | Senior Executive Vice President, Corporate Strategy, PTT Plc |

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 Thai oil | - None - |
| Conflict of Interest | - None - |
| Family Relation with Other Directors | - None - |
| Dispute in the 10 Preceding Years | - None - |



MRS. NITIMA THEPVANANGKUL

Director (Non-Executive), Member of the Nomination and Remuneration Committee
and Member of the Risk Management Committee
(Resigned from Directorship: October 1, 2018)
Age 61 Yrs.

Director Term Duration

- >> Director (Non-Executive) (Appointed on October 28, 2016: 6 months)
- >> Director (Non-Executive) (Re-elected on April 7, 2017: 1 year 6 months)

Board-Committee Term Duration

- >> Member of the Risk Management Committee
(Appointed on May 26, 2017: 1 year 4 months)
- >> Member of the Risk Management Committee
(Appointed on December 15, 2017 and effective from January 1, 2018:
9 months)

Education

- >> Bachelor of Accounting, Chulalongkorn University
- >> Master of Business Administration Program (Finance) (Honor),
National Institute of Development Administration (NIDA)

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

- >> Director Certification Program (DCP 126/2009)
- >> Risk Management Committee Program (RMP 3/2014)
- >> Anti-Corruption: The Practical Guide (ACPG 18/2015)
- >> Ethical Leadership Program (ELP 3/2016)

Other Trainings

- >> NIDA-Wharton Executive Leadership Program,
The Wharton School, University of Pennsylvania, USA
- >> PTT Executive Leadership Program, General Electric, New York, USA

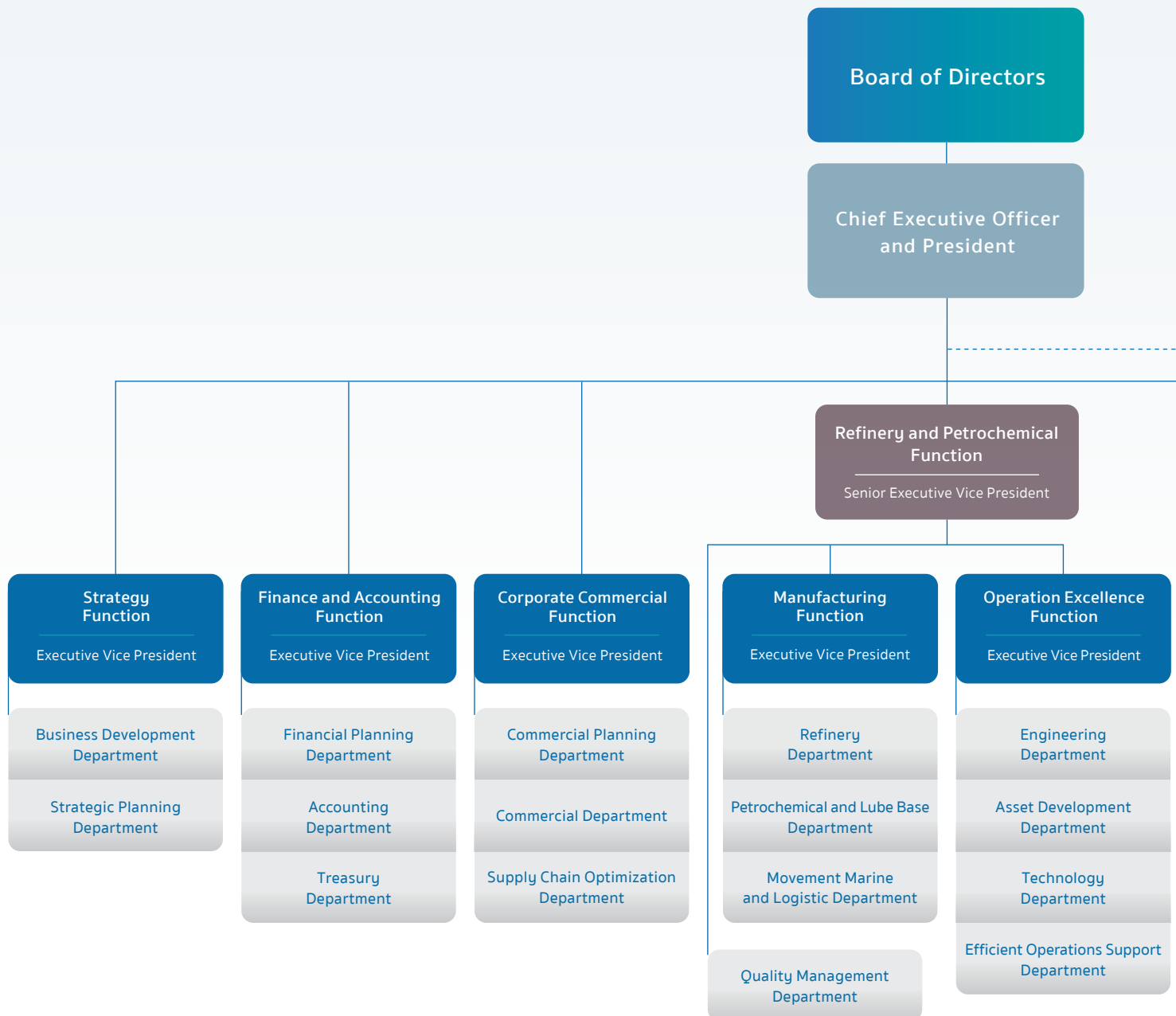
Working Experience in the 5 Preceding Years

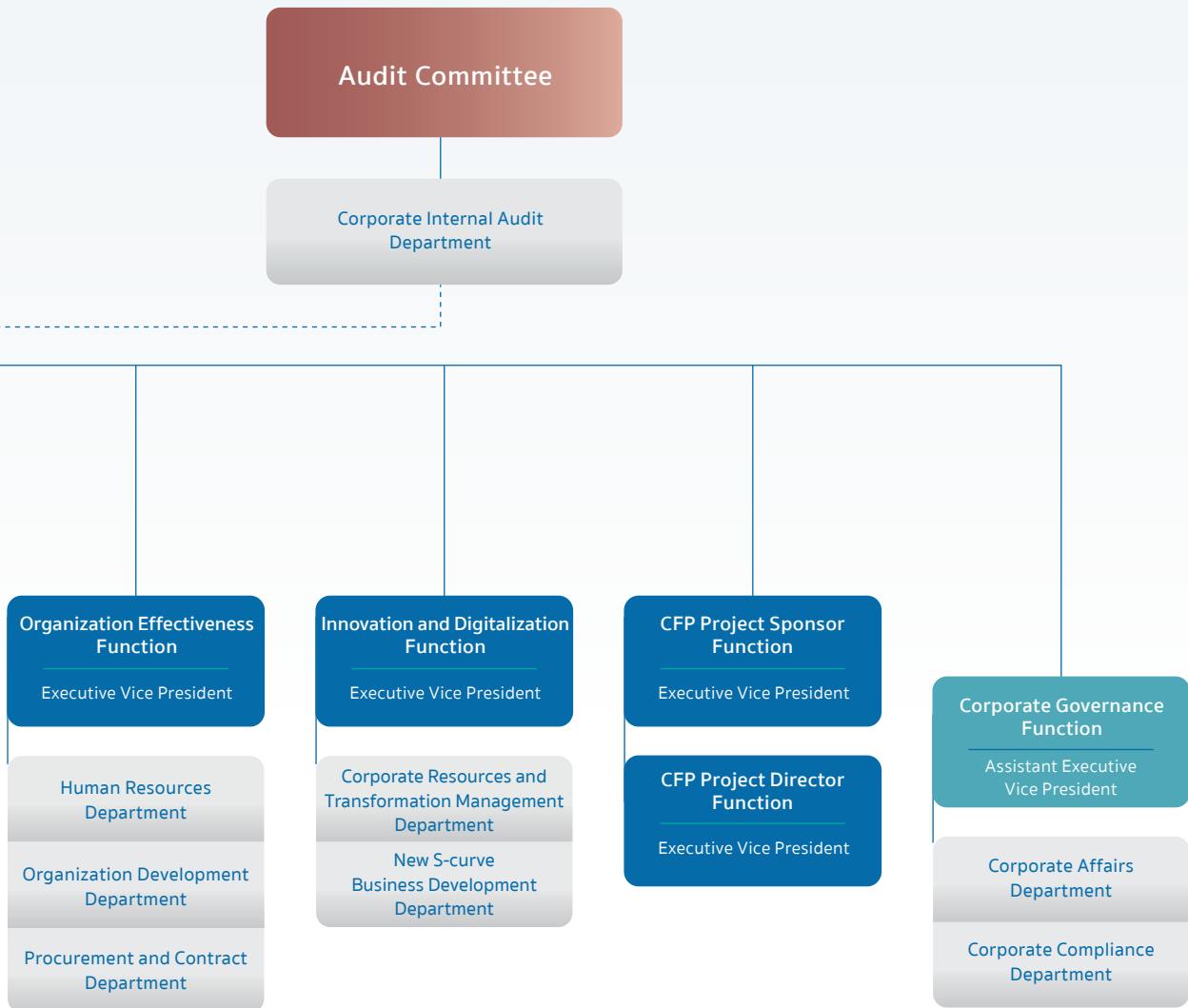
2011 - Apr 2014	Executive Vice President, PTT Plc Secondment to Thai Oil Plc as Executive Vice President-Finance and Accounting
May 2014 - May 2016	Executive Vice President, Corporate Accounting, PTT Plc
Jun - Sep 2016	Executive Vice President, Group Finance and Accounting Policy, PTT Plc
Oct 2016 - Mar 2017	Executive Vice President and Chief Financial Officer (Act.), PTT Plc
Apr 2017 - Sep 2018	Chief Financial Officer, PTT Plc

Current Positions

1. Listed Company	- None -
2. Public Company	- None -
3. Limited Company (1)	
>> Director, PTT International Trading Pte. Ltd.	
4. Other Organizations/Institutions	- None -
5. State Enterprise	- None -
% of Shareholding in Thaioil	2,000 Shares equivalent to 0.00010%
Conflict of Interest	- None -
Family Relation with Other Directors	- None -
Dispute in the 10 Preceding Years	- None -

ORGANIZATIONAL STRUCTURE





EXECUTIVES

As of December 31, 2018



01



02



03



04



05



06



07



08



09

01 Mr. Atikom Terbsiri

Chief Executive Officer and President

02 Mr. Bandhit ThamprajamchitSenior Executive Vice President-
Refinery and Petrochemical, taking a position of
Executive Vice President-Operation Excellence (Act.)**03 Mr. Jeerawat Pattanasomsit**Executive Vice President-Manufacturing (Act.)
Taking a position of Vice President-Refinery**04 Mr. Chatapong Wungtanagorn**

Executive Vice President-Corporate Commercial

05 Mr. Charlee Balmongkol

Executive Vice President-CFP Project Director (Act.)

06 Mr. Pongpun AmornvivatExecutive Vice President-Strategy, taking positions of
Executive Vice President-Innovation and Digitalization (Act.)
and Vice President-Corporate Resources
and Transformation Management (Act.)**07 Ms. Pattaralada Sa-Ngasang**Executive Vice President-Finance and Accounting
Taking positions of Senior Vice President-Financial Planning (Act.)
and Managing Director, Thailoil Treasury Center Co., Ltd.**08 Mr. Viroj Wongsathirayakhun**Executive Vice President-Organization Effectiveness (Act.)
Taking positions of Senior Vice President-Human Resources
and Managing Director, Thailoil Energy Services Co., Ltd.



10



11



12



13



14



15



16



17



18

09 Mr. Surachai Saengsamran

Executive Vice President-CFP Project Sponsor

10 Mr. Viroj Meenaphant

Assistant Executive Vice President-Corporate Governance
Taking a position of Company Secretary

11 Mr. Narongsak Chaviengpob

Vice President-Engineering, taking a position of
Vice President-Asset Development (Act.)

12 Ms. Duangporn Teerapabpaisit

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

13 Ms. Torsang Chaipravat

Vice President-Strategic Planning
Taking a position of Vice President-Assignment as
Managing Director, Thailoil Ethanol Co., Ltd.

14 Mr. Teardchart Padungrat

Vice President-Corporate Affairs

15 Mr. Nikom Kongnok

Vice President-Accounting

16 Mr. Nitas Krongvanitchayakul

Senior Vice President-Assignment as
Managing Director, Thailoil Marine Co., Ltd.

17 Mrs. Prapin Thongnium

Vice President-Corporate Internal Audit

18 Mr. Prasert Raemwanith

Vice President-Quality Management
Taking a position of
Manager-CFP SSHE & Community Management

[19](#)[20](#)[21](#)[22](#)[23](#)[24](#)[25](#)[26](#)[27](#)**19 Mr. Phumchit Tatsanaprasert**

Vice President-Movement Marine and Logistic

20 Mr. Mongkol Janchookiat

Vice President-Efficient Operations Support

21 Ms. Rungtip Maneesarachun

Vice President-Treasury

22 Mrs. Rungrapa Janchookiat

Vice President-Technology

23 Mr. Saran Harinsuta

Vice President-Business Development

24 Mr. Sarungyu LimwongseVice President-Petrochemical and Lube Base
Taking positions of Vice President-Assignment as
Managing Director, Thai Lube Base Plc
and Thai Paraxylene Co., Ltd.**25 Ms. Somporn Bunluesriruang**

Vice President-Supply Chain Optimization

26 Mr. Santi Wasanasiri

Vice President-New S-curve Business Development

27 Mrs. Suchada Deechaiga

Vice President-Organization Development



28



29



30



31



32



33



34

28 Mr. Suchart Mongyanont

Senior Vice President-Assignment as
CFP Engineering Manager

29 Ms. Sudarat Orrattanasakul

Vice President-Commercial Planning

30 Ms. Suwimol Chaluaydumrong

Vice President-Corporate Compliance (Act.)

31 Mr. Anawat Chansaksoong

Vice President-Commercial

32 Ms. Acharee Tiyaabhorn

Vice President-Assignment as Managing Director,
Thaioil Solvent Co., Ltd. and TOP Solvent Co., Ltd.

33 Mr. Udom Wongsirinopphakhun

Vice President-Procurement and Contract
Taking positions of Vice President-Assignment as
Managing Director, Thaioil Power Co., Ltd.
and TOP SPP Co., Ltd.

34 Mr. Ampon Singsakda

Vice President-Assignment as Advisor to SAKC-MD,
Sak Chaisidhi Co., Ltd.

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 14, 2018, 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 at THB 10 per share

Shareholders

As of September 14, 2018, the first ten major shareholders are as follows:

Top 10 Major Shareholders ⁽¹⁾	Number of Shares	Shareholding Percentage
1. PTT PUBLIC COMPANY LIMITED ⁽²⁾	979,765,183	48.027 %
2. STATE STREET EUROPE LIMITED	68,187,462	3.342 %
3. SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	45,982,939	2.254 %
4. SOCIAL SECURITY OFFICE	32,251,200	1.581 %
5. THE BANK OF NEW YORK (NOMINEES) LIMITED	25,035,505	1.227 %
6. BNY MELLON NOMINEES LIMITED	17,561,283	0.861 %
7. GIC PRIVATE LIMITED	14,697,800	0.720 %
8. CHASE NOMINEES LIMITED	12,696,153	0.622 %
9. SE ASIA (TYPE B) NOMINEES LLC	11,666,090	0.572 %
10. EAST FOURTEEN LIMITED-DFA EMERG MARKET CORE EQ PORT	10,281,700	0.504 %
TOTAL	1,218,125,315	59.710 %

Remark:

⁽¹⁾ Excluding shareholders of 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 right to vote at meetings of listed companies.

⁽²⁾ With Ministry of Finance as its major shareholder, PTT Plc (PTT) as Thailoil's major shareholder 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, 2018, there are five directors from a total of 14 who are also holding position as PTT's Board of Directors and/or Management team.

Issuance of Other Securities

Debentures

On April 10, 2018, the Company has repurchased the existing debentures, issue and offer the newly-issued debentures by Thailoil Treasury Center Co., Ltd. (TTC), a wholly-owned subsidiary of the Company, with the Company as the guarantor with the following details:

1. The Company has repurchased USD 500 million Senior Unsecured Debentures due 2023 and USD 500 million Senior Unsecured Debentures due 2043 from overseas investors for the total amount of USD 611 million, comprised of USD 284 million for the Debentures due in 2023 and USD 327 million for the Debentures due in 2043.
2. TTC also completed its issue and offering of USD 611 million Senior Unsecured Debentures in total, comprising of USD 284 million and USD 327 million due in 2023 and 2043, respectively, with the Company as the guarantor.

On November 20, 2018, TTC has issued Senior Unsecured Debentures to foreign institutional investors for the total amount of USD 1 billion, comprised of USD 400 million with the tenor of 10 years, due in 2028 and USD 600 million with the tenor of 30 years, due in 2048. The Debentures are fully guaranteed by the Company.

As of December 31, 2018, Thailoil and Subsidiaries have six Senior Unsecured Debentures of USD 2 billion in total, comprised of two Unsecured Debentures issued by the Company totaling USD 389 million: comprised of USD 216 million due in 2023 and USD 173 million due in 2043, and four Unsecured Debentures issued by TTC totaling USD 1.611 billion, comprised of USD 284 million due in 2023, USD 400 million due in 2028, USD 327 million

due in 2043 and USD 600 million due in 2048. All of the Debentures issued by TTC are fully guaranteed by the Company.

Also, the Company has six Unsecured and Unsubordinated Debentures of THB 23.5 billion in total, comprised of THB 3 billion due in 2019, THB 3 billion due in 2021, THB 3 billion due in 2022, THB 7 billion due in 2024, and THB 7.5 billion due in 2027.

Dividend Policy

The Company's dividend payout policy is to pay at least 25 percent of the consolidated net profit after deductions of all categories of reserves as specified in applicable laws and the Company's Article of Association. Each year, the dividend payments are subjected to the cash flows and investment plans of Thailoil and its Subsidiaries, and other requirements and considerations as determined by the Board of Directors (the Board). The Board may consider paying the annual dividend with approval from the Annual General Meeting of Shareholders (AGM), with exception to the payment of interim dividend, in 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	2012	2013 ⁽¹⁾	2014 ⁽¹⁾	2015	2016	2017
Earnings (Baht per share)	6.04	4.57	(2.03)	5.97	10.40	12.18
Dividend (Baht per share)	2.70	2.30	1.16	2.70	4.50	5.25
Dividend Payout (%)	45.0	50.0	N/A	45.0	43.0	43.0

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 Plc comprises of:

- >> The Board of Directors (the Board)
- >> The four Board-Committees supporting the consideration and important issues as assigned by the Board namely: the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, and the Risk Management Committee
- >> The executives with the Chief Executive Office and President (CEO/President) as the highest executive of the Company

The Board of Directors (as of December 31, 2018)

The Board comprised of 14 Directors as follows:

- >> Thirteen Non-Executive Directors, six of which are Independent Directors
- >> One Executive Director, namely the CEO/President

The Board as of December 31, 2018 comprised of:

Name - Surname	Position	Effective Date
1. Prof. Dr. Thosaporn Sirisumphand ⁽¹⁾	Independent Director Chairman of the Board Director and Chairman of the Board	April 11, 2018 (re-elected) April 7, 2017 August 23, 2018
2. Ms. Chularat Suteethorn ⁽²⁾	Independent Director Member of the Nomination and Remuneration Committee Member of the Audit Committee Chairman of the Audit Committee	April 11, 2018 (re-elected) April 11, 2018 April 27, 2018 May 10, 2018
3. Mr. Chen Namchaisiri ⁽³⁾	Independent Director Member of the Audit Committee	April 7, 2017 April 27, 2018
4. Assoc. Prof. Dr. Pasu Decharin ⁽⁴⁾	Independent Director Member of the Audit Committee	April 11, 2018 April 27, 2018

Name - Surname	Position	Effective Date
5. ACM Suttipong Inseepong	Independent Director Member of the Nomination and Remuneration Committee Chairman of the Nomination and Remuneration Committee	April 7, 2017 (re-elected) April 28, 2017 May 17, 2017
6. Mr. Auttapol Rerkpiboon ⁽⁵⁾	Director Member of the Nomination and Remuneration Committee Member of the Risk Management Committee Chairman of the Risk Management Committee	April 11, 2018 September 28, 2018 September 28, 2018 October 11, 2018
7. Pol. Gen. Aek Angsanant	Independent Director Member of the Corporate Governance Committee Chairman of the Corporate Governance Committee	April 7, 2017 May 26, 2017 June 21, 2017
8. Mr. Yongyut Jantararotai	Director Member of the Corporate Governance Committee	April 7, 2017 (re-elected) May 26, 2017
9. Mr. Kanit Si ⁽⁶⁾	Independent Director Member of the Corporate Governance Committee	February 1, 2018 April 27, 2018
10. Mr. Noppadol Pinsupa ⁽⁷⁾	Director Member of the Risk Management Committee Chairman of the Risk Management Committee	April 7, 2016 (re-elected) April 27, 2016 January 1, 2018 October 11, 2018 (resigned)
11. Ms. Phannalin Mahawongtikul ⁽⁸⁾	Director Member of the Risk Management Committee	October 1, 2018 October 1, 2018
12. Mr. Suchalee Sumamal ⁽⁹⁾	Director	April 11, 2018 (re-elected)
13. Ms. Duangporn Thiengwatanatham ⁽¹⁰⁾	Director	October 1, 2018
14. Mr. Atikom Terbsiri ⁽⁹⁾	Director Member of the Risk Management Committee Chief Executive Officer and President and Secretary to the Board	April 11, 2018 (re-elected) October 1, 2014 October 1, 2014

- ⁽¹⁾ Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; term completed as Independent Director on August 22, 2018 in compliance with the Corporate Governance and Code of Conduct Manual, stated that the Independent Directors shall serve no more than six consecutive years from the date of the appointment (effective from the date when the Board approved this policy on August 23, 2012 onwards)
- ⁽²⁾ Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee in the Board of Directors Meeting (Extra) No. 1/2018 on April 11, 2018; appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018; and elected as a Chairman of the Audit Committee in the Audit Committee Meeting No. 3/2018 on May 10, 2018
- ⁽³⁾ Appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- ⁽⁴⁾ Appointed as Independent Directors in the 2018 Annual General Meeting of Shareholders on April 11, 2018 and appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- ⁽⁵⁾ Appointed as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee and Member of Risk Management Committee in the Board of Directors Meeting No. 9/2018 on September 28, 2018; and elected as Chairman of the Risk Management Committee in the Risk Management Committee Meeting No. 5/2018 on October 11, 2018
- ⁽⁶⁾ Appointed as Independent Director in the Board of Directors Meeting No. 1/2018 on January 26, 2018 and appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- ⁽⁷⁾ Appointed as Chairman of the Risk Management Committee in the Risk Management Committee Meeting No. 9/2017 on December 12, 2017, effective from January 1, 2018; and resigned from the Chairman of the Risk Management Committee, effective from October 11, 2018
- ⁽⁸⁾ Appointed as Director and Member of the Risk Management Committee in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018
- ⁽⁹⁾ Term completed and re-elected as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018
- ⁽¹⁰⁾ Appointed as Director in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018

The Directors who Resigned and Completed the Term during the Year 2018 are as follows:

Name - Surname	Position	Reasons
1. Mr. Sarun Rungkasiri	Director Chairman of the Risk Management Committee Member of the Nomination and Remuneration Committee	Resigned, effective from January 1, 2018
2. Mrs. Suvimol Chrityakierne	Independent Director Member of the Audit Committee	Completed the term in the 2018 Annual General Meeting of Shareholders
3. Gen. Thanakarn Kerdnaimongkol	Independent Director Member of the Audit Committee Member of the Corporate Governance Committee	Resigned, effective from May 1, 2018

Name - Surname	Position	Reasons
4. Mrs. Sriwan Eamrungrroj	Director Member of the Risk Management Committee	Resigned, effective from October 1, 2018
5. Mrs. Nitima Thepvanangkul	Director Member of the Nomination and Remuneration Committee Member of the Risk Management Committee	Resigned, effective from October 1, 2018

Shareholding Report of the Board of Directors and the Company's Management in 2018

(Inclusive of Spouse, Unmarried Partner, and Minor)

Information as of December 31, 2018

Name - Surname	No. of Shares		No. of Shares Addition (Reduction) During the Year
	Dec 31, 2017	Dec 31, 2018	
1. Prof. Dr. Thosaporn Sirisumphand	-	-	-
By Spouse and/or Minor	-	-	-
2. Ms. Chularat Suteethorn	10,000	10,000	-
By Spouse and/or Minor	-	-	-
3. Mr. Chen Namchaisiri	-	-	-
By Spouse and/or Minor	-	-	-
4. Assoc. Prof. Dr. Pasu Decharin	N/A	-	N/A
By Spouse and/or Minor	N/A	-	N/A
5. ACM Suttipong Inseepong	-	-	-
By Spouse and/or Minor	-	-	-
6. Mr. Auttapol Rerkpiboon	N/A	-	N/A
By Spouse and/or Minor	N/A	-	N/A
7. Pol. Gen. Aek Angsanant	-	-	-
By Spouse and/or Minor	-	-	-
8. Mr. Yongyut Jantararotai	-	-	-
By Spouse and/or Minor	-	-	-
9. Mr. Kanit Si	N/A	-	N/A
By Spouse and/or Minor	N/A	20,000	N/A
10. Mr. Noppadol Pinsupa	-	-	-
By Spouse and/or Minor	-	-	-

Name - Surname	No. of Shares		No. of Shares Addition (Reduction) During the Year
	Dec 31, 2017	Dec 31, 2018	
11. Ms. Phannalin Mahawongtikul	N/A	-	N/A
By Spouse and/or Minor	N/A	-	N/A
12. Mr. Suchalee Sumamal	-	-	-
By Spouse and/or Minor	-	-	-
13. Ms. Duangporn Thiengwatanatham	N/A	600	N/A
By Spouse and/or Minor	N/A	-	N/A
14. Mr. Atikom Terbsiri	-	-	-
By Spouse and/or Minor	-	-	-
Directors who Resigned and Completed the Term during the Year 2018			
1. Mr. Sarun Rungkasiri	-	-	-
By Spouse and/or Minor	-	-	-
2. Mrs. Suvimol Chrityakierne	-	-	-
By Spouse and/or Minor	-	-	-
3. Gen. Thanakarn Kerdnaimongkol	-	-	-
By Spouse and/or Minor	-	-	-
4. Mrs. Sriwan Eamrunroj	-	-	-
By Spouse and/or Minor	-	-	-
5. Mrs. Nitima Thepvanangkul	2,000	2,000	-
By Spouse and/or Minor	-	-	-
Company's High-Level Executives			
1. Mr. Atikom Terbsiri	-	-	-
Chief Executive Officer and President			
By Spouse and/or Minor	-	-	-
2. Mr. Bandhit Thamprajamchit	7,200	7,200	-
Senior Executive Vice President- Refinery and Petrochemical Taking a Position of Executive Vice President- Operation Excellence (Act.)			
By Spouse and/or Minor	-	-	-
3. Mr. Jeerawat Pattanasomsit	N/A	-	N/A
Executive Vice President- Manufacturing (Act.)			
By Spouse and/or Minor	N/A	-	N/A

Name - Surname	No. of Shares		No. of Shares Addition (Reduction) During the Year
	Dec 31, 2017	Dec 31, 2018	
4. Mr. Chatapong Wungtanagorn Executive Vice President- Corporate Commercial By Spouse and/or Minor	97,400 -	97,400 -	- -
5. Mr. Charlee Balmongkol Executive Vice President- CFP Project Director (Act.) By Spouse and/or Minor	N/A N/A	- -	N/A N/A
6. Mr. Pongpun Amornvivat Executive Vice President-Strategy Taking a Position of 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 Taking a Position of Senior Vice President-Financial Planning (Act.) By Spouse and/or Minor	- -	- -	- -
8. Mr. Viroj Wongsathirayakhun Executive Vice President- Organization Effectiveness (Act.) By Spouse and/or Minor	N/A N/A	21,600 -	N/A N/A
9. Mr. Surachai Saengsamran Executive Vice President- CFP Project Sponsor By Spouse and/or Minor	98,500 -	98,500 -	- -
10. Mr. Nikom Kongnok Vice President-Accounting By Spouse and/or Minor	- -	- -	- -
11. 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 2018

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 (AGM) under the following criteria and procedures:

1. Each shareholder shall have one vote for one 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; and
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 year 2018, there was no nomination proposed by minor shareholders (see detail in Corporate Governance Policy Section on page 137).

Removal and Termination of Directors

1. At every Annual General Meeting of Shareholders, one-third 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 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 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, the CEO/President or two 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. 9/2018 on Friday, September 28, 2018, the Board of Directors has approved Directors having authority to sign on behalf of the Company, namely Mr. Atikom Terbsiri, CEO/President, signing with affixation of the Company's seal; or, Ms. Duangporn Thiengwatanatham, Mr. Noppadol Pinsupa, and Mr. Auttapol Rerkpiboon, any two of the three representative Directors jointly sign together with the affixation of the Company's seal.

Board of Directors Roles and Responsibility

Observing Company's regulations, the Board of Directors is authorized to conduct roles and responsibilities under the law, the Company's objectives, regulations, and resolutions approved by Shareholders' meetings. Directors must observe the "Code of Practice for Directors of Listed Companies" stipulated by the 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 assure 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 CEO/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 followed:

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 CEO/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 the President (CEO/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 CEO/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-tune 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 the Board of Directors, Board-Committees, and Shareholders' Meeting in 2018

Name - Surname	Position	Board of Directors Meeting (16 times)	Audit Committee Meeting (7 times)	Nomination and Remuneration Committee Meeting (5 times)	Corporate Governance Committee Meeting (5 times)	Risk Management Committee Meeting (7 times)	Annual General Meeting of Shareholders (AGM) (1 time)	Extraordinary General Meeting of Shareholders (EGM) (1 time)	Independent Directors Meeting (2 times)	Non-Executive Directors Meeting (1 time)
1 Prof. Dr. Thosaporn Srisumpraphand ⁽¹⁾	Director and Chairman of the Board	16/16					1/1	1/1	1/1	1/1
2 Ms. Chularat Suteethorn ⁽²⁾	Independent Director, Chairman of the Audit Committee, and Member of the Nomination and Remuneration Committee	15/16	7/7	5/5			1/1	1/1	2/2	1/1
3 Mr. Chen Namchaisiri ⁽³⁾	Independent Director and Member of the Audit Committee	16/16	4/5				1/1	1/1	2/2	1/1
4 Assoc. Prof. Dr. Pasu Decharin ⁽⁴⁾	Independent Director	11/13	5/5				1/1	1/1	1/2	1/1
5 ACM Suttipong Inseeyong	Independent Director and Member of the Audit Committee	16/16		5/5			1/1	1/1	2/2	1/1
6 Mr. Autapal Rerkpiboon ⁽⁵⁾	Chairman of the Nomination and Remuneration Committee, Director, Chairman of the Risk Management Committee, and Member of the Nomination and Remuneration Committee	13/13		1/1		2/2	1/1	1/1		1/1
7 Pol. Gen. Aek Angsanaront	Independent Director and Chairman of the Corporate Governance Committee	16/16			5/5		1/1	1/1	2/2	1/1
8 Mr. Yongyut Jantaradai	Director and Member of the Corporate Governance Committee	15/16			5/5		1/1	1/1		1/1
9 Mr. Kanit Si ⁽⁶⁾	Independent Director and Member of the Corporate Governance Committee	15/15			3/3		1/1	1/1	2/2	1/1
10 Mr. Noppadol Pirsupa ⁽⁷⁾	Corporate Governance Committee Director and Member of the Risk Management Committee	14/16				7/7	1/1	1/1		1/1
11 Ms. Phannalin Mahawongtikul ⁽⁸⁾	Director and Member of the Risk Management Committee	3/3				2/2	N/A	N/A		1/1
12 Mr. Suchalee Sumamal ⁽⁹⁾	Director	16/16					1/1	1/1		1/1
13 Ms. Duangporn Thiangwatanatham ⁽¹⁰⁾	Director	3/3					N/A	N/A		1/1
14 Mr. Atikom Terbsiri ⁽¹¹⁾	Director, Member of the Risk Management Committee, Chief Executive Officer and President, Secretary to the Board	16/16				7/7	1/1	1/1		1/1
Directors who completed their terms and resigned during the year 2018										
1 Mr. Sarun Rungkasiri	Director, Chairman of the Risk Management Committee, and Member of the Nomination and Remuneration Committee (Resigned on January 1, 2018)	N/A		N/A		N/A	N/A	N/A		N/A
2 Mrs. Suvimol Chrityaktene	Independent Director and Member of the Audit Committee (Completed term in the 2018 Annual General Meeting of Shareholders)	3/3	2/2				1/1	N/A	N/A	N/A
3 Gen. Thanakam Kerdnaimongkol	Independent Director, Member of Audit Committee and Member of the Corporate Governance Committee (Resigned on May 1, 2018)	5/5	2/2		2/2		1/1	N/A	N/A	N/A
4 Mrs. Sriwan Eamrungrroj	Director, Member of the Risk Management Committee (Resigned on October 1, 2018)	11/13				5/5	1/1	1/1		N/A
5 Mrs. Nitiwa Thepvanangkul	Director, Member of the Risk Management Committee and Member of the Nomination and Remuneration Committee (Resigned on October 1, 2018)	11/13		4/4		5/5	1/1	1/1		N/A

Remark:

N/A means not attend since the Director resigned or was appointed during the year 2018.

- (1) Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; term completed as Independent Director on August 22, 2018 in compliance with the Corporate Governance and Code of Conduct Manual, stated that the Independent Directors shall serve no more than six consecutive years from the date of the appointment (effective from the date when the Board approved this policy on August 23, 2012 onwards)
- (2) Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee in the Board of Directors Meeting (Extra) No. 1/2018 on April 11, 2018; appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018; and elected as a Chairman of the Audit Committee in the Audit Committee Meeting No. 3/2018 on May 10, 2018
- (3) Appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- (4) Appointed as Independent Directors in the 2018 Annual General Meeting of Shareholders on April 11, 2018 and appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- (5) Appointed as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee and Member of Risk Management Committee in the Board of Directors Meeting No. 9/2018 on September 28, 2018; and elected as Chairman of the Risk Management Committee in the Risk Management Committee Meeting No. 5/2018 on October 11, 2018
- (6) Appointed as Independent Director in the Board of Directors Meeting No. 1/2018 on January 26, 2018 and appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- (7) Appointed as Chairman of the Risk Management Committee in the Risk Management Committee Meeting No. 9/2017 on December 12, 2017, effective from January 1, 2018; and resigned from the Chairman of the Risk Management Committee, effective from October 11, 2018
- (8) Appointed as Director and Member of the Risk Management Committee in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018
- (9) Term completed and re-elected as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018
- (10) Appointed as Director in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018

Information of Directors, Executive Officers and Control Executives as of December 31, 2018

[illegible]

Information of Directors, Executive Officers and Control Executives as of December 31, 2018

Name	Thai Oil Lub 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 Chaisi Co., Ltd.	TOP Solvent (Vietnam) LLC.	Saphi Co., Ltd.	Saphi Marine International Plc. Ltd.	TOP Maritime Service Co., Ltd. ⁽²⁾	Labix Co., Ltd.	Indirect Subsidiaries				Jointly-Controlled Entity of Subsidiaries				Associates				Related Companies
28 Mr. Nikom Kongnok	*				*				*		*																		
29 Mr. Nitas Krongvanichayakul	*																												
30 Mrs. Prapin Thongnium	*																												
31 Mr. Prasert Raemwanth*	*																												
32 Mr. Phumchit Tatsanaprasert	*																												
33 Mr. Mongkol Janchookiat	*																												
34 Ms. Rungtip Maneesarachun	*	*						*		*		*																	
35 Mrs. Rungnapa Janchookiat	*																												
36 Mr. Saran Hairisuta*	*												*																
37 Mr. Sanayu Limwongse	*	*	*										*				*												
38 Ms. Somporn Bunluesruang	*																												
39 Mr. Santi Wasanasiri	*																												
40 Mrs. Suchada Deechaiya	*																												
41 Mr. Suchart Monyaront*	*																												
42 Ms. Sudarat Orrattanasakul	*											*																	
43 Ms. Suwimol Chaluyadumrong	*																												
44 Mr. Anawat Chansaksoong	*																												
45 Ms. Acharee Tiabhom	*		*		*					*	*	*	*																
46 Mr. Udom Wongsirinoophakhun	*									*																			
47 Mr. Amporn Singsakda*	*																												

Notes: * = Chairman * = Director * = Chief Executive Officer or Managing Director * = Executive Officer * = Retired on December 31, 2018

⁽¹⁾ Thai Oil Treasury Center Co., Ltd. founded on September 29, 2017, is a subsidiary of Thai Oil Plc (Thai Oil), in which Thai Oil holds 100% of shares.
⁽²⁾ TOP Maritime Service Co., Ltd. is a subsidiary of Thai Oil Marine Co., Ltd. (TM), in which TM holds 100% of shares. (after acquired shares 45% from previous shareholder on June 21, 2018)
⁽³⁾ TOP-NTL Plc. Ltd. and TOP-NTL Shipping Trust are jointly-controlled entities of Thai Oil Marine Co., Ltd. (TM), in which TM holds 50% of shares. Both companies do not have Thai Oil's executive serving as directors.
⁽⁴⁾ Saphi Green Energy Co., Ltd. founded on May 8, 2018, is a jointly-controlled entity of Thai Oil Ethanol Co., Ltd. (TET), in which TET holds 50% of shares.
⁽⁵⁾ Ubon Bio Ethanol Plc registered as Public Company on April 23, 2018

Management Team

As of December 31, 2018

Name - Surname	Position
1. Mr. Atikom Terbsiri	Chief Executive Officer and President
2. Mr. Bandhit Thamprajamchit	Senior Executive Vice President-Refinery and Petrochemical Taking a Position of Executive Vice President-Operation Excellence (Act.)
3. Mr. Jeerawat Pattanasomsit	Executive Vice President-Manufacturing (Act.) Taking a Position of Vice President-Refinery
4. Mr. Chatapong Wungtanagorn	Executive Vice President-Corporate Commercial
5. Mr. Charlee Balmongkol	Executive Vice President-CFP Project Director (Act.)
6. Mr. Pongpun Amornvivat	Executive Vice President-Strategy Taking Positions of Executive Vice President- Innovation and Digitalization (Act.) and Vice President- Corporate Resources and Transformation Management (Act.)
7. Ms. Pattaralada Sa-Ngasang	Executive Vice President-Finance and Accounting Taking Positions of Senior Vice President-Financial Planning (Act.) and Managing Director, Thailoil Treasury Center Co., Ltd.
8. Mr. Viroj Wongsathirayakhun	Executive Vice President-Organization Effectiveness (Act.) Taking Positions of Senior Vice President-Human Resources and Managing Director, Thailoil Energy Services Co., Ltd.
9. Mr. Surachai Saengsamran	Executive Vice President-CFP Project Sponsor
10. Mr. Viroj Meenaphant	Assistant Executive Vice President-Corporate Governance Taking a Position of Company Secretary
11. Mr. Narongsak Chaviengpob	Vice President-Engineering Taking a Position of Vice President-Asset Development (Act.)
12. Ms. Duangporn Teerapabpaisit	Senior Vice President-Assignment as Managing Director, Labix Co., Ltd.
13. Ms. Torsang Chaipravat	Vice President-Strategic Planning Taking a Position of Vice President-Assignment as Managing Director, Thailoil Ethanol Co., Ltd.
14. Mr. Teardchart Padungrat	Vice President-Corporate Affairs
15. Mr. Nikom Kongnok	Vice President-Accounting
16. Mr. Nitas Krongvanitchayakul	Senior Vice President-Assignment as Managing Director, Thailoil Marine Co., Ltd.

Name - Surname	Position
17. Mrs. Prapin Thongnium	Vice President-Corporate Internal Audit
18. Mr. Prasert Raemwanith	Vice President-Quality Management Taking a Position of Manager-CFP SSHE & Community Management
19. Mr. Phumchit Tatsanaprasert	Vice President-Movement Marine and Logistic
20. Mr. Mongkol Janchookiat	Vice President-Efficient Operations Support
21. Ms. Rungtip Maneesarachun	Vice President-Treasury
22. Mrs. Rungnapa Janchookiat	Vice President-Technology
23. Mr. Saran Harinsuta	Vice President-Business Development
24. Mr. Sarunyu Limwongse	Vice President-Petrochemical and Lube Base Taking Positions of Vice President-Assignment as Managing Director, Thai Lube Base Plc and Thai Paraxylene Co., Ltd.
25. Ms. Somporn Bunluesriruang	Vice President-Supply Chain Optimization
26. Mr. Santi Wasanasiri	Vice President-New S-curve Business Development
27. Mrs. Suchada Deechaiya	Vice President-Organization Development
28. Mr. Suchart Monyanont	Senior Vice President-Assignment as CFP Engineering Manager
29. Ms. Sudarat Orrattanasakul	Vice President-Commercial Planning
30. Ms. Suwimol Chaluaydumrong	Vice President-Corporate Compliance (Act.)
31. Mr. Anawat Chansaksoong	Vice President-Commercial
32. Ms. Acharee Tiyabhorn	Vice President-Assignment as Managing Director, Thaioil Solvent Co., Ltd. and TOP Solvent Co., Ltd.
33. Mr. Udom Wongsirinopphakhun	Vice President-Procurement and Contract Taking Positions of Vice President-Assignment as Managing Director, Thaioil Power Co., Ltd. and TOP SPP Co., Ltd.
34. Mr. Ampon Singsakda	Vice President-Assignment as Advisor to SAKC-MD, Sak Chaisidhi Co., Ltd.

Company Secretary

The Board of Directors (the Board) 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 assure 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 on September 28, 2018, the Board 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
Chulalongkorn University

Working Experience in the 5 Preceding Years

May 2009-Dec 2012	Manager-Corporate Management Office and Company Secretary
Jan-Apr 2013	Assistant Executive Vice President-Corporate Governance (Act.) and Company Secretary
May 2013-Jan 2015	Assistant Executive Vice President-Corporate Governance (Act.); Vice President-Corporate Affairs (Act.); Manager-CSR Strategy (Act.); and Company Secretary
Feb-Apr 2015	Assistant Executive Vice President-Corporate Governance; Vice President-Corporate Affairs (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

Company Secretary Training:

Thai Institute of Directors (IOD)

- >> Company Secretary Program (CSP 31/2009)
- >> Director Certification Program (DCP 185/2014)

Other Institutes

- >> Leadership Development Program II (2018)
- >> Advanced Certificate Course in Politics and Governance in Democratic Systems for Executives, 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

Name: Mrs. 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

Thai Institute of Directors (IOD)

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

Other Institutes

- >> 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
- >> Executive Development Program (EDP), Thai Listed Company Association (TLCA)
- >> Financial Executive Development Program (FINEX)
- >> Study and Visit the Internal Audits of Leading Public Companies

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

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.

Directors and Executives Remuneration

Directors Remuneration

The 2018 Annual General Meeting of Shareholders (AGM) set the monthly remuneration as well as meeting fee, and a special bonus for the Company Directors and Board-Committees, reflecting the Company's performance as follows:

2018 Remuneration Structure

Retainer Fee	Baht/Month
Chairman of the Board ⁽¹⁾	75,000
Vice Chairman of the Board (if any) ⁽¹⁾	67,500
Member of the Board	60,000
Special Bonus for the Board of Directors ⁽²⁾	50 Million Baht/Year

Board-Committees' Remuneration

(Comprised of the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee, and the Risk Management Committee)

Chairman of the Board-Committee ⁽¹⁾	31,250
Member of the Board-Committee	25,000

Meeting Fee for Directors who attend the Meeting

Chairman of the Board ⁽¹⁾	25,000 Baht/Meeting
Vice Chairman of the Board (if any) ⁽¹⁾	22,500 Baht/Meeting
Member of the Board	20,000 Baht/Meeting

Remark:

⁽¹⁾ Chairman of the Board and Chairman of the Board-Committees shall receive monthly remuneration of 25% higher than the Director. Vice Chairman of the Board (if any) shall receive monthly remuneration of 12.5% higher than the Director.

⁽²⁾ The special bonus is for the Board of Directors in office in the year 2017 including those Directors who resigned or whose term completed during 2017. 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 Director.

In summary, the remuneration of 22 Directors, which included Directors in Office during 2018 for a period of 12 months ending as of December 31, 2018, and Directors who completed their terms or resigned during the year 2018, totals THB 18.52 million. This comprises monthly remuneration for the Company Directors of THB 10.24 million, monthly remuneration of Board-Committees of THB 4.17 million, and meeting fee of THB 4.11 million. In the 2018 Annual General Meeting of Shareholders on April 11, 2018, passed the resolution for Directors' remuneration in the form of a special bonus for 2017 performance of THB 50 million. The remuneration is considered through the comparison with organizations with equal size in the same industry, as well as the Company performance, achievements, and responsibilities of the Board of Directors, and 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.

No.	Name - Surname	Position	Meeting Fee	Board of Directors Fee	Board-Committees				Total Remuneration	Annual Bonus for 2017 ⁽ⁱ⁾ (Paid in April 2018)
					Audit Committee	Nomination and Remuneration Committee	Corporate Governance Committee	Risk Management Committee		
1	Prof. Dr. Thosaporn Srisumphant ⁽²⁾	Director and Chairman of the Board	380,000.00	900,000.00	-	-	-	-	1,280,000.00	3,982,117.34
2	Ms. Chularat Suleethorn ⁽³⁾	Independent Director, Chairman of the Audit Committee, and Member of the Nomination and Remuneration Committee	280,000.00	720,000.00	356,727.14	300,000.00	-	-	1,656,727.14	3,364,520.44
3	Mr. Chen Namchalsiri ⁽⁴⁾	Independent Director and Member of the Audit Committee	300,000.00	720,000.00	203,333.33	-	-	-	1,223,333.33	2,470,387.61
4	Assoc. Prof. Dr. Pasu Decharin ⁽⁵⁾	Independent Director and Member of the Audit Committee	205,000.00	518,000.00	203,333.33	-	-	-	926,333.33	-
5	ACM Suttipong Inseeyong	Independent Director and Chairman of the Nomination and Remuneration Committee	300,000.00	720,000.00	-	375,000.00	-	-	1,395,000.00	3,364,520.44
6	Mr. Autapol Rerkpiboon ⁽⁶⁾	Director, Chairman of the Risk Management Committee, and Member of the Nomination and Remuneration Committee	240,000.00	518,000.00	-	75,000.00	-	91,733.87	924,733.87	-
7	Pol. Gen. Aek Angsanaront	Independent Director	300,000.00	720,000.00	-	-	375,000.00	-	1,395,000.00	2,470,387.61
8	Mr. Yongyut Jantararotai	Director and Member of the Corporate Governance Committee	285,000.00	720,000.00	-	-	300,000.00	-	1,305,000.00	3,364,520.44
9	Mr. Kanit Si ⁽⁷⁾	Independent Director	280,000.00	660,000.00	-	-	203,333.33	-	1,143,333.33	-
10	Mr. Noppadol Pinsupa ⁽⁸⁾	and Member of the Corporate Governance Committee	265,000.00	720,000.00	-	-	-	358,266.13	1,343,266.13	3,364,520.44
11	Ms. Phamalin Mahawongkikul ⁽⁹⁾	Director and Member of the Risk Management Committee	60,000.00	180,000.00	-	-	-	75,000.00	315,000.00	-
12	Mr. Suchalee Sumamal ⁽¹⁰⁾	Director	300,000.00	720,000.00	-	-	-	-	1,020,000.00	285,753.80
13	Ms. Duangporn Thiewwattaratnam ⁽¹¹⁾	Director, Member of the Risk Management Committee,	60,000.00	180,000.00	-	-	-	-	240,000.00	-
14	Mr. Atikom Terbsiri ⁽¹²⁾	Chief Executive Officer and President, Secretary to the Board	300,000.00	720,000.00	-	-	-	300,000.00	1,320,000.00	3,364,520.44
Directors who Completed the Term in 2018 AGM / Resign during the Year 2018										
1	Mr. Sarun Rungkasiri	Director, Chairman of the Risk Management Committee, and Member of the Nomination and Remuneration Committee (Resigned on January 1, 2018)	-	-	-	-	-	-	-	3,364,520.44
2	Mrs. Suwimol Chrityakierne	Independent Director and Member of the Audit Committee (Completed term in the 2018 Annual General Meeting of Shareholders)	60,000.00	202,000.00	84,166.67	-	-	-	346,166.67	3,364,520.44
3	Gen. Thanakarn Kerdnaimongkol	Independent Director and Member of the Audit Committee (Resigned on May 1, 2018)	100,000.00	240,000.00	100,000.00	-	100,000.00	-	540,000.00	3,364,520.44
4	Mrs. Siwan Eamrungraj	Director, Member of the Risk Management Committee (Resigned on October 1, 2018)	185,000.00	540,000.00	-	-	-	225,000.00	950,000.00	3,364,520.44
5	Mrs. Nilima Thepvanangkul	Director, Member of the Risk Management Committee and Member of the Risk Management Committee (Resigned on October 1, 2018)	205,000.00	540,000.00	-	225,000.00	-	225,000.00	1,195,000.00	3,364,520.44
Directors who Completed the Term in 2017 AGM / Resign during the Year 2017 (Received Annual Bonus for 2017 Performance)										
1	Mr. Kurujit Nakornthap	Director and Chairman of the Board (Completed his term in the 2017 Annual General Meeting of Shareholders)	-	-	-	-	-	-	-	1,117,666.04
2	Mr. Siri Jirapongphan	Independent Director and Member of the Audit Committee (Resigned on November 17, 2017)	-	-	-	-	-	-	-	2,949,716.55
3	Ms. Nantika Thangsuptanich	Director (Resigned on December 1, 2017)	-	-	-	-	-	-	-	3,078,766.65
Total			4,105,000.00	10,238,000.00	947,560.47	975,000.00	978,333.33	1,275,000.00	18,518,893.80	50,000,000.00

Remark:

- ⁽¹⁾ Special Bonus for 2016 Company Performance as resolved by the Shareholders' Annual General Meeting (AGM) 2017 on April 7, 2017 paid to the Directors on April 28, 2017.
- ⁽²⁾ Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; term completed as Independent Director on August 22, 2018 in compliance with the Corporate Governance and Code of Conduct Manual, stated that the Independent Directors shall serve no more than six consecutive years from the date of the appointment (effective from the date when the Board approved this policy on August 23, 2012 onwards)
- ⁽³⁾ Term completed and re-elected as Independent Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee in the Board of Directors Meeting (Extra) No. 1/2018 on April 11, 2018; appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018; and elected as a Chairman of the Audit Committee in the Audit Committee Meeting No. 3/2018 on May 10, 2018
- ⁽⁴⁾ Appointed as Member of the Audit Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- ⁽⁵⁾ Appointed as Independent Directors in the 2018 Annual General Meeting of Shareholders on April 11, 2018 and appointed as Member of the Nomination and Remuneration Committee in the Board of Directors Meeting No. 9/2018
- ⁽⁶⁾ Appointed as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018; appointed as Member of the Nomination and Remuneration Committee in the Risk Management Committee Meeting No. 5/2018 on October 11, 2018
- ⁽⁷⁾ Appointed as Independent Director in the Board of Directors Meeting No. 1/2018 on January 26, 2018 and appointed as Member of the Corporate Governance Committee in the Board of Directors Meeting No. 4/2018 on April 27, 2018
- ⁽⁸⁾ Appointed as Chairman of the Risk Management Committee in the Risk Management Committee Meeting No. 9/2017 on December 12, 2017, effective from January 1, 2018; and resigned from the Chairman of the Risk Management Committee, effective from October 11, 2018
- ⁽⁹⁾ Appointed as Director and Member of the Risk Management Committee in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018
- ⁽¹⁰⁾ Term completed and re-elected as Director in the 2018 Annual General Meeting of Shareholders on April 11, 2018
- ⁽¹¹⁾ Appointed as Director in the Board of Directors Meeting No. 9/2018 on September 28, 2018, effective from October 1, 2018

Executives Remuneration

As of the fiscal year ended on December 31, 2018, the remuneration of 31 executives totalled to THB 247.46 million. This comprises of remuneration in the forms of monthly salaries and allowances of THB 151.21 million, special bonus of THB 53.69 million, provident fund contributions of THB 16.2 million, retirement gratuity fund payments of THB 17.54 million, and other payments of THB 8.82 million.

Remark:

- | | |
|---|--|
| <p>>> The remuneration for 31 executives as of December 31, 2018, excludes the following executives who work in the subsidiary companies:</p> <p>Mr. Nitas Krongvanitchayakul</p> <p>Mr. Ampon Singsakda</p> <p>Ms. Acharee Tiyaabhorn</p> <p>Ms. Duangporn Teerapabpaisit</p> <p>Mr. Suchart Monyanont</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> <p>Mr. Charlee Balmongkol</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> | <p>Mr. Viroj Wongsathirayakhun</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> <p>Mr. Sarunyu Limwongse</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> <p>Ms. Torsang Chaipravat</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> <p>Mr. Udom Wongsirinopphakhun</p> <p>(partially included while divided by the proportion of the managing position of Companies within Thail and Subsidiaries)</p> |
|---|--|

RISK FACTORS AND CORPORATE RISK MANAGEMENT

The year 2018 contained many challenges that prompted Thailoil and Subsidiaries to speed up their adjustment, notably the approval of the Clean Fuel Project (CFP) and the implementation of Digital Transformation. To handle volatile risk factors and minimize the probability of such risks harming corporate objectives and goals, Thailoil therefore constantly committed to apply corporate risk management based on international standard and best practices such as Enterprise Risk Management (ERM) under the Committee of Sponsoring Organization of Treadway Commission (COSO), AS/NZS 4360:2004, and ISO 31000:2009 (Risk Management Principles and Guidelines). This focuses on integrated management, embracing Thailoil and Subsidiaries' risk management under the five "Risk Appetites" namely: performance and investment; compliance; safety, occupational health, and environment; reputation; and fraud and corruption. Thailoil then links such management to the formulation of strategic plans, investment, and business planning to align with short-term, medium-term, and long-term corporate objectives and goals. Based on stakeholders' expectation, internal and external key risk factors are defined and used for designating measures and mitigation plans of each risk factor. Also identified were key risks, early-warning indicators, and Key Risk Indicators (KRIs), designed to closely monitor key risks and risk management outcomes. Such outcomes were reported to the Risk Management Steering Committee (RMSC), Risk Management Committee (RMC), and the Board of Directors (the Board) to ensure efficient and effective enterprise risk management. In addition, Thailoil and

Subsidiaries required that risk management shall be one of the executives' and managing directors' Key Performance Indicators (KPIs).

To cope with possible threats and natural catastrophes, Thailoil established the Business Continuity Plans (BCPs), under ISO 22301:2012, for all critical and support processes. Various disasters simulations are defined for BCP drills, in conjunction with the refinery's regular emergency drills. The Company also promoted sound knowledge and positive attitudes among employees to improve their caliber for risk management and Business Continuity Management (BCM) to ensure readiness to cope with risk factors through annual assessment of employees' knowledge and attitude, that is thorough and on a par with international standards as well as good corporate governance practices. The latest assessment showed employees' high confidence in corporate risk management processes, which supported corporate risk management achievement and contributed to a corporate risk culture.

Corporate Risks and Risk Mitigation Plans

Thailoil promotes systematic monitoring and revision of key risks and the effectiveness of risk management measures. The year's set of key risks, risk mitigation plans, and KRI outcomes were presented for the RMC's endorsement before tabling to the Board. Thailoil and Subsidiaries' risks are divided into five major areas containing eight key risks and risk mitigation plans, which developed to prevent or mitigate their impacts to achieve the corporate goals.

Strategic Risks

1. Loss of Competitiveness Risks

Because of the refining business' highly-competitive production costs, which results from more efficient technology, Asia Pacific's refining capacity expansion along with digital transformation, Thailoil needs to develop its production capability as well as efficient cost control. Therefore, Thailoil leverages its operating cost control measures by executing the Orchestra Project to assure that it still commands competitive advantages over regional refinery industry leaders. Thailoil also remains committed to enhancing its own potential by modifying into a digital refinery through the leveraging of digital tools to enhance its competitiveness to accommodate changes while accurately and promptly fulfilling customers' aspiration.

2. Sustainable Business Growth Risks

Thailoil defines investment strategies for business growth in pursuing current and future business opportunities. Various strategic projects were organized to achieve growth and business sustainability. The Extraordinary General Meeting of Shareholders No. 1/2018 on August 27, 2018, approved the CFP investment, and later on October 2018, Thailoil signed an Engineering, Procurement and Construction (EPC) contract. In addition, it initiated the Jetty Expansion Project to increase product distribution capability and efficiency for customers' optimal interests, thus being able to sustain the offloading of new products stemming from future business growth for Thailoil and Subsidiaries. The jetties are expected to commercially operate in late 2019. Additionally, Thailoil commands other strategic projects to accommodate its growth, including investment in the Corporate Venture

Capital (CVC) project to pursue new opportunities from start-up businesses.

Commercial Risks

3. Market/Commercial Risks

Crude oil prices and crack spreads, which represent key indices directly affecting Thailoil's profitability, are highly and continuously volatile, particularly in view of rising crude premiums and falling Gross Refining Margins. Thailoil, therefore, deploys more aggressive oil hedging by preventing financial losses due to crack spreads and stock loss, including smart management of inventory. The Hedging Steering Committee is tasked to screen and review strategic plans, and set the target under a hedging framework, which is regularly approved by the RMC and the Board to minimize such impact.

In addition, Thailoil relentlessly improves its ability to fulfill customers' demand and constantly facilitate customers. Innovation and technologies have been implemented in operating processes to achieve full digitization, including the TOP ENERGY application to report oil prices in real-time and the TOP TRACKING application to monitor cargo vessel loading and offloading.

Financial Risks

4. Financial Risks

Fluctuation of foreign currency exchange and interest rates pose risks to business operation. This is because Thailoil's major production cost (crude oil and other feedstock) is paid in US Dollars. Thailoil, therefore, structures the debt ratio for Thailoil and Subsidiaries to assure that the US Dollar currency match its revenue structure through natural hedging and engages in forward

contracts for transactions in foreign currencies, loan withdrawals and loan repayment as done last year.

Thaioil and Subsidiaries established Thaioil Treasury Center Co., Ltd. (TTC) to create value and financial innovation through centralized financial management. This will enhance abilities for international financial transactions, risk management, and optimal capital sourcing for Thaioil and Subsidiaries leading to optimum financial management and tax benefits. This year, TTC successfully issued and offer bonds worth USD 1 billion for investment under its plans, working capital, and general operating expenditure.

Operations Risks

5. Business Disruption Risks

The risks of severe incidents affecting business or causing business disruption could result from external and internal factors, including natural catastrophes, security threats, IT threats, unplanned shutdowns due to equipment breakdown, and mishaps that could devastate the environment and communities, including oil spills and major mishaps. All of these could affect business, corporate image, communities, society, and the environment. Thaioil, thus, has formulated measures to prevent and mitigate impacts, with the addition of measures concerning safety, security, occupational health, and work environment for employees and relevant parties. Moreover, Thaioil collaborated with all sectors including neighboring communities and local government, in monitoring the incident prevention progress, and established cooperation on equipment and resources to ease the impacts of potential incidents. Also, Thaioil constantly stages emergency and Business Continuity Plan (BCP) drills,

constantly reviews and improves its emergency plans, and improves Business Continuity Management (BCM) under ISO 22301:2012. In addition, Thaioil encourages the improvement of communication plan by generating understanding for relevant parties through workshops, and boasting diverse communication channels to boost confidence in its performance, as well as monitoring performance under its protocols and procedures. Finally, before actual implementation, Thaioil performs safety, security, occupational health, and the environment assessment for high-risk tasks to ensure safety and business continuity.

As for security threats, Thaioil extends cooperation with government agencies, the military, police units, and provincial authorities on monitoring intelligence and security situations both inside and outside its areas. Thaioil also collaborates PTT Group to set up joint security operation at the policy level and the operation level, and to follow up as well as develop additional measures besides the existing security risk management plans. The goal is to ensure business continuity while protecting lives and properties of both refinery and neighboring communities.

As for IT system threats, Thaioil has added IT system safety measures to ward off external threats, including compliance with ISO 27001 (Compliance with Information Security Standards), constant system monitoring and audit, and communication of measures and guidelines among relevant parties. These systems are regularly tested by third-party experts to detect deficiencies and pursue additional protective guideline, including the assessment on security maturity level, under the Gartner

Standard for smooth business operation and satisfaction of customers and stakeholders without affecting communities, society, and the environment.

6. Regulation/Legislative Change and Compliance Risks

Changes in public policies focusing on economic growth as well as 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 a Compliance Working Team to support Thailoil and Subsidiaries' business compliance with the law, regulations, announcements, rules, and the public sector's directives that are binding to businesses. This team also systematically monitors public policy changes and emerging legislation dealing with the refining industry; new accounting standards and tax laws; and SEC and SET's rules to enable Thailoil and Subsidiaries to keep pace with changes. The efforts include forging awareness of the significance of compliance with the law among all employees and contractors, and conducting self-assessment designed to verify the efficiency and effectiveness of compatibility between its business and relevant public policies, rules, and legislation.

7. Communities and Stakeholders Risks

Thailoil prioritizes business conduct hand-in-hand with community development for a higher quality of life through its CSR projects for surrounding communities and remote areas, focusing on education, conservation of the environment, energy and natural resources. This enables Thailoil and Subsidiaries to be an entity that is admired, accepted, and trusted by communities and society. Key projects have included construction of the

Trauma and Emergency Building of Laem Chabang Hospital; "Our Khung Bang Kachao" project to develop green areas and conserve the Khung Bang Kachao (Chao Phraya river bend); "Café Amazon for Chance" project for the underprivileged at Laem Chabang Hospital; "CONNEXT ED" leadership development project under the Pracharath project (covering basic education and leadership development (E5)) in collaboration with PTT Group. Thailoil provided opportunities for stakeholders to take part in administration through the "3-Synchronizations and 5-Participations" strategy involving Thailoil, communities, and local entities to jointly think, do, fix, learn, and develop so that all sectors would together operate for the public interests with the same goals. Thailoil also follows the process for handling environment impact complaints in case its operation affects community lifestyles, thus assuring that it commands management practices to ease environmental impacts affecting communities. Thailoil is always committed to operating its businesses with fair treatment of all its stakeholders to secure sustainable mutual benefits.

Corporate Risks

8. Human Capital Risks

The year 2018 represented a challenge for preparing Thailoil's structure and manpower, notably to sustain the CFP Project, and the recruitment of qualified employees to sustain the New S-Curve business supporting and driving Thailoil's short-term and long-term business growth strategies. Therefore, Thailoil executed the following measures to reduce risks of such matter, including the upgrading of its proactive personnel recruitment strategy to acquire quality personnel;

competency improvement to accommodate digital-age business expansion plans through the “People 4.0” strategy for competencies, skills, knowledge, and personal characteristics; “DANCE+” (Diversity, Adaptability, Negotiation, Collective Leadership, Execution) to promote of the quality of life and employee engagement through the establishment of a digital workplace for work procedure flexibility, modernity, and fulfillment of Millennial-aged personnel’s needs. Organizational development and design have been made compatible with business directions. To this end, the macro structure of the corporation has been revised to produce personnel in line with the “GREAT Leader Model” (Goal Achievement, Relationship and Result, Expert and Execution, Attribute, Transform and Change). Additionally, Thailoil advocates compliance with human rights principles in the workplace through risk assessment and monitoring of human rights in the workplace.

Emerging Risks

Changes in political, economic, social, environmental, law, 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. The framework defined new regulations, rules, and work scopes in accordance with the agreement on the reduction of greenhouse gas emissions, to which Thailand agreed on cutting 20-25% by 2030 from the base-year (2015). Thailoil 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”, which required applicable public agencies to improve laws on climate change, and enforce it within three years; and in five years, to designate suitable mechanisms conducive for economic incentives for the private sector’s reduction of greenhouse gas emissions. Additional promotional measures are designed to encourage the public to alter their everyday behavior, thus become a part of the solution, for instance the development and promotion of mass transportation. This is why climate change is regarded as a business transition risk resulting from the lack of clarity in the changes of public policies, law, regulations, and requirements.

Mitigation: Thailoil has defined plans for greenhouse gas emissions reduction for both current and future businesses through market re-segmentation. Direct and indirect greenhouse gas emission reduction (scope 1 and 2) is to be achieved through higher energy efficiency in production processes and through investment in CFP, with modern and highly efficient technologies upgrading fuel oil to jet fuels and diesel, while elevating the potential for heavy crudes refining processes. At the same time, the plan is to decommission refining units aged over 50 years. This results in greenhouse gas reduction both in Business as Usual (BAU) operations and market re-segmentation with the reduction of gasoline output and the increase of diesel output in line with future demand. In addition, assorted goals have been set; for instance, long-term greenhouse gas reduction plans and goals based on BAU, leading to annual and long-term energy reduction goals based on Solomon’s Energy Intensity Indices (EII). Thailoil also monitors and

takes part in planning for greenhouse gas reduction collaborating with PTT Group. In cooperation with the Petroleum Institute of Thailand, Thailoil issued greenhouse gas life cycle inventory. By monitoring and observing the development of regulations and economic mechanisms for national climate change, Thailoil assesses, pursues guidelines, and applies them to plan adjustment to achieve its greenhouse gas reduction goals. Finally, Thailoil has developed a portfolio restructure to raise its non-refining investment to cut down on such emissions in the future.

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

Technological changes in the consumption of alternative energy in place of oil fuels will be swift and directly affecting the oil industry. Today, the technological advancements for alternative-energy production, including electric vehicles (EVs) and hydrogen fuel, have taken place. This year, European car manufacturers set targets 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. In Thailand, the public sector

issues regulations designed to concretely promote EVs, including its support for EV charging stations to accommodate and support EVs. Should consumers alter their behavior and swiftly turn to EVs, it would affect the oil industry, not being able to adjust or diversity business in time, leading to negative impacts on revenue and long-term business growth.

Mitigation: Thailoil has executed its CFP Project to improve its refining efficiency by focusing on producing more diesel and jet fuels. The project is due for completion in 2023. This year, Thailoil developed portfolio restructure to raise the non-refining investment over the long term while pursues emerging investment opportunities, especially in specialty product. In addition, Thailoil addressed future technological trends by initiating New S-Curve business strategies, including investment in start-up businesses through CVC investment; the investment goal is to develop technologies for high-efficiency production; green businesses and technologies; and hydrocarbon-replacement technologies. Today, Thailoil is partially investing in CVC while seeking additional investment opportunities to maintain the revenue growth of Thailoil and Subsidiaries in line with its goals.

INTERNAL CONTROLS

Thaioil constantly values internal control by following the scope of the Committee of Sponsoring Organizations of Treadway Commission (COSO) 2013, and by applying the “Three Lines of Defense”, where the “1st Line” means tasks designers, risk analysts, and control activity planner; the “2nd Line”, coordinators, managers, and efficiency supervisors of risk management and the internal control system; and the “3rd Line”, assurers and assessors of the efficiency of risk management and the internal control system. Applying these three, Thaioil strives to achieve all three objectives of internal control: efficient and effective operations, credible financial and non-financial reports, and compliance with laws and regulations. Ultimately, operators are expected to appreciate the value of internal control and the requirements for having it in their units. In addition, Thaioil can then ensure stakeholders that it commands an adequate and suitable internal control system that covers all activities.

The Board of Directors (the Board) assigns the Audit Committee to review adequacy assessment of the internal control system. Corporate Risk Management Section is responsible for monitoring and revising the assessment. This year, both the Board and the Audit Committee, agreed that Thaioil's system is indeed adequate and suitable for its businesses, enabling Thaioil to accomplish its objectives. Below are five-point highlights of the internal control system.

1. Control Environment

Thaioil commands a sound and adequate internal control environment for business, operating under the Corporate Governance (CG) and Code of Conduct (CoC) principles, the management highlights are as follows:

- 1.1 Defining the internal control policies and protocols in accordance to CG principles, which include the definition of the CoC for directors, executives, and employees, together with a CoC, focusing on integrity and adhering to the code. It is the duty and responsibility of the Board, executives, and employees to strictly comply with such requirements. Thaioil also undergoes the annual Corporate Governance Report of Thai Listed Companies (CGR) assessment by Thai Institute of Directors (IOD). For the tenth consecutive year, Thaioil ranked “Excellent” with top score. Additionally, for the sixth consecutive year, Thaioil was a certified Dow Jones Sustainability Indices (DJSI) Membership in 2018 in the Oil & Gas Refining & Marketing of the Emerging Markets Group.
- 1.2 Defining CoC in writing to steer good business conduct. The CoC governs conflicts of interest by requiring all employees to annually report their conflicts of interest through an electronic reporting system. This year, Thaioil stressed its practices on not giving and accepting gifts, assets, or other benefits so as to emphasize its executives and employees the needs to comply with the guidelines and the CoC.
- 1.3 Adhering to business conduct with fairness, integrity, and transparency under CG principles. This year, Thaioil drives its internal transparency and ethical program, called “Palung Akanee” to activate and raise awareness on “Integrity” and to identify employees as ethical role-model. Thaioil also values compliance, by launching Thaioil and Subsidiaries’ Compliance Policy on September 20, 2018, and commands an

Anti-corruption Policy as one of the essential CG guidelines.

- 1.4 Assuring that the Board are independent from the executives, the Board's and the executives' duties and responsibilities are clearly separated. The Board's duties and responsibilities involve reviewing and endorsing key strategies and policies; definition of objectives, financial goals, risks, plans, and budgets. The Board also exercises supervision of the executives' legal compliance, together with their efficient and effective compliance with policies and plans.
- 1.5 Structuring the organization focusing on efficient internal control and internal checks and balances through the separation of key functions, whose authorities, duties, and responsibilities are independent of one another. Each function is observed and monitored by top executives. Thailoil's organization structure is regularly revisited to keep pace with the strategies and work plans. Thailoil appointed a responsible unit to oversee compliance with applicable requirements, regulations, and provisions of the law to ensure effective checks and balances and audit of work processes.
- 1.6 Defining Human Resources (HR) Policy to increase employees' competency in a systematic and sustainable manner. The HR Policy suitably embraced aspects of personnel attraction, development, and retention and engagement. Also in place is a process of fair performance management, which reflects the ability to perform against goals and different KPIs. This year, Thailoil added functional key performance indicators (KPIs) for compliance and risk prevention as well as accommodated risk preventive measure implementation.

In addition, personnel recruitment strategies are reviewed to keep abreast of business environment and prevailing business needs. Finally, the readiness of successors to executive and section manager positions is thoroughly assessed.

2. Risk Assessment

Thailoil values and advocates corporate risk management throughout the organization. The Board assigned the Risk Management Committee to devise corporate risk management policies and institute protocols and processes to reduce impacts on business to ensure corporate objectives achievement. Thailoil and Subsidiaries' Risk Management Steering Committee reviews, monitors, and audits risk management outcomes and business continuity management to assure that they comply with the corporate risk management policy and that the management is efficient and suitable for business conduct and growth.

Additionally, Thailoil prepared risk management plans embracing risk assessment, analysis, and review in line with its strategic and business plans under its objectives and goals. It reviewed both external and internal factors, including domestic political situations, world economy, laws, regulations, government policies, and stakeholders' expectations. It also defined key risk indicator (KRI) to help track and report the outcomes of each unit and the corporation to meet the goals. Furthermore, risk management measures are monitored to lower business risks by establishing risk appetites. The key risks and their mitigation plans are regularly reported for Thailoil and Subsidiaries' Risk Management Steering Committee, the Risk Management Committee, and the Board, respectively. This year, Management System Certification

Institute (Thailand) (MASCI), Foundation for Industrial Development (FID), and the Ministry of Industry's network institutes audited Thailoil's compliance with the regulations and standards of quality management systems, including the risk management of individual sections.

In its revision and addition, Thailoil included measures to manage risks for margin hedging, inventory hedging, and foreign currency exchange risks. At the same time, internal control measures are revised to cope with such change.

In 2018, Thailoil developed internal control checklists for process owners to verify which circumstantial factors could change and affect existing internal control. The findings would then be improved or added for relevance.

3. Control Activities

Thailoil designated efficient and effective control activities, which help mitigate risks of deviating from its objectives and keep them at tolerable level. Below are the key measures:

3.1 Internal control policies, including work protocols, manuals, and clear procedures, and Corporate Authorization Procedures (CAP) are designed to define financial limits and approval authority hierarchy, involving budgets, personnel administration, material procurement, hiring for contract administration, commerce, finance and treasury, accounting, and asset transfer and amortization.

3.2 Internal control measures, taking into account sound control principles which include separation of duties, approval processes, reviewing processes, and document storage. The measures are designed to

ensure efficient and effective conduct, credible reports and compliance with relevant laws and regulations. This year, Thailoil developed Control Self-Assessment (CSA) for key processes of customers' credit assessment and personnel recruitment. The CSA were developed for all subsidiaries to monitor the internal control's adequacy and suitability.

3.3 Control activities of the preventive and monitoring types, both manual and automated, are inherent in work processes. All executives must supervise and monitor their respective work processes for efficiency and propriety under work regulations, with suitable, concise, and auditable internal controls. In addition, Thailoil applied the Continuous Control and Monitoring System (CCMS) to prevent and track automated control.

3.4 Development of technology-controlled activities is in place, in which international standards and guidelines are internally applied; for instance, the application of the guidelines of National Institute of Standard Technology (NIST) to cyber-security management; the assessment of IT infrastructure via the Gartner Maturity Model; and the performance assessment to safeguard system security via Gartner IT Score for Information Security. Being aware of cyber threats, Thailoil conducted a phishing drill to all employees to test their understandings on cyber-threats. Thailoil also assesses information systems risks by undertaking a vulnerability assessment. Moreover, the Digital Steering Committee will soon be formed, in which the top executives will steer Digital Roadmap development to enhance competitiveness and establish long-term sustainability.

3.5 Defining of TOP Group Affiliates Management (TAM) policy and TOP Way of Conduct to steer Thailoil and Subsidiaries' management in uniform directions through joint deliberation and decision-making on critical matters and regular monitoring of subsidiaries' and associates' businesses. To this end, Thailoil executives serve as directors, managing directors or section heads of those companies. As a result, Thailoil has participated in policy-setting, acknowledging information, 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, which facilitate the Board and executives' decision making, in order to support an efficient and effective internal control. Thailoil defined an Information and Communication Technology (ICT) Policy together with suitable protocols for ICT security.

Recognizing the importance of internal communication, with a focus on prompt, complete, and accurate information for employees, Thailoil developed an internal communication manual, which efficiently defined guidelines for managing contents and communication channels. To this end, Thailoil established the intranet, e-mail, e-newspaper, and internal publication named AKANEE. Thailoil also established communication between the executives and employees to ensure target achievements, together with communication of essential information to suitably facilitate the Board for their consideration. The Board's meeting documents are to be delivered to the Board at least seven days in advance of each meeting.

As for external communication, Thailoil relies on PR channels and advertisement through printed media, radio advertiser, advertisement films, and its website. This year, more social media channels, such as Facebook, are included for all interested parties' to conveniently access essential information.

Thailoil also 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. That way, employees and third parties can openly report or provide tips concerning violations of laws, regulations, fraud, or actions regarded as improper benefit exploitation.

5. Monitoring Activities

Thailoil requires all executives to oversee and audit internal work systems for efficiency and conformance to policies, requirements, and work regulations under a strict internal control regime.

The Corporate Risk Management Section is tasked with the annual monitoring of internal control. To elaborate, at the corporate-level, the executives conduct the assessment via SEC's internal control adequacy assessment form. At the functional-level, process owners are to assess via CSA to ensure adequate and suitable systems for prevailing surroundings, which will prevent and mitigate risks. In addition, should there be changes in tasks or work processes during the year, this section can review their work procedures and control measures, whereas Corporate Internal Audit Department formulates annual audit plans based on key risks, change/increase in work processes,

and requests of executives and the Audit Committee (if any) to review the adequacy and suitability of the internal control system for each activity. This year, Thairoil developed the CCMS system for the Hiring to Retire (H2R) process, spanning recruitment to retirement, with an ongoing project on the development of the CCMS system for the Order to Cash (O2C) process to facilitate the tracking of control points in the system.



CORPORATE GOVERNANCE REPORT

The Board of Directors (the Board) and executives are committed to operate business in compliance with the Corporate Governance (CG) principles, Code of Conduct (CoC), transparency, and scrutiny. These are the fundamental factors and an essential cornerstone to generate business competitiveness, enhance long-term performance, operate business ethically, respect the rights and responsibilities to all stakeholders, as well as develop or reduce negative environmental impact and increase the ability to adjust to any emerging circumstances.

The Board utilizes the basis of good corporate governance policy and principles, which are nationally and internationally recognized, to improve Thailoil's CG and CoC standard so that its policy and practices properly suit Thailoil's business context. Assigned by the Board, the Corporate Governance Committee (CGC) regularly monitor and review the appropriateness and efficiency of the CG and CoC to ensure that Thailoil has proper implementation plan, enabling it to create sustainable business value. Recently, Thailoil reviewed its performance, in comparison to the good corporate governance principles in the 2017 Corporate Governance Code (CG Code 2017), established by the Securities and Exchange Commission of Thailand (SEC) as follows:

1. Corporate Governance Policy

The Board established the CG policy in written form in 2001. The policy clearly defines roles and responsibilities of the Thailoil and Subsidiaries' Directors, executives, and employees, who are responsible for acknowledging and adhering to this policy. The Board assigned the CGC to regularly supervise, monitor, and review CG

policy and principles each year. Thailoil disclosed its CG policy, principles, and guidelines in Thailoil's website at www.thailoilgroup.com, which allowed the interested public to study and download the information.

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 undertaking 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)

Thailoil establishes its CoC to frame sound business operations, such as the CoC relating to the stakeholders, purchasing, compliance with the law and regulations, the respect for cultures and customs, etc. These CoC are guidelines for the Board, executives, and employees in complying and adhering to. The Board and executives are required to be ethical leaders and role models in

performing their duties with integrity, honesty, fairness, transparency, and scrutiny to promote CG Culture within the organization toward sustainability.

2.2 Communication and Promotion

In 2018, Thailoil continuously communicated and encouraged all employees and stakeholders to cultivate knowledge and understanding on the importance of CG and CoC policy and principles as follows:

Corporate Governance and Code of Conduct Manual

With approval of the Board, Thailoil published its fourth edition of Corporate Governance and Code of Conduct Manual (CG and CoC Manual), which are comprised of CG policy, CoC, Anti-Corruption policy, and relevant practical guidelines for all Directors, executives, and employees of Thailoil and Subsidiaries. Upon receiving, they are required to study the content and sign the “Acknowledgment Form” - a form reflecting affirmative covenant in conducting business under highest ethical value and standard. Moreover, Thailoil disclosed its CG and CoC Manual in Thailoil's website, for all stakeholders and the interested public to easily access such information.

CG e-learning

Thailoil established CG e-learning program with intention for all Thailoil and Subsidiaries' employees to easily access and learn CG, CoC, and anti-corruption principles at any time. The first version was established in 2007, since then, Thailoil has continued to improve its CG e-learning program. Currently, Thailoil has used the third version of CG e-learning, which covered the fundamental essences of CG, CoC, and anti-corruption materials with interactive concept. The program consisted of pre-test and post-test to measure employees' understandings, thus allowed Thailoil to collect data for further improvement.

New Employee Orientation, Training, Activities, and Communication

Thailoil communicates its CG policy, CoC, anti-corruption policy to all new employees to foster the conscience on their first day at Thailoil. In 2018, Thailoil hosted several activities to promote such policies and principles, for instance, the “Palung Akanee” project to recognize employees who exemplify ethical conduct, which in turns create morale and encouragement for those who were chosen. Additionally, Thailoil in conjunction with affiliates under PTT Group, hosted PTT Group CG Day 2018, with the intention to promote “Integrity” (Disciplinary, Sufficiency, Honesty, and Voluntary) via Digital Technology (4.0). Business partners and customers of each company were invited to participate in this event. Furthermore, Thailoil held a KM Together We Share session under the topic of “Practical Guidelines for Data Integrity”, along with communications of relevant principles and practices through AKANEE Journal (an internal publication) and corporate e-newspapers to all employees throughout the year.

2.3 Corporate Governance and Code of Conduct Guidelines and Enforcement

Thailoil defines the duties and responsibilities for the Directors, executives, and all employees to acknowledge and comply with the policies and terms indicated in Thailoil's CG and CoC policy and principles. Moreover, Thailoil put in place a whistle-blowing and the internal audit processes as mechanisms to monitor compliance to assure that all operations abide by such policy and principles. If the Directors, executives, and employees violate these 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 official for prosecution.

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

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

Compliance with the Law, Rules, and Regulations

Thail regularly audits and monitors performance of each operation unit to ensure compliance to any business law and regulations. In 2018, Thail established Compliance Working Team, with the role of a regulatory body to drive and assure that all operation units within Thail systematically comply with the law, rules, regulations and announcements of government agencies. The team also acts as Compliance Assurance by having adequate and appropriate monitoring process, to strengthen confidence among the Board, executives and all stakeholders. Moreover, Thail published its Corporate Compliance Policy for all Thail's employees to adhere and comply with these guidelines.

2.4 Whistle-Blowing Measures and Whistle-Blower Protection Mechanism

Thail's **whistle-blowing measures and whistle-blower protection mechanism** is published in Thail's CG and CoC Manual as well as in Thail's website for all stakeholders to aid monitoring and auditing the performance of Thail and Subsidiaries' Board, executives, and employees'

compliance with the law, rules, regulations, CG, CoC, and refraining from involving in any fraudulent matter.

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



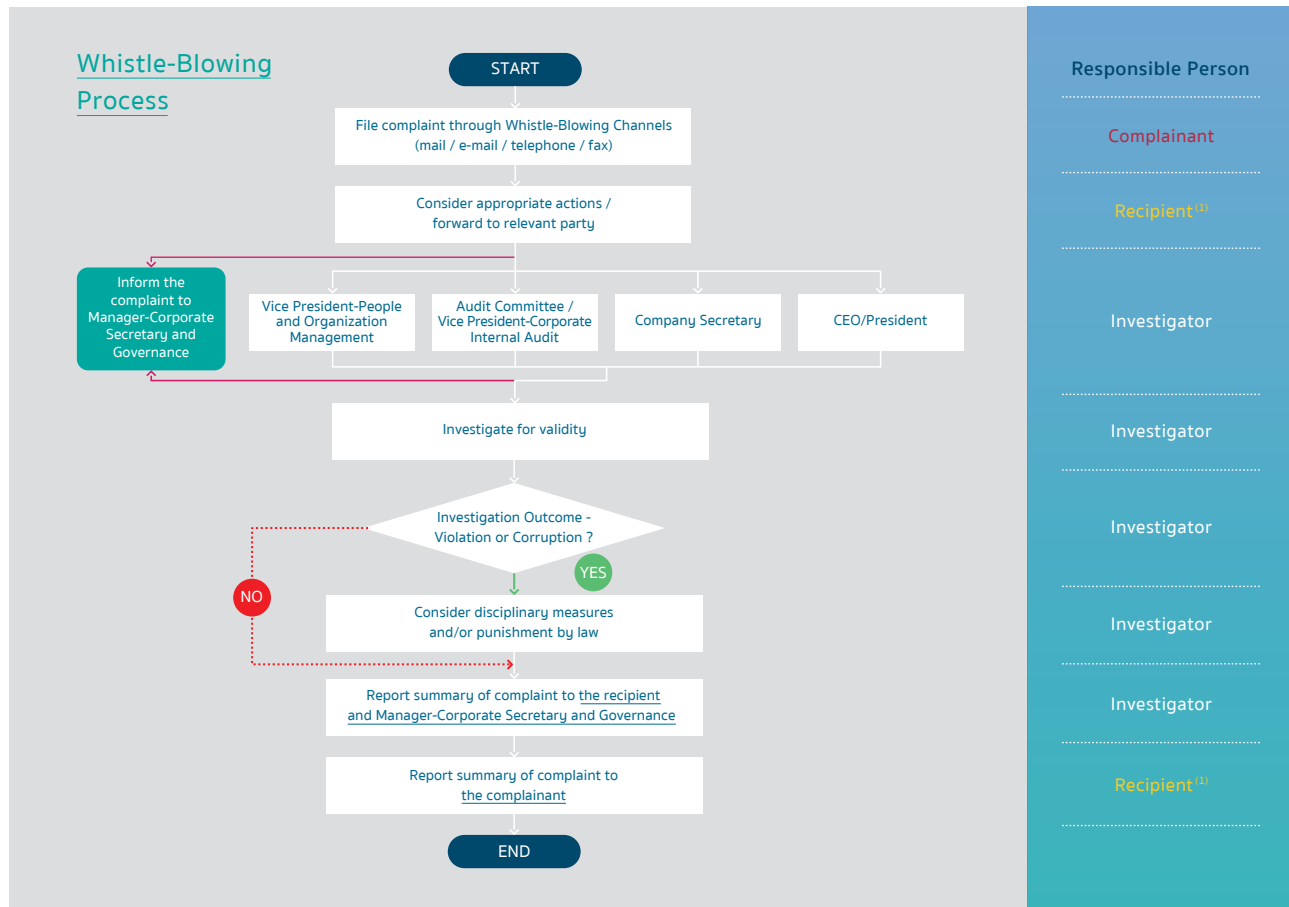
cgcoordinate@thailgroup.com
(Manager-Corporate Secretary and Governance
will acknowledge receipt of the matter and duly
forward it to responsible parties)



+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 law.

In 2018, Thailoil received four complaints from its whistle-blowing channel. All of the complaints were registered and reviewed. None of the complaints concerned an illegal act, with no fine or monetary liability,

and no corruption case. The outcomes of each complaint were informed to the complainant, while taking observations to improve internal control system to prevent further reoccurrence.

3. Compliance with the Good Corporate Governance Principles

3.1 Rights of Shareholders

Thailoil values the protections of shareholders' rights, thus upholding the protection of their fundamental rights abide by law. Beyond such fundamental rights, Thailoil provides an opportunity for shareholders to propose agenda and nominate Director candidates before the date

of shareholders' meeting. Thailoil also provides significant information on business operations in a clear and timely manner, even if the information is not required by law.

Annual General Meeting of Shareholders (AGM) 2018

Thailoil held its 2018 AGM on Wednesday, April 11, 2018 from 09.30 hrs. at Bangkok Convention Center, 5th Floor, Central Ladprao, a location convenient for transportation whether by car, underground train (MRT), or 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 the Securities and Exchange Commission Thailand (SEC). This year, Thailoil received a full score of 100 points on the quality assessment of the 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 essential views and comments to efficiently improve the future AGMs.

Before the AGM

- >> **Provided an opportunity for shareholders to propose agenda and to nominate Directors candidates**, in which the criteria and procedures are publicized on SET's SCP system and Thailoil's website from September 29 to December 31, 2017. The proposed agenda and the list of nominated Director candidates will be considered in accordance to criteria specified by Thailoil. In the 2018 AGM, none of the shareholders has proposed meeting agenda or nominate Director candidates to be elected as Thailoil's Director.
- >> On February 15, 2018, the Board passed resolution in regards to determine the date of Thailoil's 2018 AGM, Thailoil immediately submitted news releases to SET for shareholders' acknowledgment.

- >> **Published the 2018 AGM invitation notice**, in both Thai and English, via Thailoil's website for **more than 30 days prior to the date of AGM** (March 6, 2018). Thailoil also distributed the AGM invitation notice along with the 2017 Annual Report and the 2017 Sustainability Report in CD-ROM format to shareholders **21 days before the meeting** (March 14, 2018). In addition, Thailoil announced the date of AGM in Thai and English newspapers for three consecutive days and three days prior to the AGM; thus allowed shareholders some 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 offered an alternative choice for shareholders' proxy, in which Thailoil included all eight Independent Directors' CV along with work experience, and their conflicts of interest report for considering agenda in the invitation notice. This allowed 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 enough room to accommodate shareholders in attendance. To ensure the safety of all shareholders, a contingency plan is in place for emergencies. Surrounding the AGM venue were exhibitions displaying Thailoil's key information, Investor Relations (IR) Corner to facilitate shareholders, and sufficient amount of snacks and beverages to accommodate shareholders upon arrival.

- >> Thailoil facilitated all shareholders by implementing the barcode system in the shareholders' registration process and counting of votes for accuracy and convenience. Thailoil made the registration process available two hours prior to the meeting. Moreover, after the registration period, shareholders who wish to attend the AGM could register to attend without losing their rights. They are included as part of the quorum; however they could only vote on the agenda in consideration and those that has not yet been voted.
- >> Thailoil values the voting rights of shareholders of **one share equals one vote**. For further convenience of voting and ballot counting, Thailoil prepared separate ballots for each agenda item. Specifically, **on the agenda on the appointment of new Directors, Thailoil provided separate ballot for each of the Director**. To increase transparency for voting process, **Thailoil allowed volunteers from the shareholders to witness and independent legal counselors to audit the vote counting process**.
- >> All 14 Members of the Board, including executives, auditors, and independent legal counselors attended the AGM. The Chairman of the Board, as Chairman of the meeting, will clarify rules and criteria relating to the meeting such as voting procedures, etc.
- >> **Thailoil organized the AGM 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 and allowed shareholders to propose questions** prior to the AGM. All of which are indicated in the AGM invitation notice.

- >> To facilitate foreign shareholders, Thailoil provided staff to translate questions, replies and comments to ensure the understanding of all AGM attendees.

After the AGM

- >> Thailoil disclosed the resolution of its AGM along with voting results on the same day after the meeting by notifying SET in the form of newsletter through SET's SCP system and Thailoil's website. Thailoil also prepared the minutes of the AGM, comprised of the names of Directors, executives, and related persons attended the meeting, statement of claims to important agenda, questions and answers, in both Thai and English, by notifying SET within 14 days after the AGM (April 25, 2018) through SET's SCP system and Thailoil's website.

3.2 Equitable Treatment of Shareholders

All shareholders including major shareholders, minor shareholders, domestic and foreign shareholders, are entitled to identical treatment and protection of fundamental rights.

- >> Thailoil provided a direct channel for all shareholders and investors to request information, feedback, make comments through email at ir@thailoilgroup.com or by direct telephone at +66(0) 2797-2961. The Investor Relations Section is in charge of this channel and is responsible for providing information.
- >> Thailoil organized various activities to foster good relationship among the shareholders. These activities included a site-visit to Thailoil Refinery, which located in

Sriracha, Chonburi. Thailoil also participated in events for shareholders organized by SET, such as SET in the City 2018 and Opportunity Day, which are normally organized after the announcement of the financial statements each quarter.

3.3 Roles toward the Stakeholders

Thailoil is committed to conducting its business with fairness to all stakeholders, in which Thailoil established policies and ethical guidelines for each group of stakeholders in its CG and CoC Manual. The Manual can be downloaded from Thailoil's website.

In addition to this Annual Report, Thailoil publicized its Sustainability Report in accordance with the Global Reporting Initiative (GRI) framework and additional criteria for Oil & Gas Sector Disclosure. Correspondingly, Thailoil's Sustainability Report adopted Integrated Reporting <IR> concept to assure that essential information on sustainability, including information on economic, social, and environment factors for shareholders' acknowledgment are evidently and transparently stated.

Policy and Practices for the Stakeholders

Throughout the year 2018, Thailoil conducted its business in accordance with the policies, corporate plans, and projects for all stakeholders as follows:

Shareholders, Investors, and Analysts

In addition to the details in "Rights of Shareholders" and "Equitable Treatment of Shareholders" sections, in 2018, Thailoil regularly communicated its information through SET's SCP system as well as in Thailoil's website. Thailoil also organized various activities including Analyst Meetings, meeting investors at SET's Opportunity Day, IR e-newsletters, oil situation reports, and information on industrial status during key changes or transitions.

Customers

Thailoil 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. This year, Thailoil launched its Terminal Automation Management (TAM). Customer-visit were organized to build sustainable relationship in order to acquire comments for improvement and provide domestic and international market updates. Additionally, the customers' satisfaction survey is carried out each year along with consolidating workshops with relevant parties. Sport Day, a friendly sport competition including Badminton, Chairball, Marathon among others were also organized to cultivate relationship.

Thailoil established Customers Relationship Management Section, responsible for customer care and direct communication. If there is any unfair treatment or dissatisfaction on Thailoil and Subsidiaries' service, customers can directly file complaints to crm@thailoilgroup.com.

Business Partners

Thailoil strictly observed the Procurement and Service policy and guidelines, in which it released "Thailoil and Subsidiaries' Procurement Policy" as tool to drive all Subsidiaries' businesses in the same strategic direction. The procurement and selection process must comply with Thailoil's regulations and criteria. The selection methods and outcomes were systematically recorded. Thailoil also published its Supplier Code of Conduct and Code of Conduct: Purchasing, to ensure that all operations were carried out professionally, transparently, and fairly.

Furthermore, Thailoil established Supplier Relationship Management Section to take care and directly communicate

with Thailoil and Subsidiaries' business partners and suppliers. To strengthen relationship with its partners, Thailoil held the 2nd ESG Plus Verification Project to ensure conformance to environment, social, and governance aspects to acquire information for service improvement. Thailoil also extended invitations for its business partners to join PTT Group CG Day 2018.

Employees

Employees are accounted to be one of the important group of stakeholders to drive the organization. Thailoil systematically conducted human resources practices in accordance with labor law and regulations, while strictly complied with the Universal Declaration of Human Rights on the basis of equality. In 2018, Thailoil developed employees' competency programs to increase the employees' quality of life, both professional life and personal life. The programs are as follows:

- >> Thailoil strictly complied with the Universal Declaration of Human Rights at national and international levels, labor law, and regulations. Thailoil refrained from practicing unlawful labor; thus treated all employees equally with respect to human dignity and the rights of liberty and equality, in which Thailoil established "**Human Rights in Workplace Policy**" to tangibly support the human rights principles. Furthermore, Thailoil established "**Human Rights Policy for Suppliers**" to enhance its business operations, covering society, community, and the supply chain across Thailoil and Subsidiaries.
- >> **Thailoil 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 Thailoil annually reviewed the remuneration structure to assure that its remuneration remained in the industry's top

quartile. To make sure that **employees' remuneration aligned with short-term and long-term corporate performance**, Thailoil considered salary adjustment for the executives and employees once a year by **utilizing the four dimensions of Balance Scorecard Concept**, namely: financial, stakeholders, internal business process, and learning and growth, 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.

To keep motivating 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, 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. In 2018, Thailoil and Subsidiaries'

employees spent an average of 60.56 training hours per person. 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.

The details of human resources management can be found in the “Human Resources and Organization Development” section on page 68.

Creditors

With disciplinary, Thailoil professionally 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 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. In addition, 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.

Government Authorities and Associated Organizations

Thailoil strictly complied with the law, regulations, and announcements from the government authorities in order to obtain concessions and licenses, based on the criteria and processes; provided conformity assessment with relevant law; as well as followed new law enforcement

announcements. In addition, Thailoil exchanged knowledge and experiences with relevant agencies and organizations to boost relationship and utmost benefit for the public and the country as a whole.

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 essential 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 56.

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 Sustainability Report 2018)

Policies and Practices of Non-Infringement of Intellectual Properties and Copyrights

Thailoil 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, Thailoil 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. Thailoil 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

Thailoil is committed to basing its businesses on fairness, integrity, transparency, and responsibility to society and all stakeholders in accordance with Thailoil'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, Thailoil 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 addition to this policy, Thailoil 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. Thailoil distributed the Manual to all Directors, executives, and employees. The Manual can be viewed and downloaded from Thailoil's website.

Thailoil applied a concrete anti-corruption policy and practices as follows:

>> **Communicated, shared knowledge, and trained anti-corruption practices inside and outside Thailoil.**

For Internal Communication, Thailoil held employees' orientation, employees' training through CG e-learning, and participated in PTT Group CG Day 2018 - an event to promote Integrity (Disciplinary, Sufficiency, Honesty, and Voluntary) via Digital Technology (4.0). This year, Thailoil also organized KM Together We Share session under the topic of "Practical Guidelines for Data Integrity" and communicated the No Gift Policy to raise awareness on refraining from accepting gifts or hospitality of all types through internal communication channels such as e-newsletters, Thailoil's website, signages at different locations in Bangkok and Sriracha office, and articles in the internal publication to constantly cultivate knowledge and understandings among its employees.

For External Communication, Thailoil published a conforming letter for customers, business partners, financial institutions, and relevant third party for their cooperation to refrain from offering gifts to Thailoil and Subsidiaries' executives and employees. Thailoil also promoted the No Gift Policy by inviting these parties to participate in anti-corruption and business conduct activities such as CAC SME Certification Project, PTT Group CG Day 2018, etc.

>> **Encouraged employees to join workshops and seminars relating to anti-corruption** to adopt practical guidelines for the development of Thailoil and Subsidiaries' anti-corruption program, including

- "Working Paper for Better Corruption Prevention in Organization" Course, organized by the Federation of Accountings Professions under the Royal Patronage of His Majesty the King, together with the CAC
- "Corruption Risk Management" Course

>> **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 five risk appetites, namely: performance and investment; compliance; safety, occupational health, and environment; reputation; and fraud and corruption. Furthermore, Thailoil also defined key risks, and 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 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, Thailoil participated in these following activities:

- >> In 2012, Thailoil acquired a membership of the United Nations Global Compact (UNGC), which enabled Thailoil to implement the ten internationally-recognized UNGC principles in the promotion of good governance on human rights, labor, environment, and anti-corruption.
- >> **In 2014, Thailoil became a "Certified Company"** for the Private Sector Collective Action Coalition against Corruption (CAC) on April 4. **On March 9, 2017, Thailoil received re-certification from the CAC.** 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 2018", under the concept of "Thai People Refused to be Corrupt", organized by the Anti-Corruption Organization of Thailand on September 6, 2018. 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 7, 2018.

3.4 Disclosure and Transparency

Information Disclosure

Thailoil values the 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 through an accessible channels such as the SEC and SET's Community Portal and Thailoil's website (www.thailoilgroup.com).

Thaioil disclosed its information, in both Thai and English, through the following channels:

- >> SEC and SET's Community Portal
- >> 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 release
- >> Press interview and jointly hosted PTT Group Thank Press event, which are annually organized

Investor Relations

Thaioil established Investor Relations Section as a focal point to proactively conduct investor relations activities with the investors, shareholders, and analysts. This Section also facilitates the communication with the shareholders, investors, analysts and relevant regulatory authorities. Thaioil is dedicated to disclose its information with correct, reliable, and adequate information in a fair, transparent, and comprehensive matter.

In 2018, Thaioil's executives have met and shared essential information to the shareholders, investors, and analysts in the following events:

Meeting with Investors/Shareholders

Domestic Company Visit	6 times
Domestic Conference Call	5 times
Domestic Roadshow	8 times
International Company Visit	30 times
International Conference Call	14 times
International Roadshow	5 times
Opportunity Day organized by SET	4 times
SET in the City	1 times
Analyst Meeting	4 times
Knowledge Sharing Session – CFP Project	1 times
Information provided via telephone (per day)	5 times

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 (4 times a year for each institute + CFP Project one time for each institute)

Information Disclosure

SET Community Portal	23 times
Monthly Presentation	12 publications
IR e-newsletter	2 publications

Activities

Shareholders' Company Site-Visit	2 times
Investors' Company Site-Visit	2 times

Interested parties, shareholders, or investors can request for information from Thaioil'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@thaioilgroup.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

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 or Board-Committees' consideration each time this happens.

Furthermore, 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 2018, Thailoil received 100 percent response with four unsure cases of conflicts. These unsure conflicts included employees' shareholding in companies within PTT Group and ex-consultant with former contractors, etc. After thorough investigation, these cases were

concluded that they are not in conflict with Thailoil and Subsidiaries' interest.

Vested Interest Disclosure by the Board and Shareholding Information

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, high-level executives, and the top four managerial positions counting from the last high-level executives, and equivalent positions to the above managerial position, including, the Vice Presidents in Finance and Accounting Department; they are required to quarterly report changes in their vested interests to Thailoil and Subsidiaries, and update their reports annually. Such information is only used within Thailoil.

Under section 59 of the Securities and Exchange Act, Thailoil required the Directors, high-level executives, and the top four managerial positions counting from the last high-level executives, and equivalent positions to the above managerial position, including, the Vice Presidents in Finance and Accounting Department to report their shareholding information upon taking position and after share buying, selling or transferring within three working days to the SEC. At each Board Meeting, Directors are required to inform their shareholding information including that for the high-level executives to the Board. Thailoil discloses shareholding report of Directors and high-level executives in the Shareholding Report Section on page 105.

Use of Inside/Confidential Information

Thailoil is aware that the use of inside information is crucial and necessary for all listed companies. For that, Thailoil operates under cautious and preventive measures, while encouraging equality among the shareholders as follows:

- >> Established “**Code of Conduct: Maintaining Confidential Information and Use of inside Information**” as detailed in the CG and CoC Manual
- >> **Notified policies and guidelines relating to the use of inside information to the Board, executives and employees** through various channels, for instance, the Board Chairman’s notification at the Board Meeting, etc.
- >> Thailoil established a “**Personal Non-Disclosure Agreement**” between Thailoil, its executives, and employees, who are 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, **Thailoil sends 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 a representative of the shareholders, plays a significant role in establishing vision, mission, and assures that operations comply with the law, regulations, policies and ethical codes in a fair and transparent manner. The Board must be independent from the executives, in which Thailoil defined **separation of roles and responsibilities for the Board, the Chairman, and the Chief Executive Officer and President (CEO/President)** as seen on page 109. The Board also plays significant roles in the following activities:

- **Define Business Strategies, Policies, and Directions**

The Board considers and approves Thailoil’s vision, mission, corporate value, business strategies, financial target,

budgets, and operational plans. **The Board reviews and approves Thailoil’s vision, mission, and business strategies in the Annual Strategic Thinking Session (STS)**, where the Board along with high-level executives jointly review vision, mission, short-term and long-term business strategies against business direction and future trends.

In addition, Thailoil’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.

- **Corporate Governance 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 (CGC) to assure that all operations are in compliance with applicable law, rules, and regulations. This CGC also promotes compliance with CG Policy, Anti-Corruption Policy, the principles of Sustainable Development, etc.

- **Prevention of Conflict of Interest**

The Board plays an important role in monitoring and resolving conflict of interest that may occur among Thailoil’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 145.

Board Approval Authority

The Board is authorized to approve Thailoil's businesses under the scopes given by law and in accordance with Thailoil's Article 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**, namely, industrial, engineering, science, financial, business management, economic, legal, political science, social science and security. The Board must consists of Independent Directors of at least one-third of all Directors and the number must be at least three. 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. Such details can be found in this annual report on page 147.

To assure that the Board devotes their time and effort to perform their duties for the highest benefit of the Company, the Board established **a policy on the number of listed companies that the Directors can serve**, Thailoil's Directors can serve no more than five listed companies.

Presently, Thailoil's Board of Directors consisted of 14 Directors, including one executive Director and 13 non-executive Directors, six of whom were Independent

Directors. There is one female Independent Director in the Board. The names of members of the Board can be found on page 74. 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 148. Thailoil disclosed the number of meeting and Directors' meeting attendance in the "Meeting Attendance" section on page 111.

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 candidate, which must obtain an approval from Thailoil's Board. **The Directors must be fully qualified with the Public Company Limited Act** and in compliance with Thailoil's regulations, 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, 2018, 8 out of 14 Thailoil Directors' names were included in the State Enterprise Policy Office's Directors Pool.

Independent Directors and Qualifications

Thailoil clearly defined Independents 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, the 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 the shareholders. They must also attend the Board's meeting regularly.

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 (effective from the date when the Board approved this policy on August 23, 2012 onwards).

Appointment of New Directors

- **To appoint Directors to replace those who have completed their terms**, Thailoil provides an opportunity for shareholders to propose qualified Director candidates, in accordance with relevant laws and Thailoil's requirements, via 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 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. Moreover, Thailoil also provides an opportunity for shareholders to vote for

individual Director to allow shareholders to choose the candidate of their choice.

- **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 Board-Committees' Member**, the Nomination and Remuneration Committee considers qualified Director as a Board-Committee Member to fill vacancies. This must be done in accordance with the Board-Committee Charters. The names of selected Directors are to be proposed to the Board for consideration and approval.

Board-Committees

Thailoil established Board-Committees' qualifications, terms of office, roles and responsibilities, reporting, and evaluation in each of the Board-Committee's Charter. The Charters are annually reviewed for relevancy and consistency. The Board appointed four Board-Committees to scrutinize and supervise its operations. Additionally, the Board requires each Board-Committee to report their progress on a regular basis.

Thailoil's Board-Committees, as of December 31, 2018, are as follows:

1) The Audit Committee

Appointed by the Board, the Audit Committee consisted of fully qualified members against the SEC and SET Requirements. A minimum of three members must be

Independent Directors, and at least one of whom must be adequately qualified and experienced in reviewing the credibility of financial statements. The Committee reviews Thailo's performance outcomes, financial reports, internal control system, and considers connected transactions, including the appropriateness of external accounting auditors.

The Audit Committee, as of December 31, 2018, consisted of three Independent and Non-Executive Directors as follows:

Name	Position
1. Ms. Chularat Suteethorn	Chairman (Independent) with qualified knowledge and experience in accounting and finance to review the reliability of financial statements
2. Mr. Chen Namchaisiri	Member (Independent)
3. Assoc. Prof. Dr. Pasu Decharin	Member (Independent) with qualified knowledge and experience in accounting and finance to review the reliability of financial statements

Mrs. Prapin Thongnium, Vice President-Corporate Internal Audit, serves as Secretary to the Audit Committee

The Audit Committee reviews the efficiency and effectiveness of the good 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 2018, the Audit Committee performed its duties under the aforementioned roles as shown in the Audit Committee Report on page 10.

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 Chairman of the Board nor the CEO/President. 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, 2018, consisted of three Directors as follows:

Name	Position
1. ACM Suttipong Inseepong	Chairman (Independent)
2. Ms. Chularat Suteethorn	Member (Independent)
3. Mr. Attapol Rerkpiboon	Member

Mr. Viroj Meenaphant, Assistant Executive Vice President-Corporate Governance 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 focusing on education, knowledge, expertise, skills, experience, and specialization that associates with the Company's business as well as their independency in accordance with the Company's criteria; 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/President to suit the Company's business management in order to achieve its objectives, covering education, experience, knowledge and expertise, as well as taking essential business trends into consideration; develops and reviews the succession plan of CEO/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/President before proposing to the Board for approval.

In 2018, the Nomination and Remuneration Committee performed its duties under the aforementioned roles as shown in the Nomination and Remuneration Committee Report on page 16.

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, 2018, consisted of three Directors as follows:

Name	Position
1. Pol.Gen. Aek Angsanant	Chairman (Independent)
2. Mr. Kanit Si	Member (Independent)
3. Mr. Yongyut Jantararotai	Member

Mr. Viroj Meenaphant, Assistant Executive Vice President-Corporate Governance 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 2018, the Corporate Governance Committee performed its duties under the aforementioned roles as shown in the Corporate Governance Committee Report on page 13.

4) The Risk Management Committee

Appointed by the Board, the Risk Management Committee consisted of a minimum of three Directors, with the

CEO/President serving as one of the members. 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, 2018, consisted of four Directors as follows:

Name	Position
1. Mr. Attapol Rerkpiboon	Chairman
2. Mr. Noppadol Pinsupa	Member
3. Ms. Phannalin Mahawongtikul	Member
4. Mr. Atikom Terbsiri	Member/CEO/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 to ensure effective risk management at an acceptable level and corresponding with risk management policy.

In 2018, the Risk Management Committee performed duties under the aforementioned roles as shown in the Risk Management Committee Report on page 18.

Board Meetings

Board meetings are scheduled in advance each year so that the Directors can schedule themselves to attend.

Normally, Thailoil held Board meetings on the last Friday of every month, totaling 12 Board Meetings per year. The Board have been informed of the 2018 Board Meetings schedule in November 2017. **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, 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. During the meeting, Chairman of the Board serves as the Chairman of the Meeting, encouraging all Directors to openly discusses and express their opinions.

The Board sets a policy that requires no less than two-thirds of the total Board 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 2018, Thailoil managed a total of 16 Board Meetings, one Non-Executive Directors Meeting without the executives, and two 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 111.

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 2018 AGM reviewed compensation for the Board and Board-Committees is disclosed in the “Director’s Remuneration” section on page 118 and the individual Director’s compensation can be found in the “2018 Remuneration of Directors” section on page 120.

Directors’ Development

Orientation of New Directors

Thaioil encourages the CEO/President and 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 Course in 2018 can be found on page 156.

Board’s Performance Assessment

Annually, Thaioil conducts the Board’s performance assessment in three steps, namely: the Individual Director Assessment (self-assessment), the Board and Board-Committees Assessment, and the Peer Assessment.

Board’s Performance Assessment Process

Assigned by the Board, the Corporate Governance Committee is tasked to annually review and endorse all three Board’s performance assessment forms to assure that they are complete and align with prevailing circumstances. After the Committee’s approval, the assessments are distributed to all Directors. The Directors are to complete the assessment form and return it to Thaioil for analysis.

After the analysis, Thaioil is to present the assessment results and comments of the Directors to the Corporate Governance Committee and the Board, respectively, to form the basis for improvement for the Board’s performance for better efficiency.

Board’s Performance Assessment Criteria

Thaioil’s appraisal form covers additional significant criteria as follows:

- 1) Board Policy
- 2) Board Composition and Qualifications
- 3) Board Meeting
- 4) Practices, Roles, Duties, and Responsibilities of the Board, set to assess the preparedness of the Board, risk management and internal control, handling of conflict of interest, financial control and monitoring,

selection process, compensation process and performance appraisal.

The evaluation criteria are separated into five levels.

The 2018 Performance Assessment of the Board can be summarized as follows:

Performance Assessment of the Board	2018 (%)	Rating
Form 1: Individual Director Assessment (Self-Assessment)	99	Excellent
Form 2: Board and Board-Committees Assessment	99	Excellent
- Corporate Governance Committee Assessment	99	Excellent
- Audit Committee Assessment	99	Excellent
- Nomination and Remuneration Committee Assessment	100	Excellent
- Risk Management Committee Assessment	100	Excellent
Form 3: Peer Assessment	99	Excellent
The Company randomly selected assessors for each Directors		

The overall result of the 2018 Board Assessment indicated an average rating of "excellent" at the score of 99%.

Nomination, Appointment, Position-Holding Policy, and Succession Plan for the CEO/President

To nominate and appoint qualified persons to fill the vacant position of the CEO/President (the highest level of executives), the Board appointed the Nomination and Remuneration Committee to consider the qualifications and experience of qualified persons that will prove beneficial to Thailoil and submit them to the Board for consideration and approval.

In addition, Thailoil has a succession plan for this position. A qualified person must meet the criteria and is ready for the position in the future. To bolster shareholders' and investors' confidence that Thailoil and Subsidiaries' business will continue its excellence, Thailoil annually reviewed on its succession plan.

The Board allowed the CEO/President to serve as Director of subsidiary companies to ensure a unity and to mutually support Thailoil and Subsidiaries' operations for maximum efficiency and effectiveness. Thailoil defined guidelines for Thailoil's executives and employees that were invited to serve in other companies, agencies, or entities in Thailoil's CG and CoC Manual. It states that, if the CEO/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/President's Performance Assessment

Thailoil executed CEO/President's Performance Assessment each year. The Nomination and Remuneration Committee is in charge of the annual performance assessment of the CEO/President. The Committee is to forward the assessment outcome to the Board for endorsement. The CEO/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/President and is to be presented to the Board for further approval.

Compensation for the CEO/President

Each year, the Nomination and Remuneration Committee appraises the CEO/President's annual performance against the fair goals previously set and agreed with him or her. The Committee then recommends its findings to the Board for endorsement, and the Chairman then informs the CEO/President on the decision. The compensation policy also links the CEO/President's performance to overall short-term performance and long-term operating performance in line with strategic directions. Additionally, Thailoil utilizes the four dimensions of Balance Scorecard concept: namely, financial, stakeholders, internal business process, and learning and growth, to develop Corporate Key Performance Indicators (Corporate KPI), which is linked to the CEO/President's Performance. This practice lays a foundation for future business growth to become attractive and comparable to organizations within the same industry, under clear-cut and transparent rules.

4. Supervision of Thailoil and Subsidiaries' Operations

Thailoil defined the Thailoil 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 Thailoil and Subsidiaries are required to adhere to such policies while managing businesses.**

Connected Transactions or Acquisition or Disposal of Assets

Thailoil established its Connected Transaction Policy on a fair and 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, Thailoil 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 Thailoil or its subsidiaries* involves in a connected transaction or an activity in which substantial assets of Thailoil are acquired or disposed of, according to SET's principles, Thailoil 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 Thailoil, 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 Thailoil, directly or indirectly, has a shareholding of more than 50 percent of the registered paid-up capital)

Thailoil is committed to basing its business on the good corporate governance principles as well as the implementation of national and international recognized best practices, while taking into consideration of suitability of business environment, for utmost benefits of Thailoil and all stakeholders. Thailoil adopts and complies with all elements of good corporate governance, such as the

establishment of Board's meeting attendance, in which the Directors shall attend Board's meeting no less than 75 percent of all Board's meeting held in the year. Furthermore, Thaioil defines **Independent Directors' Terms of Directorship**, in which each Independent Director shall serve no more than six consecutive years from the date of the appointment. Moreover, Thaioil sets **Board's quorum and voting process**, by which it requires no less than two-thirds of the total Board in attendance to make a quorum.

In some cases, Thaioil set guidelines to the appropriateness of its business nature and environment, for instance, **the number of Directors**, where the Board should consist of 5-12 directors. As of December 31, 2018, Thaioil's Board consisted of 14 Directors. This follows Thaioil's Article of Association (AOA), 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. Additionally, even though Thaioil has not yet applied **the Cumulative Voting**, and Thaioil's AOA indicates that the nomination of Directors requires shareholder's 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.

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 Sirisumphand	Director and Chairman of the Board	DCP 80/2006							FND 30/2006 DCPU 4/2015
2 Ms. Chularat Suteethorn	Independent Director, Chairman of the Audit Committee and Member of the Nomination and Remuneration 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 FGP 4/2012 ACEP 10/2014 AAPC 15/2014 DCPU 4/2015 ELP 7/2017 BNCP 1/2017 BMT 6/2018
3 Mr. Chen Namchaisiri	Independent Director and Member of the Audit Committee	DCP 138/2010	DAP 11/2004						EXAM 30/2011
4 Assoc. Prof. Dr. Pasu Decharin	Independent Director and Member of the Audit Committee		DAP 121/2015						
5 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
6 Mr. Aittapong Rerkpiboon	Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee	DCP 173/2013							CSP 14/2005
7 Pol. Gen. Aek Angsanant	Independent Director and Chairman of the Corporate Governance Committee	DCP 111/2008					RCP 42/2018		BMT 4/2017
8 Mr. Yongyut Jantaratai	Director and Member of the Corporate Governance Committee	DCP 237/2017						FSD 31/2016	CGE 5/2015 BMT 5/2018
9 Mr. Kanit Si	Independent Director and Member of the Corporate Governance Committee	DCP 28/2003							FND 5/2003
10 Mr. Noppadol Pirsupa	Director and Member of the Risk Management Committee	DCP 146/2011						FSD 12/2011	
11 Ms. Phannalin Mahawongtikul	Director and Member of the Risk Management Committee								
12 Mr. Suchalee Sumamal	Director	DCP 255/2018	DAP 142/2017						
13 Ms. Duangporn Thiangwatanatham	Director	DCP 135/2010						FSD 8/2010	
14 Mr. Atikom Terbsiri	Director, Member of the Risk Management Committee, Chief Executive Officer and President, and Secretary to the Board	DCP 125/2009					RCP 41/2017		RCL 4/2016

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 completed their terms and resigned during the year 2018									
1 Mr. Sarun Rungkasiri	Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee (Resigned on January 1, 2018)	DCP 61/2005							CSP 8/2004 FND 19/2005
2 Mrs. Suvimol Chrityakietme	Independent Director and Member of the Audit Committee (Completed her term in the 2018 AGM)	DCP 92/2007		ACP 36/2011					AACP 27/2017 ELP 10/2017
3 Gen. Thanakarn Kerdhaimongkol	Independent Director, Member of the Audit Committee and Member of the Corporate Governance Committee (Resigned on May 1, 2018)	DCP 227/2016							BMD 4/2017
4 Mrs. Sriwan Eamungroj	Director and Member of the Risk Management Committee (Resigned on October 1, 2018)	DCP 160/2012	DAP 145/2018						M&A 1/2011
5 Mrs. Nitima Thepvanangkul	Director, Member of the Nomination and Remuneration Committee and Member of the Risk Management Committee (Resigned on October 1, 2018)	DCP 126/2009							RMP 3/2014 ACPG 18/2015 ELP 3/2016

Training Course in 2018

No.	Name - Surname	Position	Training Course in year 2018
1	Prof. Dr. Thosaporn Sirisumphand	Director and Chairman of the Board	>> Global Anti-Corruption and Integrity Forum 2018, OECD, Paris, France
2	Ms. Chularat Suteethorn	Independent Director, Chairman of the Audit Committee and Member of the Nomination and Remuneration Committee	>> Board Matters and Trends (BMT 6/2018) >> 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
3	Mr. Chen Namchaisiri	Independent Director and Member of the Audit Committee	>> 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
4	Assoc. Prof. Dr. Pasu Decharin	Independent Director and Member of the Audit Committee	>> Leadership Development Program (LDP), Class 6, Thai Listed Companies Association (TLCA)
5	ACM Suttipong Inseepong	Independent Director and Chairman of the Nomination and Remuneration Committee	>> Financial Statements for Directors (FSD 37/2018) >> Advanced Audit Committee Program (AACP 31/2018) >> Director Certification Program (DCP 267/2018)
6	Mr. Auttapol Rerkpiboon	Director, Chairman of the Risk Management Committee and Member of the Nomination and Remuneration Committee	>> 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
7	Pol. Gen. Aek Angsanant	Independent Director and Chairman of the Corporate Governance Committee	>> Role of the Chairman Program (RCP 42/2018) >> 2018 PTIT Special Lecture: The Dawn of a New Energy Era & The Transition to High Noon

No.	Name - Surname	Position	Training Course in year 2018
8	Mr. Yongyut Jantararotai	Director and Member of the Corporate Governance Committee	>> Board Matters and Trends (BMT 5/2018)
9	Mr. Kanit Si	Independent Director and Member of the Corporate Governance Committee	>> The Executive Program in Energy Literacy for a Sustainable Future, Class 12, Thailand Energy Academy >> 2018 PTIT Special Lecture: The Dawn of a New Energy Era & The Transition to High Noon
10	Mr. Noppadol Pinsupa	Director and Member of the Risk Management Committee	>> 2018 PTIT Special Lecture: The Dawn of a New Energy Era & The Transition to High Noon >> Leadership Development Program (LDP) III
11	Ms. Phannalin Mahawongtikul	Director and Member of the Risk Management Committee	>> Leadership Development Program (LDP) III
12	Mr. Suchalee Sumamal	Director	>> Director Certification Program (DCP 255/2018)
13	Ms. Duangporn Thiengwatanatham	Director	>> 2018 PTIT Special Lecture: Clean Energy and Smart Transportation: Global Trend for Sustainable World
14	Mr. Atikom Terbsiri	Director, Member of the Risk Management Committee, Chief Executive Officer and President and Secretary to the Board	>> 2018 PTIT Special Lecture: Clean Energy and Smart Transportation: Global Trend for Sustainable World

Directors who completed their terms and resigned during the year 2018

1	Mrs. Suvimol Chrityakierne ⁽¹⁾	Independent Director and Member of the Audit Committee	>> New Paradigm Leader, Transparency and Anti-Corruption, Class 1/2018
2	Mrs. Sriwan Eamrunroj ⁽²⁾	Director and Member of the Risk Management Committee	>> Director Accreditation Program (DAP 145/2018)

Remarks :

⁽¹⁾ Mrs. Suvimol Chrityakierne completed her term in the 2018 Annual General Meeting of Shareholders.

⁽²⁾ Mrs. Sriwan Eamrunroj resigned from directorship on October 1, 2018.

THAIOIL AND SUBSIDIARIES' SOCIAL RESPONSIBILITY



The performance of Thaioil and Subsidiaries concerning social and environmental responsibility was disclosed in the 2018 Sustainability Report.

In preparing the 2018 Sustainability Report, Thaioil implemented Integrated Reporting Framework to designate essential matters in line with materiality assessment under Global Reporting Initiative Standard (GRI Standard). Thaioil also presented the progress of the implementation of United Nations Global Compact's (UNGC's) 10 principles as well as the UN's Sustainable Development Goals (SDGs). The materiality assessment process, and environmental and safety performance, are verified by independent third party assurance.

Materiality Assessment of Thaioil and Subsidiaries' Sustainability

01 | Material Aspect Identification

Considered 2018 business key points through internal factors analysis including SWOT analysis, business strategic directions and corporate risk, as well as external factors analysis covering Global Reporting Initiative (GRI), Dow Jones Sustainability Indices (DJSI), UN's Sustainable Development Goals (SDGs), Global Mega Trends, and Stakeholder's Expectation.

02 | Prioritization

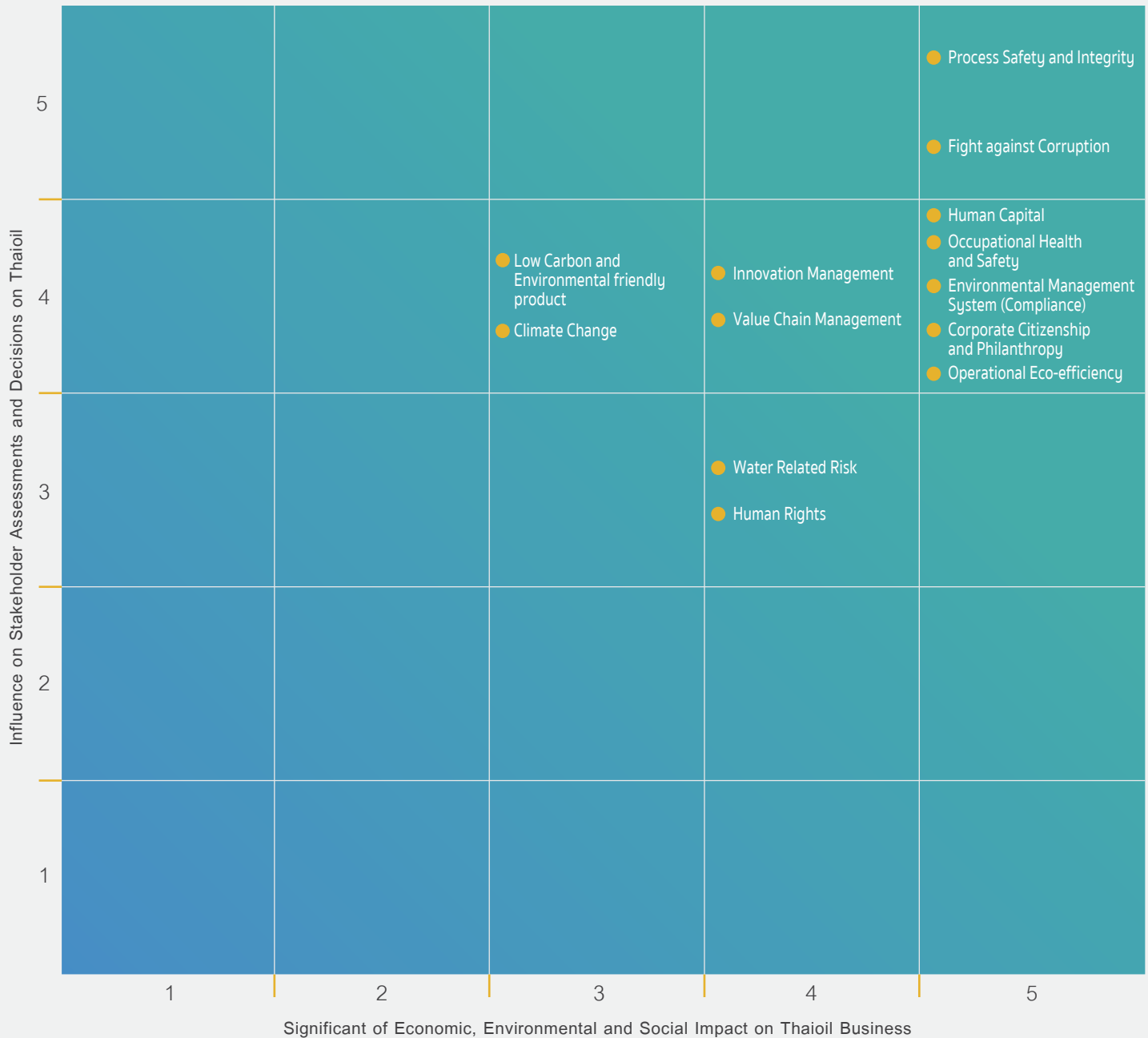
With relevant units, reviewed the ranking of 2018 sustainability material aspects with priority given to two aspects: 1) significant impacts on and opportunities for Thaioil and Subsidiaries' businesses, and 2) issues affecting stakeholders.

03 | Validation

Verified the completeness and appropriateness of material aspects with different priority by sustainability management units before tabling the findings to the Assistant Managing Director Meeting, chaired by CEO/President, for approval and confirmation of significant sustainability aspects under the scope of impacts on both inside and outside organization.

The validation process was audited by the independent third party assurance, which included the stakeholder engagement and data on safety and environmental performance, to ensure accuracy, clarity, and completeness.

2018 Performance



The assessment outcomes of Thaioil's 2018 sustainability aspect indicated that there are matters elevated from previous year including social responsibility, innovation management, and human rights. Moreover, low-carbon and environmentally-friendly products are additionally inserted in 2018 sustainability aspect.

CORPORATE INFORMATION

Thai Oil Public Company Limited

Monogram	TOP
Registration Number	0107547000711
Business	Thaioil is Thailand's largest refiner 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, logistics and renewable energy generation, LAB : an intermediate in the production of surfactants, marine and pipeline transportation and storage services of crude, petroleum and petrochemical products, business in the area of International Head Quarter 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 products are of high quality, rated in the top quartile of refineries in Asia Pacific, at lower production costs, giving Thaioil a recognized competitive advantage.
Registered Capital	20,400,278,730 Baht Comprising 2,040,027,873 fully paid-up common shares of 10 Baht per share
Number of Employees (as of December 31, 2018)	682 persons under Thai Oil Public Company Limited 802 persons under Thaiol Energy Services Company Limited
Address	Bangkok Office 555/1 Energy Complex Building A, 11th Floor, Vibhavadi Rangsit Road, Chatuchak, Chatuchak, Bangkok 10900, Thailand Telephone : +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 Telephone : +66(0) -3840-8500, +66(0) -3835-9000 Fax : +66(0) -3835-1554, +66(0) -3835-1444
Website	www.thaioilgroup.com
Investor Relations	Telephone : +66(0) -2797-2961 e-mail : ir@thaioilgroup.com

General Information of the Subsidiaries

Company Name and Address	Registration Number	Business	Registered Capital in 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 business	1,250,000,000	Common	125,000,000	10	100

Company Name and Address	Registration Number	Business	Registered Capital in 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 petrochemical products distributor	1,200,000,000	Common	120,000,000	10	100 (Shareholding through Thaitoil 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 petrochemical products distributor in Vietnam	373,520,000,000 VND	Common	-	-	100 (Shareholding through TOP Solvent Co., Ltd.)
Power Generation Business Thaitoil 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

Company Name and Address	Registration Number	Business	Registered Capital in Baht	Type of Shares	Number of Shares (Issued)	Value of Share (Baht per share)	Shareholding (%)
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	14,983,008,000	Common	1,498,300,800	10	8.91 and 20.79 (Shareholding through Thailoil 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 Thailoil 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
Thailoil 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 Thailoil Marine Co., Ltd.)

Company Name and Address	Registration Number	Business	Registered Capital in Baht	Type of Shares	Number of Shares (Issued)	Value of Share (Baht per share)	Shareholding (%)
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 Thailoil 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 in the Gulf of Thailand	520,000,000	Common	5,200,000	100	100 (Shareholding through Thailoil Marine Co., Ltd.)
T.I.M. Ship Management Company Limited 223/18-20 Country Complex Building A, 8 th 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 Thailoil Marine Co., Ltd.)
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.)

Company Name and Address	Registration Number	Business	Registered Capital in Baht	Type of Shares	Number of Shares (Issued)	Value of Share (Baht per share)	Shareholding (%)
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
Other Business Thailoil 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
Thailoil 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 Thailoil Ethanol Co., Ltd.)

Company Name and Address	Registration Number	Business	Registered Capital in Baht	Type of Shares	Number of Shares (Issued)	Value of Share (Baht per share)	Shareholding (%)
Sapthip Green Energy Company Limited 49 Moo 6, Nikomlamalai, Chaibadan Lopburi 15130, Thailand Tel : +66(0) 3646-2438 Fax : +66(0) 3846-2475	0165561000615	Power from biogas, generator and distributor	20,000,000	Common	200,000	10	50 (Shareholding through Sapthip Co., Ltd.)
Ubon Bio Ethanol Public Company Limited 333 Moo 9, Nadee, Naveer, 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, Mapchafood-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	Conduct the business in the area of International Head Quarter (IHQ) and Treasury Center (TC) in order to increase financial efficiency of Thailoil and Subsidiaries	10,000,000	Common	1,000,000	10	100
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) -2537-2984 Fax : +66(0) -2537-2978	0105560151628	Support execution of social enterprise of PTT Group	10,000,000	Common	250,000	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) -2299-1824, +66(0) -2299-1825
+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) -2230-1983

Auditor

KPMG Phoomchai Audit Limited

51st Floor, Empire Tower, 1 South Sathorn Road,
Bangkok 10120, Thailand
Tel : +66(0) -2677-2000
Fax : +66(0) -2677-2222

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



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

● 75% **Labix Co., Ltd.**
LAB Producer and Distributor
Capacity: 120,000 tons/annum

● 25% Mitsui & Co., Ltd.

● 100% **Thaioil Solvent Co., Ltd.**

100%

TOP Solvent Co., Ltd.

Solvent Distributor in Thailand

80.5%

100%

Sak Chaisidhi Co., Ltd.

Solvent Manufacturer

Capacity:

141,000 tons/annum

TOP Solvent (Vietnam) LLC.

Solvent Distributor in Vietnam



Thai Lube Base Plc

Lube Base Oil

Capacity:

Lube Base Oil

267,015 tons/annum

Bitumen

350,000 tons/annum

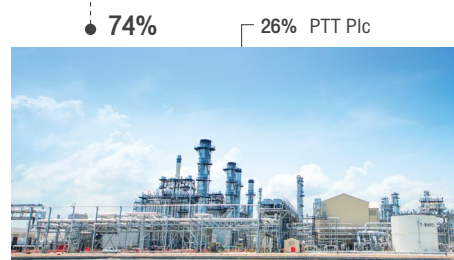
TDAE

67,520 tons/annum

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, logistics and renewable energy generation, LAB: an intermediate in the production of surfactants, marine and pipeline transportation and storage services of crude, petroleum and petrochemical products, business in the area of International Head Quarter 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



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%

8.9% Global Power Synergy Plc

Principal power plant of PTT Group

Capacity:

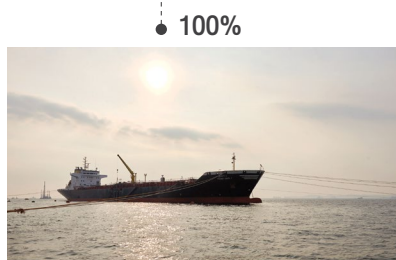
Electricity: 1,922 megawatts

Steam: 1,582 tons/hour

Industrial water: 2,080 cubic meters/hour

Chilled water: 12,000 refrigeration tons

Transportation & Others



Thaioil Marine Co., Ltd.

5 Oil & Chemical Tankers

Capacity: 22,800 deadweight tonnage

3 Crude Tankers VLCCs

Capacity: 881,050 deadweight tonnage

14 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



Thaioil Ethanol Co., Ltd.

50%

Sapthip Co., Ltd.

Cassava Based Ethanol

Capacity: 200,000 litres/day

57.4%

21.3%

Others

Bangchak Corporation Plc

21.3%

Ubun 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

Earning Stability

Marketing/IT Support

REVENUE STRUCTURE

Thai Oil's core earnings were derived from our oil refinery business. Other revenue contributors were the lube base oil refinery, petrochemical, power generation, marine transportation services, solvent, ethanol and other businesses.

(in million Baht)

			Ownership Interest		For the year ended December 31					
					2018		2017		2016	
			Operator ⁽¹⁾	(%)	Amount	%	Amount	%	Amount	%
A. Net Sales										
1. Oil refinery	TOP	-	405,130	104	349,829	102	283,293	103		
2. Lube base oil refinery	TLB	100	20,959	5	18,662	5	13,536	5		
3. Petrochemical	TPX	100	66,701	17	57,881	17	48,384	17		
4. Power generation	TP/TOP SPP	74/100	11,734	3	10,929	4	9,131	3		
5. Marine transportation services	TM	100	621	-	801	-	878	-		
6. Solvent	TOS	100	9,992	3	9,182	3	7,630	3		
7. Ethanol	TET	100	1,477	-	1,620	-	1,539	1		
8. Other	TES/TTC	100	1,925	-	985	-	900	-		
Less: Eliminations			(129,195)	(33)	(112,501)	(33)	(90,552)	(33)		
Total			389,344	99	337,388	98	274,739	99		
B. Net Foreign Exchange Gain										
1. Oil refinery	TOP	-	430	-	2,882	1	372	-		
2. Lube base oil refinery	TLB	100	14	-	-	-	10	-		
3. Petrochemical	TPX	100	159	-	333	-	58	-		
4. Power generation	TP/TOP SPP	74/100	3	-	1	-	5	-		
5. Marine transportation services	TM	100	10	-	(7)	-	(3)	-		
6. Solvent	TOS	100	11	-	(29)	-	6	-		
7. Ethanol	TET	100	-	-	1	-	(2)	-		
Total			627	-	3,181	1	446	-		

(in million Baht)

	Operator ⁽¹⁾	Ownership Interest (%)	For the year ended December 31					
			2018		2017		2016	
			Amount	%	Amount	%	Amount	%
C. Other Revenues ⁽²⁾								
1. Oil refinery	TOP	-	3,705	1	3,272	1	2,926	1
2. Lube base oil refinery	TLB	100	87	-	93	-	82	-
3. Petrochemical	TPX	100	299	-	235	-	196	-
4. Power generation	TP/TOP SPP	74/100	26	-	21	-	10	-
5. Marine transportation services	TM	100	45	-	32	-	28	-
6. Solvent	TOS	100	16	-	14	-	54	-
7. Ethanol	TET	100	6	-	6	-	8	-
8. Other	TES/TTC	100	2	-	1	-	1	-
Less: Eliminations			(2,467)	-	(2,484)	-	(2,186)	-
Total			1,719	1	1,190	1	1,119	1
Total revenues (A-C)			391,690	100	341,759	100	276,304	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 Thairoil Power Co., Ltd.

TOP SPP is TOP SPP Co., Ltd.

TM is Thairoil Marine Co., Ltd. having respective interests in Thairoil Marine International Pte. Ltd. and TOP Maritime Service Co., Ltd.

TOS is Thairoil Solvent Co., Ltd. having respective interests in TOP Solvent Co., Ltd., Sak Chaisidhi Co., Ltd. and TOP Solvent (Vietnam) LLC.

TET is Thairoil Ethanol Co., Ltd. having respective interests in Sapthip Co., Ltd.

TES is Thairoil Energy Services Co., Ltd.

TTC is Thairoil Treasury Center Co., Ltd.

⁽²⁾ Comprises of received interests, export tax subsidy, revenues from services provided to subsidiary companies, land lease, single buoy mooring service fee, oil storage tank lease etc.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL POSITION AND OPERATING RESULTS

Operating Results-Consolidated Financial Results

		2018	2017	+/(-)
Gross Integrated Margin (GIM)				
<u>excluding</u> stock gain/(loss) ⁽¹⁾	USD/barrel	6.9	9.1	(2.2)
Gross Integrated Margin (GIM)				
<u>including</u> stock gain/(loss) ⁽¹⁾	"	6.6	9.9	(3.3)
Sales revenue	Million Baht	389,344	337,388	51,956
Hedging Gain/(Loss)	"	(821)	(133)	(688)
EBITDA	"	20,239	36,925	(16,686)
Finance Costs	"	(3,511)	(3,285)	(226)
Finance Costs from repurchase of debentures	"	(431)	-	(431)
Foreign Exchange Gain/(Loss)	"	627	3,182	(2,555)
Reversal of Income Tax/(Expense)	"	(1,983)	(5,529)	3,546
Net Profit/(Loss) ⁽²⁾	"	10,149	24,856	(14,707)
Basic Earnings/(Loss) per Share	Baht	4.97	12.18	(7.21)
Stock Gain/(Loss)	Million Baht	(1,315)	3,343	(4,658)
Petroleum Inventory write-down to NRV/(Reversal)	"	(1,314)	73	(1,387)
Net Profit <u>excluding</u> stock gain/(loss)				
and inventory write-down to NRV ⁽³⁾	"	12,777	21,441	(8,664)

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⁾ Including dividends received of THB 154 million for the year 2018 and THB 158 million for the year 2017 from Thai Petroleum Pipeline Co., Ltd.

⁽³⁾ Excluding pre-tax stock gain/(loss) and pre-tax write-down to NRV on petroleum inventory/(a reversal of write-down to NRV on petroleum inventory) which are included in cost of sale of goods and rendering of services in the financial statements.

For the year 2018, Thailoil and Subsidiaries maintained elevated levels of outputs. Thailoil Refinery boasted a 113% in utilization rate. The production rate of aromatics business, LAB business and lube base oil business were 89%, 104%, and 84%, respectively. Thailoil and Subsidiaries had sales revenue of THB 389.344 billion, increased by THB 51.956 billion due to the rise in average product

selling prices tracking crude oil price. However, Thailoil and Subsidiaries recorded lower GIM excluding stock gain/(loss) by 2.2 USD per barrel to 6.9 USD per barrel because Gross Refining Margin (GRM) dropped due to considerably increased crude premium and softened gasoline spread over Dubai, despite stronger gas oil and jet/kerosene spreads from the previous year. In addition,

lube base oil and bitumen spreads over fuel oil also weakened owing to increasing lube base oil supply and softening bitumen demand. Besides, in 2018, Thailoil and Subsidiaries recorded stock loss and the write-down to NRV on petroleum inventory of THB 2.628 billion, compared with stock gain and the reversal of write-down to NRV on petroleum inventory of THB 3.416 billion in 2017. Thailoil and Subsidiaries posted EBITDA of THB 20.239 billion, dropped by THB 16.686 billion. Offsetting with finance costs, which included non-recurring expenses from amortized deferred discount on debentures and related expenses relevant to liabilities management, depreciation, and income tax expense, Thailoil and Subsidiaries earned net profit of THB 10.149 billion or 4.97 Baht per share, plunged by THB 14.707 billion from the previous year.

On November 20, 2018, Thailoil Treasury Center Co., Ltd. (TTC) issued USD-denominated debentures to foreign institutional investors for the total amount of USD 1 billion for supporting investment in the Clean Fuel Project (CFP). On the same day, the Extraordinary General Meeting of Shareholders of TOP Maritime Service Co., Ltd. (TMS) (indirect subsidiary of the Company, 100% owned by Thailoil Marine Co., Ltd. (TM) and TM 100% owned by the Company) resolved to approve on registered capital increase for the amount of THB 250 million to be THB 520 million from the existing registered capital of THB 270 million. The objective of the capital increase is mainly for capital restructuring to be aligned with the current business environment.

Results by Company

Thailoil Refinery (Thailoil) had a slight increase in throughput to 113%. It had petroleum product sales proportion of 86% for domestic, 9% for Indochina and the rest 5% for export. Thailoil had sales revenue of THB 405.130 billion, hiked

by THB 55.301 billion as a result of higher average selling prices tracking crude oil price and higher total product sales volume. However, Thailoil posted Gross Refining Margin (GRM) excluding stock gain/(loss) of 4.7 USD per barrel, dipped by 2.0 USD per barrel because of the significant rises in crude oil price and crude premium together with the decrease in gasoline spread despite rises in jet/kerosene and gas oil spreads. Unfortunately, the significant dip in crude oil price during year-end caused Thailoil to have stock loss of 0.4 USD per barrel or THB 1.315 billion while it posted stock gain of Baht 3.343 billion in 2017. Besides, with a THB 109 million higher net hedging loss to THB 237 million, Thailoil recorded EBITDA of THB 10.050 billion, reduced by THB 14.458 billion. Thailoil also had net foreign exchange gain of THB 430 million, decreased by THB 2.452 billion. Offsetting with depreciation, finance costs and income tax expense, Thailoil earned net profit of THB 3.983 billion, plunged by THB 13.631 billion from 2017 (including dividend income in this year, Thailoil had net profit of THB 8.240 billion).

Thai Paraxylene Co., Ltd. (TPX) had sales revenue of THB 48.743 billion, climbed by THB 5.135 billion from last year, mainly supported by rises in product selling prices following crude oil price and aromatics sales volume. TPX had Product-to-Feed Margin of 121 USD per ton, increased by 22 USD per ton from stronger paraxylene (PX) spread over ULG95 due to tightened supply and healthy demand from plastic and polyester production. Including net hedging loss from PX spread over ULG95 of THB 546 million, TPX posted EBITDA of THB 4.777 billion, increased by THB 27 million from the previous year. In addition, TPX had higher amortization of absorbent by THB 241 million due to a change in estimated useful life. However, TPX had net foreign exchange gain of THB 93

million, compared with net foreign exchange loss of THB 29 million in 2017. Offsetting with depreciation, finance costs, and income tax expense, TPX reported net profit of THB 2.664 billion, increased by THB 54 million from the previous year.

Labix Co., Ltd. (LABIX) had sales revenue of THB 19.117 billion, surged by THB 3.708 billion following a rise in Linear Alkyl Benzene (LAB) price tracking crude oil price and a 13% increase in LAB sales volume. However, surges in feedstock prices were faster than an increase in LAB price pressuring on LAB gross profit margin. LABIX, therefore, had a reduction in EBITDA of THB 68 million to THB 709 million. Besides, LABIX had net foreign exchange gain of THB 67 million, which dropped by THB 295 million from the previous year. Offsetting with depreciation and finance costs, LABIX posted net loss of THB 178 million, compared with net profit of THB 161 million in 2017.

Thai Lube Base Plc (TLB) had lube base oil production rate of 84%, decreased by 4% in 2017 and had sales revenue of THB 20.959 billion, boosted by THB 2.297 million because of higher total sale volume and higher product selling prices tracking crude oil price. However, Product-to-Feed Margin decreased by 28 USD per ton to 84 USD per ton due to weakened lube base oil and bitumen spreads following greater lube base oil supply, weaker bitumen demand and higher fuel oil price which is feedstock. Together with higher electricity and fuel costs tracking natural gas price, TLB then had EBITDA of THB 1.447 billion, dropped by THB 1.247 billion. However, TLB had a reduction in depreciation of THB 323 million since most of the assets are fully depreciated in Q4/2017. Offsetting with depreciation and income tax expense, TLB posted net profit of THB 1.079 billion, dipped by THB 733 million from 2017.

Thaioil Power Co., Ltd. (TP) had sales revenue of THB 4.409 billion, uplifted by THB 259 million thanks to growths in average selling prices of electricity and steam following natural gas price and higher electricity sales volume tracking customer demand. However, the increased production cost from higher fuel oil price resulted in TP to report EBITDA of THB 766 million, decreased by THB 72 million from last year. Offsetting with depreciation, finance costs, and income tax expense, TP recorded net profit, excluding share of profit from the investment in Global Power Synergy Plc (GPSC), of THB 403 million which was decreased by THB 98 million from the previous year.

TOP SPP Co., Ltd. (TOP SPP) had an increase in sales revenue of THB 546 million to THB 7.325 billion due to higher average selling prices of electricity and steam following the rise in natural gas price together with higher electricity and steam sales volume tracking customer demand. However, the significant increase in fuel oil price led TOP SPP to report EBITDA of THB 1.886 billion or lower by THB 108 million from last year. Offsetting with depreciation, finance costs, and income tax expense, TOP SPP earned net profit of THB 1.069 billion, dropped by THB 131 million from 2017.

Besides, Thaioil and Subsidiaries recognized share of profit from the investment in GPSC (without non-controlling interest) of THB 816 million, increased by THB 45 million from 2017. Thaioil and Subsidiaries, therefore, recognized net profit from power generation business of THB 2.183 billion, reduced by THB 158 million from last year.

Thaioil Solvent Co., Ltd. (TOS) had solvent utilization rate of 112%, dropped by 11%, and had lower solvent sales volume by approximately 11,000 tons, mainly because of lower by-product production and sales volume as well as lower export volume of some solvent product groups due to product shortage. However, solvent average

selling price per unit was better tracking higher average crude oil price during 2018. This resulted in a rise in sales revenue of THB 810 million to THB 9.992 billion. By contrast, softened gross profit margin from higher competition as a result of oversupply and the fluctuation of crude oil price particularly in late 2018 caused TOS to post the write-down to NRV on inventory of THB 21 million. As a result, TOS earned EBITDA of THB 437 million, reduced by THB 253 million from 2017. Offsetting with depreciation, finance costs, and income tax expense, TOS reported net profit of THB 123 million, fallen by THB 186 million from last year.

Thaioil Marine Co., Ltd. (TM) booked services revenue of THB 621 million, dipped by THB 180 million from 2017, owing to the asset disposal in February 2018 and pressure on TOP Maritime Service Co., Ltd. (TMS) fleets from the slowdown in E&P industry. Thus, TM reported EBITDA of THB 78 million, dropped by THB 75 million. Furthermore, TM booked lower share of profit from the investment in TOP-NYK MarineOne Pte. Ltd. by THB 6 million while

TM recorded higher shares of profits by THB 11 million 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. Offsetting with depreciation, financial costs, and income tax expense, TM recognized consolidated net loss of THB 44 million, reduced loss by THB 486 million from last year.

Thaioil Ethanol Co., Ltd. (TET) had consolidated sales revenue from Sapthip Co., Ltd. of THB 1.477 million, decreased by THB 143 million from 2017 and had EBITDA of THB 143 million, dropped THB 325 million from last year, because of the lower average ethanol selling price per unit and sales volume than that of last year together with the high average feedstock cost per unit. Furthermore, TET had share of profit of THB 14 million from the investment in Ubon Bio Ethanol Plc, reduced by THB 52 million due to the dips in the ethanol selling price and sales volume. Therefore, TET posted net profit of THB 4 million, plummeted by THB 259 million from the previous year.

Analysis of Consolidated Financial Position

Financial Position (Million Baht)	Dec 31, 2018	Dec 31, 2017	+/(−)
Total Assets	268,613	228,108	40,505
Total Liabilities	142,141	100,960	41,181
Total Equity	126,472	127,148	(676)

Total Assets

As of December 31, 2018, Thaioil and Subsidiaries had total assets of THB 268.613 billion, grew by THB 40.505 billion or 17.8% from December 31, 2017 due to cash, cash equivalents and current investment rose by THB 39.321 billion mainly due to increase in cash flows from operations for the year 2018 and cash receipts from

debenture issuance. However, there were investments in several projects and dividends paid in April and September 2018. Furthermore, trade accounts receivable rose by THB 2.031 billion tracking higher average product sales volume in December 2018 than December 2017 and decreases in inventories by THB 4.102 billion following a drop in average crude oil price in December 2018 from

December 2017. In addition, Non-current assets climbed by THB 1.972 billion because property, plant, and equipment had a net increase of THB 1.317 billion, mainly from several project investments according to a business plan. Moreover, other non-current assets increased by THB 2.850 billion due mainly to up-front fee payment of THB 2.962 billion according to joint venture agreement on leasing state properties signed on August 21, 2018. However, investments in available-for-sale securities reduced by THB 2.743 billion, mainly from reclassification of private funds, which have maturity date in 2019, to current investments.

Total Liabilities

As of December 31, 2018, Thailoil and Subsidiaries had total liabilities of THB 142.141 billion, increased by THB 41.181 billion or 40.8% from December 31, 2017, due to an increase in trade accounts payable of THB 2.881 billion since trade accounts payable which will be due in January next year became higher. Moreover, other payables rose by THB 396 million due mainly to an increase in Oil Fuel Fund payables tracking higher excise duty rates and product sales volume in December 2018 than December 2017. Nevertheless, income tax payable dropped by THB 3.014 billion following a decrease in net profit. In addition, Long-term borrowings and debentures (including current portions) went up by THB 39.169 billion, mainly because on November 20, 2018, TTC issued USD-denominated debentures to foreign institutional investors for the total amount of USD 1 billion, which fully guaranteed by Thailoil. These debentures comprised of USD 400 million with the tenor of 10 years and USD 600 million with the tenor of 30 years. Furthermore, TOP SPP had THB-denominated borrowings of THB 8.5 billion in Q1/2018 for inter-company loan refinancing from Thailoil and the repayment schedule began in Q2/2018 and TOP Solvent (Vietnam) LLC. (TSV) (shares indirectly held by TOP Solvent Co., Ltd. (TS))

had VND-denominated borrowings which were equivalent to THB 319 million in 2018 for the Solvent Distribution Center Project. Nevertheless, LABIX (shares indirectly held by TPX) repaid its due THB-denominated borrowings of THB 400 million and due THB-denominated with cross currency swap contract borrowings of THB 454 million and TM and TMS (shares indirectly held by TM) repaid their THB-denominated borrowings of THB 487 million.

Total Equity

As of December 31, 2018, Thailoil and Subsidiaries had total equity of THB 126.472 billion, decreased by THB 676 million or 0.5% from December 31, 2017. This resulted from total comprehensive income for the year 2018 of THB 10.330 billion, deducted by dividends paid from Thailoil and Subsidiaries of THB 11.006 billion.

Analysis of Cash Flow and Financial Ratios

As of December 31, 2018, Thailoil and Subsidiaries had cash and cash equivalents of THB 34.041 billion and current investments of THB 73.221 billion. Moreover, Thailoil and Subsidiaries had cash flows provided by operating activities of THB 18.313 billion from net profit for the year 2018 while there were payments of corporate income tax and up-front fee according to joint venture agreement on leasing state properties signed on August 21, 2018. In addition, Thailoil and Subsidiaries had cash flows used in investing activities of THB 25.846 billion as a consequence of current investment acquisitions of THB 21.597 billion and purchases of property, plant and equipment of Baht 7.864 billion which Thailoil spent THB 6.976 billion 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 888 million was used by Subsidiaries in several projects such as Solvent Distribution Center in Vietnam Project of TSV.

However, cash flows provided by financing activities was THB 25.566 billion. This was attributable to net proceeds from Short-term borrowings of THB 1.504 billion, Long-term borrowings of THB 6.937 billion, and debenture issuance of THB 31.558 billion. However, there were finance costs paid and dividends paid of THB 3.428 billion and THB 11.006 billion, respectively.

According to the mentioned cash flows activities, Thail and Subsidiaries reported cash and cash equivalents

increased by THB 18.032 billion from December 31, 2017. Furthermore, Thail and Subsidiaries recorded gain from effect of exchange rate changes on cash and cash equivalents of THB 386 million. Hence, Thail and Subsidiaries had cash and cash equivalents of THB 34.041 billion as of December 31, 2018. Including current investments of THB 73.221 billion, Thail and Subsidiaries had cash, cash equivalents and current investments of THB 107.262 billion.

Financial Ratios

		2018	2017	+ / (-)
Profitability Ratios				
Quality of Earnings ratio	%	5	11	(6)
Gross Profit Margin ratio	"	6	12	(6)
Net Profit Margin ratio	"	3	7	(4)
Liquidity Ratios				
Current ratio	times	4.3	3.8	0.5
Quick ratio	"	3.5	2.7	0.8
Financial Policy Ratios				
Total Liabilities/Total Equity	times	1.1	0.8	0.3
Net Debt/Equity	"	-	-	-
Long-term loan/Total Equity	"	0.8	0.5	0.3
Interest Coverage ratio	"	5.1	11.2	(6.1)
Long-term loan/Total Capitalization	%	45	34	11

Financial Ratios Calculation

Quality of Earnings ratio (%)	=	EBITDA/Sales Revenue
Gross Profit Margin ratio (%)	=	Gross Profit/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 + Current 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
Interest Coverage ratio (times)	=	EBITDA/Interest Expenses (Finance Costs) ⁽¹⁾
Long-term loan	=	Long-term borrowings from financial institutions + Debentures (includes current portion)
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 - Current Investments

Remark ⁽¹⁾ Including finance costs that Thail Treasury Center Co., Ltd. paid to bondholders.

CONNECTED TRANSACTIONS

For Fiscal Year 2018, Thailoil 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 Thailoil as of December 31, 2018
PTT Plc (PTT)	>> Major shareholder, with 48.03% of Thailoil's shares
Thai Paraxylene Co., Ltd. (TPX)	>> Wholly owned by Thailoil >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members on TPX's Board: Mr. Bandhit Thamprajamchit and Mr. Saranyu Limwongse
Thai Lube Base Plc (TLB)	>> Wholly owned by Thailoil >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members on TLB's Board: Mr. Bandhit Thamprajamchit, Mr. Chatapong Wungtanagorn, Ms. Rungtip Maneesarachun, and Mr. Saranyu Limwongse
Thailoil Power Co., Ltd. (TP)	>> 26.01% shares owned by PTT >> 73.99% shares owned by Thailoil >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members 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 Thailoil >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members on TOP SPP's Board: Mr. Nikom Kongnok and Mr. Udom Wongsirinopphakhun
TOP Solvent Co., Ltd. (TS)	>> Wholly owned by Thailoil Solvent Co., Ltd. >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members on TS's Board: Mr. Chatapong Wungtanagorn, Mr. Pongpun Amornvivat, Ms. Rungtip Maneesarachun, and Ms. Acharee Tiyaabhorn

Company	Relationship with Thailoil as of December 31, 2018
Sak Chaisidhi Co., Ltd. (SAKC)	>> 80.52% shares owned by TOP Solvent Co., Ltd. >> Thailoil executive members 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)	>> Wholly owned by TOP Solvent Co., Ltd. >> Thailoil executive members on TSV's Board: Ms. Rungtip Maneesarachun, Ms. Sudarat Orrattanasakul, and Ms. Acharee Tiyaabhorn
Sapthip Co., Ltd. (SAP)	>> 50% shares owned by Thailoil Ethanol Co., Ltd. >> Thailoil executive members on SAP's Board: Mr. Pongpun Amornvivat, Ms. Pattaralada Sa-NGasang, Mr. Surachai Saengsamran, and Mr. Saran Harinsuta
TOP Maritime Service Co., Ltd. (TMS)	>> Wholly owned by Thailoil Marine Co., Ltd. >> Thailoil executive members on TMS's Board: Ms. Pattaralada Sa-NGasang, Mr. Viroj Meenaphant, and Mr. Nitas Krongvanitchayakul
Labix Co., Ltd. (LABIX)	>> 75% shares owned by Thai Paraxylene Co., Ltd. >> Common director: Mr. Atikom Terbsiri >> Thailoil executive members on LABIX's Board: Ms. Pattaralada Sa-NGasang, Mr. Saranyu Limwongse, and Ms. Duangporn Teerapabpaisit
Thai Petroleum Pipeline Co., Ltd. (THAPPLINE)	>> 40.40% shares owned by PTT Oil and Retail Business Plc >> 9.19% shares owned by Thailoil >> Thailoil executive members on THAPPLINE's Board: Mr. Pongpun Amornvivat
PTT Digital Solutions Co., Ltd.	>> 20% shares owned by PTT Plc >> 20% shares owned by Thailoil >> Thailoil executive members on PTT Digital Solutions' Board: Mr. Pongpun Amornvivat
PTT Oil and Retail Business Plc (PTTOR)	>> Wholly owned by PTT Plc >> Common director: Mr. Auttapol Rerkpiboon
PTT International Trading Pte. Ltd. (PTTT)	>> Wholly owned by PTT Plc
PTT International Trading London Ltd. (PTTT LDN)	>> Wholly owned by PTT Plc

Company	Relationship with Thailoil as of December 31, 2018
PTT Exploration and Production Plc (PTTEP)	>> 65.29% shares owned by PTT Plc
PTT Global Chemical Plc (PTTGC)	>> 48.18% shares owned by PTT Plc
IRPC Plc (IRPC)	>> 48.05% shares owned by PTT Plc
PTT Phenol Co., Ltd.	>> Wholly owned by PTT Global Chemical Plc
Global Green Chemical Plc (GGC)	>> 72.29% shares owned by PTT Global Chemical Plc

Connected Transactions between Thailoil and/or Subsidiaries with Major Shareholders

Connected Transactions between Thailoil and PTT Plc

Company	Transactions	Value in 2018 (Million Baht)
PTT Plc (PTT)	>> Revenue from sale of oil products: Thailoil entered into a Product Offtake and Crude Supply Agreement (POCSA) with PTT, under which both parties agreed on the sale and purchase of refined 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.	82,490
	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.	
	>> Expenses on the purchase of oil and natural gas products: Thailoil entered into a POCSA with PTT. Both parties agreed on the sale and purchase of refined 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.	134,494
	>> Thailoil entered into a 10-year (2014-2023) and a 15-year (2007-2022) agreements with PTT for the supply of natural gas for Thailoil's refinery at an agreed volume based on market prices, considered normal business practice.	

Connected Transactions between Thailoil's Subsidiaries and PTT Plc

Company	Transactions	Value in 2018 (Million Baht)
Thai Lube Base Plc (TLB)	>> Revenues from occasional sales of lube base products to PTT, considered normal business practice.	1,698
	>> TLB entered into a five-year natural gas supply contract with PTT for an agreed volume based on market prices, considered normal business practice.	579
Thailoil Power Co., Ltd. (TP)	>> TP entered into a 25-year natural gas sales agreement (1998-2022) with PTT at an agreed volume based on market prices, considered normal business practice.	2,635
TOP SPP Co., Ltd. (TOP SPP)	>> TOP SPP entered into a 25-year natural gas sales agreement (2016-2041) with PTT at an agreed volume based on market prices, considered normal business practice.	4,470
Sapthip Co., Ltd. (SAP)	>> SAP entered into a 10-year ethanol sales agreement (2011-2021) with PTT at an agreed volume based on market prices, considered normal business practice.	355
Labix Co., Ltd. (LABIX)	>> LABIX entered into a 10-year natural gas sales agreement (2015-2025) with PTT at an agreed volume based on market prices, considered normal business practice.	690

Connected Transactions between Thailoil and its Subsidiaries (less than 100% shareholding) or Other Related Companies

Company	Transactions	Value in 2018 (Million Baht)
Thailoil Power Co., Ltd. (TP)	>> Thailoil entered into a 24-year contract, starting April 1, 1998, with TP to provide maintenance and other supporting services as well as supply of feedstock, parts, and reserved fuels to TP. The service charge is based on cost-plus pricing, considered normal business practice. >> 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.	911
	>> Thailoil entered into a 25-year contract (1998-2022) with TP for the supply of electricity and steam at an agreed volume based on market prices.	1,719
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. All parties agreed on the sale and purchase of refined 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.	90,200
	>> Expenses on occasional purchases of oil products from PTTOR, considered normal business practice	155
Thai Petroleum Pipeline Co., Ltd. (THAPPLINE)	>> Revenue from THAPPLINE's dividends	154
PTT Digital Solutions Co., Ltd.	>> Expenses for ICT services as agreed in a five-year contract	177
Global Green Chemicals Plc (GGC)	>> Expenses on occasional purchases of oil products from GGC, considered normal business practice	1,063
PTT International Trading Pte. Ltd. (PTTT)	>> Revenue from occasional sales of oil products to PTTT considered normal business practice	1,317

Company	Transactions	Value in 2018 (Million Baht)
PTT International Trading London Ltd. (PTTT LDN)	>> Expenses on occasional purchases of oil products from PTTT LDN considered normal business practice	3,543
IRPC Plc (IRPC)	>> Expenses on occasional purchases of oil products from IRPC, considered normal business practice.	144
	>> Thairoil entered into a two-year contract with IRPC for crude oil tank service at an agreed service charge stipulated in the contract.	205
	>> Purchase and sale of crude and feedstock for legal reserves	1,668

Connected Transactions between Subsidiaries and Related Companies

Company	Related Company	Transactions	Value in 2018 (Million Baht)
Thairoil Power Co., Ltd. (TP)	Thai Paraxylene Co., Ltd. (TPX)	>> TP entered into a 25-year contract to supply TPX with electricity and steam at market prices. The contract will end in 2022.	1,212
	Thai Lube Base Plc (TLB)	>> TP entered into a 25-year contract to supply TLB with electricity and steam at market prices. The contract will end in 2022.	630
Thai Lube Base Plc (TLB)	IRPC Plc (IRPC)	>> Occasional purchases of by-products, considered normal business practice	140
	PTT Oil and Retail Business Plc (PTTOR)	>> Revenue from occasional sales of lube base oil to PTTOR, considered normal business practice	1,495
Thai Paraxylene Co., Ltd. (TPX)	IRPC Plc (IRPC)	>> Occasional sales of aromatics, considered normal business practice	1,309
		>> Occasional purchases of aromatics, considered normal business practice	165
	PTT International Trading Pte. Ltd. (PTTT)	>> Occasional sales of aromatics, considered normal business practice	5,374

Company	Related Company	Transactions	Value in 2018 (Million Baht)
TOP Solvent Co., Ltd. (TS)	IRPC Plc (IRPC)	>> Occasional sales of solvents, considered normal business practice	107
		>> Occasional purchases of solvents, considered normal business practice	1,448
	PTT Global Chemical Co., Ltd. (PTTGC)	>> Occasional sales of solvents, considered normal business practice	255
	PTT Phenol Co., Ltd.	>> Occasional purchases of solvents, considered normal business practice	166
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 2018.	287
	PTT Global Chemical Plc (PTTGC)	>> SAKC entered into a feedstock purchase contract with PTTGC at an agreed volume based on reference market prices. The contract will end upon a written notice from either party.	2,303
TOP Solvent (Vietnam) LLC. (TSV)	IRPC Plc (IRPC)	>> Occasional purchases of solvents, considered normal business practice	797
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.	368
TOP Maritime Service Co., Ltd. (TMS)	PTT Exploration and Production Plc (PTTEP)	>> TMS provided transportation services for crews and materials 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



(Atikom Terbsiri)
Chief Executive Officer and President

INDEPENDENT AUDITOR'S REPORT

To the Shareholders of Thai Oil Public Company Limited

Opinion

I have audited the consolidated and separate financial statements of Thai Oil Public Company Limited and its subsidiaries (the "Group") and of Thai Oil Public Company Limited (the "Company"), respectively, which comprise the consolidated and separate statements of financial position as at 31 December 2018, the consolidated and separate statements of income, comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

In my opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of the Group and the Company, respectively, as at 31 December 2018 and their financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRSs).

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 Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that is 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.

Impairment of goodwill

Refer to Note 3 and 16 to the financial statements.

The key audit matter

TOP Solvent (Vietnam) Limited Liability Company ("TSV"), an indirect subsidiary of the Company which operates in Vietnam, has a historical business combination which resulted significant goodwill balance amounting to Baht 585 million. Goodwill is subjected to an annual impairment test. No impairment charge has been recorded by management against this balance in the current financial year.

Due to the high level of the management's judgement involved in respect of the assumptions used to support goodwill value, and the significance of the carrying amounts involved, this is one of the key judgmental areas that my audit is concentrated on.

How the matter was addressed in the audit

My audit procedures in this area included, among others:

- understanding and evaluating the Group's forecasting and budgeting procedures and testing of the principles and accuracy of the calculation derived from forecast model and evaluating the reasonableness of key inputs in the calculations such as revenue growth, discount rate and working capital assumptions, by reference to the Board approved forecast models, data external to the Group and my own views;
- evaluating the accuracy of forecasts by comparing with the actual results; and
- evaluating the adequacy of disclosure in accordance with Thai Financial Reporting Standards.

Valuation of inventory

Refer to Note 3 and 10 to the financial statements.

The key audit matter

Inventory is required to be carried at the lower of its cost and net realisable value. Inventory is a significant balance and the group's main raw materials and finished goods are commodities which can be subject to price volatility which may lead to lower of net realisable value comparing to cost. Due to the high level of the management's judgement involved, this is one of the key judgmental areas that my audit is concentrated on.

How the matter was addressed in the audit

My audit procedures in this area included, among others:

- understanding and performing test of design and implementation as well as operating effectiveness of controls over inventory valuation process;
- assessing the appropriateness of the methodology used to calculate the provisions held against inventory at year end, considering the reasonableness of selling price used by reference to commodity price, and assessing the accuracy of the calculation; and
- evaluating the adequacy of disclosure in accordance with Thai Financial Reporting Standards.

Impairment of property, plant and equipment in the consolidated financial statements and loan to and investment in subsidiary in separate financial statements in marine transportation business

Refer to Note 3 5 11 and 15 to the financial statements.

The key audit matter

The Group has certain vessels and crew boats which are not fully used in operation due to the fact that the exploration business is in the downturn from prolonged falls in prevailing oil and gas price which resulted in low freight charge and demand in marine transportation business. This situation indicated that property, plant and equipment, loan to and investment in subsidiary in marine transportation business may be impaired.

As a result, for impairment assessment, the Group has assessed the recoverable amount based on the higher of the fair value less costs of disposal and value in use.

Due to a significant judgment involved in respect of the assumptions used to support valuation of property, plant and equipment, loan to and investment in subsidiary, and the significance of the carrying amount involved, this is one of the key judgmental areas that my audit is concentrated on.

How the matter was addressed in the audit

My audit procedures in this area included, among others:

- understanding of impairment assessment, procedures to assess the recoverable amount and forecasting and budgeting process and testing of the principles and accuracy of the calculation derived from forecast model and evaluating the reasonableness of key inputs in the calculations such as freight and utilisation rate, discount rate and working capital assumptions, by reference to the Board approved forecast models, actual result, data external to the Group and my own views;
 - challenging the source of information and weighted factors that management and independent appraiser used to evaluate the fair value of underlying assets using market approach for selling consideration purpose;
 - assessing the competency of the independent appraiser engaged by the Group;
 - using the work of expert engaged by KPMG in evaluating the appropriateness of valuation methodology used by the independent appraiser including the appraisal reports; and
 - evaluating the adequacy of disclosure in accordance with Thai Financial Reporting Standards.
-

Other Information

Management is 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.

My opinion on the consolidated and separate financial statements does not cover the other information and I do 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 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. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines 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, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of

accounting unless management either intends to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's and the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs 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 skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance 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 those charged with governance 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 those charged with governance, 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.

Waiyawat h.

Waiyawat Kosamarnchaiyakij

Certified Public Accountant

Registration No. 6333

KPMG Phoomchai Audit Ltd.

Bangkok

15 February 2019

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

Assets	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2018	2017	2018	2017
Current assets					
Cash and cash equivalents	6, 19	34,041,471,033	15,623,426,718	29,868,078,023	11,914,509,851
Current investments	7, 19	73,220,568,315	52,318,064,256	73,027,317,304	51,897,422,875
Trade accounts receivable	5, 8	24,359,024,864	22,327,840,296	25,193,925,665	24,241,795,223
Other receivables	5, 9	1,381,634,279	1,170,683,073	1,443,680,409	1,126,898,197
Short-term loans	5	45,000,000	90,000,000	4,274,000,000	15,650,500,000
Inventories	5, 10	28,738,502,329	32,840,901,647	24,423,642,318	28,094,465,957
Prepaid corporate income tax		937,573,494	59,703,747	860,134,701	-
Value added tax receivable		630,751,760	751,588,384	36,760,012	-
Receivable from Oil Fuel Fund		1,388,932,491	1,029,053,483	1,388,932,491	1,029,053,483
Other current asset		-	126,927	-	-
Total current assets		164,743,458,565	126,211,388,531	160,516,470,923	133,954,645,586
Non-current assets					
Investments held as available-for-sale	7	360,515,845	3,103,250,531	360,515,845	3,103,250,531
Investments in subsidiaries	11	-	-	14,555,419,002	14,555,419,002
Investments in joint ventures	13	624,895,464	541,978,290	-	-
Investments in associates	13	14,315,601,209	13,825,697,677	1,260,604,927	1,260,604,927
Other long-term investments	7	779,871,900	779,871,900	779,871,900	779,871,900
Long-term loan to related party	5	-	-	400,000,000	-
Investment properties	14	102,520,270	102,520,270	1,100,443,418	1,100,443,418
Property, plant and equipment	15, 19	79,929,021,500	78,612,409,186	39,989,649,341	36,082,112,102
Goodwill	16	584,726,509	601,368,612	-	-
Other intangible assets	16	2,460,315,414	2,590,047,381	529,008,978	530,131,630
Deferred tax assets	17	629,338,970	507,431,217	515,758,780	481,089,961
Other non-current assets	18	4,082,687,830	1,232,329,261	3,837,325,375	958,875,127
Total non-current assets		103,869,494,911	101,896,904,325	63,328,597,566	58,851,798,598
Total assets		268,612,953,476	228,108,292,856	223,845,068,489	192,806,444,184

The accompanying notes are an integral part of these financial statements.

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

Liabilities and shareholders' equity	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2018	2017	2018	2017
Current liabilities					
Short-term borrowings	19	2,391,675,227	968,802,956	-	-
Trade accounts payable	5, 20	21,844,262,665	18,963,172,436	23,516,749,444	21,060,997,897
Other payables	5, 21	3,871,803,863	3,475,927,189	3,575,377,315	2,909,892,064
Short-term borrowings from related parties	5, 19	-	-	1,506,552,107	503,218,068
Current portion of long-term borrowing	19	1,548,627,370	1,592,435,944	-	-
Current portion of debentures	19	3,000,000,000	-	3,000,000,000	-
Excise duty payable		4,814,818,139	4,784,895,265	4,814,818,139	4,784,895,265
Income tax payable		548,624,898	3,562,808,719	-	2,886,929,511
Other current liability		238,733	-	238,733	-
Total current liabilities		38,020,050,895	33,348,042,509	36,413,735,738	32,145,932,805
Non-current liabilities					
Long-term borrowings	5, 19	15,054,311,238	8,068,138,044	52,028,386,444	-
Debentures	19	85,065,238,416	55,838,586,219	33,008,687,149	55,838,586,219
Deferred tax liabilities	17	37,020,089	8,980,502	-	-
Provision for employee benefits	22	3,586,980,032	3,510,907,406	3,183,164,072	3,161,123,920
Other non-current liabilities		376,974,231	185,392,041	524,495,928	494,853,398
Total non-current liabilities		104,120,524,006	67,612,004,212	88,744,733,593	59,494,563,537
Total liabilities		142,140,574,901	100,960,046,721	125,158,469,331	91,640,496,342

The accompanying notes are an integral part of these financial statements.

STATEMENT OF FINANCIAL POSITION

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

Liabilities and shareholders' equity	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
		2018	2017	2018	2017
Shareholders' equity					
Share capital	23				
Authorised share capital		20,400,278,730	20,400,278,730	20,400,278,730	20,400,278,730
Issued and paid share capital		20,400,278,730	20,400,278,730	20,400,278,730	20,400,278,730
Share premium					
Share premium on ordinary shares	24	2,456,261,491	2,456,261,491	2,456,261,491	2,456,261,491
Other surpluses (deficits)		303,596,612	203,040,571	-	-
Retained earnings					
Appropriated					
Legal reserve	24	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		96,400,250,174	96,975,466,730	73,487,768,327	75,955,969,926
Other components of shareholders' equity		(132,892,315)	(96,098,367)	57,762,737	68,909,822
Equity attributable to owners of the parent		121,712,022,565	122,223,477,028	98,686,599,158	101,165,947,842
Non-controlling interests	12	4,760,356,010	4,924,769,107	-	-
Total shareholders' equity		126,472,378,575	127,148,246,135	98,686,599,158	101,165,947,842
Total liabilities and shareholders' equity		268,612,953,476	228,108,292,856	223,845,068,489	192,806,444,184

The accompanying notes are an integral part of these financial statements.

STATEMENT OF INCOME

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December 2018	2017	For the year ended 31 December 2018	2017
Revenue from sale and rendering of services	5, 25	389,343,525,761	337,387,694,059	405,130,578,690	349,828,812,257
Cost of sale and rendering of services	5, 10	(373,127,967,756)	(305,385,582,808)	(398,208,441,819)	(328,442,071,503)
Gross profit		16,215,558,005	32,002,111,251	6,922,136,871	21,386,740,754
Dividend income	5	157,371,998	157,889,657	4,257,840,783	11,125,418,007
Net derivative loss on hedging		(820,524,349)	(133,218,287)	(236,862,872)	(127,593,664)
Net foreign exchange gain		626,683,439	3,181,552,556	430,095,814	2,881,989,819
Other income	5, 26	1,718,921,457	1,190,071,115	3,704,131,833	3,271,699,114
Selling expenses	5	(423,970,790)	(491,804,822)	(72,892,487)	(188,744,447)
Administrative expenses	5, 27	(2,357,752,867)	(2,969,440,802)	(2,435,738,911)	(2,493,162,306)
Share of profit of joint ventures and associates	13	1,192,891,937	1,196,663,512	-	-
Profit before financial costs and income tax expense		16,309,178,830	34,133,824,180	12,568,711,031	35,856,347,277
Finance costs	5, 30	(3,510,847,618)	(3,285,063,447)	(2,942,417,762)	(2,863,593,581)
Finance costs from repurchase of debentures	19, 30	(431,099,841)	-	(431,099,841)	-
Profit before income tax expense		12,367,231,371	30,848,760,733	9,195,193,428	32,992,753,696
Income tax expense	31	(1,982,789,060)	(5,529,487,003)	(954,711,119)	(4,253,115,118)
Profit for the year		10,384,442,311	25,319,273,730	8,240,482,309	28,739,638,578
Profit for the year attributable to:					
Owners of the parent		10,149,038,048	24,856,198,552	8,240,482,309	28,739,638,578
Non-controlling interests	12	235,404,263	463,075,178	-	-
Profit for the year		10,384,442,311	25,319,273,730	8,240,482,309	28,739,638,578
Basic earnings per share	33	4.97	12.18	4.04	14.09

The accompanying notes are an integral part of these financial statements.

STATEMENT OF COMPREHENSIVE INCOME

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
		2018	2017	2018	2017
Profit for the year		10,384,442,311	25,319,273,730	8,240,482,309	28,739,638,578
Other comprehensive income (loss)					
Items that will be reclassified					
subsequently to profit or loss					
Net change in fair value of					
available-for-sale investments		(11,147,085)	147,378,167	(11,147,085)	147,378,167
Exchange difference on translating					
foreign operations		(30,790,007)	(120,752,573)	-	-
Share of other comprehensive income					
(loss) of associate		5,355,995	(16,205,521)	-	-
Total items that will be reclassified					
subsequently to profit or loss		(36,581,097)	10,420,073	(11,147,085)	147,378,167
Items that will not be reclassified to					
profit or loss					
Loss on remeasurements of					
defined benefit plans	22	(412,747)	(323,414,348)	-	(291,993,637)
Share of other comprehensive					
income (loss) of associate		(17,600,081)	-	-	-
Total items that will not be					
reclassified to profit or loss		(18,012,828)	(323,414,348)	-	(291,993,637)
Other comprehensive income (loss)					
for the year, net of income tax		(54,593,925)	(312,994,275)	(11,147,085)	(144,615,470)
Total comprehensive income for the year		10,329,848,386	25,006,279,455	8,229,335,224	28,595,023,108
Total comprehensive income attributable to:					
Owners of the parent		10,096,673,404	24,546,308,167	8,229,335,224	28,595,023,108
Non-controlling interests	12	233,174,982	459,971,288	-	-
Total comprehensive income for the year		10,329,848,386	25,006,279,455	8,229,335,224	28,595,023,108

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CHANGES IN SHAREHOLDERS'EQUITY

Thai Oil Public Company Limited and its Subsidiaries

Consolidated financial statements													(in Baht)	
	Note	Other surpluses (deficits)				Retained earnings		Other components of shareholders' equity					Total shareholders' equity	
		Issued and paid share capital	Share Premium on ordinary shares	Surplus on business restructuring under common control	Surplus (Deficit) from the change in the ownership interests in subsidiary	Legal reserves	Other reserves	Unappropriated investments	Fair value changes in available-for-sale investments	Translating foreign operations	Share of other comprehensive income (loss) of associate	Equity attributable to owners of the parent		
														Other comprehensive income (loss)
Year ended 31 December 2017														
Balance at 1 January 2017		20,400,278,730	2,456,261,491	330,835,954	(127,795,383)	2,040,027,873	244,500,000	81,621,935,504	(78,468,345)	(38,389,563)	7,388,929	106,856,575,190	4,740,728,828	111,597,304,018
Dividend	34	-	-	-	-	-	-	(9,179,406,329)	-	-	-	(9,179,406,329)	(275,931,009)	(9,455,337,338)
Comprehensive income (loss) for the year		-	-	-	-	-	-	-	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-	24,856,198,552	-	-	-	24,856,198,552	463,075,178	25,319,273,730
Other comprehensive income (loss)		-	-	-	-	-	-	(323,260,997)	147,378,167	(120,752,573)	(13,254,982)	(309,890,385)	(3,103,890)	(312,994,275)
Total comprehensive income (loss) for the year		-	-	-	-	-	-	24,532,937,555	147,378,167	(120,752,573)	(13,254,982)	24,546,308,167	459,971,288	25,006,279,455
Balance at 31 December 2017		20,400,278,730	2,456,261,491	330,835,954	(127,795,383)	2,040,027,873	244,500,000	96,975,466,730	68,909,822	(159,142,136)	(5,866,053)	122,223,477,028	4,924,769,107	127,148,246,135
Year ended 31 December 2018														
Balance at 1 January 2018		20,400,278,730	2,456,261,491	330,835,954	(127,795,383)	2,040,027,873	244,500,000	96,975,466,730	68,909,822	(159,142,136)	(5,866,053)	122,223,477,028	4,924,769,107	127,148,246,135
Dividend	34	-	-	-	-	-	-	(10,708,683,908)	-	-	-	(10,708,683,908)	(297,032,038)	(11,005,715,946)
Acquisition of non-controlling interests without a change in control	4	-	-	-	100,556,041	-	-	-	-	-	-	100,556,041	(100,556,041)	-
Comprehensive income (loss) for the year		-	-	-	-	-	-	-	-	-	-	-	-	-
Profit for the year		-	-	-	-	-	-	10,149,038,048	-	-	-	10,149,038,048	235,404,263	10,384,442,311
Other comprehensive income (loss)		-	-	-	-	-	-	(15,570,696)	(11,147,085)	(30,790,007)	5,143,144	(52,364,644)	(2,229,281)	(54,593,925)
Total comprehensive income (loss) for the year		-	-	-	-	-	-	10,133,467,352	(11,147,085)	(30,790,007)	5,143,144	10,096,673,404	233,174,982	10,329,848,386
Balance at 31 December 2018		20,400,278,730	2,456,261,491	330,835,954	(27,239,342)	2,040,027,873	244,500,000	96,400,250,174	57,762,737	(189,932,143)	(722,909)	121,712,022,565	4,760,356,010	126,472,376,575

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

Thai Oil Public Company Limited and its Subsidiaries

Separate financial statements										(in Baht)
	Note	Issued and paid share capital	Share Premium on ordinary shares	Retained earnings			Other components of shareholders' equity			
				Legal reserve	Other reserves	Unappropriated	Fair value changes in available-for-sale investments	Total		
Year ended 31 December 2017										
Balance at 1 January 2017		20,400,278,730	2,456,261,491	2,040,027,873	244,500,000	56,687,731,314	(78,468,345)	81,750,331,063		
Dividend	34	-	-	-	-	(9,179,406,329)	-	(9,179,406,329)		
Comprehensive income (loss) for the year										
Profit for the year		-	-	-	-	28,739,638,578	-	28,739,638,578		
Other comprehensive income (loss)		-	-	-	-	(291,993,637)	147,378,167	(144,615,470)		
Total comprehensive income (loss)										
for the year		-	-	-	-	28,447,644,941	147,378,167	28,595,023,108		
Balance at 31 December 2017		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		
Year ended 31 December 2018										
Balance 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	34	-	-	-	-	(10,708,683,908)	-	(10,708,683,908)		
Comprehensive income (loss) for the year										
Profit for the year		-	-	-	-	8,240,482,309	-	8,240,482,309		
Other comprehensive income (loss)		-	-	-	-	-	(11,147,085)	(11,147,085)		
Total comprehensive income (loss)										
for the year		-	-	-	-	8,240,482,309	(11,147,085)	8,229,335,224		
Balance 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		

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)					
	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
		2018	2017	2018	2017
Cash flows from operating activities					
Profit for the year		10,384,442,311	25,319,273,730	8,240,482,309	28,739,638,578
Adjustments for reconcile profit (loss) to cash receipts (payments)					
(Reversal of) Allowance for decline in value of inventories adjusted to net realisable value		1,350,443,972	(93,066,711)	1,313,858,368	(72,798,534)
Depreciation and amortisation	29	7,263,783,285	7,641,956,999	3,787,642,038	3,956,228,840
Finance costs	30	3,510,847,618	3,285,063,447	2,942,417,762	2,863,593,581
Finance costs from repurchase of debentures	19, 30	431,099,841	-	431,099,841	-
Unrealised (gain) loss on foreign exchange		428,191,957	(2,335,144,065)	427,512,032	(2,013,562,075)
Share of profit of joint ventures and associates	13	(1,192,891,937)	(1,196,663,512)	-	-
Dividend income	5	(157,371,998)	(157,889,657)	(4,257,840,783)	(11,125,418,007)
Impairment loss on property, plant and equipment	15	-	546,355,384	-	-
(Gain) loss on disposal of investment		(1,523,522)	33,223,606	(1,523,522)	71,850,322
Loss on disposal of property, plant and equipment		2,808,995	20,392,717	1,622,872	27,991
Realisation of deferred land lease and other income		(24,758,209)	(24,475,755)	(147,874,075)	(143,187,307)
Income tax expense	31	1,982,789,060	5,529,487,003	954,711,119	4,253,115,118
		23,977,861,373	38,568,513,186	13,692,107,961	26,529,488,507

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
		2018	2017	2018	2017
Changes in operating assets and liabilities					
Trade accounts receivable		(2,061,153,981)	(2,791,694,120)	(963,003,532)	(3,396,869,165)
Other receivables		(559,425,087)	(524,254,021)	(630,982,298)	(430,974,011)
Inventories		2,751,955,346	441,048,195	2,356,965,271	974,328,151
Value add tax receivable		120,836,623	190,443,380	(36,760,012)	41,899,088
Receivable from Oil Fuel Fund		(359,879,008)	(864,928,898)	(359,879,008)	(864,928,899)
Other non-current assets		(2,951,945,960)	(157,942,426)	(2,977,634,638)	42,690,633
Trade accounts payable		2,977,035,656	(927,669,858)	2,550,746,871	(1,498,321,028)
Other payables		142,307,634	671,588,852	1,050,028,233	357,425,364
Excise duty payable		29,922,874	3,335,282,422	29,922,874	3,335,282,422
Other non-current liabilities		220,682,015	(381,726,948)	68,138,049	(154,795,864)
Cash generated from operating activities		24,288,197,485	37,558,659,764	14,779,649,771	24,935,225,198
Income tax paid		(5,975,151,623)	(3,141,476,623)	(4,736,444,150)	(1,986,846,267)
Net cash from operating activities		18,313,045,862	34,417,183,141	10,043,205,621	22,948,378,931

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)					
	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
		2018	2017	2018	2017
Cash flows from investing activities					
Dividends received		772,443,637	740,393,772	4,257,840,783	11,125,418,007
Increase in current investment		(21,597,119,763)	(23,423,007,008)	(21,824,510,133)	(23,458,465,627)
Purchase of investments held as					
available-for-sale		(5,010,249)	(3,016,015,165)	(5,010,249)	(3,016,015,165)
Sale of investments held as					
available-for-sale		2,737,427,082	150,575,691	2,737,427,082	150,575,691
Proceeds from sales of investments					
in associates	13	-	50,625,000	-	-
Cash outflows on investments					
in subsidiary	11	-	-	-	(10,000,000)
Cash outflows on short-term loans to					
related parties	5	-	-	(310,000,000)	(7,220,500,000)
Cash inflows on short-term loans to					
related parties	5	-	-	11,686,500,000	4,153,500,000
Cash outflows on long-term loans to					
related parties	5	-	-	(400,000,000)	-
Cash inflows on short-term loans		45,000,000	-	-	-
Cash inflows on long-term loans to					
savings co-operative of employees		45,991,743	21,989,620	45,991,743	21,989,620
Cash outflows on other long-term investments		-	(375,000)	-	(375,000)
Purchase of property, plant and equipment		(7,863,692,892)	(3,679,007,164)	(6,975,873,167)	(3,257,293,377)
Sale of property, plant and equipment		128,649,619	1,936,392	16,400	15,700
Purchase of intangible assets		(130,835,947)	(920,624,370)	(82,816,383)	(96,526,356)
Exchange differences on translating					
foreign operations		20,867,660	(18,874,068)	-	-
Net cash used in investing activities		(25,846,279,110)	(30,092,382,300)	(10,870,433,924)	(21,607,676,507)

The accompanying notes are an integral part of these financial statements.

STATEMENT OF CASH FLOWS

Thai Oil Public Company Limited and its Subsidiaries

(in Baht)

		Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
	Note	2018	2017	2018	2017
Cash flows from financing activities					
Finance costs paid		(3,371,009,367)	(3,364,337,657)	(3,374,795,938)	(2,946,483,285)
Finance costs paid for repurchase of debentures		(56,631,225)	-	(56,631,225)	-
Dividends paid		(11,005,715,946)	(9,455,337,338)	(10,708,683,908)	(9,179,406,329)
Proceeds from short-term borrowings		29,126,652,825	3,571,377,956	18,990,292,661	-
Repayment of short-term borrowings		(27,622,780,554)	(3,470,000,000)	(18,990,292,661)	-
Net proceeds (repayments) of short-term borrowings from related parties	5	-	-	1,003,334,040	(27,955,034)
Proceed of long-term borrowings from related parties	5	-	-	51,606,332,137	-
Proceeds from long-term borrowings		14,943,975,491	110,052,978	-	-
Repayment of long-term borrowings		(8,006,998,447)	(1,685,992,899)	-	-
Proceeds from debenture		51,634,496,961	-	-	-
Redemption of debenture		(20,076,405,723)	(4,931,799,674)	(20,076,405,723)	(4,931,799,674)
Net cash from (used in) financing activities		25,565,584,015	(19,226,036,634)	18,393,149,383	(17,085,644,322)
Net increase (decrease) in cash and cash equivalents		18,032,350,767	(14,901,235,793)	17,565,921,080	(15,744,941,898)
Effect of exchange rate change on cash and cash equivalents		385,693,548	(596,099,490)	387,647,092	(580,525,685)
Cash and cash equivalents as at 1 January		15,623,426,718	31,120,762,001	11,914,509,851	28,239,977,434
Cash and cash equivalents at 31 December	6	34,041,471,033	15,623,426,718	29,868,078,023	11,914,509,851
Non-cash transactions					
Payable for purchase of property, plant and equipment		567,076,652	391,724,053	496,162,798	350,450,144
Payable for purchase of intangible assets		243,155,260	202,242,529	-	-
Payable on purchase of securities (Private funds)		-	49,839,374	-	49,839,374

The accompanying notes are an integral part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Note	Contents	Note	Contents
1	General information	21	Other payables
2	Basis of preparation of the financial statements	22	Provisions for employee benefits
3	Significant accounting policies	23	Share capital
4	Acquisition of non-controlling interests	24	Additional paid-in capital and reserves
5	Related parties	25	Segment information
6	Cash and cash equivalents	26	Other income
7	Other investments	27	Administrative expenses
8	Trade accounts receivable	28	Employee benefit expenses
9	Other receivables	29	Expenses by nature
10	Inventories	30	Finance costs
11	Investments in subsidiaries	31	Income tax expense
12	Non-controlling interests	32	Promotional privileges
13	Investments in joint ventures and associates	33	Basic earnings per share
14	Investment properties	34	Dividends
15	Property, plant and equipment	35	Financial instruments
16	Intangible assets	36	Commitments with non-related parties
17	Deferred tax	37	Contingent liabilities and contingent assets
18	Other non-current assets	38	Insurance policy
19	Interest-bearing liabilities	39	Event after the reporting period
20	Trade accounts payable	40	Thai Financial Reporting Standards (TFRS) not yet adopted

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

These notes form an integral part of the financial statements.

The financial statements issued for Thai statutory and regulatory reporting purposes are prepared in the Thai language. These English language financial statements have been prepared from the Thai language statutory financial statements, and were approved and authorised for issue by the Board of Directors on 15 February 2019.

1 General information

Thai Oil Public Company Limited, the “Company”, is incorporated in Thailand and has its 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, Cholburi 20230, Thailand

The Company was listed on the Stock Exchange of Thailand on 26 October 2004.

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 and owned 48.03% of the Company's issued and paid-up share capital as at 31 December 2018 (31 December 2017: 49.1%).

The principal businesses of the Company are oil refining and distributions. Details of the Company's direct and indirect subsidiaries as at 31 December 2018 and 2017 were as follows:

Name of the entity	Type of business	Country of incorporation	Ownership interest (%)	
			2018	2017
Direct subsidiaries				
Thai Paraxylene Co., Ltd.	Paraxylene manufacturing and distribution	Thailand	99.99	99.99
Thai Lube Base Public Company Limited	Lube base oil refining and distribution	Thailand	99.99	99.99
Thaioil Marine Co., Ltd.	Providing marine transportation services for petroleum and liquid chemical products	Thailand	99.99	99.99

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Name of the entity	Type of business	Country of incorporation	Ownership interest (%)	
			2018	2017
Thaioil Energy Services Co., Ltd.	Providing human resource management	Thailand	99.99	99.99
Thaioil Solvent Co., Ltd.	Investment in solvent and chemical businesses	Thailand	99.99	99.99
Thaioil Ethanol Co., Ltd.	Investment in ethanol business and alternative energy products	Thailand	99.99	99.99
Thaioil Power Co., Ltd.	Power and steam generation and distribution	Thailand	73.99	73.99
TOP SPP Co., Ltd.	Power and steam generation and distribution	Thailand	99.99	99.99
Thaioil Treasury Center Co., Ltd.	Treasury center for the Group's business	Thailand	99.99	99.99
Indirect subsidiaries				
TOP Solvent Co., Ltd.	Distribution of solvent and chemical products	Thailand	99.99	99.99
Sak Chaisidhi Co., Ltd.	Solvent and chemical products manufacturing and distribution	Thailand	80.52	80.52
TOP Solvent (Vietnam) LLC.	Distribution of solvent and chemical products	Vietnam	100.00	100.00
Sapthip Co., Ltd.	Ethanol products manufacturing and distribution	Thailand	50.00	50.00
Sapthip Green Energy Co., Ltd.	Biogas power generation and Distribution	Thailand	50.00	-
Thaioil Marine International Pte. Ltd.	Investment in marine transportation for crude oil and petroleum product business	Singapore	100.00	100.00
TOP Maritime Service Co., Ltd.	Providing marine transportation services for crew and utilities in Gulf of Thailand	Thailand	99.99	55.00
LABIX Co., Ltd.	Linear Alkyl Benzene manufacturing and distribution	Thailand	75.00	75.00

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

2 Basis of preparation of the financial statements

(a) Statement of compliance

The financial statements are prepared in accordance with Thai Financial Reporting Standards (TFRS), guidelines promulgated by the Federation of Accounting Professions ("FAP"), and applicable rules and regulations of the Thai Securities and Exchange Commission.

The FAP has issued new and revised TFRS effective for annual accounting periods beginning on or after 1 January 2018. The initial application of these new and revised TFRS has resulted in changes in certain of the Group's accounting policies. These changes have no material effect on the financial statements.

In addition to the above new and revised TFRS, the FAP has issued a number of new and revised TFRS which are not yet effective for current period. The Group has not early adopted these standards in preparing these financial statements. Those new and revised TFRS that are relevant to the Group's operations are disclosed in note 40.

(b) Basis of measurement

The financial statements have been prepared on the historical cost basis except for the following items.

Items	Measurement bases
Available-for-sale investment	Fair value
Provisions for employee benefits	Present value of employee benefit obligations as explained in Note 22

(c) Functional and presentation currency

The financial statements are prepared and presented in Thai Baht, which is the Company's functional currency. All financial information presented in Thai Baht has been rounded in the notes to the financial statements to the nearest million unless otherwise stated.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(d) Use of judgements and estimates

The preparation of financial statements in conformity with TFRS requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised prospectively.

Assumptions and estimation uncertainties

Information about assumption and estimation uncertainties that have a significant risk of resulting in a material adjustments to the amounts recognised in the financial statements is included in the following notes:

Note 10	Allowance for decline in value of inventories adjusted to net realisable value
Note 5 11 and 16	Impairment test of loan to and investment in subsidiaries, goodwill and customer database - key assumptions underlying recoverable amounts
Note 15	Determining the fair value less costs of disposal of marine transportation services segment's assets on the basis of significant unobservable inputs
Note 22	Measurement of provisions for employee benefits - key actuarial assumption

Measurement of fair values

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities.

The Group has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values, and reports directly to the CFO.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that such valuations meet the requirements of TFRS, including the level in the fair value hierarchy in which such valuations should be classified.

Significant valuation issues are reported to the Group's Audit Committee.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques 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 (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data.

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

The Group recognises transfers between levels of the fair value hierarchy at the end of the reporting period during which the change has occurred.

Further information about the assumptions made in measuring fair values is included in following notes:

Note 14	Investment properties
Note 15	Property plant and equipment
Note 35	Financial instruments

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

3 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

(a) Basis of consolidation

The consolidated financial statements relate to the Company and its subsidiaries (together referred to as the “Group”) and the Group’s interests in joint ventures and associates

Business combinations

The Group applies the acquisition method for all business combinations when control is transferred to the Group other than those with entities under common control.

The Group controls an entity when it 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. The acquisition date is the date on which control is transferred to the acquirer. Judgment is applied in determining the acquisition date and determining whether control is transferred from one party to another.

Goodwill is measured as the fair value of the consideration transferred including the recognised amount of any non-controlling interest in the acquiree, less the net recognised amount (generally fair value) of the identifiable assets acquired and liabilities assumed, all measured as of the acquisition date. Any gain on bargain purchase is recognised in profit or loss immediately.

Consideration transferred includes the fair values of the assets transferred, liabilities incurred by the Group to the previous owners of the acquiree, and equity interests issued by the Group. Consideration transferred also includes the fair value of any contingent consideration and share-based payment awards of the acquiree that are replaced mandatorily in the business combination. If a business combination results in the termination of pre-existing relationships between the Group and the acquiree, then the lower of the termination amount, as contained in the agreement, and the value of the off-market element is deducted from the consideration transferred and recognised in other expenses.

A contingent liability of the acquiree is assumed in a business combination only if such a liability represents a present obligation and arises from a past event, and its fair value can be measured reliably.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

Acquisitions from entities under common control

Business combination under common control are accounted for using a method similar to the pooling of interest method. Under that method the acquirer recognises assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the moment of the transaction. The difference between the carrying amount of the acquired net assets and the consideration transferred is recognised as surplus or discount from business combinations under common control in shareholder's equity. The surplus or discount will be transferred to retained earnings upon divestment of the businesses acquired.

The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it 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. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

Non-controlling interests

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Loss of control

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

Interests in joint ventures and associates are accounted for using the equity method. They are initially recognised at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which joint control or significant influence ceases.

Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealised income or expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealised gains arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

(b) Foreign currencies

Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies are translated to the functional currency at the exchange rate at the reporting date. Foreign exchange differences arising on translation are recognised in profit or loss.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rates at the dates of the transactions.

Foreign operations

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition, are translated to Thai Baht at the exchange rates at the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at the average foreign exchange rates ruling during the periods.

Foreign exchange differences are recognised in other comprehensive income and accumulated in the translation reserve, except to extent that the translation difference is allocated to non-controlling interest.

When a foreign operation is disposed of in its entirety or partially such that control, significant influence or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss as part of the gain or loss on disposal. If the Group disposes of part of its interest in a subsidiary but retains control, then the relevant proportion of the cumulative amount is reattributed to non-controlling interests. When the Group disposes of only part of a joint venture or associate while retaining joint control or significant influence, the relevant proportion of the cumulative amount is reclassified to profit or loss.

When the settlement of a monetary item receivable from or payable to a foreign operation is neither planned nor likely in the foreseeable future, exchange gains and losses arising from such a monetary item are considered to form part of a net investment in a foreign operation and are recognised in other comprehensive income, and presented in the foreign currency translation reserve in equity until disposal of the investment.

(c) Derivative

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 on inception. The premium or discount on the establishment of each agreement is amortised over the contract period.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Cross currency swap and interest rate swap contracts

Cross currency swap and interest rate swap contracts hedging future fluctuations in exchange rates and interest rates. Foreign financial assets and liabilities hedged by cross currency swap contracts 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 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.

(d) Cash and cash equivalents

Cash and cash equivalents in the statements of cash flows comprise cash balances, current and savings accounts, and highly liquid short-term investments. Bank overdrafts that are repayable on demand are a component of financing activities for the purpose of the statement of cash flows.

(e) Trade and other accounts receivable

Trade and other accounts receivable are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of payment histories and future expectations of customer payments. Bad debts are written off when incurred.

(f) Inventories

Inventories are measured at the lower of cost and net realisable value.

Cost of inventories is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work in progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(g) Non-current assets classified as held for sale

Non-current assets that are expected to be recovered primarily through sale rather than through continuing use, are classified as held for sale. The assets are measured at the lower of their carrying value and fair value less cost to sell. Any impairment loss on a disposal group is first allocated to goodwill, and then to remaining assets and liabilities on a pro rata basis, except that no loss is allocated to inventories, financial assets, deferred tax assets and investment properties. Impairment losses on initial classification as held for sale and subsequent gains and losses on remeasurement are recognised in profit or loss.

(h) Investments

Investments in subsidiaries, joint ventures and associates

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

Any changes in the equity interest in subsidiaries of the Group while control is retained are recorded in equity.

Investments in other debt and equity securities

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for intended to be held to maturity, are classified as investments in available-for-sale securities. Investments in available-for-sale securities are, subsequent to initial recognition, stated at fair value, therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. When these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Disposal of investments

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

(i) Investment properties

Investment properties are properties which are held to earn rental income, for capital appreciation or for both, but not for sale in the ordinary course of business, use in the production or supply of goods or services or for administrative purposes.

Investment properties are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the investment property. The cost of self-constructed investment property includes the cost of materials and direct labour, and other costs directly attributable to bringing the investment property to a working condition for its intended use and capitalised borrowing costs.

(j) Property, plant and equipment

The Group's owned assets

Property, plant and equipment are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

Reclassification to investment property

When the use of a property changes from owner-occupied to investment property, its carrying amount at the date of reclassification becomes its cost for subsequent accounting.

Subsequent costs

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

Depreciation

Depreciation is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

Depreciation is charged to the profit or loss on a straight line basis over the estimated useful lives of each component of an item of property, plant and equipment. The estimated useful lives are as follows:

Buildings	10 - 25 years
Leasehold improvements	5 - 20 years
Refinery plant and equipment (depreciated over the remaining estimated useful life starting from 1 October 1994)	20 - 35 years
Lube base oil refinery plants and equipment	16 - 20 years
Petrochemical plants	10 - 25 years
Power plants	20 - 25 years
Transmission facilities	25 years
Machinery, equipment and plant equipment	3 - 20 years
Oil and liquid chemical tankers and crew boats	10 - 25 years
Furniture, fixtures, office equipment and others	5 - 10 years
Vehicles	5 years

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

No depreciation is provided on freehold land and assets under construction.

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

(k) Intangible assets

Goodwill

Goodwill that arises upon the acquisition of subsidiaries is included in intangible assets. The measurement of goodwill at initial recognition is described in note 3 (a). Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses. In respect of equity-accounted investees, the carrying amount of goodwill is included in the carrying amount of the investment, and an impairment loss on such an investment is not allocated to any asset, including goodwill, that forms part of the carrying amount of the equity-accounted investee.

Customer database

Customer database is stated at cost less accumulated impairment losses.

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.

Subsequent expenditure

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, is recognised in profit or loss as incurred.

Amortisation

Amortisation is calculated over the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill, from the date that they are available for use.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The estimated useful lives are as follows:

License fee	10 - 25 years
Computer software	5 - 10 years
Patent	10 years

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

(I) Impairment

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

Calculation of recoverable amount

The recoverable amount of the Group's investments in held-to-maturity securities carried at amortised cost is calculated as the present value of estimated future cash flows, discounted at the original effective interest rate.

The recoverable amount of available-for-sale assets is calculated by reference to the fair value.

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Reversals of impairment

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss. For financial assets carried at amortised cost and available-for-sale financial assets that are debt securities, the reversal is recognised in profit or loss. For available-for-sale financial assets that are equity securities, the reversal is recognised in other comprehensive income.

An impairment loss in respect of goodwill is not reversed. Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

(m) Interest-bearing liabilities

Interest-bearing liabilities are recognised initially at amortised cost less attributable transaction charges.

(n) Trade and other accounts payable

Trade and other accounts payable are stated at cost.

(o) Employee benefits

Defined contribution plans

A defined contribution plan, provident fund, is a post-employment benefit plan under which an entity pays fixed contributions into a separate entity and will have no legal or constructive obligation to pay further amounts. Obligations for contributions to defined contribution pension plans are recognised as an employee benefit expense in profit or loss in the periods during which services are rendered by employees.

Defined benefit plans

A defined benefit plan is a post-employment benefit plan other than a defined contribution plan. The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The calculation of defined benefit obligations is performed annually by a qualified actuary using the projected unit credit method. When the calculation results in a potential asset for the Group, the recognised asset is limited to the present value of economic benefits available in the form of any future refunds from the plan or reductions in future contributions to the plan. To calculate the present value of economic benefits, consideration is given to any application minimum funding requirements.

Remeasurements of the net defined benefit liability, actuarial gain or loss are recognised immediately in other comprehensive income. The Group determines the interest expense on the net defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period, taking into account any changes in the net defined benefit liability during the period as a result of contributions and benefit payments. Net interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

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 to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

Termination benefits

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(p) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognised as a finance cost.

(q) Revenue

Revenue excludes value added taxes or other sales taxes and is arrived at after deduction of trade discounts.

Sale of goods and services rendered

Revenue is recognised in profit or loss when the significant risks and rewards of ownership have been transferred to the buyer. No revenue is recognised if there is continuing management involvement with the goods or there are significant uncertainties regarding recovery of the consideration due, associated costs or the probable return of goods. Service income is recognised as services are provided.

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.

(r) Expenses

Lease payments

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Repair and maintenance expenses

Expenditure on repair and maintenance is charged to profit or loss in the period in which the expenditure is incurred. Expenditure of a capital nature is added to the cost of the related plant and equipment.

Finance costs

Interest expenses and similar costs are charged to profit or loss for the period in which they are incurred, except to the extent that they are capitalised as being directly attributable to the acquisition, construction or production of an asset which necessarily takes a substantial year of time to be prepared for its intended use or sale.

(s) Income tax

Income tax expense on the profit or loss for the year comprises current and deferred tax.

Current tax is the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognised for the following temporary differences: the initial recognition of goodwill; the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss; and differences relating to investments in subsidiaries and jointly-controlled entities to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

Deferred tax is measured at the tax rates that are expected to be applied to the temporary differences when they reverse, using tax rates enacted or substantively enacted by the reporting date.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax liabilities and assets, and they relate to income taxes levied by the same tax authority on the same taxable entity, or on different tax entities, but they intend to settle current tax liabilities and assets on a net basis or their tax assets and liabilities will be realised simultaneously.

A deferred tax asset is recognised to the extent that it is probable that future taxable profits will be available against which the temporary differences can be utilised. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(t) Earnings per share

The Group presents basic earnings per share (EPS) data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held.

(u) Segment Reporting

Segment results that are reported to the Group's chief operating decision maker include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

4 Acquisition of non-controlling interests

On 23 April 2018, Thailo Marine Co., Ltd. ("TM"), a subsidiary, signed a shares sale and purchase agreement with a company ("a seller") which is a shareholder of TOP Maritime Service Co., Ltd. ("TMS") (an indirect subsidiary) to enter into an agreement to sell and purchase shares of TMS.

This transaction is completed by 21 June 2018 and caused TM increase its shareholding of TMS from 55% to 99.99%. This transaction has total value of Baht 81 million consisting of purchasing 45% ordinary shares of TMS at Baht 1 considering from financial statements, performance and capital expenditures plan and loan repayment of Baht 81 million which TMS borrowing from a seller in accordance with novation agreement. Novation agreement is for period of 3 years by repayment amount of Baht 27 per annum from the date as stipulated in the agreement and bears a fix interest rate of 2.5% per annum. As at 31 December 2018, the outstanding amount of loan was Baht 54 million. This transaction is consistent with the Company's strategy and industry outlook.

The carrying amount of TMS's net assets in the Group's financial statements on the date of the acquisition was Baht 223 million. The Group recognised a decrease in non-controlling interests of Baht 100 million attributable to owners of the Group.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

5 Related parties

For the purposes of these financial statements, parties are considered to be related to the Group if the Group has the ability, directly or indirectly, to control or joint control the party or exercise significant influence over the party in making financial and operating decisions, or vice versa, or where the Group and the party are subject to common control or common significant influence. Related parties may be individuals or other entities.

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
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 Solvent Co., Ltd.	Thailand	Indirect subsidiary and/or common directors
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
Sapthip Co., Ltd.	Thailand	Indirect subsidiary and/or the Company's management as a director

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Name of entities	Country of incorporation	Nature of relationships
Sapthip Green Energy Co., Ltd. ⁽¹⁾	Thailand	Indirect subsidiary and/or the Company's management as a director
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 ⁽²⁾	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 ⁽³⁾	Thailand	Subsidiary of the parent company and/or Common directors
PTT Exploration and Production Public Company Limited	Thailand	Subsidiary of the parent company
Energy Complex Co., Ltd.	Thailand	Subsidiary of the parent company

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Name of entities	Country of incorporation	Nature of relationships
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
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
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
GC Glycol Co., Ltd. ⁽⁴⁾	Thailand	Indirect subsidiary of the parent company
Thai Petroleum Pipeline Co., Ltd.	Thailand	Related company and/or the Company's management as a director
Sarn Palung Social Enterprise Co., Ltd.	Thailand	Related company and/or the Company's management as a director

⁽¹⁾ On 10 May 2018, an indirect subsidiary registered Sapthip Green Energy Co., Ltd.

⁽²⁾ On 23 April 2018, it was registered as a public company.

⁽³⁾ On 28 April 2017, PTT Public Company Limited ("PTT") resolved to approve the restructuring of PTT in relation to the transfer of the oil business unit to PTT Oil and Retail Business Public Company Limited ("PTTOR"). PTT and PTTOR successfully executed Business Transfer Agreement on 18 June 2018 and PTT commenced the process of transferring the assets and liabilities and shares of related companies to PTTOR since 1 July 2018.

⁽⁴⁾ On 21 December 2018, TOC Glycol Co., Ltd. has changed its registered name to GC Glycol Co., Ltd.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The pricing policies for particular types of transactions are explained further below:

Transactions	Pricing policies
Revenue from sale and rendering of 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 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

Significant transactions for the years ended 31 December 2018 and 2017 with related parties were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Parent Company				
Revenue from sale and rendering of services	84,544	151,356	82,490	147,470
Purchase of crude oil and feedstock	142,972	108,358	134,494	100,709
Other income	9	13	9	13
Other expenses	118	130	117	129
Purchase of assets	3	-	-	-
Subsidiaries				
Revenue from sale and rendering of services	-	-	75,109	64,717
Purchase of crude oil and feedstock	-	-	49,740	44,165
Interest income	-	-	276	492
Dividend income	-	-	3,917	10,798
Land lease income	-	-	72	68
Other income	-	-	2,334	1,614
Interest expense	-	-	927	17
Other expenses	-	-	1,022	1,105
Purchase of assets	-	-	41	8

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Joint ventures				
Revenue from sale and rendering of services	-	91	-	91
Other expenses	1,263	1,101	1,263	1,101
Associates				
Revenue from sale and rendering of services	10	5	6	2
Purchase of crude oil and feedstock	623	619	622	619
Dividend income	-	-	183	169
Land lease income	8	8	8	8
Other income	21	32	19	30
Other expenses	289	287	270	259
Purchase of assets	63	89	63	89
Other related parties				
Revenue from sale and rendering of services	100,564	4,677	91,517	285
Purchase of crude oil and feedstock	10,424	5,690	4,905	1,098
Purchase - sale of crude oil and feedstock for legal reserve	1,668	-	1,668	-
Dividend income	154	158	154	158
Other income	7	2	7	2
Other expenses	368	257	318	202
Directors' remuneration	79	77	69	69

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Balances as at 31 December 2018 and 2017 with related parties were as follows:

Trade accounts receivable - related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Parent Company				
PTT Public Company Limited	85	10,416	85	10,188
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	2,959	3,552
Thai Lube Base Public Company Limited	-	-	1,254	1,237
Thaioil Power Co., Ltd.	-	-	39	37
TOP SPP Co., Ltd.	-	-	75	45
Sak Chaisidhi Co., Ltd.	-	-	-	37
LABIX Co., Ltd.	-	-	2,163	1,841
Associates				
Global Power Synergy Public Company Limited	5	5	5	2
Other related parties				
PTT Oil and Retail Business Public Company Limited	10,592	-	10,346	-
PTT International Trading Pte. Ltd.	1,077	36	431	36
IRPC Public Company Limited	7	142	33	-
PTT Exploration and Production Public Company Limited	10	16	-	-
PTT Global Chemical Public Company Limited	35	11	-	-
Vencorex (Thailand) Co., Ltd.	-	2	-	-
PTT Exploration and Production International Company Limited	1	-	-	-
	11,812	10,628	17,390	16,975
Less allowance for doubtful accounts	-	-	-	-
Net	11,812	10,628	17,390	16,975
Bad and doubtful debts expense for the year	-	-	-	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Other accounts receivable - related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Parent Company				
PTT Public Company Limited	1	4	1	4
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	148	40
Thai Lube Base Public Company Limited	-	-	7	6
Thaioil Marine Co., Ltd.	-	-	11	78
Thaioil Energy Services Co., Ltd.	-	-	5	14
Thaioil Solvent Co., Ltd.	-	-	1	6
Thaioil Ethanol Co., Ltd.	-	-	2	6
Thaioil Power Co., Ltd.	-	-	31	30
TOP SPP Co., Ltd.	-	-	51	76
TOP Solvent Co., Ltd.	-	-	4	13
Sak Chaisidhi Co., Ltd.	-	-	5	6
LABIX Co., Ltd.	-	-	27	40
Thaioil Treasury Center Co., Ltd.	-	-	32	-
Sapthip Co., Ltd.	-	-	3	-
Associates				
Global Power Synergy Public Company Limited	1	5	1	5
Ubon Bio Ethanol Public Company Limited	-	43	-	-
T.I.M. Ship Management Co., Ltd.	-	5	-	-
Total	2	57	329	324

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Short-term loans to related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	3,500	5,500
Thaioil Marine Co., Ltd.*	-	-	300	210
Thaioil Solvent Co., Ltd.	-	-	362	1,008
Thaioil Ethanol Co., Ltd.	-	-	112	433
TOP SPP Co., Ltd.	-	-	-	8,500
Total	-	-	4,274	15,651

* Please see Note 11 impairment assessment for loan to and investment in a subsidiary

Interest rates during the years of 2018 and 2017 were charged at highest money market rate for short-term loan based on BIBOR 3M plus margin and at money market rate (MMR) but not exceeding the average minimum loan rate (MLR) of 5 financial institutions less margin, respectively.

Movements of short-term loans to related parties during the years ended 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
At 1 January	-	90	15,651	12,584
Increases	-	-	310	7,221
Decreases	-	(90)	(11,687)	(4,154)
At 31 December	-	-	4,274	15,651

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Loan Agreement

On 29 September 2017, a subsidiary entered into term loan facility agreements with financial institutions in Thailand for a credit facility of Baht 8,500 million, to repay short-term borrowing from related parties. The borrowing bears the interest rate at THBFIX plus margin. Under the terms of the agreements, a subsidiary agrees to maintain certain financial ratio and comply with conditions stipulated in the agreements.

During 2018, the credit facility has been utilised. As at 31 December 2018, the Company had outstanding long-term loan from financial institutions totalling Baht 8,209 million (31 December 2017: nil).

Short-term loan

In February 2017, a subsidiary has disposed shares in Maesod Clean Energy Company Limited, which is an indirect associate company to existing shareholders. Hence, in the consolidated financial statements for the year ended 2017, the Group has reclassified of Baht 90 million “Short-term loan to related company” to “Short-term loan to other company”, by other terms and conditions has remained with original loan agreement.

Long-term loans to related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Subsidiaries				
Thaioil Marine Co., Ltd.*	-	-	400	-
Total	-	-	400	-

* Please see Note 11 impairment assessment for loan to and investment in a subsidiary

On 14 November 2018, a subsidiary entered into a loan agreement with the Company at the 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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Trade accounts payable - related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Parent Company				
PTT Public Company Limited	9,546	10,928	8,093	9,773
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	1,829	2,270
Thai Lube Base Public Company Limited	-	-	389	252
Thaioil Marine Co., Ltd.	-	-	17	12
Thaioil Power Co., Ltd.	-	-	153	129
TOP SPP Co., Ltd.	-	-	273	228
Sak Chaisidhi Co., Ltd.	-	-	6	10
Sapthip Co., Ltd.	-	-	17	14
LABIX Co., Ltd.	-	-	1,232	1,099
Associates				
Ubon Bio Ethanol Public Company Limited	23	32	23	32
T.I.M. Ship Management Co., Ltd.	4	4	-	-
Other related parties				
PTT Oil and Retail Business Public Company Limited	159	-	158	-
IRPC Public Company Limited	138	148	-	-
PTT Global Chemical Public Company Limited	178	178	-	-
PTT Phenol Co., Ltd.	10	31	-	-
GC Glycol Co., Ltd.	1	-	-	-
PTT International Trading London Ltd.	489	-	489	-
Global Green Chemicals Public Company Limited	47	68	47	68
Total	10,595	11,389	12,726	13,887

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Other accounts payable - related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Parent Company				
PTT Public Company Limited	5	5	2	4
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	1	-
Thaioil Marine Co., Ltd.	-	-	1	6
Thaioil Energy Services Co., Ltd.	-	-	73	60
TOP Solvent Co., Ltd.	-	-	3	2
LABIX Co., Ltd.	-	-	-	2
Thaioil Treasury Center Co., Ltd.	-	-	627	-
Associates				
PTT Digital Solutions Co., Ltd.	25	62	25	61
PTT Energy Solutions Co., Ltd.	26	26	26	26
T.I.M. Ship Management Co., Ltd.	-	5	-	-
Other related parties				
PTT Oil and Retail Business Public Company Limited	2	-	-	-
PTT International Trading Pte. Ltd.	-	1	-	-
Energy Complex Co., Ltd.	1	1	1	1
IRPC Public Company Limited	18	8	18	8
Thai Tank Terminal Ltd.	1	2	-	-
PTT Tank Terminal Co., Ltd.	1	-	-	-
Thai Petroleum Pipeline Co., Ltd.	5	2	5	2
Total	84	112	782	172

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Short-term borrowings from related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Subsidiaries				
Thai Paraxylene Co., Ltd.	-	-	1,076	226
Thai Lube Base Public Company Limited	-	-	422	261
Thaioil Marine Co., Ltd.	-	-	8	16
Total	-	-	1,506	503

Interest rates during the years of 2018 and 2017 were charged at highest money market rate for short-term loan based on BIBOR 3M plus margin and at money market rate (MMR) but not exceeding the average minimum loan rate (MLR) of 5 financial institutions less margin, respectively.

Movements of short-term loans from related parties during the years ended 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
At 1 January	-	-	503	531
Increase (Decrease)	-	-	1,003	(28)
At 31 December	-	-	1,506	503

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Long-term borrowings from related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Subsidiaries				
Thaioil Treasury Center Co., Ltd.	-	-	52,197	-
Less deferred cost of borrowings	-	-	(169)	-
Total	-	-	52,028	-

Long-term loan Agreement

On 11 April 2018, a subsidiary has entered into a long-term loan agreement with the Company from the net proceeds from the issuance of the new notes at the amount of U.S. Dollars 283.6 million, equivalent to Baht 9,250 million, with maturity date in 2023 and bears a fixed interest rate of 4.09% per annum and U.S. Dollars 327.6 million, equivalent to Baht 10,684 million, with maturity date in 2043 and bears a fixed interest rate of 5.35% per annum for the purpose of liability management.

On 21 November 2018, a subsidiary has entered into a long-term loan agreement with the Company from the net proceeds from the issuance of the new notes at the amount of U.S. Dollars 396.1 million, equivalent to Baht 13,140 million, with maturity date in 2028 and bears a fixed interest rate of 5.22% per annum and U.S. Dollars 593.1 million, equivalent to Baht 19,676 million, with maturity date in 2048 and bears a fixed interest rate of 5.96% per annum. These loans shall be used for capital expenditure and general corporate purpose.

Significant agreements with related parties

As at 31 December 2018, the Group had the following significant agreements with related parties.

Raw Materials and Oil-Products Purchases and Sales Agreements

The Company has raw materials and oil products purchase and sale agreements with a subsidiary, whereby the purchase and sale volumes and prices of raw materials and oil products are specified in the agreements. These agreements are effective on the agreement date and shall be terminated by either party giving at least 6 months notice in writing to the other party.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Oil-Products Sale and Purchase Agreements

The Company has oil products purchase and sale agreements with a subsidiary, whereby the purchase and sale volumes and prices are specified in the agreements. These agreements are effective on the agreement date and shall be terminated if either party does not comply with the terms stipulated in the agreements.

By-Product Sale and Purchase Agreement

The Company has a by-product purchase and sale agreement with a subsidiary, whereby the purchase and sale volumes and prices of the by-product are specified in the agreement. The agreement is for a period of 16 years expiring in September 2020, or until the termination by mutual consent.

Technology and Communication Service Agreement

The Company has a technology and communication service agreement with an associate, whereby the service fees are specified in the agreement. The agreement is for a period of 2 years expiring in December 2020 and is renewable for additional periods as mutual agreement until either party giving at least 180 days before contract end date notice in writing to other party.

Crack Spread Swap Agreements

The Company has crack spread swap agreements with a subsidiary and a related company ("counterparties"). The Company or the counterparties have commitments to make payments for the differences between the fixed price and floating price for each period.

As at 31 December 2018, the Company has oil volume under the agreements of 90,000 tons with the subsidiary (31 December 2017: nil).

Product Offtake and Crude Oil Supply Agreement

The Company has a product off take and crude oil supply agreement with a related company, whereby (a) the Company will sell and the related company will purchase refined petroleum products produced by the refinery for 49.99% of 270,000 barrels per day; and (b) the related party will supply and the Company will purchase crude oil and/or feedstock for the refinery required to produce 49.99% of 270,000 barrels per day. The credit term for crude oil shall be mutually agreed.

On 10 May 2018, Novation Agreement has been made to transfer rights, obligations and partial responsibility to another related party, effective since 1 July 2018 onward.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Throughput Agreement

The Company has a throughput agreement with a related company, whereby the tariff fee is specified in the agreement. The agreement is for a period of 20 years expiring in 2014 or when a target is achieved and is renewable.

The Company has a throughput agreement with a related company, whereby the tariff fee is specified in the agreement. The agreement is for a period of 20 years from the service date and shall be renewed for periods of 5 years.

Natural Gas Supply Agreements

The Company and certain subsidiaries have natural gas supply agreements with a related company, whereby the related company agrees to supply the natural gas to the Company and the subsidiaries at quantities and prices as stipulated in the agreements. These agreements are effective for periods of 10 to 25 years expiring during 2022 and 2041.

Cost Reimbursement Agreements

A subsidiary and an associate have cost reimbursement agreements with the Company covering the reimbursement of construction costs of natural gas pipeline facilities and the use of the pipeline facilities, raw water pipeline and the use of land for the construction of a transmission line connecting the subsidiary and the associate to the Electricity Generating Authority of Thailand (EGAT). Under the terms of the agreements, the subsidiary and the associate agree to share the cost of investments with the Company on the basis and conditions stipulated in the agreements. These agreements are effective for a period of 25 years, or until the termination of the power purchase agreements entered into by the subsidiary and the associate with EGAT, whichever is sooner.

Power Purchase Agreements

Certain subsidiaries ("sellers") have power purchase agreements with the Company and certain subsidiaries for periods of 24 and 25 years expiring in 2023, 2027 and 2040, whereby the sellers will sell power energy to the Company and the subsidiaries at the agreed quantities and prices as stipulated in the agreements.

Steam Purchase Agreements

The Company and certain subsidiaries have entered into steam purchase agreements for periods of 20 and 25 years expiring in 2023, 2027 and 2040, whereby the agreed quantities and prices are specified in the agreements.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Services and Supplies Agreements

Certain subsidiaries and an associate have services and supplies agreements with the Company and a subsidiary, whereby the Company and a subsidiary provide the subsidiaries and the associate for the operating, repair and maintenance, management, controlling and administration, procurement, fuel transmission, waste water treatment and utilities, information technology, financial, accounting and human resource services. The subsidiaries and the associate agree to pay certain fees as stipulated in the agreements. These agreements are for periods of 5 years or 28 years or until the termination of the land lease agreement entered into by a subsidiary with the Company, whichever is sooner or until the termination of the power purchase agreement entered into by the associate with EGAT.

Land Lease Agreements

Certain subsidiaries and an associate have land lease agreements with the Company to lease/sublease certain parcels of land ending in September 2022, May 2041, and August 2043 with the rate as stipulated in the agreements, and the rate will be adjusted every 5 years.

The Company have land lease agreements with certain subsidiaries to lease certain parcels of land ending in September 2046 with the rate as stipulated in the agreements, and the rate will be adjusted every 5 years.

The Company has a land lease agreement with a related company to lease certain parcels of land ending in August 2026 with the rate as stipulated in the agreements. If the Company does not giving a cancelable notice within a month before contract end date, the contract shall be renewed for additional 15 years.

Raw Materials and Petrochemical Products Purchase and Sale Agreements

An indirect subsidiary has raw materials and petrochemical products purchase and sale agreements with related companies, whereby the purchase and sale volumes and prices of raw materials and petrochemical products are specified in the agreements. These agreements are for periods of 1 year to 15 years expiring during 2019 and 2025.

Technical Service Agreements

An associate has a technical service agreement with the Company to provide a consultancy technical solutions service for energy-related and petrochemical businesses, whereby the service fees are specified in the agreements. This agreement expires in December 2019.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Time Charter and Affreightment Agreements

A subsidiary has time charter and affreightment agreements with the Company, subsidiary and another indirect subsidiary, whereby the freight rate is specified in the agreements. These agreements are for periods of 1 year and 5 years and 8 years expiring during 2019, 2020, and 2024.

Certain joint ventures have time charter agreements with the Company, whereby the freight rate is specified in the agreements. These agreements are for periods of 10 years expiring in 2021, 2022 and 2024.

Charter of Crew Boat Agreements

An indirect subsidiary has charter of crew boat agreement with a related company, whereby the service fees are specified in the agreements. These agreements are for period of 3 years expiring in 2019 and 2020.

Office Rental Agreements

The Company has office rental and service agreements with a related party, whereby the rental and service fees are specified in the agreements. These agreements are for the periods of 3 years expiring in November 2021 and are renewable for additional periods of 3 years.

Ethanol Products Purchase and Sale Agreements

An associate has ethanol products purchase and sale agreements with the Company, whereby the purchase and sale volumes and prices of the ethanol products are specified in the agreements. This agreement expired in December 2019. This agreement shall be automatically renewed for additional period of 1 year until either party giving notice in writing to the other party.

An indirect subsidiary has an ethanol products purchase and sale agreement with a related company, whereby the purchase and sale volumes and prices of the ethanol products are specified in the agreement. The agreement is for a period of 10 years expiring in June 2021 and shall be renewed by either party giving at least 6 months before contract end date notice in writing to the other party.

Service Agreements

A subsidiary has human resource service agreements with the Company, whereby the service fees are specified in the agreements. This agreement expires in December 2019.

The Company has a human resource service agreements with certain subsidiaries, whereby the service fees are specified in the agreement. These agreements expire in May and December 2019.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Crude Oil Storage Tank Service Agreement

A related company has a crude oil storage tank service agreement with the Company, whereby the service fees are specified in the agreement. These agreements are for a period of 2 years expiring in September 2019 and December 2019.

Sea berth and throughput Agreement

A related company has a sea berth and throughput agreement with the Company, whereby the tariff fee is specified in the agreement. The agreement is for a period of 20 years and is renewable for additional periods of 5 years.

Loan Agreement

The Company has uncommitted unsecured short term inter-company borrowing and lending agreements with a related company to manage liquidity. Each of the borrowing credit line and lending credit line is not exceeding Baht 2,000 million, bearing the interest rate reference by BIBOR or LIBOR, plus interest rate margin by considering short-term borrowing interest rate, the return on short-term investment and credit rating of the Company and the counterparty. This agreement is for a period of 1 year expiring in December 2019.

6 Cash and cash equivalents

(in million Baht)

	Consolidated		Separate	
	financial statements		financial statements	
	2018	2017	2018	2017
Cash on hand	6	37	1	2
Cash at banks - savings and current accounts	14,431	7,998	10,262	4,325
Cash at banks - savings account (Private Funds)	36	84	36	84
Cash at banks - fixed deposits (maturity period less than 3 months from the investment date)	19,569	4,888	19,569	4,888
Certificate of deposits (maturity period less than 3 months from the investment date)	-	2,616	-	2,616
Total	34,042	15,623	29,868	11,915

As at 31 December 2018, the Group's savings accounts, current accounts and fixed deposits (maturity period less than 3 months from the investment date) totalling Baht 1,772 million have been pledged as collateral for credit facilities as described in note 19 to the financial statements (2017: Baht 54 million).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

7 Other investments

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Current investments				
Cash at bank - fixed deposits	60,596	43,140	60,403	42,719
Debt securities held to maturity	721	-	721	-
Debt securities - available-for-sale securities (Private funds)	11,903	9,178	11,903	9,178
	73,220	52,318	73,027	51,897
Investments held as available-for-sale				
Equity securities - available-for-sale securities	361	363	361	363
Debt securities - available-for-sale securities (Private funds)	-	2,740	-	2,740
	361	3,103	361	3,103
Other long-term investments				
Other non-marketable securities	780	780	780	780
	780	780	780	780
Total	74,361	56,201	74,168	55,780

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Cash at bank - fixed deposits

As at 31 December 2018, the Group's fixed deposits totalling Baht 540 million have been pledged as collateral for credit facilities as described in note 19 to the financial statements (2017: Baht 421 million).

Equity securities - available-for-sale securities

In 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 2018 is Baht 361 million. (2017: Baht 364 million)

Debt securities - available-for-sale securities

The Company established private funds and engaged independent assets management companies. As at 31 December 2018, the value of private funds outstanding totalling Baht 11,939 million (2017: Baht 12,002 million) (including cash at banks - savings account as disclosed in note 6 to financial statements). Those private funds have invested in debt securities which are considered investment grade.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Other non-marketable securities

Type of Business	Consolidated/Separate financial statements					
	Ownership interest		Paid-up capital		Cost method	
	2018	2017	2018	2017	2018	2017
	(%)				(in million Baht)	
Related party						
Thai Petroleum Pipeline Co., Ltd.						
Oil transportation	9.19	9.19	8,479	8,479	779	779
by pipeline						
Sarn Palung Social Enterprise Co., Ltd.	15.00	15.00	3	3	1	1
Social enterprise						
					780	780
					154	154
					158	158

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

8 Trade accounts receivable

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Related parties	5	11,812	10,628	17,390	16,975
Other parties		12,547	11,700	7,804	7,267
Total		24,359	22,328	25,194	24,242
Less allowance for doubtful accounts		-	-	-	-
Net		24,359	22,328	25,194	24,242
Bad and doubtful debts expenses for the year		-	-	-	-

Aging analyses for trade accounts receivable are as follows:

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Related parties					
Within credit terms		11,812	10,628	17,390	16,975
		11,812	10,628	17,390	16,975
Less allowance for doubtful accounts		-	-	-	-
Net	5	11,812	10,628	17,390	16,975
Other parties					
Within credit terms		12,545	11,699	7,804	7,267
Overdue:					
Less than 3 months		2	1	-	-
		12,547	11,700	7,804	7,267
Less allowance for doubtful accounts		-	-	-	-
Net		12,547	11,700	7,804	7,267
Total		24,359	22,328	25,194	24,242

The normal credit term granted by the Group ranges from 15 days to 90 days.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

9 Other receivables

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Prepaid expenses	601	571	500	452
Other accounts receivable	256	362	502	469
Current portion of long-term loans to savings co-operative of employees	34	37	34	37
Other	491	201	408	169
Total	1,382	1,171	1,444	1,127

10 Inventories

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Crude oil and feedstock	9,874	12,016	8,835	10,796
Materials, spare parts and supplies	1,560	1,479	1,115	1,027
Finished and semi-finished oil products	6,995	8,820	4,245	5,812
Goods in transit				
Crude oil	11,652	10,533	11,541	10,458
Materials, spare parts and supplies	16	1	2	1
	30,097	32,849	25,738	28,094
Less allowance for decline in value of inventories adjusted to net realisable value	1,358	8	1,314	-
Net	28,739	32,841	24,424	28,094

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

As at 31 December 2018, the Company's inventories as stated above included a legal reserve amounting to Baht 10,413 million (2017:Baht 10,829 million).

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Inventories recognised as an expense in 'cost of sale of goods':				
- Cost	369,354	303,821	396,894	328,515
- (Reversal of) write-down to net realisable value	1,350	(93)	1,314	(73)
Net	370,704	303,728	398,208	328,442

11 Investments in subsidiaries

(in million Baht)

	Separate financial statements	
	2018	2017
At 1 January	14,555	14,545
Acquisition	-	10
At 31 December	14,555	14,555

At the meeting of the Board of the Director of the Company held on 29 September 2017, the Company's Board of Directors has resolved to establish Thail Treasury Center Co., Ltd. to conduct as treasury center for the Group's business. Thail Treasury Center Co., Ltd. is 99.99% owned by the Company. On 3 October 2017, Thail Treasury Center Co., Ltd. has been incorporated with the registered share capital of 1 million ordinary shares at par value of Baht 10 each, totalling Baht 10 million. All shares have been fully paid-up in December 2017.

Under the Sponsors Support Agreement with financial institutions, a subsidiary, as a shareholder in an indirect subsidiary, has some commitments as specified in the agreement such as maintain its shareholding, provide financial support in proportion of its shareholding in order to enter into a Credit Facilities Agreement.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

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 determine discounting future cash flows. The key assumptions used to determine recoverable amount included utilisation and freight rate, operating cost, long-term growth rate derived from expectations of future outcomes taking into account past experience, adjusted for anticipated revenue growth and discount rate referred to weighted average cost of capital (WACC) at 8.2%. The recoverable amount was estimated to be higher than its carrying amount and no impairment was required to these financial statements. Increasing in discount rate higher than 2.2% could cause the carrying amount to exceed the recoverable amount.

Capital increase of TOP Maritime Service Company Limited

On 20 November 2018, the Extraordinary Meeting of Shareholders of TOP Maritime Service Company Limited ("TMS") resolved to approve on capital increase for the amount of Baht 250 million, the registered capital shall increase from Baht 270 million to Baht 520 million. The registration has been completed by the end of November 2018. The objective of capital increase is mainly for liability restructuring to be consistent with current business environment.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Investments in subsidiaries as at 31 December 2018 and 2017, and dividend income from those investments for the years then ended were as follows:

	Separate financial statements							
	Ownership interest		Paid-up capital		Cost method		Dividend income	
	2018	2017	2018	2017	2018	2017	2018	2017
	(%)		(in million Baht)					
Subsidiaries								
Thai Paraxylene Co., Ltd.	99.99	99.99	2,572	2,572	2,161	2,161	1,029	6,688
Thai Lube Base Public Company Limited	99.99	99.99	1,758	1,758	1,979	1,979	1,318	1,846
Thaioil Marine Co., Ltd.	99.99	99.99	970	970	970	970	-	-
Thaioil Energy Services Co., Ltd.	99.99	99.99	40	40	40	40	-	60
Thaioil Solvent Co., Ltd.	99.99	99.99	1,250	1,250	1,250	1,250	-	-
Thaioil Ethanol Co., Ltd.	99.99	99.99	1,450	1,450	1,450	1,450	-	-
Thaioil Power Co., Ltd.	73.99	73.99	2,810	2,810	3,195	3,195	520	769
TOP SPP Co., Ltd.	99.99	99.99	3,500	3,500	3,500	3,500	1,050	1,435
Thaioil Treasury Center Co., Ltd.	99.99	99.99	10	10	10	10	-	-
Total			14,360	14,360	14,555	14,555	3,917	10,798

None of the Company's investment in subsidiaries are publicly listed and consequently do not have published price quotations.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

12 Non-controlling interests

The following table summarises the information relating to each of the Group's subsidiaries that has a material non-controlling interest, before any intra-group eliminations:

	(in million Baht)					
	Thaioil Power Co., Ltd.		LABIX Co., Ltd.		Other individually immaterial subsidiaries	
	31 December 2018	31 December 2017	31 December 2018	31 December 2017	31 December 2018	31 December 2017
Non-controlling interest percentage	26.01	26.01	25	25		
Current assets	1,196	927	2,615	2,628		
Non-current assets	10,381	10,304	11,371	12,008		
Current liabilities	(630)	(675)	(3,573)	(3,986)		
Non-current liabilities	-	-	(5,994)	(6,053)		
Net assets	10,947	10,556	4,419	4,597		
Carrying amount of non-controlling interest	2,847	2,746	1,105	1,149	808	1,030
					4,760	4,925

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Thaioil Power Co., Ltd.		LABIX Co., Ltd.		Other individually immaterial subsidiaries		Total	
	31 December		31 December		31 December		31 December	
	2018	2017	2018	2017	2018	2017	2018	2017
Revenue from sale and rendering of services	4,409	4,150	19,117	15,409				
Profit (loss)	1,101	1,160	(178)	161				
Other comprehensive income (loss)	1	(11)	-	-				
Total comprehensive income (loss)	1,102	1,149	(178)	161				
Profit (loss) allocated to non-controlling interest	286	302	(45)	40	(6)	121	235	463
Total comprehensive income (loss) allocated to non-controlling interest	284	299	(45)	40	(6)	121	233	460
Cash flows from operating activities	671	890	1,345	1,516				
Cash flows from investing activities	390	339	157	(840)				
Cash flows from financing activities	(871)	(1,222)	(1,163)	(938)				
Net increase (decrease) in cash and cash equivalents	190	7	339	(262)				
Dividends paid to non-controlling interest	183	270	-	-				

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

13 Investments in joint ventures and associates

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
At 1 January	14,368	13,866	1,261	1,261
Share of net gain of investments - equity method	1,193	1,197	-	-
Disposal	-	(12)	-	-
Dividend income	(605)	(625)	-	-
Currency translation differences	(3)	(42)	-	-
Share of other comprehensive income (loss) of associate	(12)	(16)	-	-
At 31 December	14,941	14,368	1,261	1,261

On 16 February 2017, a subsidiary has diverted all its shareholding in Maesod Clean Energy Company Limited, an indirect associate, to existing shareholders.

On 20 June 2018, an associate entered into a shares purchase agreement with a company which is a shareholder of Glow Energy Public Company Limited ("GLOW") to enter into an agreement to purchase shares of GLOW. At present, the shares purchase transaction is not yet completed.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Investments in joint ventures and associates as at 31 December 2018 and 2017, and dividend income for the years then ended were as follows:

Consolidated financial statements															
Ownership interest				Paid-up capital		Cost method		Equity method		Market price of listed securities		Dividend income			
2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017		
(in million Baht)															
Joint ventures															
TOP-NTL Pte. Ltd.		50.00	50.00	1	1	-	-	16	11	-	-	-	-		
TOP-NTL Shipping Trust		50.00	50.00	48	48	24	24	67	43	-	-	-	-		
TOP Nautical Star Co., Ltd.		35.00	35.00	150	150	53	53	110	66	-	-	-	-		
TOP-NYK MarineOne Pte. Ltd.		50.00	50.00	548	548	274	274	432	422	-	-	33	34		
				747	747	351	351	625	542			33	34		

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Consolidated financial statements												
	Ownership interest		Paid-up capital		Cost method		Equity method		Market price of listed securities		Dividend income	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
	(in million Baht)											
(%)												
Associates												
PTT Digital Solutions Co., Ltd.	20.00	20.00	150	150	30	30	368	319	-	-	16	16
PTT Energy Solutions Co., Ltd.	20.00	20.00	150	150	30	30	48	51	-	-	-	-
Global Power Synergy Public Company Limited	29.70	29.70	14,983	14,983	3,855	3,855	13,081	12,652	26,026	32,032	556	511
Ubon Bio Ethanol Public Company Limited	21.28	21.28	2,740	2,740	769	769	819	804	-	-	-	64
T. I. M. Ship Management Co., Ltd.	33.33	33.33	3	3	1	1	-	-	-	-	-	-
			18,026	18,026	4,685	4,685	14,316	13,826			572	591
Total			18,773	18,773	5,036	5,036	14,941	14,368			605	625

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

	Separate financial statements									
	Ownership interest		Paid-up capital		Cost method		Market price of listed securities		Dividend income	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
	(in million Baht)									
	PTT Digital Solutions Co., Ltd.									
	20.00	20.00	150	150	30	30	-	-	16	16
	PTT Energy Solutions Co., Ltd.									
	20.00	20.00	150	150	30	30	-	-	-	-
	Global Power Synergy Public Company Limited									
	8.91	8.91	14,983	14,983	1,201	1,201	7,808	9,610	167	153
Total			15,283	15,283	1,261	1,261			183	169

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Joint ventures and Associates

The following table summarises the financial information of the joint ventures and associates as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in these companies.

(in million Baht)

	Global Power Synergy Public Company Limited	
	2018	2017
Revenue	24,235	19,325
Net profit	3,889	3,340
Other comprehensive income (loss)	(41)	(55)
Total comprehensive income	3,848	3,285
Attributable to NCI	530	165
Attributable to investee's shareholders	3,318	3,120
Current assets	12,164	9,918
Non-current assets	52,275	50,050
Current liabilities	(4,727)	(4,087)
Non-current liabilities	(17,363)	(15,507)
Net assets	42,349	40,374
Attributable to NCI	2,357	1,827
Attributable to investee's shareholders	39,992	38,547
Group's interest in net assets of investee at 1 January	12,652	12,236
Total comprehensive income (loss) attributable to the Group	985	927
Dividends received during the year	(556)	(511)
Group's interest in net assets of investee at end of year	13,081	12,652
Carrying amount of interest in investee at 31 December	13,081	12,652

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Immaterial joint ventures and associates

The following is summarised financial information for the Group's interest in immaterial joint ventures and associates based on the amounts reported in the Group's consolidated financial statements:

	(in million Baht)			
	Immaterial Joint ventures		Immaterial Associates	
	2018	2017	2018	2017
Carrying amount of interests in immaterial joint ventures and associates	625	542	1,235	1,174
Group's share of:				
- Profit from continuing operations	118	113	77	141
- Other comprehensive income (loss)	(35)	(42)	-	-
- Total comprehensive income	83	71	77	141

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

14 Investment properties

(in million Baht)

		Consolidated financial statements		Separate financial statements	
	Note	2018	2017	2018	2017
Cost					
At 1 January		103	94	1,111	1,097
Reclassification from property, plant and equipment, net	15	-	9	-	14
At 31 December		103	103	1,111	1,111
Impairment losses					
At 1 January		-	-	(11)	(11)
At 31 December		-	-	(11)	(11)
Net book value					
At 1 January		103	94	1,100	1,086
At 31 December		103	103	1,100	1,100

Investment properties as at 31 December 2018 and 2017 were valued by a firm of independent professional valuers, at open market values on an existing use basis and income approach. The appraised value of the Group and the Company was Baht 273 million and Baht 1,764 million respectively (2017: Baht 273 million and Baht 1,764 million respectively).

Measurement of fair value

Fair value hierarchy

The fair value of investment property was determined by external, independent property valuers, having appropriate recognised professional qualifications and recent experience in the category of the property being valued. 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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Valuation technique and significant unobservable inputs

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
Discounted cash flows; 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.	- Contractually agreed lease income over the remaining period. - Risk-adjusted discount rates (9%)	The estimated fair value increase (decrease) if: - Expected market rental growth were higher (lower); - The risk-adjusted discount rate were lower (higher).
Market approach	The adjusted quoted price and the actual selling price of comparable investment properties	The estimated fair value increase (decrease) if land price were higher (lower).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

15 Property, plant and equipment

Consolidated financial statements													(in million Baht)
	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	
Cost													
At 1 January 2017	6,194	1,935	211	102,781	34,683	17,360	193	6,158	4,543	821	23	3,589 178,491	
Additions	52	-	-	136	25	-	-	15	23	24	4	3,567 3,846	
Transfers, net	-	78	-	1,754	175	28	-	68	-	68	-	(2,171) -	
Reclassification to investment properties, net (Note 14)	(9)	-	-	-	-	-	-	-	-	-	-	(9)	
Disposals	-	-	-	-	(21)	-	-	(5)	-	(2)	(9)	- (37)	
Translation differences													
on consolidation	-	(2)	-	-	-	-	-	(14)	-	-	-	(16)	
At 31 December 2017 and 1 January 2018	6,237	2,011	211	104,671	34,862	17,388	193	6,222	4,566	911	18	4,985 182,275	
Additions	302	1	-	200	6	-	-	54	35	16	1	7,412 8,027	
Transfers, net	-	726	-	14	62	32	-	353	-	15	-	(1,202) -	
Disposals	-	(47)	-	(133)	-	-	-	(4)	(1,246)	(4)	(1)	- (1,435)	
Translation differences													
on consolidation	-	(1)	-	-	-	-	-	(4)	-	-	-	(5)	
At 31 December 2018	6,539	2,690	211	104,752	34,930	17,420	193	6,621	3,355	938	18	11,195 188,862	

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in 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	Oil and liquid chemical tankers and crew boats and others	Furniture, fixtures, office equipment	Construction in progress	Total
Depreciation												
At 1 January 2017	-	1,266	8	72,637	13,051	4,373	150	3,043	1,024	595	21	- 96,168
Depreciation charge for the year	-	73	8	3,699	1,822	729	6	341	209	71	-	- 6,958
Disposals	-	-	-	-	-	-	-	(5)	-	(2)	(7)	- (14)
Translation differences on consolidation	-	-	-	-	-	-	-	(7)	-	-	-	- (7)
At 31 December 2017												
and 1 January 2018	-	1,339	16	76,336	14,873	5,102	156	3,372	1,233	664	14	- 103,105
Depreciation charge for the year	-	83	8	3,178	2,018	722	6	349	149	72	1	- 6,586
Disposals	-	(46)	-	(131)	-	-	-	(3)	(600)	(3)	(1)	- (784)
Translation differences on consolidation	-	-	-	-	-	-	-	(3)	-	-	-	- (3)
At 31 December 2018	-	1,376	24	79,383	16,891	5,824	162	3,715	782	733	14	- 108,904

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in 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	Oil and liquid chemical tankers and crew boats and others	Furniture, fixtures, office equipment and vehicles in progress	Total
Impairment losses											
At 1 January 2017	11	-	-	-	-	-	-	-	-	-	11
At 31 December 2017											
and 1 January 2018	11	-	-	-	-	-	-	-	547	-	558
At 31 December 2018	11	-	-	-	-	-	-	-	18	-	29
Net book value											
At 1 January 2017	6,183	669	203	30,144	21,632	12,987	43	3,115	3,519	226	82,312
At 31 December 2017											
and 1 January 2018	6,226	672	195	28,335	19,989	12,286	37	2,850	2,786	247	78,612
At 31 December 2018	6,528	1,314	187	25,369	18,039	11,596	31	2,906	2,555	205	79,929

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

	Separate financial statements							(in million Baht)
	Land	Buildings	Refinery plant and equipment	Machinery, equipment and plant equipment	Furniture, fixtures, office equipment and others	Vehicles	Construction in progress	
Cost								
At 1 January 2017	3,830	844	94,578	1,235	492	4	3,255	104,238
Additions	40	-	136	4	9	-	3,250	3,439
Transfers, net	-	-	1,739	19	56	-	(1,814)	
Reclassification to investment properties, net (Note 14)	(14)	-	-	-	-	-	-	(14)
Disposals	-	-	-	(1)	-	-	-	(1)
At 31 December 2017								
and 1 January 2018	3,856	844	96,453	1,257	557	4	4,691	107,662
Additions	298	-	200	27	13	-	6,584	7,122
Transfers, net	-	642	14	2	2	-	(660)	-
Disposals	-	(47)	(132)	(2)	-	-	-	(181)
At 31 December 2018	4,154	1,439	96,535	1,284	572	4	10,615	114,603

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

	Separate financial statements							(in million Baht)	
	Land	Buildings	Refinery plant and equipment	Machinery, equipment and plant equipment	Furniture, fixtures, office equipment and others	Construction			Total
						Vehicles	in progress		
Depreciation									
At 1 January 2017	-	706	66,144	974	338	4	-	68,166	
Depreciation charge for the year	-	20	3,290	61	44	-	-	3,415	
Disposals	-	-	-	(1)	-	-	-	(1)	
At 31 December 2017 and 1 January 2018									
At 31 December 2017	-	726	69,434	1,034	382	4	-	71,580	
Depreciation charge for the year	-	28	3,078	61	45	-	-	3,212	
Disposals	-	(46)	(131)	(2)	-	-	-	(179)	
At 31 December 2018	-	708	72,381	1,093	427	4	-	74,613	
Net book value									
At 1 January 2017	3,830	138	28,434	261	154	-	3,255	36,072	
At 31 December 2017 and 1 January 2018									
At 31 December 2017	3,856	118	27,019	223	175	-	4,691	36,082	
At 31 December 2018	4,154	731	24,154	191	145	-	10,615	39,990	

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The gross amounts of the Group's fully depreciated property, plant and equipment that were still in use as at 31 December 2018, amounted to Baht 56,387 million in the consolidated financial statements (2017: Baht 49,402 million) and amounted to Baht 47,894 million in the separate financial statements (2017: Baht 41,010 million).

Certain subsidiaries mortgaged their land, building, petrochemical plant, machines and crew boats as collateral for long-term borrowings as described in note 19 to the financial statements. The net book value of land, building, petrochemical plant, machines and crew boats as at 31 December 2018 amounted to Baht 21,373 million (2017: Baht 11,672 million).

Impairment assessment for vessels and crew boats

During 2017 and 2018, certain subsidiaries have vessels and crew boats which are not fully used in operation due to the fact that the exploration business is in the downturn from prolonged falls in prevailing oil and gas price which resulted in low freight charge and demand in marine transportation business. This situation indicated that vessels and crew boats may be impaired. Management of subsidiaries and independent appraiser determined fair value of underlying assets using market approach. Fair value less costs of disposal was less than its carrying amount therefore subsidiaries recognised impairment loss amounting to Baht 547 million in 2017. Impairment loss recognised as an expenses in consolidated statement of income. In 2018, the subsidiaries did not recognise additional impairment loss because the fair value less costs of disposal of assets was higher than its carrying amount.

Measurement of fair value

Fair value hierarchy

The fair value of assets of subsidiaries which are not fully used in operation was determined by management of subsidiaries and external independent appraiser, having 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 3 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 and its Subsidiaries

16 Intangible assets

(in million Baht)

	Consolidated financial statements					
	License fee	Computer software	Customer database	Goodwill	Patent	Total
Cost						
At 1 January 2017	3,013	759	205	655	-	4,632
Additions	261	96	-	-	1	358
Translation differences on consolidation	-	-	-	(54)	-	(54)
At 31 December 2017 and 1 January 2018	3,274	855	205	601	1	4,936
Additions	58	73	-	-	-	131
Adjustment	(79)	-	-	-	-	(79)
Translation differences on consolidation	-	-	-	(16)	-	(16)
At 31 December 2018	3,253	928	205	585	1	4,972
Accumulated amortisation						
At 1 January 2017	1,210	316	-	-	-	1,526
Amortisation charge for the year	154	65	-	-	-	219
At 31 December 2017 and 1 January 2018	1,364	381	-	-	-	1,745
Amortisation charge for the year	122	67	-	-	-	189
Adjustment	(7)	-	-	-	-	(7)
At 31 December 2018	1,479	448	-	-	-	1,927
Net book value						
At 1 January 2017	1,803	443	205	655	-	3,106
At 31 December 2017 and 1 January 2018	1,910	474	205	601	1	3,191
At 31 December 2018	1,774	480	205	585	1	3,045

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Impairment testing for carrying amount of goodwill and other intangible assets within indefinite useful life

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 assets. 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 asset operates and experiences by management.

Based on the impairment testing by the discounted cash flow method using the estimated post-tax rates referred to weighted average cost of capital (WACC) at the rates 8.9% and 8.8% for goodwill and other intangible assets within indefinite useful life, respectively. The recoverable amount was estimated to be higher than its carrying amount and no impairment was required to these financial statements. Management has identified that 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 change individually for the estimated recoverable amount to be equal the carrying amount.

	Goodwill	Customer database (%)
Change required for carrying amount to be equal to the recoverable amount		
Discount rate increase	1.0	18.2

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Separate financial statements			
	License fee	Computer software	Patent	Total
Cost				
At 1 January 2017	838	613	-	1,451
Additions	-	95	1	96
At 31 December 2017 and 1 January 2018	838	708	1	1,547
Additions	17	66	-	83
At 31 December 2018	855	774	1	1,630
Accumulated amortisation				
At 1 January 2017	750	184	-	934
Amortisation charge for the year	25	58	-	83
At 31 December 2017 and 1 January 2018	775	242	-	1,017
Amortisation charge for the year	25	59	-	84
At 31 December 2018	800	301	-	1,101
Net book value				
At 1 January 2017	88	429	-	517
At 31 December 2017 and 1 January 2018	63	466	1	530
At 31 December 2018	55	473	1	529

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

17 Deferred tax

Deferred tax assets and liabilities as at 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements			
	Assets		Liabilities	
	2018	2017	2018	2017
Total	792	725	(200)	(227)
Set off of tax	(163)	(218)	163	218
Net deferred tax assets (liabilities)	629	507	(37)	(9)

(in million Baht)

	Separate financial statements			
	Assets		Liabilities	
	2018	2017	2018	2017
Total	708	695	(192)	(214)
Set off of tax	(192)	(214)	192	214
Net deferred tax assets (liabilities)	516	481	-	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Movements in total deferred tax assets and liabilities during the years 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements			
		(Charged) / credited to:		
	At 1 January 2018	Statement of income (Note 31)	Equity	At 31 December 2018
Deferred tax assets				
Employee benefits	703	14	-	717
Impairment losses on assets	2	-	-	2
Other	20	53	-	73
Total	725	67	-	792
Deferred tax liabilities				
Depreciation	(204)	51	-	(153)
Deferred cost of debenture	-	(28)	-	(28)
Other	(23)	4	-	(19)
Total	(227)	27	-	(200)
Net	498	94	-	592

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements			
	(Charged) / credited to:			At 31 December 2017
	At 1 January 2017	Statement of income (Note 31)	Equity	
Deferred tax assets				
Employee benefits	658	(36)	81	703
Impairment losses on assets	2	-	-	2
Other	5	15	-	20
Total	665	(21)	81	725
Deferred tax liabilities				
Depreciation	(211)	7	-	(204)
Other	(23)	-	-	(23)
Total	(234)	7	-	(227)
Net	431	(14)	81	498

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Separate financial statements			
	(Charged) / credited to:			
	At 1 January 2018	Statement of income (Note 31)	Equity	At 31 December 2018
Deferred tax assets				
Employee benefit	693	13	-	706
Impairment losses on assets	2	-	-	2
Total	695	13	-	708
Deferred tax liabilities				
Depreciation	(204)	51	-	(153)
Deferred cost of borrowing	-	(34)	-	(34)
Other	(10)	5	-	(5)
Total	(214)	22	-	(192)
Net	481	35	-	516

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Separate financial statements		
	(Charged) / credited to:		
	At 1 January 2017	Statement of income (Note 31)	At 31 December 2017
		Equity	
Deferred tax assets			
Employee benefit	651	(31)	693
Impairment losses on assets	2	-	2
Total	653	(31)	695
Deferred tax liabilities			
Depreciation	(211)	7	(204)
Other	(9)	(1)	(10)
Total	(220)	6	(214)
Net	433	(25)	481

Certain subsidiaries have not recognised deferred tax asset arising from loss carry forward in the financial statements as at 31 December 2018 amounted to Baht 474 million, which expire during 2019 - 2023 (2017: Baht 224 million), because it is not probable that future taxable profit will be available against which the subsidiaries can utilise the benefits.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

18 Other non-current assets

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Deferred land lease arrangement and registration fees, net	36	3,244	221	3,169	242
Long-term loans to savings co-operative of employees		538	583	538	583
Deferred natural gas pipeline facilities, raw material pipeline and the use of land, net		64	77	41	50
Other deferred charges, net		112	310	22	22
Refundable deposits and others		125	41	67	62
Total		4,083	1,232	3,837	959

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

19 Interest-bearing liabilities

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Current					
Short-term borrowings					
- Secured		1,365	595	-	-
- Unsecured		1,027	374	-	-
Short-term borrowings from related companies	5	-	-	1,506	503
Current portion of long-term borrowings					
- Secured		863	1,112	-	-
- Unsecured		685	480	-	-
Unsecured debentures		3,000	-	3,000	-
		6,940	2,561	4,506	503
Non-current					
Long-term borrowings					
- Secured		13,587	6,235	-	-
- Unsecured		1,468	1,833	52,028	-
Unsecured debentures		85,065	55,839	33,009	55,839
		100,120	63,907	85,037	55,839
Total		107,060	66,468	89,543	56,342

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The periods to maturity of interest-bearing liabilities as at 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Within one year	6,940	2,561	4,506	503
After one year but within five years	18,495	15,460	13,031	9,000
After five years	81,625	48,447	72,006	46,839
Total	107,060	66,468	89,543	56,342

Secured interest-bearing liabilities as at 31 December 2018 and 2017 were secured on the following assets:

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Cash at banks - current, savings and fixed deposits	6	1,772	54	-	-
Current investments in fixed deposits	7	540	421	-	-
Land, building, petrochemical plant, machines and crew boat - carrying value	15	21,373	11,672	-	-
Total		23,685	12,147	-	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Changes in liabilities arising from financing activities

(in million Baht)

	Consolidated financial statements			
	Short-term borrowing	Long-term borrowing	Debentures	Total
Balance at 1 January 2018	969	8,068	55,839	64,876
Changes from financing cash flows	1,504	6,937	31,558	39,999
The effect of changes in foreign exchange rates	-	1,598	343	1,941
Other changes	(81)	-	325	(244)
Balance at 31 December 2018	2,392	16,603	88,065	107,060

(in million Baht)

	Separate financial statements			
	Short-term borrowing	Long-term borrowing	Debentures	Total
Balance at 1 January 2018	503	-	55,839	56,342
Changes from financing cash flows	1,003	51,606	(20,076)	32,533
The effect of changes in foreign exchange rates	-	422	(75)	347
Other changes	-	-	321	321
Balance at 31 December 2018	1,506	52,028	36,009	89,543

As at 31 December 2018, the Group and the Company had unutilised long-term credit facilities totalling Baht 6,039 million and Baht 4,700 million respectively (2017: Baht 5,069 million and Baht 5,000 million respectively).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Interest-bearing liabilities as at 31 December 2018 and 2017 were as follows:

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Short-term borrowings		2,392	969	-	-
Short-term borrowings from related companies	5	-	-	1,506	503
Long-term borrowings		16,603	9,660	-	-
Long-term borrowings from related companies	5	-	-	52,028	-
Debentures		88,065	55,839	36,009	55,839
Total		107,060	66,468	89,543	56,342

Long-term borrowings

Details of principal features of the Group's long-term borrowings as at 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Company :				
1) U.S. Dollars 1,600.4 million Loan Agreements with a subsidiary from net proceeds from bond issuance (note 5)	-	-	52,028	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Subsidiaries :				
2) Baht 1,500 million Loan Facility Agreement at interest MLR less a margin, payable in semi-annual installments commencing in September 2012	688	737	-	-
3) Baht 324 million Loan Facility Agreement at interest MLR less a margin, payable in monthly installments commencing in April 2012	-	117	-	-
4) Baht 228 million Loan Facility Agreement at interest MLR less a margin, payable in monthly installments commencing in January 2013	-	95	-	-
5) Baht 365 million Loan Facility Agreement at interest MLR less a margin, payable in monthly installments commencing in June 2014	-	280	-	-
6) Baht 365 million Loan Facility Agreement at interest MLR less a margin, payable in monthly installments commencing in October 2014	-	292	-	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
7) Baht 300 million Loan Facility Agreement at interest MLR less a margin, payable in semi-annual installments commencing in September 2015	125	175	-	-
8) Baht 1,200 million Loan Facility Agreement at interest 6-month FDR plus a margin, payable in semi-annual installment June 2014	-	164	-	-
9) Baht 1,800 million Loan Facility Agreement at interest 6-month FDR plus a margin, payable in semi-annual installments commencing in June 2015	804	1,020	-	-
10) Baht 3,875 million Loan Facility Agreement at interest THBFIX plus a margin, payable in three-months installments commencing in June 2016	-	3,065	-	-
11) Baht 3,875 million Loan Facility Agreement at interest THBFIX plus a margin, payable in three-months installments commencing in June 2016	-	3,027	-	-
12) Baht 420 million Loan Facility Agreement at interest MLR less a margin, payable in monthly installments commencing in October 2016	-	400	-	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
13) Baht 141 million Loan Facility Agreement at interest 6-month FDR plus a margin, payable in semi-annual installment June 2017	72	72	-	-
14) Baht 8,500 million Loan Facility Agreement at interest THBFIX 3M plus a margin, payable in semi-annual installment June 2018	8,209	-	-	-
15) Baht 800 million Loan Facility Agreement at interest FDR plus a margin, payable in three-months installments commencing in March 2020	796	-	-	-
16) Baht 5,400 million Loan Facility Agreement at interest THBFIX plus a margin, payable in semi-annual installment June 2019	5,374	-	-	-
17) Baht 434 million Loan Facility Agreement at 6.40% fixed interest payable in semi-annual installment July 2019	319	-	-	-
18) Baht 217 million Loan Facility Agreement at interest THBFIX plus a margin, payable in conditions as stipulated in the agreement.	216	216	-	-
Total	16,603	9,660	52,028	-

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Debentures

Details of the Company's debentures as at 31 December 2018 and 2017 were as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Debentures	88,729	56,347	36,180	56,347
Less discount on debentures	(664)	(508)	(171)	(508)
Total	88,065	55,839	36,009	55,839

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Bond	Currency	Amount (million)	Years	Interest rate (%/annum)	Payment term	Maturity date
Company						
BhtBond-1/2010	Baht	3,000	12	4.80	Semi-annual basis	April 2022
BhtBond-1/2012	Baht	7,500	15	5.05	Semi-annual basis	March 2027
Bond USD-1/2013	U.S. Dollars	216.4	10	3.625	Semi-annual basis	January 2023
Bond USD-1/2013	U.S. Dollars	172.4	30	4.875	Semi-annual basis	January 2043
BhtBond-1/2014	Baht	3,000	5	4.13	Semi-annual basis	March 2019
BhtBond-1/2014	Baht	3,000	7	4.61	Semi-annual basis	March 2021
BhtBond-1/2014	Baht	7,000	10	4.84	Semi-annual basis	March 2024
Subsidiary						
Bond USD-1/2013	U.S. Dollars	283.6	10	3.625	Semi-annual basis	January 2023
Bond USD-1/2013	U.S. Dollars	327.6	30	4.875	Semi-annual basis	January 2043
Bond USD-1/2018	U.S. Dollars	400	10	4.625	Semi-annual basis	November 2028
Bond USD-1/2018	U.S. Dollars	600	30	5.375	Semi-annual basis	November 2048

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Repurchase and issuance and offering of debentures

The Company has repurchased US\$500,000,000 3.625% Senior Unsecured Notes due 2023 (the “2023 Notes”) and US\$500,000,000 4.875% Senior Unsecured Notes due 2043 (the “2043 Notes” and together with the 2023 Notes, the “Existing Notes”) from investors overseas in aggregate principal amount of U.S. Dollars 283.6 million for the 2023 Notes and U.S. Dollars 327.6 million for the 2043 Notes. The repurchase of the Existing Notes completed on 10 April 2018. The Company amortised deferred discount on debenture and recorded related expenses relevant to repurchase of debentures at amount of Baht 431.1 million in profit or loss.

On 10 April 2018, a subsidiary also completed its issue and offering of US\$283,619,000 3.625% Senior Unsecured Notes due 2023 (the “New Notes Serie 1”) which have the aggregate principal amount of U.S. Dollars 283.6 million, due on 2023 and bear a fixed interest rate of 3.625% per annum and US\$327,587,000 4.875% Senior Unsecured Notes due 2043 (the “New Notes Serie 2”) which have the aggregate principal amount of U.S. Dollars 327.6 million, due on 2043 and bear a fixed interest rate of 4.875% per annum to investors overseas under the Medium Term Note Program of the Company and a subsidiary Payment under the New Notes Serie 1 and the New Notes Serie 2 (the “New Notes”) is guaranteed by the Company.

On 20 November 2018, a subsidiary has issued Senior Unsecured Notes to foreign institutional investors for the total amount of U.S. Dollars 1,000 million, comprising of U.S. Dollars 400 million carrying a coupon of 4.625% per annum with tenor of 10 years and U.S. Dollars 600 million carrying a coupon of 5.375% per annum with the tenor of 30 years, fully guaranteed by the Company.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

20 Trade accounts payable

(in million Baht)

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Related parties	5	10,595	11,389	12,726	13,887
Other parties		11,249	7,574	10,791	7,174
Total		21,844	18,963	23,517	21,061

21 Other payables

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Payable for purchase of securities (Private funds)	-	50	-	50
Accrued operating expenses	103	327	39	67
Oil Fuel Fund payable	517	104	517	104
Other payables	1,739	1,491	2,133	1,289
Other	1,513	1,504	886	1,400
Total	3,872	3,476	3,575	2,910

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

22 Provisions for employee benefits

Movement in the present value of the defined benefit obligations:

	(in million Baht)			
	Consolidated		Separate	
	financial statements		financial statements	
	2018	2017	2018	2017
Provisions for employee benefits at 1 January	3,511	3,297	3,161	3,003
Recognised in profit or loss:				
Current service costs and interest	305	286	244	238
Actuarial gain recognised in the year	-	(66)	-	(40)
	305	220	244	198
Recognised in other comprehensive income:				
Actuarial loss recognised in the year	1	404	-	365
	1	404	-	365
Benefit paid	(230)	(410)	(222)	(405)
	(230)	(410)	(222)	(405)
Provisions for employee benefits at 31 December	3,587	3,511	3,183	3,161

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Actuarial (gains) losses recognised in other comprehensive income arising from:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Demographic assumptions	1	13	-	(3)
Financial assumptions	-	(34)	-	(19)
Experience adjustment	-	425	-	387
Total	1	404	-	365

Principal actuarial assumptions as at 31 December 2018 and 2017:

(% per annum)

	Consolidated financial statements and Separate financial statements	
	2018	2017
Discount rate	Interest rate of long-term Thai Government Bond	Interest rate of long-term Thai Government Bond
Salary increases rate	5.0-10.0	5.0-10.0
Employee turnover	0.0-2.1	0.0-2.1

Assumptions regarding future mortality have been based on published statistics and mortality tables.

At 31 December 2018, the weighted-average duration of the defined benefit obligation was 19 years (2017: 19 years).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Sensitivity analysis

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below.

31 December 2018	(in million Baht)			
	Consolidated		Separate	
	financial statements		financial statements	
	Increase	Decrease	Increase	Decrease
Discount rate (1% movement)	(299)	350	(247)	285
Salary growth (1% movement)	403	(354)	362	(319)

Although the analysis does not take account of the full distribution of cash flows expected under the plan, it does provide an approximation of the sensitivity of the assumptions shown.

The increase in employee benefits

On 13 December 2018, the National Legislative Assembly passed a bill amending the Labor Protection Act to include a requirement that an employee who is terminated after having been employed by the same employer for an uninterrupted period of twenty years or more, receives severance payment of 400 days of wages at the most recent rate. The Group will amend its retirement plan in the period in which the amendment will have become law and is announced in the Royal Gazette. As a result of this change, the provision for retirement benefits as at that future period end as well as past service cost recognised during that period in the consolidated and the separate financial statements is estimated to increase by an amount of approximately Baht 368.6 million and Baht 294.6 million, respectively.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

23 Share capital

	2018			2017	
	Par value	Number		Number	
	per share	of shares	Amount	of shares	Amount
	(in Baht)		(million shares / million Baht)		
Authorised					
At 1 January					
- Ordinary shares	10	2,040	20,400	2,040	20,400
At 31 December					
- Ordinary shares	10	2,040	20,400	2,040	20,400
Issued and paid-up					
At 1 January					
- Ordinary shares	10	2,040	20,400	2,040	20,400
At 31 December					
- Ordinary shares	10	2,040	20,400	2,040	20,400

24 Additional paid-in capital and reserves

Share premium

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.

Legal reserve

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account ("legal reserve"), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Fair value changes

The fair value changes account within equity comprises the cumulative net change in the fair value of available-for-sale financial assets until the investments are derecognised or impaired.

Exchange differences on translating foreign operations

The exchange differences on translating foreign operations account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations.

25 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:	Other

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Information about reportable segments

	For the year ended 31 December 2018									(in million Baht)
	Marine									
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	Marine transportation services	Solvent	Ethanol	Other	Eliminations	Total
Revenue from sale and rendering of services										
- External	330,063	15,671	27,583	4,839	354	9,851	983	-	-	389,344
- Inter-segment	75,067	5,288	39,118	6,895	267	141	494	1,925	(129,195)	-
Cost of sale and rendering of services	(398,208)	(19,533)	(62,776)	(9,795)	(616)	(9,193)	(1,381)	(1,846)	130,220	(373,128)
Gross profit	6,922	1,426	3,925	1,939	5	799	96	79	1,025	16,216
Dividend income	4,258	-	-	-	-	-	-	-	(4,101)	157
Net derivative loss on hedging	(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	(2,467)	1,719
Selling expenses	(73)	(97)	(207)	-	-	(291)	(19)	-	263	(424)
Administrative expenses	(2,436)	(76)	(118)	(34)	(122)	(279)	(77)	(40)	824	(2,358)
Share of gain of joint ventures and associates	-	-	-	997	118	-	15	-	63	1,193
Profit (loss) before finance costs and income tax expense	12,569	1,354	3,474	2,931	56	256	21	41	(4,393)	16,309

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

For the year ended 31 December 2018														
	Marine													
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	Marine transportation services	Solvent	Ethanol	Other	Eliminations	Total				
Profit (loss) before finance costs and income tax expense														
Finance costs	12,569 (3,374)	1,354 (4)	3,474 (409)	2,931 (321)	56 (123)	256 (76)	21 (17)	41 -	(4,393) 382	16,309 (3,942)				
Profit (loss) before income tax expense														
Income tax (expense) income	9,195 (955)	1,350 (271)	3,065 (581)	2,610 (140)	(67) 1	180 (40)	4 -	41 3	(4,011) -	12,367 (1,983)				
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)	-	(23)	17	-	-	287	235				
Profit (loss) for the year	8,240	1,079	2,484	2,470	(66)	140	4	44	(4,011)	10,384				

NOTES TO
THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

For the year ended 31 December 2017										(in million Baht)
	Marine									
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	transportation services	Solvent	Ethanol	Other	Eliminations	Total
Revenue from sale and rendering of services										
- External	285,137	15,044	22,082	4,561	473	9,046	1,045	-	-	337,388
- Inter-segment	64,692	3,618	35,799	6,368	328	136	575	985	(112,501)	-
Cost of sale and rendering of services	(328,442)	(16,310)	(54,238)	(8,772)	(776)	(8,184)	(1,212)	(898)	113,446	(305,386)
Gross profit	21,387	2,352	3,643	2,157	25	998	408	87	945	32,002
Dividend income	11,125	-	-	-	-	-	-	-	(10,967)	158
Net derivative loss on hedging	(128)	-	(5)	-	-	-	-	-	-	(133)
Net foreign exchange gain (loss)	2,882	-	333	1	(7)	(29)	1	-	-	3,181
Other income	3,272	93	235	21	32	14	6	1	(2,484)	1,190
Selling expenses	(189)	(95)	(217)	-	-	(257)	(19)	-	285	(492)
Administrative expenses	(2,493)	(84)	(148)	(70)	(664)	(254)	(18)	(23)	785	(2,969)
Share of gain of joint venture and associates	-	-	-	943	113	-	75	-	66	1,197
Profit (loss) before finance costs and income tax expense	35,856	2,266	3,841	3,052	(501)	472	453	65	(11,370)	34,134

Thai Oil Public Company Limited and its Subsidiaries

For the year ended 31 December 2017										(in million Baht)
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	Marine transportation services	Solvent	Ethanol	Other	Eliminations	Total
Profit (loss) before finance costs and income tax expense	35,856	2,266	3,841	3,052	(501)	472	453	65	(11,370)	34,134
Finance costs	(2,863)	(1)	(418)	(302)	(103)	(77)	(29)	-	508	(3,285)
Profit (loss) before income tax expense	32,993	2,265	3,423	2,750	(604)	395	424	65	(10,862)	30,849
Income tax (expense) income	(4,253)	(453)	(653)	(107)	3	(57)	2	(12)	-	(5,530)
Profit (loss) for the year	28,740	1,812	2,770	2,643	(601)	338	426	53	(10,862)	25,319
Profit (loss) attributable to :										
Owners of the parent	28,740	1,812	2,730	2,643	(530)	309	263	53	(11,164)	24,856
Non-controlling interests	-	-	40	-	(71)	29	163	-	302	463
Profit (loss) for the year	28,740	1,812	2,770	2,643	(601)	338	426	53	(10,862)	25,319

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	As at 31 December 2018									
	Marine									
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	Marine transportation services	Solvent	Ethanol	Other	Eliminations	Total
Trade accounts receivable	25,194	1,547	5,098	1,482	55	1,491	114	697	(11,319)	24,359
Inventories	24,423	1,865	1,347	113	33	738	245	-	(26)	28,738
Other current assets	110,899	809	2,170	2,506	204	990	92	203	(6,228)	111,645
Investments in subsidiaries	14,555	-	-	-	-	-	-	-	(14,555)	-
Investments in joint ventures	-	-	-	-	625	-	-	-	-	625
Investments in associates	1,261	-	-	9,115	-	-	819	-	3,121	14,316
Property, plant and equipment	39,990	1,301	18,609	11,753	2,707	2,341	1,366	-	1,862	79,929
Other non-current assets	7,523	639	1,910	84	7	1,366	7	52,223	(54,758)	9,001
Total assets	223,845	6,161	29,134	25,053	3,631	6,926	2,643	53,123	(81,903)	268,613
Trade accounts payable	23,517	1,362	5,419	1,514	31	640	39	626	(11,304)	21,844
Current portion of long-term borrowings	-	-	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	(6,258)	11,627
Long-term borrowings	52,028	-	5,054	7,921	1,459	589	32	-	(52,028)	15,055
Debentures	33,009	-	-	-	-	-	-	51,793	263	85,065
Other non-current liabilities	3,708	46	256	17	477	62	12	442	(1,018)	4,002
Total liabilities	125,159	2,123	15,970	9,884	2,573	3,261	549	52,967	(70,345)	142,141

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

As at 31 December 2017														
	Oil refinery	Lube base oil refinery	Petro-chemical	Power generation	Marine transportation services	Solvent	Ethanol	Other	Eliminations	Total				
Trade accounts receivable	24,242	1,272	4,848	1,268	84	1,479	113	60	(11,038)	22,328				
Inventories	28,094	2,083	1,631	102	40	703	214	-	(26)	32,841				
Other current assets	81,618	618	1,580	2,072	367	852	392	120	(16,577)	71,042				
Investments in subsidiaries	14,555	-	-	-	-	-	-	-	(14,555)	-				
Investments in joint ventures	-	-	-	-	542	-	-	-	-	542				
Investments in associates	1,261	-	-	8,814	-	-	804	-	2,947	13,826				
Property, plant and equipment	36,082	1,582	20,523	12,394	2,799	2,152	1,423	-	1,657	78,612				
Other non-current assets	6,954	463	1,906	159	6	1,415	3	372	(2,361)	8,917				
Total assets	192,806	6,018	30,488	24,809	3,838	6,601	2,949	552	(39,953)	228,108				
Trade accounts payable	21,061	1,331	5,558	1,200	131	795	19	-	(11,132)	18,963				
Current portion of long-term borrowings	-	-	-	164	142	216	40	-	-	1,592				
Other current liabilities	11,085	369	6,806	8,671	460	1,167	650	83	(16,498)	12,793				
Long-term borrowings	-	-	5,278	-	1,954	804	32	-	-	8,068				
Debentures	55,839	-	-	-	-	-	-	-	-	55,839				
Other non-current liabilities	3,656	41	108	15	21	59	9	357	(561)	3,705				
Total liabilities	91,641	1,741	18,780	10,050	2,708	3,041	750	440	(28,191)	100,960				

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Major customer

Revenue from two customers represents Baht 176,610 million (2017: revenue from one customer represented Baht 151,356 million) of the Group's revenue from sale of goods and rendering of service.

Geographical segments

In presenting information on the basis of geographical segments, segment revenue is based on the geographical location of customers. Segment assets are based on the geographical location of the assets.

Geographical information

(in million Baht)

	Revenues		Non-current assets	
	2018	2017	2018	2017
Thailand	344,795	296,837	102,794	101,145
Other countries	44,549	40,551	1,075	752
Total	389,344	337,388	103,869	101,897

26 Other income

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Interest income	1,381	915	1,618	1,369
Land lease income	20	18	92	87
Service income and other	318	257	1,994	1,816
Total	1,719	1,190	3,704	3,272

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

27 Administrative expenses

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Advisory and legal fees	203	99	178	91
Personnel expenses	1,020	1,007	838	836
Depreciation	65	65	35	37
Impairment losses on assets	-	547	-	-
Other	1,070	1,251	1,385	1,529
Total	2,358	2,969	2,436	2,493

28 Employee benefit expenses

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Management				
Salaries and wages	223	210	170	159
Contributions to provident fund	21	19	16	14
Retirement gratuity fund	17	10	17	10
Other	126	124	113	111
	387	363	316	294
Other employees				
Salaries and wages	2,464	2,462	1,385	1,454
Contributions to provident fund	142	137	99	101
Retirement gratuity fund	148	146	144	146
Other	439	360	360	290
	3,193	3,105	1,988	1,991
Total	3,580	3,468	2,304	2,285

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The Group established a contributory registered provident fund to which the employees contribute monthly at rates ranging from 3% to 15% of their basic salaries and by the Group at rates ranging from 3% to 15% of the employees' basic salaries. Membership to the funds is on a voluntary basis. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by licensed Fund Managers.

29 Expenses by nature

The statements of income include an analysis of expenses by function. Significant expenses by nature are detailed as follows:

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Changes in finished goods and work in progress	2,400	(55)	2,112	469
Purchase and raw materials used	282,928	222,268	323,252	257,399
Natural gas used	10,677	8,946	2,214	1,322
Employee benefits expense	3,580	3,468	2,304	2,285
Depreciation and amortisation	7,264	7,642	3,788	3,956
Excise tax	57,313	56,924	57,256	56,665

30 Finance costs

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Interest expense: financial institutions and other	3,426	3,265	2,883	2,846
Finance costs from repurchase of debenture	431	-	431	-
Financial expenses	96	23	60	18
	3,953	3,288	3,374	2,864
Capitalised as cost of property plant and equipment under construction	(11)	(3)	-	-
Net	3,942	3,285	3,374	2,864

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

31 Income tax expense

(in million Baht)

		Consolidated financial statements		Separate financial statements	
	Note	2018	2017	2018	2017
Current tax expense					
Current year		2,078	5,518	991	4,228
Adjustment for prior years		(1)	(2)	(1)	-
Deferred tax expense					
	17				
Movements in temporary differences		(94)	14	(35)	25
Total		1,983	5,530	955	4,253

Reconciliation of effective tax rate

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Profit before income tax expense	12,367	30,849	9,195	32,993
Income tax using the Thai corporation tax rate	2,473	6,170	1,839	6,599
Income not subject to tax	(517)	(729)	(896)	(2,363)
Expenses not deductible for tax purposes	29	137	13	17
Utilisation of previously unrecognised tax losses	(1)	(46)	-	-
Over provided in prior years	(1)	(2)	(1)	-
Total	1,983	5,530	955	4,253

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The Group's consolidated effective tax rate in respect of continuing operations for the year ended 31 December 2018 and 2017 were 16.03% and 17.92%, respectively. The effective tax rate is less than Thai corporation tax rate principally because:

- (a) a significant portion of the Company's profit was derived from promoted activities for which concessionary tax rates apply, and
- (b) unutilised tax losses brought forward from the previous year have been utilised during the year to set-off against the current year's tax charge.

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 2018 are as follow:

(in million Baht)

Country	Revenues ⁽¹⁾	Profit before finance costs and income tax expense	Income tax expense
Thailand	389,166	16,298	1,983
Vietnam	2,681	(62)	- ⁽²⁾
Singapore	-	73	- ⁽³⁾
Total	391,847	16,309	1,983

Notes:

- (1) Revenues subject to tax consist of revenue from sale of goods and rendering of services, dividend income, net derivative gain on hedging, net foreign exchange gain, and other income from interest received, land lease agreement, other services rendered, etc.
- (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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

32 Promotional privileges

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company and certain local subsidiaries have been granted privileges by the Board of Investment relating to power and steam generation, petroleum product production, chemical product production, ethanol product production, marine transportation, offshore crude oil unloading facilities and industrial zone. The privileges granted include:

- 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, and
- c) a 50% reduction in the normal corporate income tax rate on the net profit derived from certain promotional operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company and its subsidiaries must comply with certain conditions and restrictions provided for in the promotional certificates.

Summary of revenue from promoted and non-promoted businesses:

(in million Baht)

	Consolidated financial statements					
	2018			2017		
	Promoted businesses	Non- promoted businesses	Total	Promoted businesses	Non- promoted businesses	Total
Export sales	5,195	39,574	44,769	15,830	25,082	40,912
Local sales	28,922	449,511	478,433	274,609	138,446	413,055
Eliminations			(133,858)			(116,579)
Total revenues			389,344			337,388

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Separate financial statements					
	2018			2017		
	Promoted businesses	Non- promoted businesses	Total	Promoted businesses	Non- promoted businesses	Total
Export sales	-	16,838	16,838	13,056	3,916	16,972
Local sales	-	388,292	388,292	252,235	80,622	332,857
Total revenues			405,130			349,829

33 Basic earnings per share

The calculations of basic earnings per share for the years ended 31 December 2018 and 2017 were based on the profit for the years attributable to owners of the Company and the weighted average number of ordinary shares outstanding during the years as follows:

(million Baht/million Shares)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Profit for the year attributable to owner of the Company	10,149	24,856	8,240	28,740
Weighted average number of ordinary shares outstanding during the year	2,040	2,040	2,040	2,040
Basic earnings per share (in Baht)	4.97	12.18	4.04	14.09

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

34 Dividends

At the meeting of the Board of the Director of the Company held on 31 August 2018, the Company's Board of Directors approved the appropriation of 2018 interim dividends at Baht 1.50 per share, totalling Baht 3,060 million. The interim dividends were paid to the Company's shareholders in September 2018.

At the annual general meeting of the shareholders of the Company held on 11 April 2018, the shareholders approved the appropriation of 2017 annual dividends at Baht 5.25 per share, totalling Baht 10,710 million. After a deduction of the interim dividends of Baht 1.50 per share which were paid to the Company's shareholders in September 2017, the remaining dividends of Baht 3.75 per share, totalling Baht 7,650 million. The dividend was paid to the shareholders in April 2018.

At the meeting of the Board of the Director of the Company held on 25 August 2017, the Company's Board of Directors approved the appropriation of 2017 interim dividends at Baht 1.50 per share, totalling Baht 3,060 million. The interim dividends were paid to the Company's shareholders in September 2017.

At the annual general meeting of the shareholders of the Company held on 7 April 2017, the Company's shareholders approved the appropriation of 2016 annual dividends at Baht 4.50 per share, totalling Baht 9,180 million. After a deduction of the interim dividends of Baht 1.50 per share which were already paid to the Company's shareholders in September 2016, the remaining dividends of Baht 3.00 per share, totalling Baht 6,120 million, were already paid to the Company's shareholders in April 2017.

35 Financial instruments

Financial risk management policies

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligations 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 system of controls 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 and its Subsidiaries

Capital 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.

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 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 2018 and 2017 and the periods in which those assets mature were as follows:

	Consolidated financial statements			
	Effective interest rate (% per annum)	Within 1 year	After 1 year (in million Baht)	Total
2018				
Non-current				
Long-term loans to savings				
co-operative of employees	MLR less margin	34	538	572
Loans to employees	MMR less margin	1	6	7
Total		35	544	579
2017				
Non-current				
Long-term loans to savings				
co-operative of employees	MLR less margin	37	583	620
Loans to employees	MMR less margin	-	6	6
Total		37	589	626

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

	Separate financial statements			
	Effective interest rate (% per annum)	Within 1 year	After 1 year (in million Baht)	Total
2018				
Current				
Short-term loans to subsidiaries	BIBOR 3 M Plus margin	4,274	-	4,274
Non-current				
Long-term loans to subsidiaries	BIBOR 3 M Plus margin	-	400	400
Long-term loans to savings co-operative of employees	MLR less margin	34	538	572
Total		4,308	938	5,246
2017				
Current				
Short-term loans to subsidiaries	MMR rate not exceeding the average MLR of 5 banks less margin	15,651	-	15,651
Non-current				
Long-term loans to savings co-operative of employees	MLR less margin	37	583	620
Total		15,688	583	16,271

The effective interest rates of borrowings from financial institutions and debentures as at 31 December 2018 and 2017 and the periods in which those liabilities mature were disclosed in note 19 to the financial statements.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Interest Rate Swap Contract

A subsidiary has entered into interest rate swap contract with financial institutions to manage exposure and fluctuations in interest rates of long-term loans for Thai Baht currency. As at 31 December 2018, a subsidiary had notional amount of baht 6,241 million (31 December 2017: nil), whereby exchanging floating interest rate based on THBFIX 3M plus margin with fixed interest rate. The swap contract effective from April 2018 to March 2028.

Foreign currency risk

The Group is exposed to foreign currency risk relating to purchases of raw materials and long-term borrowings which are denominated in foreign currencies. However, the Group enters into short-term currency hedging contracts for short term foreign currency exposures when appropriate.

As at 31 December 2018 and 2017, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

	(in million Baht)			
	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
U.S. Dollars				
Cash and cash equivalents	17,548	5,657	17,062	5,243
Other investments	39,076	10,889	39,076	10,889
Trade accounts receivable	3,004	2,345	983	693
Other receivables	165	184	162	177
Interest-bearing liabilities	(64,706)	(35,920)	(64,706)	(32,339)
Trade accounts payable	(4,425)	(1,810)	(4,128)	(1,546)
Other payables	(1,016)	(355)	(104)	(95)
	(10,354)	(19,010)	(11,655)	(16,978)

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Other currencies				
Cash and cash equivalents	38	70	-	-
Trade accounts receivable	327	276	-	-
Other receivables	18	10	4	-
Interest-bearing liabilities	(576)	(50)	-	-
Trade accounts payable	(13)	(14)	-	-
Other payables	(98)	(30)	(15)	(6)
	(304)	262	(11)	(6)
Gross exposure in statement of financial position	(10,658)	(18,748)	(11,664)	(16,984)
Currency forwards	2,806	233	2,806	-
Currency and interest rate swaps	-	(3,581)	-	-
Net exposure	(7,852)	(22,096)	(8,858)	(16,984)

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 full first class collateral for the rest.

Liquidity risk

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Fair values of financial assets and liabilities

The fair value of current portion of financial assets and liabilities are taken to approximate the carrying value due to the relatively short-term maturity of these financial instruments.

The fair value of long-term loans and borrowings carrying a floating rate, which is considered to be market rate, are taken to approximate their fair values.

Other financial assets and liabilities not stated above had the fair and carrying value as at 31 December 2018 and 2017 as following:

(in million Baht)

		Consolidated financial statements			
		Fair value			Total
	Carrying amount	Level 1	Level 2	Level 3	
31 December 2018					
Financial assets/Financial liabilities					
measured at fair value					
Equity securities - available-for-sale securities	361	361	-	-	361
Debt securities - available-for-sale securities					
(Private funds)	11,903	-	11,903	-	11,903
Financial assets/Financial liabilities					
not measured at fair value					
Debt securities held to maturity	721	-	721	-	721
Debentures	(85,605)	-	(89,035)	-	(89,035)
Forward exchange contracts	(24)	-	(9)	-	(9)
Crack spread swap and time spread swap	-	-	(278)	-	(278)
Interest rate swap contracts	-	-	(112)	-	(112)

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

		Consolidated financial statements				
		Carrying amount	Fair value			Total
			Level 1	Level 2	Level 3	
31 December 2017						
Financial assets/Financial liabilities						
measured at fair value						
Equity securities - available-for-sale securities	364	364	-	-	364	
Debt securities - available-for-sale securities						
(Private funds)	11,918	-	11,918	-	11,918	
Financial assets/Financial liabilities						
not measured at fair value						
Debentures	(55,839)	-	(60,546)	-	(60,546)	
Forward exchange contracts	(14)	-	(12)	-	(12)	
Crack spread swap and time						
spread swap	-	-	40	-	40	
Cross currency and interest						
rate swap contracts	185	-	201	-	201	

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(in million Baht)

		Separate financial statements			
	Carrying amount	Fair value			Total
		Level 1	Level 2	Level 3	
31 December 2018					
Financial assets/Financial liabilities					
measured at fair value					
Equity securities - available-for-sale securities	361	361	-	-	361
Debt securities - available-for-sale securities					
(Private funds)	11,903	-	11,903	-	11,903
Financial assets/Financial liabilities					
not measured at fair value					
Debt securities held to maturity	721	-	721	-	721
Long-term borrowings	(52,028)	-	(51,652)	-	(51,652)
Debentures	(36,009)	-	(37,624)	-	(37,624)
Forward exchange contracts	(24)	-	(9)	-	(9)
Crack spread swap and time spread swap	-	-	(33)	-	(33)
31 December 2017					
Financial assets/Financial liabilities					
measured at fair value					
Equity securities - available-for-sale securities	364	364	-	-	364
Debt securities - available-for-sale securities					
(Private funds)	11,918	-	11,918	-	11,918
Financial assets/Financial liabilities					
not measured at fair value					
Debentures	(55,839)	-	(60,546)	-	(60,546)
Crack spread swap and time spread swap	-	-	37	-	37

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

Measurement of fair values

Valuation techniques

The following tables show the 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 borrowings	Market comparison technique: The valuation model is based on ask prices or latest price of comparable market securities.
Forward exchange contracts/Crack spread swap and time spread swap/Cross currency and 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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

36 Commitments with non-related parties

(in million Baht)

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Capital commitments				
Project construction agreements	4,162	6,013	4,051	4,388
Other agreement	-	21	-	-
Total	4,162	6,034	4,051	4,388
Non-cancellable operating lease commitments				
Within one year	238	250	231	231
After one year but within five years	1,418	880	1,390	852
After five years	17,724	140	17,591	-
Total	19,380	1,270	19,212	1,083
Other commitments				
Letters of guarantee issued by financial institutions	2,007	2,019	1,426	1,428
Crude oil purchase agreements	44,543	47,706	44,543	47,706
Total	46,550	49,725	45,969	49,134

Investment in Clean Fuel Project

The Company is in process of engaging contractors for construction of Clean Fuel Project (“CFP”) which has been approved in the Extraordinary General Meeting of Shareholder held on 27 August 2018, with the investment project value of USD 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.

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

The Board of Directors' meeting No. 1/2019 held on 21 January 2019 has passed the resolutions and approved the execution of the relevant agreements, the novation agreement and any other agreements necessary for and in connection with the disposal of assets to transfer the ownership in the ERU with Global Power Synergy Public Company Limited ("GPSC") or a wholly-owned subsidiary of GPSC and approved that the ERU project to be proposed to the 2019 Annual General Meeting of Shareholders for consideration and approval. The ERU project has significant aims to reduce investment costs of the CFP, enhance liquidity and efficiently support future investment.

Investment in Corporate Venture Capital

On 17 December 2018, the Company entered into Subscription Agreement to invest in corporate venture capital with the amount of U.S. Dollars 3 million or equivalent to Baht 97 million to increase business capability and exploring new business opportunity. The Company shall pay in accordance with capital call notice.

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 agreement.

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 annually for the period of 30 years from 2022 until 2052.

On a signing date, the Company paid up-front fee amounting to Baht 2,962 million.

37 Contingent liabilities and contingent assets

As at 31 December 2018, the Company had the following contingent liabilities and contingent assets:

The Company has crack spread swap and time spread swap with foreign companies ("counterparties"). The Company has or the counterparties have commitments to make payments for the differences between the fixed price and floating price for each period.

As at 31 December 2018, the Company had oil volume under the agreements totalling 1.1 million barrels (2017: 5.5 million barrels).

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

38 Insurance policy

As at 31 December 2018, the Group has an All Risks and Loss of Profit Insurance Policy ("ALOP") from a syndicate of insurers and reinsurers for a total insured value of U.S. Dollars 15,168 million (2017: U.S. Dollars 9,699 million). Such policy is renewed on an annual basis. Certain subsidiaries have assigned their rights to proceeds from insurance claims under the ALOP to the lenders under certain borrowings agreements.

39 Event after the reporting period

At the meeting of the Board of Directors of the Company held on 15 February 2019, 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 2018 annual dividends 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 remaining dividends of Baht 1.15 per share, totalling Baht 2,346 million, are scheduled for payment on 26 April 2019. This dividend is subject to the approval of the Company's shareholders at the annual general meeting to be held on 10 April 2019.

40 Thai Financial Reporting Standards (TFRS) not yet adopted

A number of new and revised TFRS which relevant to the Group operations are expected to have significant impact on the consolidated and separate financial statements on the date of initial application. Those TFRS become effective for annual financial reporting periods beginning on or after 1 January of the following years.

TFRS	Topic	Effective
TFRS 7*	Financial Instruments: Disclosures	2020
TFRS 9*	Financial Instruments	2020
TFRS 15	Revenue from Contracts with Customers	2019
TAS 32*	Financial Instruments: Presentation	2020
TFRIC 16*	Hedges of a Net Investment in a Foreign Operation	2020
TFRIC 19*	Extinguishing Financial Liabilities with Equity Instruments	2020

* TFRS - Financial instruments standards

NOTES TO THE FINANCIAL STATEMENTS

Thai Oil Public Company Limited and its Subsidiaries

(a) TFRS 15 Revenue from Contracts with Customers

TFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. Revenue should be recognised when (or as) an entity transfers control over goods or services to a customer, measured at the amount to which the entity expects to be entitled. It replaces existing revenue recognition standards as follows:

- TAS 11 (revised 2017) Construction Contracts,
- TAS 18 (revised 2017) Revenue,
- TSIC 31 (revised 2017) Revenue-Barter Transactions Involving Advertising Services,
- TFRIC 13 (revised 2017) Customer Loyalty Programmes,
- TFRIC 15 (revised 2017) Agreements for the Construction of Real Estate, and
- TFRIC 18 (revised 2017) Transfers of Assets from Customers.

Management has considered the potential impact of adopting and initially applying TFRS 15 on the consolidated and separate financial statements and found that there is no material impact on the financial statements in the period of initial application.

(b) TFRS - Financial instruments standards

These TFRS establish requirements related to definition, recognition, measurement, impairment and derecognition of financial assets and financial liabilities, including accounting for derivatives and hedge accounting.

Management is presently considering the potential impact of adopting and initially applying TFRS - Financial instruments standards on the consolidated and separate financial statements.

AUDIT FEES OF THE AUDITORS 2018

1. Audit Fee

Thaioil, subsidiaries and Thaioil Group Registered Provident Fund paid for the audit fees to the auditors' company for the latest account period amounting to Baht 8,603,000 (Eight million six hundred and three thousand baht only).

2. Non-Audit Fee

Thaioil 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 5,980,000 (Five million nine hundred and eighty thousand 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

