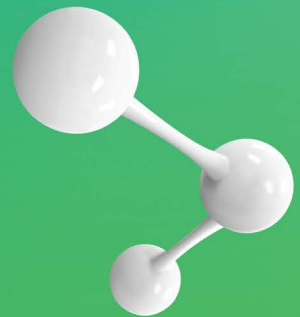




60<sup>th</sup>  
Anniversary  
Thaioil  
—

# REFORMING THE SUSTAINABLE FUTURE



Thai Oil Public  
Company Limited

INTEGRATED  
REPORT 2020





# ABOUT THIS REPORT



Thai Oil Public Company Limited is committed to disclose all material information on corporate sustainability to our stakeholders with the utmost accuracy and transparency. In line with this commitment, we have been publishing annual corporate sustainability reports aligned with international standards since 2011. This report is the 10th of its kind, and covers our economic, social, and environmental performance from 1st January to 31st December 2020.

## Approach to Reporting

The 2020 Integrated Report follows the International <IR> Framework of the International Integrated Reporting Council (IIRC), and reports on the management approach and performance of the material sustainability issues identified through a materiality assessment process in accordance with the Global Reporting Initiative (GRI) Standards: Core Option. Additional indicators for the Oil and Gas Sector Disclosures (OGSD) are reported on page 162-165. The Report also outlines the progress on the United Nations Global Compact 10 Principles (UNGC) on page 165 and the progress towards the United Nations Sustainable Development Goals (SDGs) on page 166-170. Reported information on environment and safety has been verified by an external verifier, with the statement of the assurance shown on page 160-161



## Scope of Reporting

The scope of reporting has been determined based on the business relevance, the readiness of comprehensive and accurate information, and the level of impacts towards Thail's core businesses - oil refining, petrochemical production, lube base oil business, power generation, transportation, and other businesses. The coverage extends to only the businesses of Thai Oil Public Company Limited (TOP), Thai Lube Base Public Company Limited (TLB), Thai Paraxylene Company Limited (TPX), Thail Energy Services Company Limited (TES), Thail Power Company Limited (TP), LABIX Company Limited (LABIX), and TOP SPP Company Limited. Additional reporting for TOP Solvent Company Limited (TS), and Sak Chaisidhi Company Limited (SAKC) only covers information on human and organizational development, and product and service stewardship. In total, this determined scope of reporting covers 97% of Thail Group's sales revenue.

To download an electronic version of the 2020 Integrated Report, please visit:  
[https://www.thaioilgroup.com/home/media\\_ebook.aspx?id=273&lang=en](https://www.thaioilgroup.com/home/media_ebook.aspx?id=273&lang=en)



For information on the performance of Thail Group companies not included in the scope of this Report, please refer to the 2020 Annual Report at  
<https://investor.thaioilgroup.com/ar.html>



For more information, please contact:  
Sustainability Development Function,  
Corporate Governance and Sustainability  
Department



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## MESSAGE TO OUR STAKEHOLDERS



To sustainably drive  
Thaioil towards becoming  
a 100-year organization  
amidst turbulent economic  
and industrial conditions,  
I believe the time is ripe for  
Thaioil Group to mobilize  
our strategy and accelerate  
the reform by extending  
the supply chain towards  
chemical products  
and developing high-value  
products for consumers.

**Mr. Wirat Uanarumit**

President and Chief Executive Officer  
Thai Oil Public Company Limited



It has been 10 years since Thailoil started preparing and publishing annual sustainability reports to communicate the business activities and performance of Thailoil and Subsidiaries to interested stakeholders. In the preparation for this annual Integrated Report, Thailoil has followed the Integrated Reporting <IR> Framework of the International Integrated Reporting Council (IIRC), which offers guidance for companies to communicate the integration of strategy, work processes, and sustainability performance through effective management of the six capitals – namely, financial capital, manufactured capital, natural capital, human capital, intellectual capital, and social and relationship capital. Through this reporting, we demonstrate our commitment to sustainably create value for the organization, society, and the environment.

For the past 59 years, Thailoil has been committed to operate our business activities in line with our vision to “Empowering Human Life through Sustainable Energy and Chemicals”. To continue onwards on our path to becoming a 100-year organization, we have set a goal to become an energy and chemical leader that delivers sustainable returns – be that relating to environmental, social, or governance aspects – while contributing to the improvement of quality of life for all stakeholder groups.

In 2020, nobody could deny that the widespread impact caused by an outbreak of the 2019 novel coronavirus (COVID-19) has more or less impacted on the operations in every part of our value chain. Thailoil has therefore established a series of COVID-19 prevention and response measures to ensure the confidence of our employees, customers, business partners, and subcontractors, as well as other relevant stakeholders. In particular, the I-COVID Center was launched to act as a center for coordinating efforts and communicating important information, while the TOP Team Committee was tasked to closely monitor development of the situations. It is our hope that through these efforts, we can reaffirm that Thailoil and all stakeholders in our value chain will be able to safely step past the COVID-19 pandemic together.

The impact of COVID-19 pandemic has not only affected the operations of Thailoil and Subsidiaries, but the pandemic has contributed to significant declines in oil markets and prices. Nonetheless, while confronted by the challenges imposed from this crisis, Thailoil saw opportunities to adapt and accelerate business transformation to operate sustainably and meet our business targets. The Company thus reviewed and revised the long-term organizational strategy for more flexibility to respond to future changes and for alignment with the Company’s strategic direction. The three strategies are outlined as follows.

### Value Maximization

Moving towards an integrated value chain with high-value products, including refinery products, aromatics, and olefins.

### Earnings Diversification

Building stable income, especially in the power business, and seek new business opportunities (Seed New Options).

### Supply Chain Management as Growth Platform

Increasing capacity in product management to effectively deliver products to the increased pool of customers through focusing on distribution and logistics management with collaboration within the business group.

Over the past year, Thailoil has continued the construction of the Clean Fuel Project (CFP), which is expected to commence operations in 2023. The CFP is considered an important project for the Company, as it will play a key role in helping Thailoil to maintain our leadership position as a leading refinery, extend our value chain towards petrochemicals businesses, and develop high-value products. The Company is focused on knowledge development in parallel with business partnerships to expand business opportunities, including opportunities abroad that will support our future growth. Notwithstanding, the Company continues to prioritize social, environmental, and governance aspects while caring for stakeholders of all groups.

With our unwavering commitment to pursue sustainable development grounded on a foundation of collaboration between all parties, Thailoil has been listed as a member of the Dow Jones Sustainability Indices (DJSI) for the 8th consecutive year, and recognized as the Oil and Gas Refining and Marketing Industry Leader in 2020. This achievement is rewarding for us, and motivates us to continue advancing our sustainability performance.

Finally, on behalf of Thailoil Group, I would like to thank the support from every party involved that enable Thailoil to operate and grow our business sustainably. I strongly believe that the determination and genuine dedication of all parties involved to drive responsible business conduct with due consideration towards benefits on the environment, economy, and society will lead Thailoil in continuing to empower human life through sustainable energy and chemicals.

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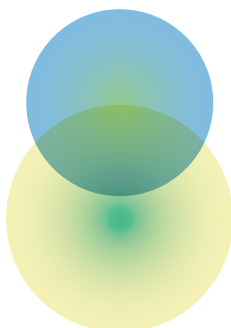
# FINANCIAL HIGHLIGHTS



## Sales Revenues (Million THB)

2020  
**242,840**

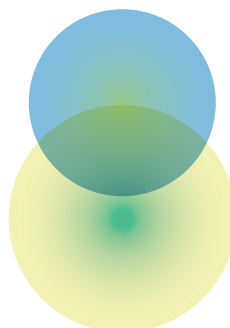
2019  
**361,768**



## EBITDA (Million THB)

2020  
**(2,055)**

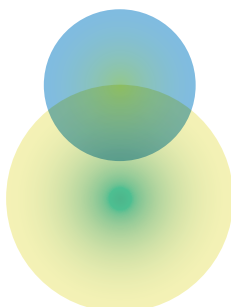
2019  
**14,149**



## Net Profit/(Loss) (Million THB)

2020  
**(3,301)**

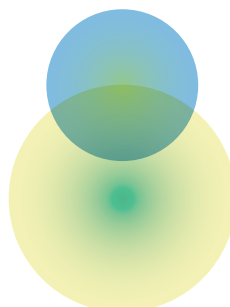
2019  
**6,277**



## Basic Earnings/(Loss) per Share (THB/Share)

2020  
**(1.62)**

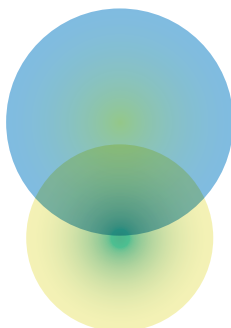
2019  
**3.08**



## Total Assets (Million THB)

2020  
**306,188**

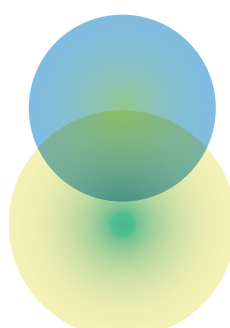
2019  
**283,445**



## Total Equity (Million THB)

2020  
**120,118**

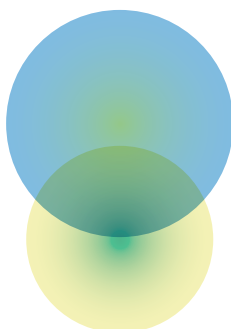
2019  
**123,924**



## Dividend Payment (THB/Share)

2020  
**0.70**

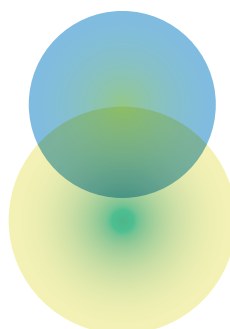
2019  
**1.50**



## Market Capitalization (Million THB)

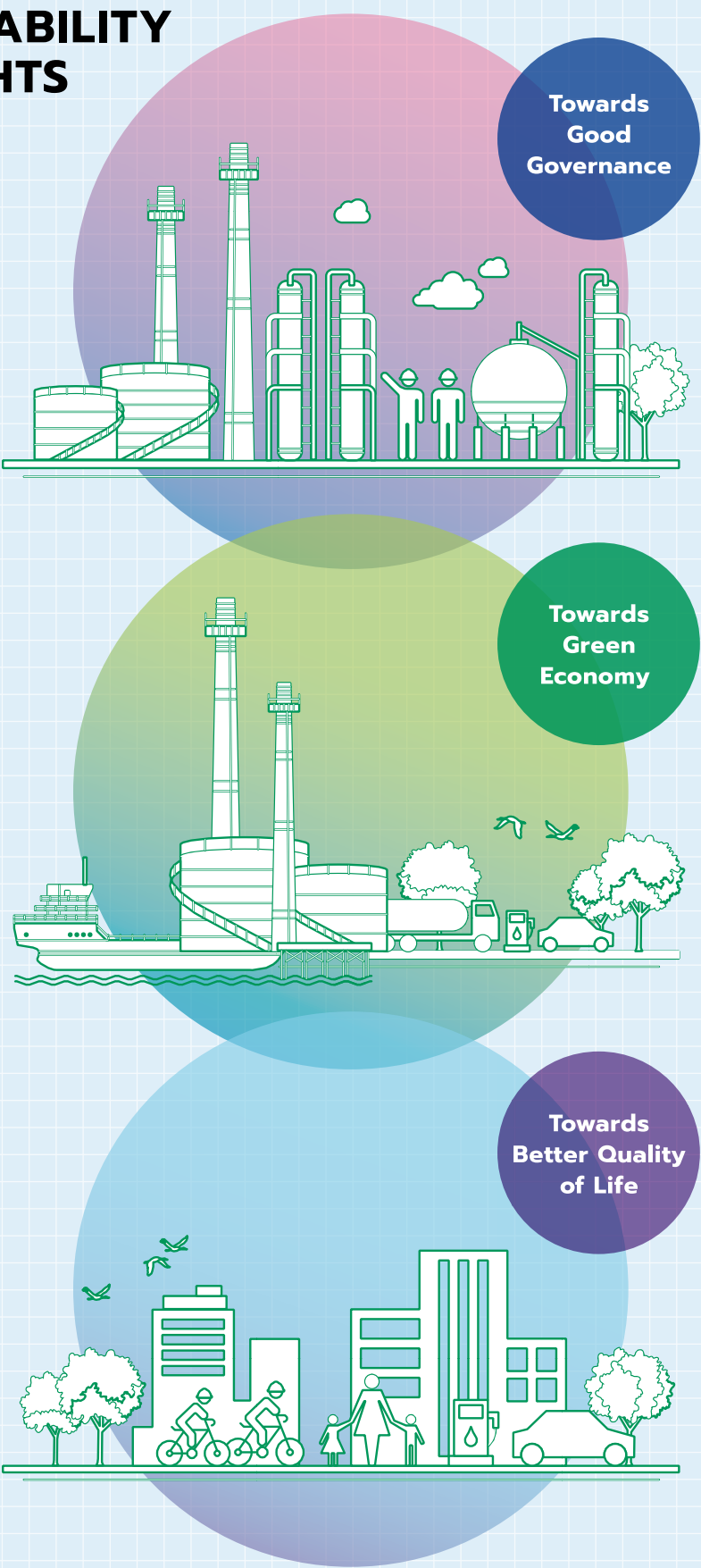
2020  
**89,659**

2019  
**139,252**



Remark: the 2020 dividend payment of 0.70 THB per share will be presented to the Annual General Meeting 2021 for further consideration.

SUSTAINABILITY  
HIGHLIGHTS



Towards Good Governance

Enhancing transparency through efficient corporate governance systems



Social and Relationship Capital

No human rights complaint  
No corruption case

No violation of business ethics, non-compliance with rules and regulations, or acts that may lead to corruption



Intellectual Capital

Set up the holistic corporate governance, risk and compliance (GRC) monitoring system.



Financial Capital

No fine for non-compliance with laws and regulations

Towards Green Economy

Supporting business growth through environmental responsibility along the value chain of production process



Natural Capital

51,084 tons of carbon dioxide equivalents reduced by implementing energy efficiency improvement initiatives in 2020

85.1 Energy Intensity Index

3.88% reduction in water discharge

Zero waste disposed to landfill

852,409 tons of carbon dioxide equivalents reduced from avoided emission product (Gasohol & Biodiesel) consumed by end users



Social and Relationship Capital

94% supplier satisfaction

98% customer engagement



Manufactured Capital

Infrastructure expansion of Clean Fuel Project  
315,378 tons of carbon credits registered with the Thailand Greenhouse Gas Management Organization (TGO) between April 2019 – March 2020

101% refining capacity



Financial Capital

44% Share of environmentally-friendly product in sales revenue.

Towards Better Quality of Life

Creating a good quality of life through adopting innovation and digital technologies in work processes and building capacity of people in communities surrounding the refinery and society as a whole



Social and Relationship Capital

94.89% community engagement

94 organizations and more than 30,000 beneficiaries that benefited from corporate social responsibility projects



Human Capital

1,328 employee volunteers and a total of 16,470 employee volunteer hours

284 average hours of training and development per employee  
No case of occupational illness



Intellectual Capital

2 registered patents



Financial Capital

2,257 million THB of benefits gained from applying knowledge and innovation to work process improvement

Zero damage from cyber-attacks and associated business impacts



# COVID-19 CONTROL MEASURES



Thaioil Group is aware of the potential effects of the COVID-19 pandemic on the Group’s operations – whether that be on production processes, the safety of the employees and the surrounding communities, or market volatility – and has henceforth been closely monitoring its development since the onset of the virus outbreak in China.

The Company has conducted a business impact analysis and a business opportunity analysis under different scenarios, using data from reputable sources such as McKinsey. We have also established action plans for prevention and response measures that cover our stakeholder groups, and prepared financial response plans (regarding

cash flow and financial strength). Our plans include, among others, actions to manage risks related to crude oil and product prices (Hedging), extend credit payment terms for crude purchases (Crude credit extension), and study of asset monetization.

The outcomes and actions taken following the determined action plans are regularly updated and reported to the Board of Directors. Thaioil has also established the TOP TEAM committee, led by the CEO and relevant functions such as refinery and petrochemicals, finance and accounting, corporate commerce, and corporate strategy, to closely monitor the situations. The committee holds weekly meetings, including crisis communication meetings to share experiences in risk and crisis management in each function’s area of operation.

For communication during a crisis situation, Thaioil has developed crisis communication processes for each stakeholder group. We closely monitor news from different channels, such as social media, in order to ensure that we are able to provide adequate clarification or response to opinions in a timely manner.

## Risk Management Approach

As of present, the Company has implemented COVID-19 prevention and response measures including a standard of practice (SOP), a business continuity plan (BCP), and clear work requirements. These measures ensure that we are able to take action at short notice and appropriately respond to unexpected incidents. Our prevention plan and response measures for the COVID-19 pandemic are categorized into three main principles, called the 3 Principles for COVID-19. These include:



### Principle 1: Human Life as Priority

The Company operates while prioritizing employee safety, and has established three measures:

#### 01 Proactive measures

These measures are to raise public health consciousness and proactive prevention measures. For example, the Company has been providing influenza vaccination, screening visitors, and prohibiting international travel. We have surveillance measures and have been closely monitoring the situation of infections in Thailand and abroad. Furthermore, we have also established the trigger point criteria and the COVID-19 crisis line of command to be referred to in the event of an emergency or crisis. This is split into three phases:

- Phase 0** No infected cases identified in Thaioil Group’s area of operations. The situation should be under regular surveillance and close monitoring by the People Management function.
- Phase 1** Infected cases have been identified in Thaioil Group’s area of operations, but there are no impacts to business. Actions are to be taken by the People Management function.
- Phase 2** Infected cases have been identified in Thaioil Group’s area of operations, and there have been impacts to business. The business continuity plan should be followed, with actions taken accordingly.

#### 02 Preventive measures

These measures include strict control measures for employees working onsite and work from home policies to reduce the risks associated with travel and use of shared spaces among large numbers of people. To support employees work from home without difficulty, we provide office supplies and systems that facilitate working from home, such as Microsoft Teams and Avaya software. For functions that cannot implement work from home and/or need to work at the office or the refinery, the Company has prepared additional workspaces through dispersing personnel across different areas. We also organized the lunch space and adjusted employee pickup and drop-off times to reduce density and the risks of infection. Employees are given essential supplies to reduce infection risks, such as alcohol-based gel sanitizers, masks, and PPE suits for workers. Additionally, the Company has introduced measures to prevent infection risks for employees, their families, subcontractors, and visitors. These measures are recorded and shared via email, the E-News, and posters. Through this communication, recipients are informed of precaution measures and how to act as we remain vigilant of the pandemic. We also share internal, national, and global news updates related to the COVID-19 pandemic to all our employees.

#### 03 Response measures

These measures will be taken in the event that the Company identifies an infected case or a suspected case. If that occurs, the person should immediately isolate him/herself and self-quarantine. Thaioil has put in place plans for such actions with a clear operational plan and responsible person in charge, including a plan to secure substitute employees and prepare residential areas for employees with high risks, in order to ensure that the business can successfully follow through with the business continuity plan.

Thaioil Group has communicated the aforementioned measures to all relevant personnel, including employees, customers, subcontractors, and relevant public health agencies, to make certain that our actions are aligned and coordinated.



### Principle 2: Ensure Business As Usual

To maintain business continuity, the Company has launched the I-COVID Center to act as the central body in coordinating and communicating important information between different functions. We have also defined special measures for Mission Critical Activities (MCA), or activities that need to be carried out continuously, such as our work in the refinery, product distribution, finances, and maintenance. These activities are firstly separated from other activities, with contact between these activities and others are minimized, in order to reduce the risks of infection. There are also specific response plans for these activities identified in the business continuity plan, which outline measures to protect these activities from disruption and prevent impacts on business continuity of the Company.



### Principle 3: Business Continuity Management

The Company has prepared a business continuity plan (BCP) and conducted BCP exercises to prepare our readiness in responding to the COVID-19 pandemic, which will create impacts on the Company. We have also determined measures and standard of operations (SOP) that cover medical considerations to guarantee that our business can continue operating without interruption, even during a state of crisis.

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# ABOUT THAIOIL GROUP



# GROUP OVERVIEW



THAI OIL PUBLIC  
COMPANY LIMITED

Thai Oil Public Company Limited, the largest petroleum refinery business in Thailand, has been operating for 59 years. We have a modern and highly efficient production process that allows us to produce and distribute refined petroleum, and mainly support the domestic petroleum demands. Furthermore, Thaioil extends our value chain to include upstream and downstream businesses in order to maintain business stability.

## Vision

Empowering human life through sustainable energy and chemicals

## 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.

## Corporate Values



● Professionalism	● Ownership and Commitment	● Social Responsibility	● Integrity
● Teamwork and Collaboration	● Initiative	● Vision Focus	● Excellence Striving

Headquarter : **Bangkok, Thailand**

Listed Date in the Stock Exchange of Thailand : **October 9, 2004**

Registered Capital : **20,400,278,730** baht

Percentage of shares owned by PTT PLC. : **45.03%**

Refinery Production in 2020 Approximately :

**277,204** BBL per day

**101%** of nameplate capacity at 275,000 BBL per day

Domestic Distribution

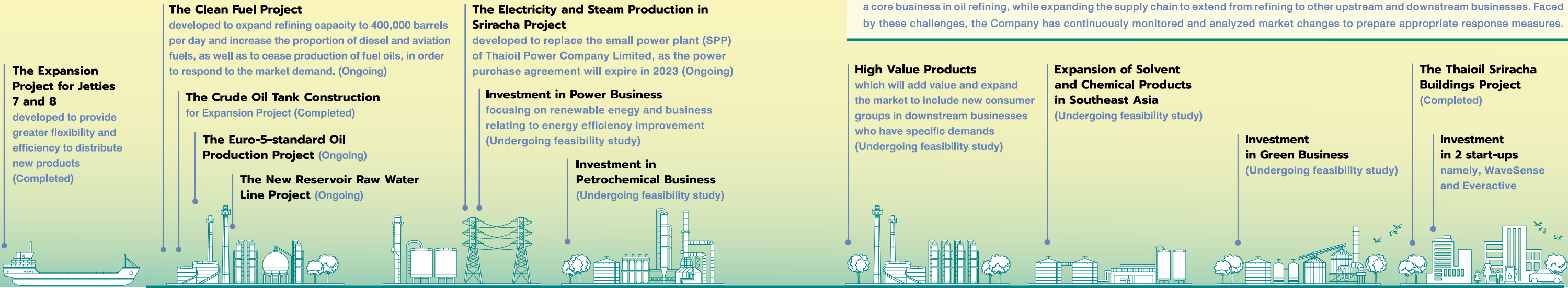
**29%** of total domestic finished oil demand

Locations of operations :

**Thailand, Vietnam, Singapore, Indonesia and Myanmar**



# Thaioil's Value Chain and Market Outlook 2020



<p>01</p> <p><b>Transportation</b></p> <p>Business activities that support marketing, primarily consisting of international marine transportation of petroleum and petrochemical products, with small, medium, and large oil and petrochemical products tankers.</p> <p><b>Petroleum Transportation Industry</b></p> <p>In 2020, the freight rates and vessel demand were highly volatile. In the beginning of the year, freight service rates for vessels transporting petroleum and petrochemical products increased as shipowners saw their costs surge after the enforcement of the International Maritime Organization's (IMO), limiting sulphur content in fuel oil at 0.5%. At the same time, the COVID-19 pandemic have resulted in national lockdown measures, which further contributing to the reduction in vessel demand.</p> <p>Meanwhile, demand for very large crude carriers (VLCC) for floating storage increased following the drop in global oil prices.</p> <p>Demand for offshore supporting vessels and crew boats slightly increased in the first half of the year, but it fell shortly after the COVID-19 outbreak.</p>	<p>02</p> <p><b>Oil Refinery</b></p> <p>Core business with the refining capacity of 275,000 barrels per day.</p> <p><b>Crude Oil Market and Refining Industry</b></p> <p>As a result of impacts from the COVID-19 pandemic, average Dubai crude oil prices fell from 64 USD per barrel in 2019 to 42 USD per barrel in 2020.</p> <p>The refining industry – including gasoline, diesel, and aviation fuels – saw an overall slowdown after several countries around the world enforced national lockdown measures and restricted public activity to contain the spread of the COVID-19 virus. However, the market for fuel oil improved, supported by turnarounds and the production reductions of various refineries around the world.</p> <p><b>Domestic Petroleum Product Market</b></p> <p>Domestic demand for petroleum products decreased by approximately 11.7% following the slowdown in private sector consumption. However, government measures to stimulate spending did bolster petroleum product demand.</p> <p>The average petroleum production of oil refineries in Thailand stood at 884,074 barrels per day in 2020 or down from the same period in 2019 at 993,194 barrels per day due to the reduction in domestic demand for petroleum products. Nonetheless, Thaioil still maintained the highest production share in the country in comparison to other refineries, with a 29% share of total domestic production.</p>	<p>03</p> <p><b>Power and Steam</b></p> <p>Extended business activities that strengthen business stability, primarily consisting of natural gas-fired co-generation power plants, with the generated electricity and produced steam are used within Thaioil Group and other areas of operations, respectively.</p> <p><b>Power Industry</b></p> <p>As of November 2020, the total domestic power capacity in Thailand was 45,477.87 megawatts, increase of 4% from 2019. The peak electricity demand on the EGAT (Electricity Generating Authority of Thailand) power system – excluding the production capacity of independent power supply – declined by 7.18% from 2019 to approximately 28,637 megawatts in 2020. This was mainly caused by the COVID-19 pandemic.</p>	<p>04</p> <p><b>Petrochemicals</b></p> <p>Business activities that utilize the by-products to add value within the oil refining value chain, consisting of the production of aromatics and linear alkyl benzene (LAB).</p> <p><b>Aromatics Market</b></p> <p>In comparison to 2019, the paraxylene market slowed down due to market surplus. The oversupply was caused by the commissioning of new petrochemical plants in China and other locations, which together led to a historical increase in the supply of 8.1 million tons per year. Meanwhile, an eventual state of over supply also drove petrochemical plants with high costs to adjust and reduce production levels. At the same time, the COVID-19 pandemic contributed to the reduction in paraxylene demand by approximately 3.3 million tons per year.</p> <p>The benzene market improved after prices increased following the de-escalation in the US-China trade war. However, the market still face an ongoing pressure from new petrochemical plants, which have added around 3.2 million tons per year in benzene supply.</p> <p><b>Linear Alkyl Benzene (LAB) Market</b></p> <p>Linear alkyl benzene (LAB) prices fell from 2019 levels following the decline in feedstock prices that resulted from the global economic slowdown, which placed downward pressure on global oil prices. However, the average difference between LAB and feedstock prices significantly increased from 2019, mainly because demand in the Asia-Pacific region continued to grow alongside increasing populations and quality of life in developing countries. On the other hand, LAB supply in the region decreased due to unplanned shutdowns in production plants in China, and ultimately led to tightening supply in the latter half of the year.</p>	<p>05</p> <p><b>Lube Base</b></p> <p>Business activities that utilize the by-products to add value within the oil refining value chain, consisting of the production of lube base oil, bitumen/asphalt, and treated distillate aromatics extract (TDAE).</p> <p><b>Lube Base Oil and Bitumen Market</b></p> <p>The lube base oil market weakened, which resulted in a reduction in lube base oil demand by 17%. The eventual reduction was contributed by impacts of the COVID-19 pandemic, along with the market surplus resulting from the commissioning of new Group II and Group III base oil production plants in the region.</p> <p>Meanwhile, bitumen prices in Asia also declined from 2019 following the drop in oil prices caused by the Russia-Saudi Arabia oil price wars. However, the price difference between bitumen and fuel oil increased, mainly due to the decrease in fuel oil prices and the reduction in refining capacity after fuel oil demand in the region fell.</p>	<p>06</p> <p><b>Solvents</b></p> <p>Business activities relating to the distribution of by-products from the refinery to joint venture companies to produce solvents and distribute to markets in Thailand and Asia-Pacific.</p> <p><b>Solvent Market</b></p> <p>Demand for solvent products fell across various industries, while domestic and foreign supply flooded the market since 2019. These factors contributed to intense competition in the beginning of the year.</p> <p>The economic recession in Thailand resulted in a reduction in demand for solvent products, which further contributed to the decline in sales volume and resulted in an ongoing price competition. Additionally, during the first half of the year, there was a market surplus in Asia – especially in China, Korea and Japan, which then later overflowed into the ASEAN market. However, in the second half of the year, after some producers had to reduce production capacity or shut down their plants for turnarounds, the market saw shortages for certain product types. In the last quarter of the year, there were also issues in marine transportation concerning delayed delivery and freight rates that had significantly increased, especially for ISO tank delivery and full container load delivery. Thus, some product deliveries from overseas did not arrive on time, and contributed to aforementioned solvent product shortages, resulted in the price of imported solvents to increase until the end of the year.</p>	<p>07</p> <p><b>Ethanol</b></p> <p>Business activities that support the production and use of renewable energy.</p> <p><b>Ethanol Market</b></p> <p>Domestic ethanol demand for blending gasohol fell by 6.8% from 2019 to 4.1 million tons per year in 2020. Additionally, the sales of vehicles that are compatible with gasohol E20 and E85 declined from the previous year as a result of economic conditions. However, the government continued to implement policies to promote ethanol consumption to accomplish the targets that had been established in the energy conservation plan, and to ultimately drive and promote gasohol E20 as the primary petrol.</p> <p>In 2020, the domestic ethanol supply continued to exceed domestic demand. Although ethanol inventory had reduced by 33.3% from the previous year, which mainly caused by the reduction in molasses-based ethanol production. Meanwhile, the cassava production in Thailand has slightly increased due to the expansion of cassava cultivation, resulting in a larger proportion gained from the cassava-based ethanol production.</p>	<p>08</p> <p><b>Other Supporting Businesses</b></p> <p>including:</p> <ul style="list-style-type: none"><li>- Recruitment</li><li>- Financial Management Services</li><li>- Social Enterprise</li><li>- Digital and Communications</li><li>- Engineering Expertise</li></ul> <p>09</p> <p><b>New Opportunities Business</b></p> <p>Business activities relating to investments in corporate venture capital funds to capture new business opportunities in new industries (step out) and support new business expansion (new S-curve).</p>
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Business Model

The Macro Environment

The global situations especially the COVID-19 pandemic has changed the nature of business operations. Thaioil recognizes the importance of setting short- and long-term strategic directions which are resilient and effective to cope with ever-changing business risks & opportunities to ensure sustainable growth and create long-term sustainable value to stakeholders. (see Strategy Outlook p.24-29)

Financial Capital

Capitals/Inputs

The financial resources raised, consisting of debt and equity financing which are amounted to 120,118 and 144,361 million THB, respectively, is being strategically allocated by Thaioil to ensure organizational growth, and align with the strategic direction plan. In 2020, Thaioil's operating expenses were 255,300 million THB to support our business activities.

Manufactured Capital

Thaioil's investment in the purchase, development and maintenance of infrastructure to maintain production efficiency. In 2020, Thaioil's Property, Plants & Equipment (PPE) and capital expenditures were 145,225 and 47,032 million THB, respectively.

Natural Capital

Thaioil understands natural resources are limited and irreplaceable, such as energy and water, play a critical role that supports our refining and business activities. In 2020, Thaioil's refinery throughput was 13.5 milliontons; and total water and energy consumption were 22 million m³ and 28 million GJ, respectively. In addition, 19 implemented energy improvement projects have enabled the organization to reduce our dependence on natural resources.

Human Capital

People are Thaioil's most valuable assets, our 1,749 employees are the pillar that supports organizational growth, and Thaioil has invested 422 million THB and 94,716 training hours in employee training and development.

Social and Relationship Capital

To create an enabling environment for Thaioil's operations, we believe engaging with our financial and non-financial stakeholders are essential to grow and maintain trusted relationship sustainably. In 2020, Thaioil spent 118 million THB through community development programs and donations.

Intellectual Capital

Thaioil's intellectual capital lies in our people. We not only focus on operational excellence, but we also focus on building innovative culture within the organization, knowledge management, and digital transformation projects. In addition, around 80 million THB was spent for reserch and development.



Outputs

Products

Refined oil 277,204 barrels per day	LAB (Linear Alkyl Benzene) 126,500 tons
Aromatics 591,730 tons	Ethanol (TET) 186 million liters
Lubricants 235,897 tons	TDEA, TRAE & AROS 83,345 million tons
Generated power 2,528 GWh	Green solvent 2,743 million tons

Emission and Wastes

GHG Emissions (Scopes 1 and 2) 3.03 million tons of CO <sub>2</sub> equivalent
Wastes 10,820 tons
Wastes to landfill 0 ton
Water discharge 17.43 million m <sup>3</sup>

Sustainable Value

Delivering on our purpose and contribution to the SDGs will be essential for long-term shared value creation together with our stakeholders and to Thaioil. (see SDGs Progress p.166-170)

Outcomes to Thaioil

- EBITDA -2,055 million THB
- + 112.4 million THB in cost saving from energy improvement project
- + 207 million THB in cost savings from collaborating with partners for crude oil co-loading project
- + 0 incident and penalty fee from noncompliance with laws and regulations, as well as case of corruptions and bribery
- + 106,248 million THB of revenues from low-carbon products

- + Operational availability to enhance 101% of nameplate refinery capacity
- Gross Refining Margin (GRM) of 1.9 US dollar per barrel, which decreased by 47% from previous year

- + 16% GHG emission reductions, compared with business-as-usual (BAU)

- Employee turnover rate increased from 2.44 to 2.69%
- + Employee engagement increased from 90% to 92%

- + 94.87% community engagement, increased from 93.32%
- + 98% customer engagement, increased from 93%
- + 94% supplier satisfaction, increased from 93%

- + 2 registered patents from gained knowledge on managing oil refinery efficiency
- + Zero damage from cyber attack

Outcomes to Stakeholders

- Market capitalization 120,118 million THB
- Earnings per share 1.62 THB
- Average daily closing stock price at 43.95 THB per share
- Dividend payment at 0.70 THB per share
- + Government tax payment at 647 million THB

- + Long-term benefits towards investors through investments in purchases, construction, and maintenance of property, plants, and other equipment.

- + Reduce dependence on external freshwater resources by 46% through desalination
- + Reduce dependence on external natural gas resources by 0.76 GJ as a result of energy efficiency improvement projects 51,084 million tons of CO<sub>2</sub> equivalent reduced through energy efficiency improvement projects to limit greenhouse gas emissions from production processes
- + 852,409 million tons of CO<sub>2</sub> equivalent reduced through low carbon products sales

- + 284 average hours of training per employee
- + 4,701 million THB of employee welfare
- + 0.29 cases/million work hours of Total Recordable Injury Rate (TRIR) for employee and contractor, which was better than the target

- + 3,809 people benefited from participating in Thaioil's Dental Clinic Project
- + 53,642 persons benefited from the use of the Health and Learning Center
- + 1,328 employees who volunteered a total of 16,470 hours to work with communities

- + To ensure our people are equipped with right knowledge and skill set in a fast-moving world, Thaioil has organized a number of knowledge sharing initiatives to assist with their transition. Example of these initiatives include "Innovation Talk from well-known keynote speakers", "Thaioil Innovation Awards" and "Thaioil Learning and Innovation Day"

Covid-19 Impact

Thaioil recognized that COVID-19 had significant impacts on capitals and business directions. Managing each capital will be crucially of importance to Thaioil to maintain competitiveness within the industry. (see COVID-19 control measure p.8-9)

Covid-19 Impacts on Capitals

In the midst of the COVID-19 pandemic, managing corporate financial liquidity will be of critical importance for Thaioil in creating long-term sustainable value for our stakeholders. A review of our performance is provided in the following chapters:  
• Message to our stakeholders (p.2-3)  
• Strategy Outlook (p.24-29)

Maintaining refining efficiency during the COVID-19 pandemic is a challenge therefore Thaioil has maintained the refining capacity at the sufficient level to prevent supply disruption through our value chain, and ensure returns to our stakeholders are maximized. A review of our performance is provided in the following chapters:  
• Market Outlook (p.12-13)  
• Strategy Outlook (p.24-29)  
• Operational Eco-efficiency (p.72-82)

The impact of the COVID-19 pandemic has reduced global oil demand. As a result, the utilization of natural resources in the production process decreases, and together, it reduces the impact on society and the environment as a whole. A review of our performance is provided in the following chapters  
• Market Outlook (p.12-13)  
• Climate Change Actions (p.66-71)  
• Operational Eco-Efficiency (p.72-82)  
• Sustainable Procurement (p.84-91)

The impact of COVID-19 pandemic has prompted Thaioil to establish preventive measures to control the spread of the virus to personnel in the organization, while maintaining the effectiveness of continuous human resource development is of utmost importance that will the organization to its goals that are aligned with the corporate strategy. A review of our performance is provided in the following chapters  
• Human Rights (p.42-47)  
• Occupational Health and Safety (p.98-106)  
• Human and Organizational Development (p.107-117)

The COVID-19 pandemic impacts on all stakeholder groups therefore Thaioil has continually engaged with our stakeholders through various communication channels and engagement activities. This enables Thaioil to understand the needs and expectations of its stakeholders during the epidemic, and therefore, the engagement level of all groups of stakeholders is high. A review of our performance is provided in the following chapters  
• Human Rights (p.42-47)  
• Human and Organizational Development (p.107-117)  
• Corporate Social Responsibility (p.130-145)

The impact of COVID-19 pandemic has changed organizational working pattern, Thaioil has adopted a knowledge management strategy through applying technology and digital systems to promote innovation within the organization, and to foster innovation awareness of our people to accommodate their transition towards digital transformation. A review of our performance is provided in the following chapters  
• Product and Service Stewardship (p.92-95)  
• Human and Organizational Development (p.107-117)  
• Digital Transformation (p.118-124)  
• Innovation (p.125-129)

SDGs Impacted



# STAKEHOLDERS AND MATERIAL MATTERS

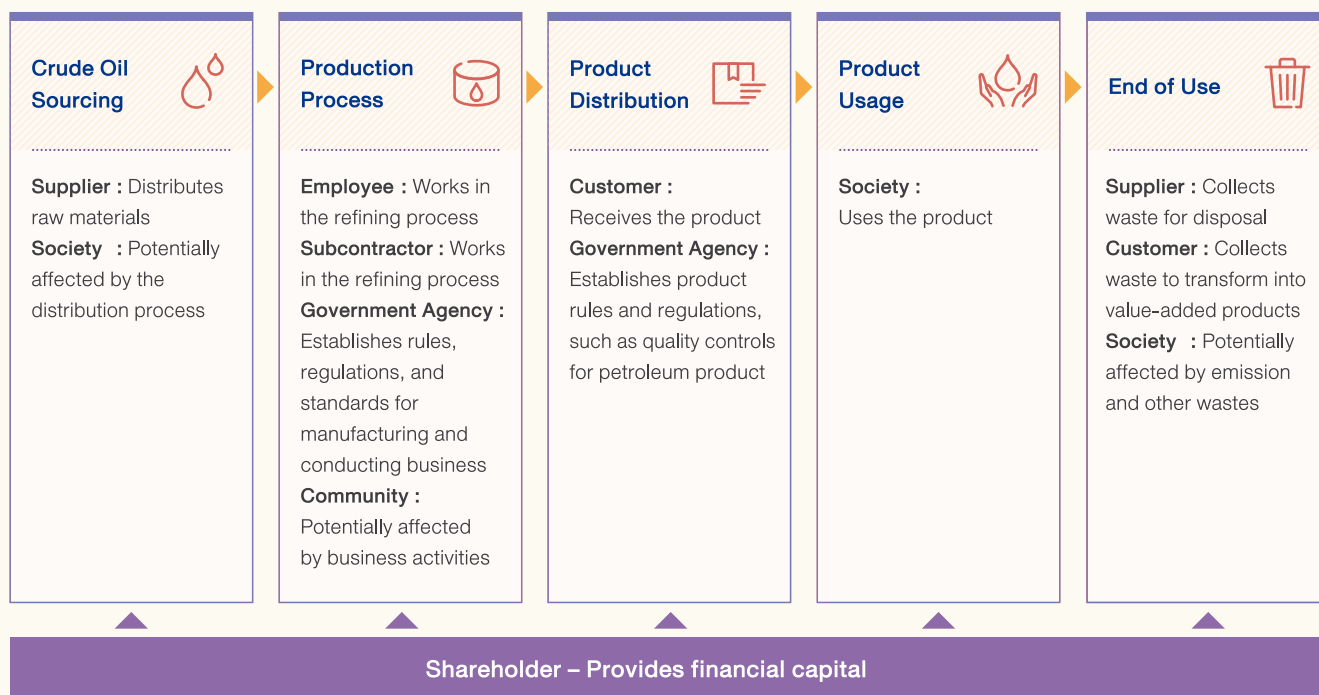


## Stakeholder Engagement

Maintaining good stakeholder relationships are vital in creating long term business value for businesses. To that end, Thailoil has established internal functions to ensure that we are in continuous communication with each of our stakeholder groups, and are aware of their viewpoints and expectations of the Company's business activities.

Thailoil has identified the stakeholder groups that are relevant to our organization through evaluating the relevance of each group across our value chain – from receiving crude oil inputs to the disposal of waste after product use. In identifying stakeholder groups, we also assess the impact and influence levels, as shown in the diagram below.

## Stakeholders along the Value Chain



Based on the value chain analysis, Thailoil grouped the identified stakeholders into six main groups, and developed appropriate engagement approaches for every stakeholder group accordingly. However, the COVID-19 pandemic has affected the method and frequency in communication, leading to increased reliance on online communications, as demonstrated in the table below.

Stakeholder Engagement Approach							
Frequency	Engagement Approach	Shareholders/ Creditors/Financial Institutions	Customers	Suppliers/ Contractors	Employees	Community/ Society	Government and Related Public Agencies
Annual	Face-to-Face Meeting				• Labour Union Meeting		
	Virtual Meeting	• Annual General Meeting (AGM)		• Supplier Seminar			
	Survey	• Feedback survey	• Online Customer Engagement Survey	• Online Supplier Engagement Survey	• Online Employee Engagement Survey	• Community Engagement Survey	• Feedback survey
	Annual Reporting	• Annual Report • Integrated Report	• Annual Report • Integrated Report	• Annual Report • Integrated Report	• Annual Report • Integrated Report	• Annual Report • Integrated Report	• Annual Report • Integrated Report
Quarterly	Virtual Meeting	• Meeting with analysts and rating agencies			• “CEO Connect” Forum (Live)		
	Survey	• Feedback survey				• Survey on feedback for various activities	
	Press Release	• Press release on business performance					• Press release on business performance
Bi-Monthly	Pamphlets					• Pamphlets	
Monthly	Face-to-Face Meeting				• Joint meetings between management and employee representatives, such as the welfare committee and the employee committee	• Meetings with community leaders • Tripartite meetings between Thailoil, government agencies, and communities • Events with small Thailoil teams and communities	• Meetings with representative from government and relevant public agencies • Tripartite Meetings between Thailoil, government agencies, and communities
						Remark: During the COVID-19 pandemic, events were either held off or cancelled.	
	Virtual Meeting		• Meetings with customer representatives				
	Magazines				• The “Akanee” monthly magazine		
	Newsletters and online news	• Newsletters or online news	• Newsletters or online news		• Newsletters or online news		

Frequency	Engagement Approach	Shareholders/ Creditors/Financial Institutions	Customers	Suppliers/ Contractors	Employees	Community/ Society	Government and Related Public Agencies
Weekly	Newsletters and online news		• Newsletters or online news		• Newsletters or online news		
Always Accessible	Engagement Activities	<ul style="list-style-type: none"> <li>• Post-event engagement for feedback</li> <li>• 8-10 Exhibitions, seminars, and roadshows for investors (both domestic and foreign investors) per year</li> </ul>	<ul style="list-style-type: none"> <li>• Customer engagement during ceremonies and festivals</li> <li>• Engagement for feedback</li> </ul>	<ul style="list-style-type: none"> <li>• Activities promoting workplace safety, such as providing awards for outstanding supplier performance</li> </ul>	<ul style="list-style-type: none"> <li>• Employee visits conducted by People Management function to touch base and have conversations</li> <li>• Communicating through digital platforms and notice board</li> </ul>	<ul style="list-style-type: none"> <li>• Visiting communities onsite with project partners</li> <li>• Community development projects, such as school activities and community activities</li> <li>• Communicating through social media and digital platforms</li> </ul>	
	Virtual Meeting	<ul style="list-style-type: none"> <li>• Participation in at least 4 events organized by the Stock Exchange of Thailand (SET) per year</li> </ul>		<ul style="list-style-type: none"> <li>• Supplier and contractor meetings in accordance with the procurement process</li> </ul>			
	Communications through company newsletters or other applications	<ul style="list-style-type: none"> <li>• TOP IR application</li> </ul>	<ul style="list-style-type: none"> <li>• TOP Energy Application</li> </ul>	<ul style="list-style-type: none"> <li>• Email communications as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Applications to access welfare benefits and other activities, such as 'Jam Saab'</li> </ul>		
	Grievance Mechanisms	<ul style="list-style-type: none"> <li>• Hotline</li> <li>• Investor Relations Function</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>	<ul style="list-style-type: none"> <li>• Hotline</li> <li>• Online customer complaint channel</li> <li>• Customer Relations Function</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>	<ul style="list-style-type: none"> <li>• Supplier Relations Function</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>	<ul style="list-style-type: none"> <li>• Hotline</li> <li>• I-COVID center</li> <li>• Employee Relations Function</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>	<ul style="list-style-type: none"> <li>• Hotline</li> <li>• Community Relations Function</li> <li>• Thaioil Group Community Health and Learning Center</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>	<ul style="list-style-type: none"> <li>• Government Affairs Function</li> <li>• Corporate Governance Function Email</li> <li>• Corporate grievance channel</li> </ul>

## Thaioil Group's Materiality Assessment Process

Thaioil assessed significant sustainability issues and its materiality to our stakeholders and business in accordance with the Global Reporting Initiative (GRI) Standards. In this process, we also adapted the value creation concept in managing material matters, which aligned with the International Integrated Reporting Council (IIRC) Framework. The process presented in this Report has also been externally verified.



## Thaioil Group's Materiality Assessment Process



In 2020, Thaioil adjusted the materiality assessment timeline such that the assessment took place at the start of the year. Outcomes of the materiality assessment were then used to inform the development of the organization's sustainability strategy in the Strategic Thinking Session. This supported the company in planning, setting targets, and managing the six capitals – namely, financial capital, manufactured capital, natural capital, human capital, intellectual capital, and social and relationship capital.

### Step 1: Identification of material matters

Thaioil identified material sustainability issues in 2020 through analyzing both internal and external drivers. **Internal drivers** reflect results of our SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis, our short-term, medium-term, and long-term business strategic directions, and our corporate risk profile. **External drivers** reflect issues of interest communicated by the Dow Jones Sustainability Indices (DJSI), the material matters identified by other oil refining companies, the United Nations' Sustainable Development Goals (SDGs), and national and global trends as identified by reputable organizations, such as the World Economic Forum (WEF). Upon compiling these internal and external drivers, we then reviewed the information to determine if there were any additional material matters that should be added in comparison to the previous year.

### Step 2: Prioritization of material matters

Thaioil prioritized the material sustainability matters identified in 2020 through reviewing the prioritization results of the previous year while considering the external drivers that may affect the business and the organization's stakeholders. We also considered the impacts resulting from the COVID-19 pandemic on business direction in different areas of the business. All material matters were grouped into high, medium, and low levels of importance based on a 1-7 point scoring criteria. Each material matter was then prioritized based on two dimensions, including:

- 1 Impact and importance to Thaioil's ability to create value, and
- 2 Impact and importance to the stakeholders.

### Step 3: Validation of material matters

The Sustainable Development function was the first line to review the results of the prioritized material matters to ensure completeness. The results were then presented to the Sustainable Development Committee in a meeting chaired by the President and CEO for a final review and endorsement of prioritized material matters within the scope of both internal and external impacts. Finally, Thaioil grouped together material matters that were similar, and consolidated the 30 sub-topics into 16 main topics.

Additionally, an external independent verifier was invited to ensure that the materiality assessment process, stakeholder engagement process, and the collection and compilation of data related to our safety and environmental performance have all been done with accuracy, clarity, and completeness. The assurance statement is presented on page 160-161

## Results of 2020 Materiality Assessment

The 2020 materiality assessment found that there are changing external contexts that have had effects on the expectations of stakeholders. These changes have also created both positive and negative impacts on stakeholders and Thailoil's ability to create long-term value. The COVID-19 pandemic in particular has altogether disrupted the global economy and changed consumer behavior. Observation of such behavior changes include reducing in transportation and fuel consumption, increasing use of digital systems for social distancing, rising health concerns, and crisis management. These factors have resulted in the addition and adjustments of Thailoil's material issues from the previous year as follows:



Crisis and risk management has increased in importance.



Digital transformation, which encapsulates the organization's capacity to respond to cyber-attack risks, has been added as a material matter.



Business diversification to adapt to the new normal has been added as a material matter.



Equal treatment, including adequately communicating and enacting measures to care for the health of workers and all relevant personnel in the business, has been added as a material matter.

## 2020 Materiality Matrix

✓ Impact and Importance to Stakeholder



Economic / Governance


















Social







Environment

➤ Impact and Importance to Business's Ability to Create Value

Sustainability Context	Risks, Opportunities, and Impacts on Business	Expectations and Viewpoints Expressed by Stakeholder Group Representatives	Related Material Sustainability Matter	Sustainability Strategies to manage materiality matters			Details of Management Approach
				Towards Good Governance	Towards Green Economy	Towards Better Quality of Life	
COVID-19 Pandemic	• Oil production volume has declined as domestic and international demand for oil have been disrupted.	• Shareholders/creditors/ financial institutions expect Thairoil to build financial stability by finding more secure revenue streams.	 Business Diversification				Page 24-29
	• Infection risks in the area of operations could lead to operational disruption for at least 14 days.	• The government and related public agencies expect Thairoil to have adequate social distancing measures.	 Risk and Crisis Management				Page 8-9
		• Different stakeholder groups expect that Thairoil will provide appropriately respond to the crisis and associated risks. This includes providing a decent working environment that allows all relevant personnel to maintain good health while working.	 Occupational Health and Safety			•	Page 98-106
			 Digital Transformation			•	Page 118-124
			 Human Rights			•	Page 42-47
Climate Change	• Greenhouse gas reduction policies that lead to more stringent enforcement of regulations on GHG emissions and environmental management may expose Thairoil to potential business costs in case of noncompliance with the new laws and regulations.	• Shareholders/creditors/ financial institutions expect Thairoil to report the approach on business adaptation and use of innovation in order to confront future challenges, especially the risks from changes in the oil and gas industry.	 Climate Change Risk			•	Page 66-71
	• Technological changes driving towards the use of alternative energy in replacement of oil as an energy source is likely to occur rapidly and will impact the energy industry. The enforcement of various regulations that would promote alternative energy usage instead of oil may also impact long term revenue and business growth.	• The government and related public agencies expect that Thairoil will invest in environmental projects, such as environmentally friendly fuels and renewable energy, to support the achievement of Thailand's national greenhouse gas emission reduction targets.	 Environmental Management			•	Page 60-64
	• Investment opportunities in new businesses that reduce the impacts on climate change.	• Communities expect that Thairoil's corporate social responsibility strategy will include renewable energy projects.	 Product and Service Stewardship			•	Page 92-95
	• Impacts of physical risks from climate change on water resources.		 Corporate Social Responsibility			•	Page 130-134

Sustainability Context	Risks, Opportunities, and Impacts on Business	Expectations and Viewpoints Expressed by Stakeholder Group Representatives	Related Material Sustainability Matter	Sustainability Strategies to manage materiality matters			Details of Management Approach
				Towards Good Governance	Towards Green Economy	Towards Better Quality of Life	
<b>Operational Eco-Efficiency</b>	<ul style="list-style-type: none"> <li>The movement towards circular economy principles is driven by Thai and foreign governments, as seen in recent initiatives to increase recycling and the ban on single-use plastic.</li> <li>Social and consumer trends that move towards the circular economy create expectations on businesses to reduce environmental impacts throughout the product life cycle, which may create impacts on reputation, revenues, and long-term business growth</li> <li>The opportunity to adapt business operations to be more in line with circular economy principles reduce production costs and maximizes efficiency in extracting and consuming of limited resources.</li> </ul>	<ul style="list-style-type: none"> <li>Shareholders/creditors/financial institutions expect Thailoil to continuously increase energy efficiency.</li> <li>Suppliers/contractors expect Thailoil to promote supplier environmental, social, and governance performance, in line with Thailoil's policies.</li> <li>The government and related public agencies expect Thailoil to manage energy efficiency to support the country in achieving national greenhouse gas reduction targets. They also expect that Thailoil will reduce impacts on air quality, which could lead to other business opportunities to further reduce the impacts, such as the Euro 5 fuel products.</li> <li>Communities expect that Thailoil will promote the attainment of knowledge related to energy in order to support sustainable standard of living.</li> </ul>	 <b>Operational Eco-Efficiency</b>		•		Page 72-83
			 <b>Product and Service Stewardship</b>		•		Page 92-95
			 <b>Sustainable Supply Chain</b>		•		Page 84-91
			 <b>Corporate Social Responsibility</b>			•	Page 130-145
<b>Demographic Changes</b>	<ul style="list-style-type: none"> <li>Global aging population trends are especially relevant in Thailand, a country with one of the most rapidly aging populations in the world, and associated potential business impacts are unable to manage retirement, especially for businesses such as Thailoil that is seeking to expand.</li> <li>The new generation's (Millennials and Gen Z) behavior and expectations of the workplace, and the differences of such behavior and expectations from existing workplace practices, may lead to challenges in recruitment and eventual labour shortage without adaptation to attract this demographic. This is especially relevant in the context of business expansion.</li> </ul>	<ul style="list-style-type: none"> <li>Shareholders/creditors/financial institutions, customers, suppliers/contractors, and communities expect that Thailoil's employees will have the capacity to adequately respond to stakeholders' expectations.</li> <li>Employees expect that Thailoil will develop employee' capabilities to support business expansion, and provide a working environment that is fitting to their needs.</li> </ul>	 <b>Human and Organization Development</b>		•		Page 107-117
			 <b>Talent Attraction and Retention</b>			•	Page 107-117



Sustainability Context	Risks, Opportunities, and Impacts on Business	Expectations and Viewpoints Expressed by Stakeholder Group Representatives	Related Material Sustainability Matter	Sustainability Strategies to manage materiality matters			Details of Management Approach
				Towards Good Governance	Towards Green Economy	Towards Better Quality of Life	
Innovation and Digitalization	<ul style="list-style-type: none"> <li>Risks in transitioning to the digital age in the oil refinery business, especially with regards to ensuring that there is enough workforce and talent to support this digital transformation, may affect the Company's ability to compete.</li> </ul>	<ul style="list-style-type: none"> <li>Shareholders/creditors/ financial institutions expect Thaioil to report the approach on business adaptation and use of innovation in order to confront future challenges, especially the risks from changes in the oil and gas industry.</li> </ul>	 Human and Organization Development				<ul style="list-style-type: none"> <li>Page 107-117</li> </ul>
	<ul style="list-style-type: none"> <li>Opportunities to increase operational efficiency through the use of technology.</li> <li>Opportunities to invest in new technologies that create long term revenue growth.</li> <li>Risks from cyber threats and data theft.</li> </ul>	<ul style="list-style-type: none"> <li>Customers expect Thaioil to maintain product quality, especially in the context of business expansion with the CFP Project, and use innovation to meet customer demands and secure customer satisfaction.</li> </ul>	 Innovation Management				<ul style="list-style-type: none"> <li>Page 125-129</li> </ul>
		<ul style="list-style-type: none"> <li>Employees expect Thaioil to be an agile organization that is able to improve operations to respond to customer and consumer needs in a timely manner, adapt to the changing business context in a timely manner, and improve human resource management.</li> </ul>	 Digital Transformation				<ul style="list-style-type: none"> <li>Page 118-124</li> </ul>
ESG Reporting	<ul style="list-style-type: none"> <li>Increased awareness of responsible investment that considers environmental, social and good governance aspects amongst investors of various institutions in both the global and national levels, as evidenced by the development of the Thailand Sustainability Investment (THSI) and the Negative List Guideline of the Government Pension Fund, may impact on business in terms of reputation and revenue if management of such issues are inadequate.</li> </ul>	<ul style="list-style-type: none"> <li>Suppliers/contractors expect Thaioil to treat all suppliers equally, with fairness, and without bias.</li> <li>The government and related public agencies expect Thaioil to continue to strengthen measures to fight against corruption.</li> </ul>	 Fight Against Corruption				<ul style="list-style-type: none"> <li>Page 48-55</li> </ul>

# STRATEGY OUTLOOK



Upon finalizing the outcomes of Thailoil Group's sustainability material matters, the matters with high materiality are used as reference in the strategic planning process, in conjunction with the business plans, to formulate the sustainability management strategic plan along with target setting and resource allocation to ensure the strategic plan is being executed as planned.

Thailoil Group's vision is to operate business while "Empowering Human Life through Sustainable Energy and Chemicals". This means our goal is to become a high competitive energy and chemicals company that will generate sustainable returns to all our stakeholders, increase their quality of life, and drive sustainable growth within the organization, all while maintaining the balance across the economic, social, environmental, and governance dimensions.

In 2020, we observed high rates of volatility and recurring economic and political instability across our country, region, and the world – including the COVID-19 pandemic crisis. This brought about large, abrupt changes in how business is conducted and how we live our lives, and further reiterated to Thailoil Group the importance of increasing the resilience of our strategic plan in order to adapt to the changes and trends of this unpredictable context. Henceforth, the Company has revisited the strategic direction and plan, including the short-term, medium-term, and long-term business plans – altogether spanning the years 2022-2030 – and reformulated it into three main business directions and strategies. In this process, we have considered global megatrends, analyzed competitor movements, and studied the 'new normal' context and associated changes in society and consumer behavior, to make certain that Thailoil has the appropriate business direction and strategic plan in accomplishing our goals that can truly grow our business towards sustainable business growth.

## Three Main Business Directions and Strategies



### Value Maximization

Value maximization involves the integration of the business value chain in both the present and the future, and the search for additional investment opportunities in petrochemical businesses. This serves the purpose of further developing the oil refinery business – our current core business – and expanding towards high value products that are centered on customer needs.

**Oil Refinery Business:** We will fortify our status as the regional leader in the oil refinery and petrochemical businesses, and support national energy security, by aspiring for excellence while conducting business sustainably.

**Aromatics Business:** We will extend the value chain in downstream businesses by continuously seeking business expansion opportunities.

**Olefins Business:** We will seek business expansion opportunities in the olefins business, and take advantage of the benefit of being able to directly use the by-products of our refinery business as the raw material inputs in the future.

**High-value Products Business:** We will add value to our products, and aspire to deliver products to respond to customer needs and gain customer satisfaction, in our chemicals, surfactant, and lube base oil businesses.



### Earnings Diversification

The earnings diversification strategy entails diversifying our investment portfolio to build earnings stability through seeking opportunities in environmentally friendly businesses, and creating new innovative businesses that align with future trends, to increase the resilience of our investment portfolio. Details are outlined below.

**Power Business:** We will uphold power security and generate stable incomes for Thaioil Group through investing in the power business, focusing especially on generating power from renewable energy sources.

**New Businesses:** We will increase the proportion of new innovative businesses through investing in venture capital funds, driving the commercialization of innovation initiatives, and making direct investments in start-ups.



### Supply Chain Management as a Growth Platform

The Supply Chain Management as a Growth Platform strategy encapsulates integrating joint operations within Thaioil Group – from raw material sourcing, customer service, to product delivery within the region – through the management of the product distribution and logistics system, both in the present and in the future, and within Thailand and in the region, in order to strengthen Thaioil Group's competitiveness and support the increased production capacity resulting from the Clean Fuel Project (CFP).

Action plans and time frames  
of the three business strategies



Value  
Maximization



Earnings  
Diversification



Supply Chain Management  
as a Growth Platform



Building competitive advantage in core businesses - e.g. the oil refining business - through the Clean Fuel Project by ensuring that the project is implemented as planned. And, study investment opportunities to build upon the oil refining business - for example, businesses in aromatics, olefins and various chemicals - and develop high value products.



- Expanding power and steam production capacity of TOP-SPP Company Limited to replace the power plant of Thailoil Power Company Limited. This will strengthen Thailoil Group's stability and support electricity and steam consumption of the Group within the Sriracha Refinery area.
- Studying new businesses that align with industry trends and technological changes, especially future energy consumption. Furthermore, exploring business options to expand into bio-business and renewable energy businesses, including environmentally friendly businesses.



Maximizing benefits by managing the supply chain of every product within Thailoil Group, from sourcing to distribution and logistics, to distribute the products to customers and utilize the existing product distribution platforms.

For transportation and storage, focusing on operating efficiently and gaining competitive costs in order to increase profits in business operations. To that end, make use of the services of the Thailoil Group's marine transportation business, and make sure brokering adequately responds to customer needs.



Upon completion of the Clean Fuel Project, exploring investment options to extend the petroleum business towards petrochemicals and high value products businesses in order to meet customer needs and future market.



Focusing on ensuring power security for the Company's core businesses and drive growth in the power business by using a joint strategy to push forward growth as a shareholder of Global Power Synergy Co., Ltd. (GPSC) - PTT Group's flagship electric power company. In addition, advance growth in the development of the power business together with GPSC and other companies in the PTT Group.



Aiming to expand the customer base to target countries and leverage on existing platforms, workforce, and customer base within Thailand and abroad in order to seek new opportunities and increase market share in target countries presently identified - Thailand and Indochina countries such as Cambodia, Laos, Myanmar, Vietnam, Indonesia, and other countries with high economic growth rates through partnerships with suppliers, joint ventures, and mergers and acquisitions (M&A).



In 2030, the goal is to increase the proportion of investments and revenue generated from the high-value product businesses to 20% of total revenues. This is to reduce the level of risk and volatility in the refinery and petrochemical businesses. The share of profits will be 40% from the petroleum business, and 40% from petrochemicals business, high-value products business, and through supply chain management.



Seeking business opportunities and achieve growth in the power business and within the field of new technologies that are in line with industry trends and forecasted changes in energy consumption. By 2030, the share of profits from power business should be 15%, and the share of profits from investments in new businesses led by the corporate venture capital fund should be at least 5%.



Becoming the center of product and service distribution and delivery in Thailoil Group, and strengthen the security of transportation and utilities. Seek joint venture partners, as well as opportunities for mergers and acquisitions (M&A), while focusing on businesses that will find synergy with Thailoil, add value, and contribute to strengthening the Company's value chain. This will support Thailoil in sustainably progressing towards becoming a business leader with the 2030 target, the proportion of revenues from foreign businesses is not less than 30%.

**Plans for Success Enablers: enhancing work related enablers in order to facilitate Thail Group in accomplishing the targets in line with our vision, mission, and strategic directions. These include:**



### Financial Strategic Plan

In the short term, the Company focuses on managing operating expenses, managing and reducing liquidity risks, and securing funding through various financial instruments (innovative funding tool) to maintain operational liquidity. This also includes prioritizing investment projects.

In the long term, the Company will focus on managing the capital structure to create a sustainable capital structure, under study, in order to apply and make use of new financial platforms. For example, we might raise funds through the assistance of cloud funding service providers – a method that relies on crowdsourcing through technology – or raise funds digitally through blockchain offerings.



### Human Resource and Organization Strategic Plan

The Company has revisited the human resource and organization management strategy in order to drive the organization towards the defined business targets under the “Start @ **MIND**” philosophy, the details are as follows:

**Matrix Organization:** Reinforce the existing organizational structure, which is traditionally characterized as a functional structure, by establishing a business unit (BU) functional group to accelerate the development of business and product differentiation more efficiently, and driving towards a matrix organizational structure.

**Intensive Future Workforce Development:** Develop human capital through 1) Developing in-depth expertise with business excellence in the different areas that are important to the organization, and 2) Developing competencies of business explorers with appropriate knowledge and skills. Through these actions, we will increase our ability to drive forward businesses that are not associated with the oil refining business and accomplish the targets set in our business strategy with practical development approaches and methods.

**New Work Life Enrichment:** Foster a sense of balance in employees’ work and personal lives through various well-being projects, such as physical health, emotional health, finance, and society.

**Digitized People Platform:** Enhance work efficiency of our employees by adopting technology in human resource and organization management processes – from recruiting, human capital development, performance evaluation, and building employee engagement (Hire-to-Retire) – through the development of the Digital People Platform.



### Digital Strategic Plan

The Company has a digital strategic plan that consists of three main parts, as presented below:

**Digital for Business & People Excellence Strategy:** strengthening the development of digital technology to develop projects that meet the needs of our business strategy. The strategy consists of three areas, as follows:

- 1) Accelerate development of digital projects that will generate business returns and increase production efficiency
- 2) Expand and seek new digital business opportunities, and
- 3) Focus on developing and changing work processes, alongside developing employee knowledge, to respond to the rapidly changing working environment towards the digital age.

**Platform & Foundation Strategy:** developing digital systems infrastructure in four important areas as follows:

- 1) Reduce the complexity of developed programs and systems, and are user-friendly to customers and users
- 2) Compile and manage the database, and establish the digital governance structure and data management processes to ensure transparency and validity
- 3) Develop infrastructure so that it is modern, resilient, ready for use, reliable, and capable of handling large quantities of data, as well as reduce costs, and
- 4) Enhance cybersecurity, reduce risks and impacts that may result from cyber attacks, and comply with relevant regulations.

**Digital Organization Readiness Strategy:** Improve the operating approach of the digital function – including structure and roles, duties and responsibility, and competency of the digital personnel – to become a partner who knows and understands the organizational strategy and business needs of every function in the organization.





## Sustainability Management Strategic Plan

This management strategic plan serves to uphold the organization's vision to "Empowering Human Life through Sustainable Energy and Chemicals" with a sustainability goal of becoming a 100-year organization, in parallel with being a global leader in sustainability through Environment, Society and Governance (ESG) management to maintain good engagement with all stakeholder groups.

Henceforth, Thaioil has reviewed the sustainability strategic plan to ensure consistency with our vision. This is vital to managing ESG risks and building our competitive advantage. Additionally, this strategic plan is important in guiding us to create the long-term stakeholder value throughout our value chain, while taking in account of various environmental factors and responding to national and global policies. In 2020, the results of our re-evaluation of the sustainability strategy and ESG management are outlined below.

Sustainability Dimension	Strategy	Success Indicators
 Environment	<p><b>Towards Green Economy:</b> supporting the green economy through the following measures:</p> <ul style="list-style-type: none"> <li>Reduce the organization's greenhouse gas emissions by continuously increasing energy efficiency and expanding capacity by investing in renewable power business.</li> <li>Increase the share of revenue from environmentally friendly businesses and products, in effect helping end users reduce greenhouse gas emissions associated with product use.</li> </ul>	<p><b>Top Quartile Performance:</b> reduce net greenhouse gas (GHG) emissions by 15% from business as usual (BAU) by 2030 through implementing the following measures:</p> <ul style="list-style-type: none"> <li>Increase energy efficiency – this has the potential to reduce GHG emissions by 6% from BAU.</li> <li>Invest in renewable power of approximately 1,000 MW – this has the potential to reduce GHG emissions by 9% from BAU.</li> </ul> <p><b>Product or Service with Positive Impact:</b> maintain the proportion of revenue generated from environmentally friendly businesses and products to no less than 25% of all sales revenue from 2023 onwards.</p>
 Society	<p><b>Towards Better Quality of Life:</b> building the capacity of our communities and society to ensure engagement and long-term mutual growth, and support business expansion surrounding the communities (refinery in the city). Social investment will be managed to advance sustainable development and positive impacts.</p> <ul style="list-style-type: none"> <li>CSR for the Community: develop public utilities, improve public health, create green spaces, and promote employment in the communities</li> <li>CSR for the Society: develop public health services in hospitals and medical centers through managing energy efficiency, building pilot renewable energy projects, installing solar cell systems, and continuing to develop infrastructure as well as the development of medical innovations in alignment with the Company's future business projects.</li> </ul>	<p><b>Positive Impact from Social Investment:</b> achieving SROI (social return on investment) value of at least 2:1 by 2023.</p> <p>Conduct engagement survey with the surrounding communities to maintain the target of more than 90% of community engagement score.</p>
 Corporate Governance	<p><b>Towards Good Governance:</b> enhancing transparency with the GRC (Governance, Risk, and Compliance) strategy through three main principles:</p> <ol style="list-style-type: none"> <li>Tone from the top.</li> <li>Strengthen from inside.</li> <li>Balance control and efficiency.</li> </ol> <p>These principles will build strength within the organization through the GRC processes, driven by people, process and technology, resulting in a balance and effective corporate governance system.</p>	<p><b>Zero Case of Non-Compliance and Fraud Incidents</b></p>

# CORPORATE GOVERNANCE AND SUSTAINABILITY



## Board Structure

As of 31 December 2020, the Board of Directors of Thaioil Group had 15 members, including :



**Executive director**  
1 person

**Non-executive directors**  
14 persons, including :



Non-independent  
directors 7 persons



Independent  
directors 7 persons



**The average tenure  
of directors was**  
**3.52 years\***

\*Average data covers 1<sup>st</sup> January - 31<sup>st</sup> December 2020



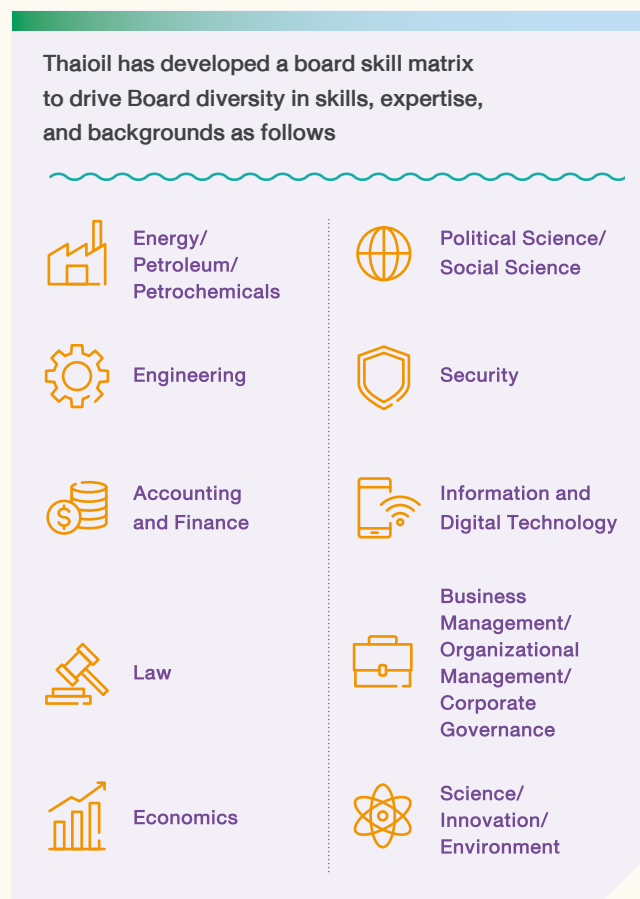
**The average meeting  
attendance of the Board  
of Directors was**  
**97.5%**

Section 5 of the Corporate Governance Guidelines of Thai Oil Public Company (Limited) states that the Board must have at least five and up to 15 directors, and at least half must be permanent residents of Thailand. Directors may be or not be Company's Shareholders. Directors are appointed to the Board either through being elected by shareholders during the Annual General Shareholders' Meeting, or through appointment by the Board in the event that a vacancy has resulted from termination that is not based on service years. Directors must all have qualifications that meet regulatory requirements, and should not possess any characteristics prohibited by the Public Limited Company Act, B.E. 2535 (1992). As stated in Section 6, Chapter 68 of the Public Limited Company Act, B.E. 2535 (1992), they must be sui juris (full age); not be bankrupt, incompetent, or quasi-incompetent; not have been sentenced by a final judgement to imprisonment for dishonesty; and not have been dismissed from a government service or state organization or agency for dishonesty on duty. Furthermore, the Board must have at least one-third of its members be independent directors, and must have at least three independent directors at all times.

In order to ensure that directors can adequately dedicate their time to fulfill their roles and deliver the best interest for Thaioil, all members of the Board must have no more than three directorships in companies listed in the Stock Exchange of Thailand. This number includes the directorship for Thaioil. Additionally, the Company has established guidelines for directors and executives, their partners in marriage and/or cohabitation, and children who are not of age, specifically that if they desire to sell Company securities, they should report to the Company Secretary at least one day in advance, and should report change in information related to holding securities to the Securities Exchange Commission within three days of the date of purchase, sale, or transfer. This is to control use of insider information that has not been disclosed to the public, and to promote fairness for other shareholders, in alignment with good corporate governance principles. In 2020, the Company reviewed the policy to prevent the use of inside information to purchase or sell the company's shares. As a standard for good governance practice, the policy "prohibits directors, management executives, and other persons in close relationships with them from purchasing, selling, or transferring the Company's securities, or from having contractual obligations with futures contracts with the Company's securities, within the one month period prior to

the release of performance results to the stock exchange, or before the public has access to insider information that has the potential to affect the price of the securities.”

In line with good corporate governance practices, the Company annually conducts Board performance assessments. The assessment consists of two parts, including: 1) assessment of the Board and the Board committees, and 2) self-assessment and assessment of other directors. Thailoil also has a policy to conduct an independent, third party Board assessment every three years, in order to gain feedback and recommendations to further improve Board performance.



To ensure that recruitment processes are done to increase Board diversity, the Company will consider implementing practices that cover gender diversity in recruitment, and will continue to recruit without allowing race, ethnicity, nationality, or place of birth to hinder appointment. This follows with international corporate governance principles. The Board of Directors should have the qualifications that are appropriate for the size, type, and characteristics of the Company’s business activities. Appointed directors should also have the required qualifications – including in educational background, knowledge, expertise, skills, experiences, and specialized skills that are relevant to or

beneficial to the Company’s business. Thailoil supports the Board in having a variety of expertise that complements corporate strategy. To that end, the Company has checked and reviewed the list of individuals with appropriate qualifications from the Directors’ Pool of the State Enterprise Policy Office and the Institute of Directors’ Chartered Director (IOD Chartered Director). This list consolidates the names of individuals with different knowledge, skills, and expertise.

On 31 December 2020, 8 of the total 15 members of the Board of Directors had their names listed in the Directors’ Pool of the State Enterprise Office. The Board had 8 independent directors and non-executive directors with knowledge and experience in the energy/petroleum/petrochemicals industry.

Furthermore, Thailoil requires that independent directors must maintain independence from major shareholders, or major shareholder groups, and the Company’s management executives. Directors should be capable of understanding the financial and business information of the Company, and of other businesses, sufficiently enough to provide unbiased opinion to protect the interests of minority shareholders. The Company expects all directors to regularly attend Board meetings. The qualifications of director independence have been clearly stated, and align with and go beyond the standards of the Capital Market Supervisory Board. For instance, Thailoil requires that independent directors limit their shareholding to no more than 0.5% of the total number of shares with voting rights of the Company, parent company, subsidiary, affiliate, major shareholder or controlling person, including shares held by persons related to that independent director. We also require that the terms of office of independent directors be limited to no more than six consecutive years (from the date of the appointment), to facilitate the Board in completing their duties to advance corporate governance, in line with the Company’s strategy. To ensure continuous development of directors’ ability to perform tasks effectively, the Company has a policy to promote development and training for directors, such as training courses provided by the Institute of Thai Directors (IOD), or other courses and/or seminars that are relevant to the Company’s strategy.

In 2020, the Company’s Board attended various courses organized by the IOD, including:

- Successful Formulation & Execution of Strategy (SFE);
- IT Governance and Cyber Resilience Program (ITG);
- Boards that Make a Difference (BMD);
- Risk Management Program for Corporate Leaders (RCL); and
- Ethical Leadership Program (ELP).

## Roles and Responsibilities

Thaioil's Board of Directors and executives has always prioritized good corporate governance, as demonstrated in our mission "to enrich stakeholders' well-being and deliver sustainable returns built upon innovation, technology, and resilient portfolio with top class management and accountable corporate governance". The Board has appointed four committees to oversee specific responsibilities as assigned, and are to regularly report performance and progress to the Board. These include Audit Committee, Nomination and Remuneration Committee, Corporate Governance Committee, and Risk Management Committee. All committees are required to have the qualifications as required by laws and regulations. Thaioil has identified the qualifications, term of office, roles and responsibilities, reporting, and assessment in the charter of each committee.

The roles and responsibilities of the four committees at present are outlined below.



**Audit  
Committee**

The Audit Committee must consist of at least three independent directors that qualify all the requirements of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET). The Committee's responsibilities are to review the Company's operations, financial reporting, internal control processes, as well as to select auditors and examine connected transactions. The Committee ultimately serves to guarantee oversight and functions as a check and balance of the Company's management to ensure that it is conducted accurately and fairly, and maximizes the benefits of all shareholders. The Committee must also have at least one director with adequate knowledge and experience in accounting and finance to inspect the credibility of the financial budget.



**Nomination and  
Remuneration  
Committee**

The Nomination and Remuneration Committee must consist of at least three non-executive directors, most of whom must be independent directors. The Chairman of the Board must not be a member of this Committee. The Committee is responsible for considering the criteria and process for nominating qualified individuals for director and executive management positions, reviewing the succession plan of the CEO and President, selecting qualified Directors to serve in relevant Board committees, proposing remuneration criteria to suit the responsibilities of the Board, conducting the performance evaluation, and considering the appropriate remuneration for the CEO/President before proposing to the Board for approval.



**Corporate Governance  
Committee**

The Corporate Governance Committee must consist of at least three non-executive directors, most of whom must be independent directors. The Chairman of the Board must not be a member of this Committee. The Committee takes on the role of supporting the Board in regularly overseeing, reviewing, and determining the Company's corporate governance policies to ensure alignment with international practices and the good corporate governance principles of regulators such as the SEC and SET.



For the name list and details of the Board of Directors, and the roles and responsibilities of the Board committees, please see further in the 2020 Annual Report, or <https://investor.thaioilgroup.com/ar.html>



### Risk Management Committee

The Risk Management Committee must consist of at least three directors, with the Chief Executive Officer and President, by position, serving as one of the members. The Chairman of the Board must not be a member of this Committee. The Committee defines and reviews the corporate risk management framework, which should be conducive for efficient business operations and in alignment with international standards of practice, and recommends actions to be taken to manage risks corresponding with the Company's strategic direction and business plans. The Risk Management Committee is also charged with supervising, monitoring, and reviewing key risk management reporting on the Company's operational risks, strategic and business risk, investment risk, financial risk, human capital risk, and information security and cybersecurity risk, while providing suggestions to ensure that risk management practices are effective and relevant for the Company's business.



In 2020, the Board of Directors examined, reviewed, and monitored progress in corporate governance practices. Findings can be summarized as follows.



Considered and approved plans and control measures to prevent against the outbreak of the 2019 coronavirus pandemic (COVID-19) in the Annual General Shareholders' Meeting 2020 and the Extraordinary General Meeting of Shareholders No. 1/2020



Reviewed the Company's nomination processes to increase Board diversity



Reviewed the policy to prevent the use of insider information to purchase or sell securities



Reviewed and revised the Thaioil Group Sustainability Management Policy



Monitored the progress of various projects, including the management of submitted grievances, through sharing recommendations and appointing relevant functions to continuously report progress

Moreover, the Board of Directors plays a key role in representing shareholder interests in corporate governance, such that stakeholders can gain confidence in the Company's ability to do business ethically and in compliance with legal regulations. The Board must be independent from the Company's management executives. To that end, the responsibilities of the Board and the Board chairman are separated from the President and CEO.



## Corporate Governance and Code of Conduct Manual

Thaioil has developed a Corporate Governance and Code of Conduct Manual, which includes the Corporate Governance and Code of Conduct Policy and the Anti-Corruption Policy, as well as the Complaint and Whistle-blowing Procedure, to guide our Board of Directors, management executives, and employees in applying our principles of good business conduct in their daily responsibilities. The Manual is centered on our belief in equitable treatment of all stakeholders and respect of all stakeholders' rights, and encourages our people to perform all their duties and responsibilities with honesty, dedication, perseverance, responsibility, and a desire to contribute to goodness in society.

It assigns responsibility to our Board of Directors and executives to lead employees in applying Thaioil values in integrity, fairness, transparency, and accountability in all that we do.

Additionally, Thaioil has embedded the Corporate Governance Policy and Anti-Corruption Policy as part of the Thaioil Group Affiliates Management (TAM) Policy, in order to appoint Company personnel to act as Company representatives to manage Thaioil Group subsidiaries towards the same direction, thus helping the Group achieve long term targets and sustainable development.

## Thaioil Group Sustainability Management Policy

In 2020, to align Thaioil Group's 2030 vision and strategy for business expansion abroad with the UN Sustainable Development Goals (UN SDGs) and the increasingly relevant global ESG trends, the Company has reviewed and published the 2020 Thaioil Group Sustainability Management Policy to fit with the sustainable development context and the operations of the organization. Details are presented below.

Thaioil Group is committed to “empowering human life through sustainable energy and chemicals” in line with the principles and guidance of social responsibility by creating collaboration, trustworthiness, and value for stakeholders through operation excellence, transparency and continuous development in innovation. To achieve sustainable growth in three dimensions: environment, society, and corporate governance, while contributing to the realization of sustainable development goals. The key aspects of Thaioil Group Sustainability Management Policy consist as follows:



### Environment

Operate an environmentally friendly business through

- Using resources efficiently
- Controlling and reducing impacts on ecosystems resulting from business activities
- Mitigating and being more resilient towards climate change
- Applying the circular economy principles



### Social

Responsibly conduct business while considering

- Human rights principles and labour rights protection
- Safety, occupational health, and good working environment
- Continuous management and development of new knowledge, skills, and competency of employees
- The use of organizational expertise to create value and enhance the quality of life in the community and society to achieve sustainable growth



### Governance

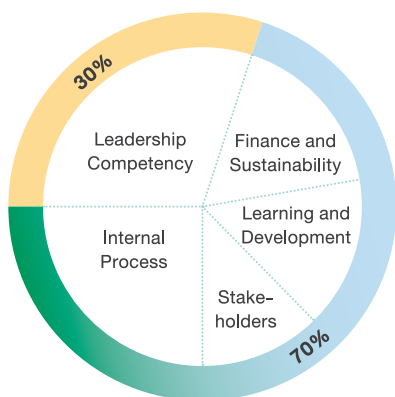
Conduct business in compliance with principles of good corporate governance and ethics through

- Complying with laws, covenants and relevant regulations in all countries of operations, and adhering to international practices and guidelines
- Transparently disclosing information and performance
- Managing risks
- Adapting to respond to changes, and seeking opportunities for sustainable business growth
- Reducing impacts from activities throughout the value chain
- Balancing the interests of all stakeholder groups

The Board, management executives, and employees share the responsibility of supporting, driving, integrating, and complying with the policy as well as deploy to all companies within Thaioil Group, and to pursue collaborative actions through dialogue and partnerships with leading global organization to build capacity in sustainable development.

## Sustainability Performance Indicators

In 2020, Thailoil established sustainability performance indicators that are tied to the compensation of the President and CEO and the Sustainability Development Committee. Additionally, Thailoil has corporate key performance indicators that are related to sustainability, and are cascaded to all relevant employees. Incorporating sustainability into performance measurement drives Thailoil towards achieving set targets in managing environmental, social, and governance issues.



● Part 1  
● Part 2

### Part 1) Corporate Key Performance Indicators (70%)

Thailoil has defined the corporate key performance indicators (KPI) that are based on the four dimensions of the Balanced Scorecard, including finance and sustainability (20%), stakeholders (15%), internal process (45%), and learning and development (20%).

### Part 2) Leadership Competency Key Performance Indicators (30%)

Thailoil assesses the leadership competency of the President and CEO in six areas, including fostering a group vision, management that follows strategic plans, risk management, team management to achieve the highest productivity, teaching and development, and personal excellence.

Thailoil's sustainability management progress is therefore measured through the four key dimensions of the Balanced Scorecard and Leadership Competency.

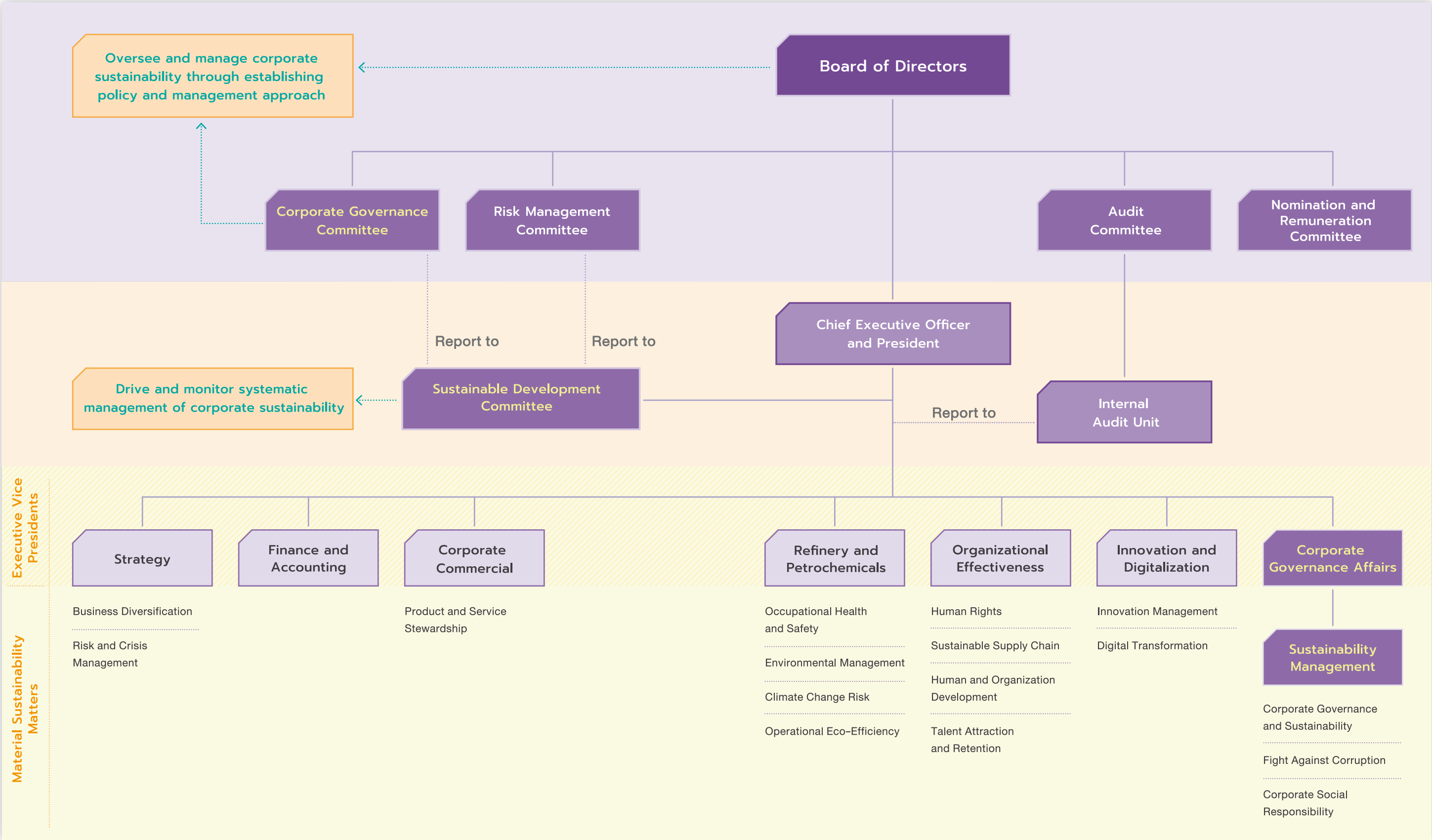
## Sustainable Development Structure

The Board of Directors prioritizes environmental, social, and governance (ESG) factors in conducting business, and steers Thailoil towards sustainability through establishing policies, targets, and strategies in the short, medium, and long term in the annual Strategic Thinking Session (STS). In the STS, the Board and all management functions are gathered to discuss sustainability matters that may create impacts on the business in the future.

Thailoil manages sustainability matters through assigning relevant functions to oversee each issue, with the Sustainable Development Function coordinating between functions and reporting to the Sustainable Development Committee every

quarter. Progress is also reported to the Corporate Governance Committee biannually. The Committee then reports to the Board of Directors to ensure that the Board is regularly kept aware of the state of organizational sustainability. In the event of a pressing material issue that requires immediate attention, the Sustainable Development Committee will notify the Corporate Governance Committee and the Risk Management Committee for immediate consideration and response, and then report to the Board of Directors. This process fortifies Thailoil's practices and compliance with the policy and guidelines of the corporate strategy, and helps the organization respond to the needs and expectations of all stakeholder groups.

Structure of SD Governance



### Sustainable Development Committee

Consisting of the Chief Executive Officer and all Executive Vice Presidents, and is tasked with the following responsibilities.

1. Strategize and develop policies, targets, and key performance indicators that will lead to long-term sustainable development.
2. Drive integration of sustainability strategy into the business strategy with short-term and long-term plans.
3. Review and validate completeness of material sustainability matters of the organization.
4. Support relevant functions in identifying and assessing environmental, social, and governance (ESG) risks and developing action plans.
5. Provide consultation and support of appropriate resources and human resources, and consider the material matters.
6. Promote employee awareness and build a sustainability-oriented organizational culture.

### Thaioil Group Risk Management Steering Committee

1. Establish risk management frameworks, policies, structure, and strategy, including internal controls and business continuity management, to respond to changing contexts.
2. Drive analysis and assessment of the risk levels, and the development of risk mitigation measures.
3. Review, monitor, and oversee risk management performance, and regularly report results and progress to the Risk Management Committee (RMC).
4. Provide feedback on plans, processes, and guidelines, and allocate resources as needed.

### Energy Management and Loss Improvement-Working Team

1. Implement tasks related to energy management and loss improvement to follow with Thaioil's energy conservation policy and targets.
2. Collect past data, monitor present energy performance, and evaluate performance in comparison to the target to ensure that energy management and loss improvement is conducted effectively.
3. Organize training sessions and activities that promote awareness and understanding of energy conservation and loss improvement.
4. Report progress and results for review and improvement opportunities of policies and processes.

### Thaioil Group Research and Development Steering Committee

1. Determine the direction, master plan, targets, and indicators that support the strategic master plan, and identify the approach to strategically invest in research and development.
2. Support commercialization of research and development results.
3. Monitor progress and evaluate success.
4. Provide research budget, manpower, equipment, and facilities, and promote collaborations with other research institutes.

### Environmental and Community Relations Committee

1. Determine the direction on managing environmental impacts, community relations, and other impacts from Thaioil, such that the Code of Conduct principles on corporate social responsibility are satisfied and stakeholders' expectations and needs are adequately responded to.
2. Manage Thaioil's activities and initiatives related to the environment and community relations such that they are in line with international standards, and communicate these initiatives.
3. Analyze and review the effectiveness of activities and initiatives related to the environment and community relations, provide recommendations for improvements, and report performance on environmental management and community relations in line with Thaioil's principles on corporate social responsibility or international standards.

### Waste Management Committee

1. Determine waste management approach and develop waste management plans.
2. Drive the use of appropriate waste management systems and tools.
3. Monitor and reports progress such that they are in line with corporate targets.
4. Review processes and share lessons learned.

### Human Rights Working Team

1. Manage and support the implementation of the Human Rights Policy, and promote the integration of human rights principles with company culture.
2. Review the accuracy and relevance of assessment results and the Company's interpretation of human rights.
3. Monitor performance and progress, assess likelihood of human rights impacts, as well as potential of human rights risks relevant to the organization and regulatory context, and develop mitigation measures.
4. Report results of improvement actions taken, conflicts, issues, or risks related to human rights to executives of corporate human resource management.

### Safety, Occupational Health, and Work Environment Committee

1. Review policies and action plans related to occupational health and safety.
2. Report and provide recommendations to improve performance and maintain compliance with occupational health and safety regulations and standards in order to ensure the safety of all employees, subcontractors, and any other individual visiting onsite
3. Promote and support the organization of occupational health and safety-related activities, and monitor, report, and evaluate performance.
4. Conduct audits of occupational health and safety at operation areas and inspect statistics related to incidents in the area of operations at least once every month.

### Corporate Venture Capital (CVC) Screening Committee

1. Examine and approve investments in venture capital funds (VC Fund) and in startup companies
2. Report result and performance to the executive management meeting and the Board of Directors meeting.

### Thaioil Group Digitalization Committee

1. Determine management approach, policy, and strategy for digitalization in the organization.
2. Enforce standards, management measures, and management systems as deemed fit.
3. Regularly review, monitor, and report digitalization performance results to the Chief Executive Officer and President.
4. Approve approach and action plans, and provide support and allocate resources as needed.

### Cyber Emergency Response Team (CERT) Working Committee

1. Oversee, promote, and support compliance with the digital policies to protect Thaioil Group or other external parties from cyber threats.
2. Evaluate and assess risks in compliance, reputation, and other damage relevant to information and cyber hazard management, and establish prevention measures.
3. Determine the cybersecurity approach and organize business continuity plan drills related to cybersecurity to ensure business continuity in the organization.
4. Report on progress and updates related information systems and cyber threats to the working committee at least twice a year.

### Thaioil Group GRC Integration Steering Committee

1. Study, evaluate, and determine action plans and strategies to integrate practices in good corporate governance, risk management, internal controls, and regulatory compliance, or GRC, across Thaioil Group.
2. Determine measures to drive good corporate governance, risk management, internal controls, and compliance with rules, regulations, and requirements in the management systems of different functions, in order to maximize efficiency and align directions.
3. Provide support and strengthen organizational culture, and apply technology to be used in integrating GRC processes.
4. Provide recommendations, and monitor and assess performance in line with the action plans and strategies for GRC integration.





# Towards Good Governance

The Towards Good Governance strategy guides Thailoil in securing transparency through an effective governance management system. This entails communicating a clear tone from the top, strengthening from the inside with robust systems, and balancing control with efficiency to ensure that all business activities of Thailoil Group are transparent, fair and verifiable across the supply chain. This strategy also prioritizes ethical business conduct with respect for human rights principles.



## Key Performance Indicators



### Financial Capital / Social and Relationship Capital

Maintaining strict adherence and compliance with laws and regulations to maintain the license to operate and business expansion opportunities

### Zero incidents

and penalty fees from non-compliance with laws and regulations, as well as cases of corruption and bribery



### Social and Relationship Capital

Maintaining approval from the government and civil society sector in order to continue conducting business alongside them

### Zero complaints

filed concerning human rights and business ethics violations

# HUMAN RIGHTS



## CHALLENGES, RISKS, AND IMPACTS

Since the United Nations declared the Universal Declaration on Human Rights 70 years ago, the global community has witnessed various developments in the human rights space drive towards a “universal” human rights framework. In 2017, the Thai government announced a commitment to put human rights at the forefront of the national agenda, and proceeded to develop the 4<sup>th</sup> National Human Rights Plan of Thailand and the National Action Plan on Business and Human Rights. The first phase of the National Action Plan on Business and Human Rights for 2019–2021 was then published in 2019 to further efforts in enacting national human rights policy. While facing this context, the Company is also confronted with the various human rights risks of our investment in the Clean Fuel Project – a large-scale investment initiative that depends on a large workforce and involves high volumes of transportation to deliver equipment and machines over the 4 – 5 years of construction – in combination with the ongoing COVID-19 pandemic in 2020. The Company must take special care to prevent potential human rights violations, such as employment of illegal forms of labour or labour practices that are not in compliance with the law, non-compliance in employment or treatment of migrant labour, impacts on communities from our construction activities, impacts on communities from our operations during the COVID-19 pandemic, as well as impacts on the safety and welfare of our employees – a key stakeholder group of the organization. In light of the aforementioned context and factors, Thailoil has enhanced our measures to protect the human rights of our stakeholders and prevent adverse impacts from our business activities.

## COMMITMENT

Thailoil Group remains committed to promoting good human rights practices throughout our value chain. We continue to operate as mandated by the Human Rights Policy in Own Operations, the Business and Human Rights Policy for Business Partners, and the Supplier Code of Conduct. All our human rights-related policies and procedures have been aligned with the UN Guiding Principles on Business and Human Rights, or the UNGP, which guide us towards the protection of the human rights of our employees, business partners (i.e. suppliers, contractors, customers), and local communities, as well as environmental rights relating to natural resources, fisheries, and a clean environment free of pollution. We uphold our commitment to ensure that our treatment of all stakeholders throughout our value chain go above and beyond expected human rights standards, such that Thailoil may be looked to as a leading practice on sustainability management in both Thailand and abroad.

Thailoil Group made some improvements to the “Grievance Mechanisms and Effective Remedy Framework Procedure” previously in 2019. We had developed this procedure to guide management of the grievances and complaints submitted regarding the practices of Thailoil Group and our value chain, reduce social risks in the business, transmit the worries and concerns of stakeholders, and mitigate existing conflicts. The procedure also demonstrates transparency in Thailoil’s business conduct, and promotes good relations with business partners in our supply chain. In 2020, Thailoil Group established a target to achieve zero human rights complaints.



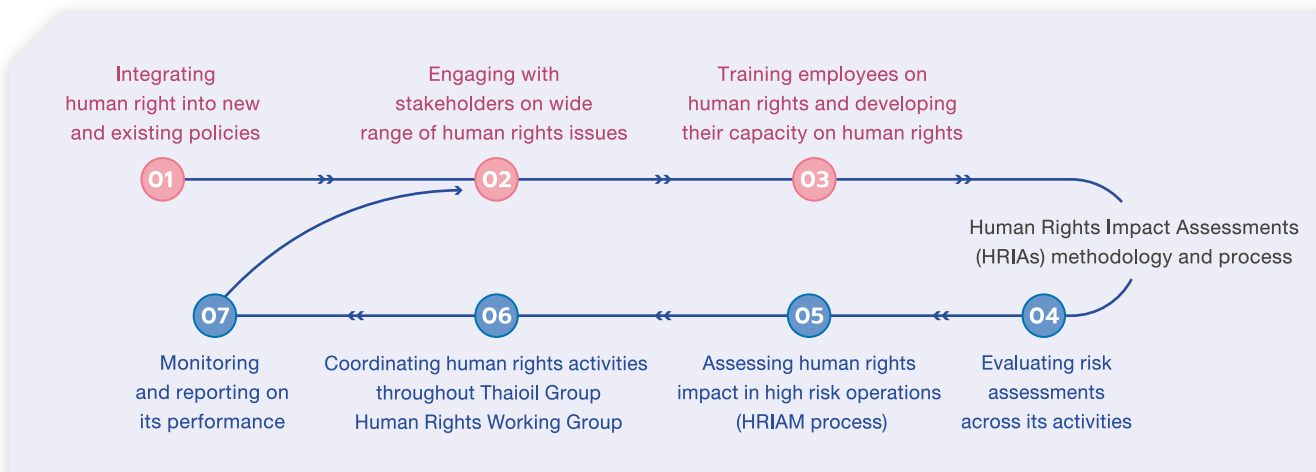
For more details on Thailoil Group’s human rights policies, please see our website.

## MANAGEMENT APPROACH

### Thaioil's Human Rights Impact Assessment and Management

Thaioil Group has developed a process to assess human rights risks in our business activities and throughout our value chain based on the human rights impact assessment and management guidelines of the International Finance Corporation (IFC), the UN Guiding Principles, and our internal risk management standards.

The Human Rights Impact Assessment and Management (HRIAM) counts as one of the 7 steps in conducting the human rights due diligence, namely:



### Human Rights Risk Assessment in Own Operations 2020

In 2020, Thaioil conducted human rights risk assessment that covered 100% of all business activities in our value chain, including both the activities that are part of our core business, as well as the activities related to our other businesses and joint ventures. The assessment was conducted by applying our enterprise risk management framework to assess and determine the level of human rights risks. Thaioil assessed the severity and likelihood of the human rights risks in accordance with the UN Guiding Principles on Business and Human Rights, and comprehensively reviewed salient human rights issues that may affect internal and external stakeholders.

The 2020 human rights risk assessment revealed that 38% of Thaioil Group's activities have residual risks, with 100% of activities with risk mitigation measures. The outcomes of this assessment have been validated by relevant personnel responsible overseeing Thaioil Group's business activities in the value chain. The Thaioil Group Human Rights Working Team has also reviewed the results and regularly monitors these issues.



#### The scope of the human rights risk assessment conducted for own operations included

- Refinery business : Thaioil Public Company Limited
- Petrochemicals business : Thai Lube Base Public Company Limited, Thai Paraxylene Company Limited, LABIX Company Limited, Thaioil Solvent Company Limited, TOP Solvent Company Limited, and Sak Chaisidhi Company Limited
- Power and steam business : Thaioil Power Company Limited and TOP SPP Company Limited
- Transportation business : Thaioil Marine Company Limited
- Other supporting businesses: Thaioil Energy Services Company Limited and Thaioil Treasury Center Company Limited.



#### The scope of internal and external stakeholders included

- Employees
- Business partners
- Customers
- Communities
- Vulnerable groups, including: women, children, migrant labour, people with disabilities, the elderly, the sick, and LGBTQ+ individuals.



## Salient Human Rights Issues in 2020



## Human Rights Risk Assessment in the Supply Chain 2020

Besides assessing risks in our own operations, Thailoil also assesses the risks resulting from the activities of our tier 1 suppliers. The assessment covered 100% of tier 1 suppliers, for both crude oil procurement and general procurement. The Company assessed severity and likelihood based on the risk assessment criteria, and considered the scope of issues that is aligned with the Sustainable Code of Conduct for Supplier of Thailoil and Subsidiaries (SCOC).

The 2020 risk assessment revealed that 24% of all activities have human rights risks. Identified risks included those relating to working conditions and occupational health and safety. Thailoil has prepared adequate measures to manage these issues, including rules, regulations, contracts, and communications to increase understanding of human rights policies and practices.



### Performance 2020



#### Social and Relationship Capital

**100%**

of activities in each business activity covered in the preliminary human rights risk assessment

**100%**

of activities of tier 1 suppliers covered in the preliminary human rights risk assessment

**100%**

of new suppliers completed the online self-assessment form and responded to questions on their environment, social and good governance performance

**100%**

of management executives and employees received human rights training that covered the Company's policies and practices. This is to prevent human rights violations in Thailoil's operations, and avoid complicity in human rights violations by suppliers in the value chain in 2020.

## Communications and Activities to Promote Human Rights

In 2020, Thailoil Group developed our communications strategy and organized additional activities to promote human rights for our stakeholders. We used the "3 parts for fulfilling human rights" framework, which includes:

**Ensuring education for all:** Thailoil will take action to ensure that our stakeholders are conscious of and understand human rights. For employees, the Company has developed a Human Rights E-Learning course which is accessible to all employees through the "Thailoil Academy Application". We have also organized other activities to increase human rights awareness for other stakeholders, such as the Human Rights Workshop for Thailoil Affiliates; the lecture series we provided to suppliers as a part of the annual Thailoil group supplier seminar in 2019

(SRM Seminar 2019). In 2020, Thailoil Group organized another lecture series – also a part of the annual supplier seminar, but held online (SRM Seminar 2020: Microsoft Team Live) – to deepen supplier understanding of human rights.

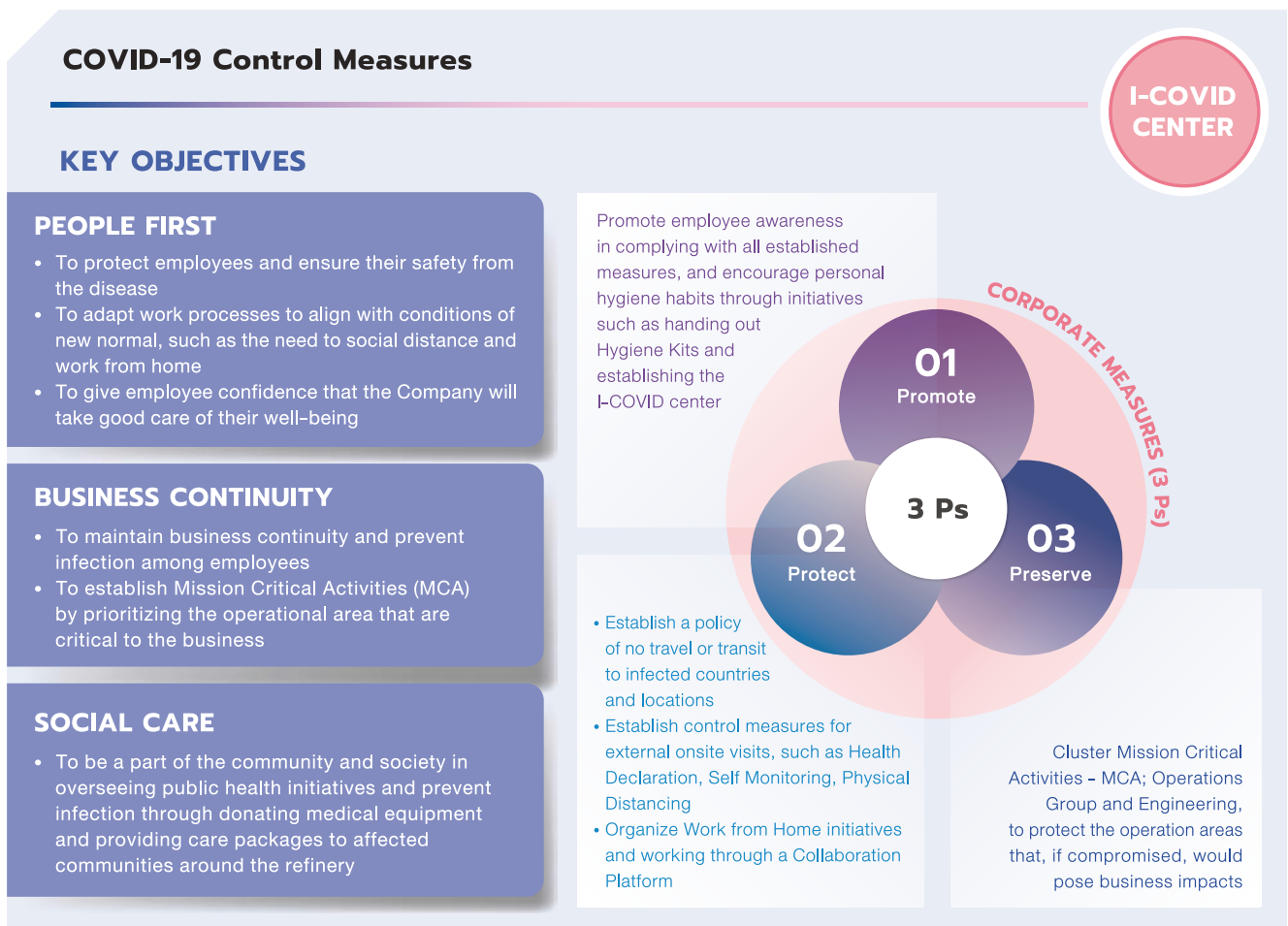




**Improving mental health care:** 4 Happiness: New Normal Work Life: All employees should understand the rights they are entitled to, including the benefits they should receive as employees and as retired employees. Thail Group has thus developed the 4 Happiness initiative for employees, which includes 4 projects:



**Working with the right to health:** In response to the outbreak of the COVID-19 pandemic, Thail Group established the “I-COVID Center” as a working committee to align the organization’s occupational health and safety and environmental policies with government direction in order to protect the safety of our employees, subcontractors, business partners, and other stakeholders, to ensure that they comply with social distancing measures, and to strengthen customers’ and business partners’ confidence in Thail Group’s ability to conduct business with stability and maximum efficiency while wholly meeting the needs of customers and business partners.



## GOOD LABOUR PRACTICES (LABOUR RIGHTS AND EQUALITY)

Thaioil Group respects the human rights of our employees and other stakeholders, and refrains from discrimination on the basis of personal opinions, nationality, race, colour, religion, sex, gender, age, disability, or any other status that is their human right to hold. We apply human rights principles that guarantee fair treatment to all stakeholders in all our business activities, and are committed to eliminate unfair treatment, discrimination, harassment, and any form of human rights violation.

1. All Thaioil employees from every level and function must have a comprehensive understanding of the regulations related to their line of work and responsibilities. They must strictly comply with these regulations, and seek the consultation of the Legal Department if they have any questions or concerns. Employees shall not solely rely on their own interpretation without proper counsel.
2. Thaioil Group has compiled and categorized regulations and regulatory requirements of public agencies for employees to study and understand, and also have organized training sessions on related regulations for employees.
3. Thaioil Group must strictly operate according to international human rights principles, increase employee awareness and understanding towards human rights principles such that they may apply these principles in their daily routine duties and responsibilities, and must not support any activity that may violate human rights principles.
4. If employees have to work in foreign countries, they should study the regulations, cultures, and traditions of the country of destination before traveling to ensure that the products, product samples, equipment, and documents that they may bring with them, as well as the objective of the trip and the practices of the destination where they intend to visit, do not violate regulations, cultures, and traditions of that country.

As one of our sustainability objectives is talent retention, we annually review the compensation and remuneration schemes for employees to ensure that they are competitive with industry peers and leading Thai companies. We also continue to ensure that we support our employees in enjoying their freedom of association and collective bargaining. In 2019, Thaioil and the Thai Oil Refinery Workers' Union participated in collective bargaining based on a bilateral system that builds on good labour relations. We did not need a third party mediator (a labour officer who mediates labour disputes when the Company and the Union cannot reach an agreement) to mediate any dispute, and were able to reach an agreement regarding working conditions. The next collective bargaining round will be held in 2021.



### Gender Equality

**24.01%**

of employees are female

**40%**

of management positions held by women

**42.19%**

of junior management positions held by women

**32.43%**

of top management positions held by women

**31.43%**

of positions in revenue-generating functions held by women



### Freedom of Association

**74.65%**

of Thaioil employees are members of the Thaioil Refining Union

**Zero**

labour complaints

## GOOD COMMUNITY PRACTICES (COMMUNITY RIGHTS)

Thaioil gives importance to working with communities around the operation sites, by using the Principle of Operation (3 Synchronizations), consists of Thaioil Group representatives, representatives of all 10 community leaders around the refinery, and government agencies such as Laem Chabang district, Laem Chabang Hospital, and educational institutions. According to the 5-together conceptual framework, namely think-together, act-together, correct-together, learn-together, and develop-together for the community to participate in their own community development to become a strong self-reliant community. It is also a channel to communicate progress of construction project expansion, and listen to opinions from the community to make appropriate adjustments.

In addition, Thaioil gives importance to conducting an environmental impact assessment in every key project, and ensures that mitigation plans are available, as well as considers opinions of communities as key stakeholders. In 2020, all key projects have been subjected to public hearing, as required by law.

In 2020, due to the COVID-19 pandemic, Thaioil continued to conduct community activities, while complying with safety measures as announced by the Thai government, for supporting communities in different areas according to identified needs. (See more details in the Corporate Social Responsibility chapter.)

## GRIEVANCE MECHANISMS

Thaioil Group's grievance mechanisms have been designed to receive and manage grievances from all stakeholders throughout our value chain, including any concern our business partners may have. It is our hope that through transparently accepting and responding to submitted grievances and concerns, we may reduce social risks on our business, appropriately handle conflicts, as well as strengthen relations with all stakeholder groups.

Stakeholders may access grievance mechanisms and submit grievances or concerns by explicitly noting the confidentiality of the document(s) and addressing the document(s) to the Chairman of the Board, Chairman of the Corporate Governance Committee, Chairman of the Audit Committee, Chief Executive Officer and President, Secretary, or to [cgcoordinate@thaioilgroup.com](mailto:cgcoordinate@thaioilgroup.com)

Additionally Thaioil has direct complaint channels classified for different groups of stakeholders. These channels enable Thaioil to monitor and collect feedback. For suppliers, another channel is available to receive complaints, and questions from website or email at [srm@thaioilgroup.com](mailto:srm@thaioilgroup.com).

Communities that have been impacted can directly report incidents or complaints to Thaioil Group's coordinating function. This function then works with other internal functions relevant to the incident/complaint, following our established operating procedures for responding in the event of grievances relating to occupational health and safety or the environment. Thaioil will then establish additional preventive measures to mitigate the risk, reduce the severity, and resolve the issue that is the root cause of the impact. Measures will vary depending on the context of the case. The Company mainly uses the Voice of Stakeholder (VOS) management system to collaborate and engage with affected stakeholders. We are determined to efficiently manage grievances arising from our operations during normal operating conditions, as well as grievances from other expansion projects. Progress in resolving reported issues will be regularly communicated to communities. Ultimately, understanding and reducing community concerns are of utmost importance for Thaioil to manage, maintain, and protect the rights of all stakeholders.



### Performance 2020



#### Social and Relationship Capital



No complaints about human rights violations from employees in 2020



No complaints about human rights violations from suppliers in 2020

# 34

complaints submitted by communities in 2020. The Company has investigated the submitted complaints as stated in our process, and proceeded to resolve the complaints, establish further prevention measures, and notified the complainants of the results. However, none of them are non-compliance cases.

# FIGHT AGAINST CORRUPTION



## CHALLENGES, RISKS, AND IMPACTS

The impact of the COVID-19 pandemic has already extended beyond people and economies around the world. One issue that has garnered attention of society, and is a challenge for Thail's business, is 'transparency and corporate governance'. This is especially visible through the trends in ESG (Environment, Social, and Governance), which will likely lead to a future wherein the civil society sector will share the role of monitoring the workings of the public and private sectors in order to drive forward transparency. It will become ever more important to adopt a business approach centered on creating value for society and stakeholders of all parties to bring sustainable shared growth.

One of the challenges the Company has encountered is a new normal trend that encourages citizens to stay at home to stop the spread of COVID-19, which has resulted in surging of online media consumption by citizens all over the world. This can potentially lead to interest-seeking behavior and corruption. Henceforth, the Company has to focus on measures and policies that are flexible, such that it can be adapted in a timely manner to suit any scenario and prevent issues arising from future uncertainties.

Thail is duly aware that corruption is a major obstacle in securing sustainable development in the business, economic, and social dimensions. We recognize that corruption can occur anywhere and at any time, and can take different forms and create varying levels of impact. Our Board of Directors and executives thus place heavy emphasis on managing efforts to fight against corruption. We have established a policy that is strictly enforced, and continuously review and evaluate the adequacy of our working processes and practices in order to create an organizational culture of transparency, fairness, code of conduct compliance, and anti-corruption. We take these actions to build stakeholder confidence, strengthen our capacity to promptly respond with short- and long-term challenges and changing contexts, so that the Company can grow sustainably.

## COMMITMENT

Thail remains committed to create a better quality of life to empowering human life through sustainable energy and chemicals, while continuing to create shared values to society. Along with maintaining the key mechanism that supports national energy security, and progressing towards sustainability, even whilst facing challenges in various fronts. Our "Bonding Human Life: Creating Shared Values for Society" theme reinforces Thail's roles more explicitly in delivering shared value to communities, society, and our country, in order to grow sustainably alongside with all stakeholder groups.

With this commitment in mind, the Board and executives of the Company have prioritized conducting business with fairness, integrity, transparency, and accountability. We aim to secure and maintain the confidence of our investors and all other stakeholders while increasing business competitiveness and pursuing sustainable development through grounding our activities on principles of good corporate governance and ethical business conduct. The organization's corporate governance practices was developed to be aligned with the internationally accepted OECD (Organization for Economic Co-operation and Development), Principles of Corporate Governance and the guidelines of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET). Thail's Corporate Governance and Code of Conduct Manual was published and distributed to Directors, executives, and all employees for their ease in accessing, understanding, and implementing all principles in their daily duties and responsibilities with accuracy and effectiveness. Additionally, Thail has publicly disclosed the Corporate Governance and Code of Conduct Manual on our website in order to allow any interested person to study and understand our practices.

Thail's Board of Directors and executives acknowledge the importance of securing good corporate governance and fighting

against corruption, which may obstruct the company's ability to achieve its corporate goal of being a 100th year sustainable organization that embodies a business culture of transparency. To meet this imperative, the Company has established and disclosed the Anti-Corruption Policy, which specifies roles, responsibilities, guidelines, and measures to fight against corruption. The Policy has been announced throughout the Company, with an explicit statement declaring that:

*"The Board, the management, and employees must not corrupt nor accept corruption of all forms in any circumstances, covering the business of the Company in every country and in every relevant agency. The Company defines guidelines, operating measures, and roles and duties of responsible persons, as well as regularly monitoring and reviewing the implementation of the anti-corruption policy in compliance with changes in businesses, rules, regulations, and relevant laws."*

Thaioil has determined guidelines for tasks with high corruption risks. The guidelines require that Directors, management executives, and employees perform their tasks with caution. This consists of:

**Political neutrality and contribution**, wherein Thaioil will not provide any direct or indirect support to political parties, or perform acts that may be counted as political engagement, including the use of Company resources in activities that might lead the Company to lose political neutrality and/or suffer costs from engaging in such activities;

**Charitable contributions and sponsorships**, wherein Thaioil has a policy governing different types of charitable contributions and sponsorships to ensure that such activities are not avenues for corruption. The policy includes procedures and control measures that are clear, concise, and effective, to ensure that charitable contributions and sponsorships are supported by documents and evidences that can be reviewed and monitored;

**Gifts, hospitalities, and expenses**, wherein the giving or receiving of gifts, hospitalities, and expenses, must be suitable with customs and traditions, but not be of exceedingly high values, and must not be a cause for action, or a failure to take action, that will lead to bribery and corruption.

Furthermore, Thaioil has established guidelines regarding anti-corruption in the Code of Conduct written in the Corporate Governance and Code of Conduct Manual of the Company. This includes guidelines regarding conflicts of interest, political neutrality, and the giving or receiving of gifts, hospitalities, expenses, or other benefits. To ensure that Thaioil's practices are in alignment with international standards on anti-corruption, The Company has adopted a management approach that is based on the system of checks and balances, including the appointment of an investigation and audit committee that will strictly ensure our work processes do not facilitate corruption both internally or externally.

In honor of our commitment to manage our business with a strong foundation on fairness, integrity, transparency, and accountability, in alignment with international standards on good corporate governance, Thaioil has developed a list of corporate values – abbreviated as POSITIVE – for all our employees to apply in their daily duties and responsibilities. The "I" in POSITIVE stands for integrity, and represents our commitment to operate with honesty and fairness. We have also consulted best practices in Thailand and abroad to develop frameworks and mechanisms that can support good corporate governance practices in our operations that reflect the key principles of "REACT+E" in the corporate governance of Thaioil. Details are shown below:





Thaioil recognizes that neglecting or failing to fulfill our duties in complying with laws, regulations, corporate values, corporate governance principles, and code of conduct will undermine the confidence of our stakeholders, and create misinterpretation regarding the Company's corporate governance processes that impact the Company in the short and long term. For this reason, Thaioil places great importance to raise awareness both internally and externally to ensure the Board, executives, and all employees will not neglect nor fail to comply with policies and practices.

During 2020, the Company reviewed the Corporate Governance Policy and the Anti-Corruption Policy through studying relevant rules and regulations, public announcements, good corporate governance guidelines shared by regulators (SET and SEC), and the principles and standards of corporate governance evaluations that have been recently updated by different institutions. Based on this study, the Company found that there were no significant changes, and the Company's policies were consistent, appropriate and in alignment with expected practices.

## MANAGEMENT APPROACH

### Assessing corruption risks

Thaioil gives importance to managing risks across the organization. To that end, the Board of Directors has assigned the Risk Management Committee as a governing body responsible for establishing risk management policies for the organization and for overseeing the risk management systems and processes in the organizational, business unit, and functional levels, to reduce impacts on the business and ensure the achievement of corporate goals.

To support risk management, Thaioil has established the Risk Management Steering Committee to review, monitor, and oversee risk management performance, as well as managing business continuity in alignment with the corporate risk management framework, in order to make certain that the Company has efficient risk management that is suitable for business activities and capable of supporting stable business growth.

In addition, Thaioil has developed risk management plans that include the assessment, analysis, and review of risks with consideration to business plans. This process covers both internal and external risks, such as national political risks, global economic risks, legal and regulatory risks, and risks related to stakeholder expectations. The Company uses a risk appetite framework that covers seven areas, including:

- Performance and Investment
- Compliance
- Safety, Occupational Health, and Environment
- Reputation
- Fraud and Corruption
- ICT Security, and
- Clean Fuel Project (CFP) Investment.

To monitor the implementation and results of risk management measures, and reduce risks that may impact on the business operations, the Company has identified key risk indicators (KRIs) that can be used to measure and monitor the performance of relevant functions and the organization against set targets. Furthermore, the Company has developed a business continuity management (BCM) plan that accounts for all risks and organizes drills by stimulating scenarios that might create impacts on business operations. Risks and risk management measures are regularly reported to the Risk Management Steering Committee, Risk Management Committee, Audit Committee, and the Board of Directors, respectively.

As for the management of risks related to corporate governance and anti-corruption, Thaioil has developed a plan to assess three risks that may lead to corruption, including:

- Request permits from public agencies
- Tax non-compliance, and
- Procurement as it could lead to interest-seeking behavior and corruption.

Moreover, Thaioil assesses risks of non-compliance with rules, regulations, and good corporate governance principles, and monitors complaints as stated in the complaint and whistle-blowing procedure. Thaioil assesses the aforementioned risks, communicates relevant policies and guidelines, and continuously keeps up to date with the Corporate Governance function, through comparing assessment results against guidelines in order to confirm the accuracy, completeness, and quality of our guidelines. We also regularly organize joint meetings with relevant functions to develop and improve upon our measures, and regularly report performance to the Board of Directors for their feedback, for which they may also determine additional measures to mitigate the risks.

Thaioil is aware of cyber-security threats, which may compromise the Company's reputability and lead to corruption. Henceforth, Thaioil maintains a cyber crisis drill as part of the business continuity plan (BCP) drill to make sure that if unforeseen circumstances should arise, Thaioil will be ready to respond, protect, and prevent impacts from occurring immediately. Furthermore, we have organized a special lecture on the topic of "Cyber Security in the Boardroom". On this occasion, we invited Mr. Prinya Hom-anek, Special Consultant to the National Cyber Security Committee and lecturer for the IT Governance and Cyber Resilience (ITG) course at the Institute of Directors (IOD), to share his knowledge and experiences to the Board of Directors and management executives. At the operational level, the Company has raised awareness and enacted preventive measures through regularly providing updates and news to employees, and conducting cyber hazards testing, such as the phishing email test, to assess employee competency and as an approach to establish a preventative measure.

Over the course of 2020, Thaioil has conducted business while maintaining compliance to the laws, rules, and regulations of the government and regulatory agencies, with precision. We did not identify any case of misconduct or action that might be related to corruption.



### Promoting REACT+E principles and corporate POSITIVE values

Thaioil has prepared itself to respond to future regulatory changes, especially with regards to the fight against corruption, through becoming a member of the Collective Action Coalition against Corruption (CAC). We recognize that to accomplish our goals, we must start with ensuring internal readiness. The most important factor, we believe, is our people. We have thus organized various events to emphasize the REACT+E principles and the POSITIVE values, and campaigning for all Thaioil employees to perform their work with integrity. Our goal is to instill in employees a sense of conscience, and inspire them to keep business ethics in mind in all the work that they do, so that these principles and values become embedded in the organizational culture. Furthermore, Thaioil communicates to all new employees to adhere to and comply with the principles of corporate governance, business ethics, and anti-corruption from the first day of work. This is accomplished primarily through employee orientation, as well as communication and information on corporate governance and business ethics through articles in the Akanee journal (Internal communication journal) and email within the organization on a regular basis throughout the year.

### Collaborating with anti-corruption network partners

To demonstration of our determination to fight against corruption, Thaioil has been a membership of the United Nations Global Compact (UNGC) since 2010. We have applied the 10 UNGC Principles that promote good governance regarding human rights, labour, environment, and anti-corruption in our working processes, and have used the principles to share anti-corruption knowledge, experiences, and practices. The Company has been a member of the Thailand's Private Sector Collective Action Coalition against Corruption, or the CAC, since 2012. And, a CAC Certified Company for the first time in 2014, with a membership term of 3 years, and became a CAC Re-Certified Company in 2017 and then again in 2020. The CAC was established, and continues to be supported, by the government and the Office of the National Anti-Corruption Commission (NACC). Our participation in this program has contributed to significant advancements in developing and improving our practices towards greater transparency and uplifting corporate governance standards, as well as reducing the regulatory risks of being prosecuted under the Anti-Corruption Act 2018. Furthermore, our membership and active participation in the CAC demonstrates our commitment to fight against all forms of corruption, such as our continuous participation in the Anti-Corruption Day.

Promoting an internal corporate governance culture, and establishing a good public reputation in corporate governance and anti-corruption



In 2020, we expanded our partnership in the fight against corruption through supporting one of the companies of Thaioil Group – TOP Solvent Company – in becoming a certified company in the CAC program. We also encouraged our business partners to attend the seminar organized as part of the SME CAC Certification program to initiate their path towards building business value chains that are transparent, fair, and free of bribery. Along with encouraging the business partners to participate in the Anti-Corruption Day 2020 (Thailand), under the theme “Catching Corruption Has Never Been So Easy – Power of Data”, which the event organized in the form of virtual collaboration.

In 2020, Thaioil joined other PTT Group companies in organizing the PTT Group CG Day 2020 event, with the theme of the year being “Step to the Future: A New World of CG”. The event served to remind employees of all levels the importance of applying good corporate governance principles in their work, and reiterated Thaioil’s organizational culture of transparency and collaboration to drive us towards sustainable growth. Activities organized during the past year reflected Thaioil’s determination in driving our business forward in line with corporate governance principles, including strengthen the working processes (CG in practice) that cope with new lifestyles that can accommodate and overcome the volatilities in today’s fast-changing business world with uncertainties from both natural disasters and disasters caused by humans. We aspire to uphold ethics, transparency, fairness towards all groups of stakeholders, management excellence, maintain competitive advantage, as well as seeking for innovation, developing working system with modern technologies, and quickly adapting to changes.

Furthermore, the Company organized additional activities to promote stakeholder awareness of corporate governance principles, as follows:



1 Cultivated awareness and promoted transparent, fair, and accountable behavior in the workplace by having management prioritized on this issue and act as good examples with the CG in DNA: Executive Quotes activity.

2 Reviewed the policy to protect use of insider information to buy or sell shares.

3 Compiled information related to corporate governance to respond to the Internal Control Sufficiency Evaluation Form of the Securities and Exchange Commission (SEC).

4 Reviewed and included the Corporate Governance Policy, Anti-Corruption Policy, and Whistle-Blowing Policy and Procedure as important parts of the TOP Way of Conduct Manual to standardize corporate governance and management practices across Thaioil Group companies.

5 Supported subsidiaries in Thaioil Group, specifically, TOP Solvent Company Limited, to apply for the Collective Action Coalition against Corruption (CAC).

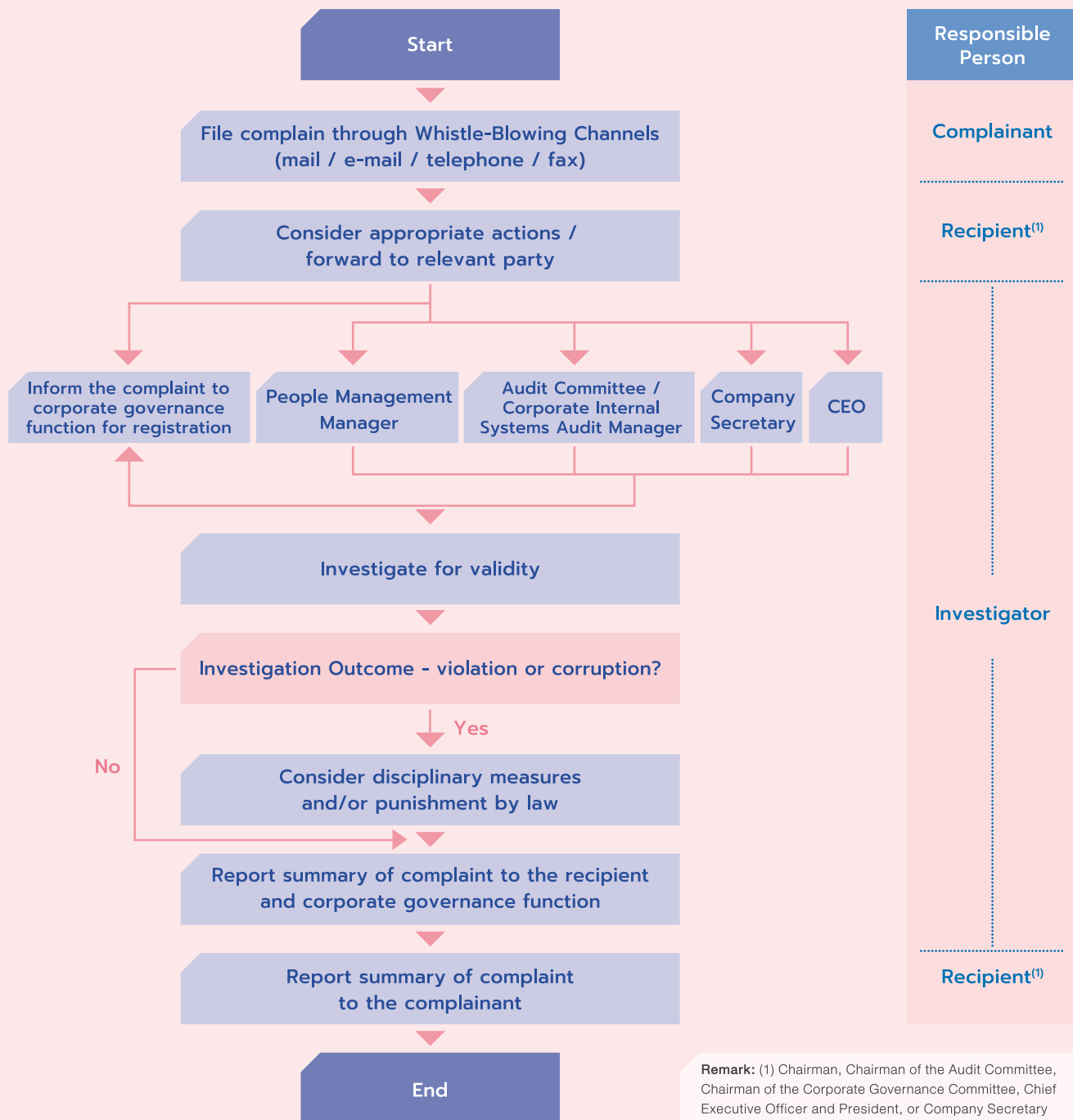
6 Communicated the No Gift Policy to employees of all levels through internal channels such as our website, the corporate e-newspaper, the “Akanee” magazine, and news bulletins in our offices in Bangkok and Sri Racha. We also organized and sent out copies of “Request letter to avoid giving gifts to executives and employees of Thaioil and Subsidiaries” to all our suppliers, customers, financial institutions, and other business partners. We believe that these efforts should help reduce behavior that is not in line with our Anti-Corruption Policy, and will promote the equitable treatment of all stakeholders.

<p><b>7</b></p> <p>Developed the Supplier Code of Conduct to establish mutual understanding between the Company and our suppliers with regards to sustainably operating business activities. We also communicated the Corporate Governance Policy, Anti-Corruption Policy, and other relevant guidelines to suppliers. This ensures our suppliers are able to conduct their business while maintaining compliance with good corporate governance guidelines, and enable to apply the principles to improve their performance in this area.</p>	<p><b>10</b></p> <p>Communicated CG policies and guidelines to employees and business partners (including suppliers and customers), such as organizing a “Corporate Management towards Sustainability” seminar for customers.</p>	<p><b>13</b></p> <p>Established the I-COVID Center to act as the center for managing the pandemic. The Center is responsible with issuing measures to prevent an outbreak in the organization. This includes but is not limited to organizing campaigns to encourage employees to protect themselves and act in a socially responsible manner, distributing basic protective equipment, and cleaning and disinfecting in office buildings and operating areas.</p>
<p><b>8</b></p> <p>Organized lectures and exhibitions on corporate governance and anti-corruption at the annual Thailoil Group supplier seminar event, the SRM Seminar 2020, which was attended by over 130 supplier representatives.</p>	<p><b>11</b></p> <p>Developed projects to strengthen the capacity of employees and took initiatives to care for employees of all groups in the organization to enhance the quality of their professional and personal lives, well-being, and happiness at the workplace. This served to build employee engagement and morale, and increase success at work.</p>	
<p><b>9</b></p> <p>Encouraged our business partners to attend the seminar organized as part of the SME CAC Certification program to initiate their path towards building business value chains that are transparent, fair, and free of bribery</p>	<p><b>12</b></p> <p>Developed an online learning platform, the Thailoil Academy, which integrated the use of new learning technologies such as micro learning and augmented reality learning. This is fitting for the modern age of learning and allows employees to learn anytime (24-hr.) and anywhere through their phone.</p>	<p><b>14</b></p> <p>Communicated all policies, including the complaint and whistle-blowing procedure, complainant or whistle-blowing protection mechanisms, and mechanisms to monitor and investigate complaints that are in line with Thailoil’s Code of Conduct, to all business stakeholders through our website and various activities, such as the quarterly analyst meetings to report performance, and through live broadcast sessions hosted on the TOP IR Mobile Application and Facebook Live to report on our quarterly performance.</p>

## Complaint and Whistle-blowing Procedure

Thailoil has established a complaint channel and whistle-blowing procedure to receive complaints from stakeholders who have been affected or risk being affected by the Company’s business activities, and/or complaints regarding the acts of Directors, management executives, and employees that are illegal, non-compliant with business ethics, or might lead to corruption. The complaint channel and whistle-blowing procedure are accessible to those who have been violated or affected by the Company’s activities, as well as stakeholders, employees, related officers, and external individuals who have witnessed or possess knowledge of the act. Complainants can follow up with the details of the complaint and whistle-blowing procedure in the manual as shown below.

Channel	Contact
Letter	Chairman, or Chairman of the Corporate Governance Committee, or Chairman of the Audit Committee, or Chief Executive Officer and President, or Company Secretary Thailoil Public Company Limited 555/1 Energy Complex Building A, 11 <sup>th</sup> Floor Vibhavadi Rangsit Road, Chatuchak, Bangkok 10900
E-mail	cgcoordinate@thailoilgroup.com
Telephone	02-797-2999 ext 43320, 43324-43325
Fax	02-797-2973



Thaioil has established fair and adequate protection measures for the complainant, whistle-blower, or the relevant individual. This means that the individual is protected from retaliation, such as job reassignment, threats, harassment in the workplace, termination, or any other unfair treatment. Thaioil will maintain the confidentiality of information related to the complaint and will not disclose this information to any irrelevant personnel, unless it is necessary by law. As for complaints regarding acts that violate rules and regulations or legal requirements, or acts that might lead to corruption, Thaioil has appointed the Internal Audit function, which is independent and reports directly to the Audit Committee, as the primary body responsible for investigating the validity of the complaint and reporting the progress of the investigation. This is to make certain that Thaioil Group appropriately responds to every complaint submitted.












## Monitoring, investigating, and responding complaints

Thaioil closely monitors performance related to complaint management in order to improve the efficiency of our working processes and complaint response. We also have plans in place to increase employee awareness of the complaint and whistle-blowing procedures.

In 2020, Thaioil received a total of 4 complaints through the Company's complaint and whistle-blowing channels. The Company has thoroughly investigated the complaints, as

specified in the Company complaint and whistle-blowing procedure, and found that there were 2 cases that counted as complaints. After the investigation, it was found that there was no bribery or violation of Company rules. The results have been communicated to the complainants, and the opinions and suggestions of the investigation committee have been applied to further improve the effectiveness of the procedure.

The complaints investigated can be categorized as shown below.

Types of Complaint	Number of Investigated Case	Number of Breach / Non-compliance Cases
 Corruption and bribery	1	0
 Discrimination	0	0
 Confidentiality of information and use of inside information	0	0
 Conflicts of interest	0	0
 Antitrust/anticompetitive practices	0	0
 Money-laundering	0	0
 Quality, Security, Safety, Occupational Health and Environment	0	0
 Non-compliance with the company's regulations	1	0
 Other issues of code of conduct	0	0

**Remark:** The two cases that did not classify as complaints included one inquiry for information on the Company's operations, and another complaint that the Company had investigated and determined that it was not relevant to the personnel or activities of the Company. After the investigation, the complaint was thus closed, and the complainant was informed of the investigation results.

## Preventing conflicts of interest

Thaioil requires all employees to report conflicts of interest through the Conflict of Interest Disclosure Electronic System every year. This platform serves as a channel to monitor conflicts of interest in the organization. In 2020, 100% of our employees completed the annual conflict of interest form. There were two reported cases of potential conflicts of interest. However, after these cases were investigated, it was found that none of them posed conflicts of interest with Thaioil's business activities.

## Performance 2020

- **Zero case** of non-compliance with rules and regulations, or conduct that may lead to corruption, by Thaioil Group employees
- **Zero violations** of corporate governance and business ethics principles done by Thaioil Group employees
- **100%** of Thaioil Group employees complied with principles of corporate governance, business ethics, and anti-corruption as specified in the TOP Way of Conduct. All companies within Thaioil Group (wholly-owned companies) operated in compliance with rules, regulations, requirements, and the Company's corporate governance principles and code of conduct. There were no corruption-related actions identified.
- **100%** of strategic suppliers (critical suppliers) complied with policies on corporate governance, business ethics, anti-corruption, and other policies as specified in the Supplier Code of Conduct (SCoC). All strategic suppliers signed their acknowledgement of the Company's SCoC.

In 2020, Thaioil operated under the principles of good corporate governance, and fostered awareness and understanding within Thaioil Group employees and business partners of different groups through various different channels. We also have developed plans to continuously develop and promote awareness and understanding of different practices, and seek new ways to effectively and inclusively reach out to target groups. As a result of our determination and dedication, the Company has been recognized at both the national and international levels, as demonstrated in the rewards and successes we have received, including:

### International Recognitions



- ASEAN Asset Class Publicly Listed Companies 2019: Thaioil was one of the publicly listed companies that obtained a score of 97.50 or above for the ASEAN CG Scorecard.
- ASEAN Top 20 Publicly Listed Companies: Thaioil was one of the top 20 publicly listed companies in the ASEAN CG Scorecard. Only four publicly listed companies from Thailand were awarded in this category.
- Country Top 3 Publicly Listed Companies (Thailand): Thaioil was one of the top three publicly listed companies with the highest ASEAN CG Scorecard in Thailand.

### National Recognitions



- 2012 – Thaioil signed the declaration form to express intention in joining the CAC.
- 2014 – Thaioil was certified as a CAC Certified Company.
- 2017 – Thaioil was re-certified as a CAC Re-Certified Company for the first time.
- 2020 – Thaioil was re-certified as a CAC Re-Certified Company for the second time.

The Corporate Governance Report of Thai Listed Company 2020 (CGR): Thaioil scored 98 points, which was rated as the "excellence" level (Excellent: 90-100 points), the highest obtainable level, for the 12<sup>th</sup> consecutive year.

Thaioil received a full score of 100 points for the quality assessment of Annual General Meeting (AGM Checklist) 2020 for the 5<sup>th</sup> consecutive year. The AGM Checklist is organized by the Thai Investors Association.







# Towards Green Economy

The Towards Green Economy strategy drives Thailo in growing our business with environmental responsibility throughout the value chain of our production process. This strategy focuses on reducing of greenhouse gas emissions in the production process through efficient use of natural resources and studying the feasibility of investing in the renewable power business. Furthermore, as part of this strategy, Thailo supports sustainable procurement sourcing of raw materials, focuses on developing the capabilities of our suppliers and business partners, and strives to increase our environmentally friendly product portfolio through research and development (R&D) and innovation.



## Key Performance Indicators



**Natural Capital** Increasing operational eco-efficiency to create a competitive advantage and mitigate business impacts on the environment.

**Zero**

waste disposed to landfills

**762,264 gigajoules**

of energy consumption reductions resulting from energy efficiency improvement initiatives, equivalent to greenhouse gas emissions reductions of 51,084 tons of carbon dioxide.

**852,409 tons of carbon dioxide equivalents**

reduced from sales of avoided emission products, in comparison to general refined fuel products (counted as end-user greenhouse gas emissions reductions).

**3,100 kilograms of carbon dioxide equivalents**

reduced from the purchase and use of environmentally friendly materials instead of general materials.



**Social and Relationship Capital**

Enhancing quality of the supply chain management to advance operational capabilities in the energy industry.

**100 %**

of new suppliers that have signed and acknowledged the Supplier Code of Conduct and responded to the ESG self-assessment questionnaire



**Intellectual Capital**

Developing organizational knowledge in the areas of energy, and engineering to generate revenue and reduce production costs.

**19**

energy efficiency improvement initiatives implemented in the production process.



**Manufactured Capital**

Preventing operations from interruption and maximizing efficiency to continuously deliver products to the market.

**101%**

Refinery Utilization Capacity



**Financial Capital**

Improving efficiency of the supply chain management to reduce production costs, and generate revenue from products.

**44 %**

share of green product in sales revenues (higher than 25% target)



# ENVIRONMENTAL MANAGEMENT



## CHALLENGES, RISKS, AND IMPACTS

Thaioil Group is cognizant of the various external factors and environmental changes facing the world, including resource scarcity, the increase in severe air pollution in many locations across the globe, as well as environmental impacts resulting from economic growth and consumption. These factors, alongside expectations to live in a good environment, have resulted in changes in rules and regulations concerning the environment, thus forcing businesses to adapt for the future.

## COMMITMENT

To achieve sustainable business growth, it is vital that all sectors share the responsibility to protect, guard, and improve the environment for future generations. To take our share of that responsibility, Thaioil has placed environmental management as a corporate priority, and has set targets to drive efficiency improvement in our processes. Our commitment is stated in the Quality, Security, Occupational Health and Safety, Environment, Energy Management, and Corporate Social Responsibility (QSHE-CSR) Policy. Furthermore, we have aligned our management system to respected standards and best practices, including ISO 14001: 2015, the Global Reporting Initiative (GRI) Standards, best practices based on the DJSI assessment, best environmental governance practices, best biodiversity management practices, and the CSR (ISO 26000) Standards as included in the CSR – DIW Project. We have also referred to PTT Group's Operational Excellence Management System (OEMS) to design our processes to assess risks, establish measures to control and reduce environmental impacts, monitor performance, report results, and apply improvement actions to the entire value chain of the production process. Our targets are outlined below:



### Targets 2020



0

complaint regarding environmental incidents



0

case of significant oil and chemical spills



0

non-compliance with relevant laws and regulations



0

major non-compliance with ISO 14001 : 2015



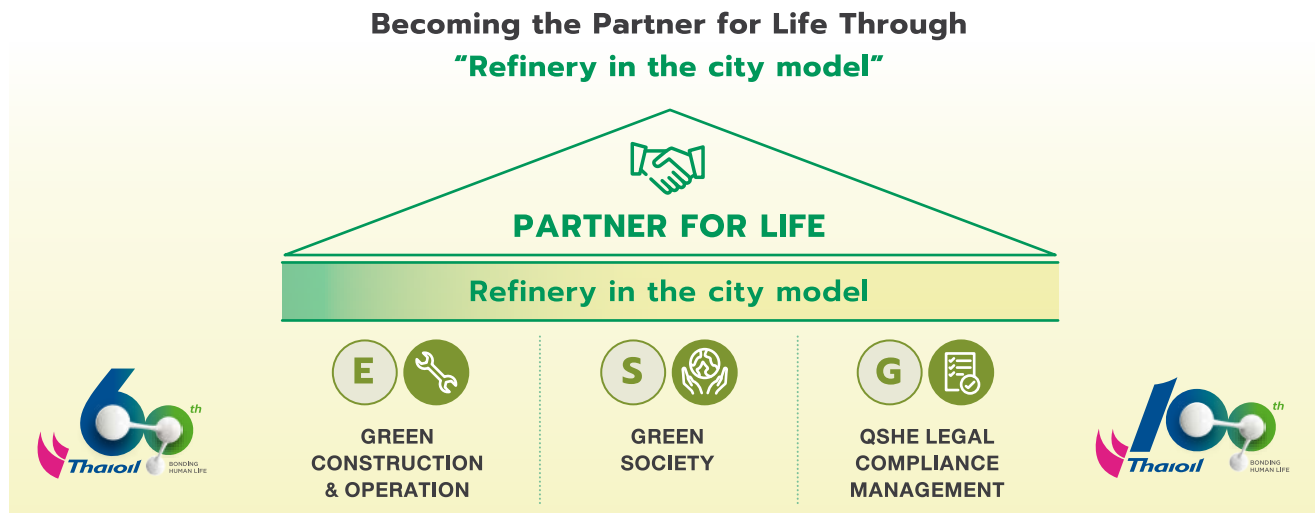
100%

compliance with the environmental governance excellence standards of petroleum and petrochemical oil refineries



## MANAGEMENT APPROACH

In 2020, Thailoil Group dedicated our efforts to fulfilling our responsibilities in the environmental, social, and governance, or ESG, dimensions through the Operation Excellence to Business Excellence (O2Bx) project. The “Refinery in the City” model was used to manage excellence in 3 main areas – Excellent Impact Management, Excellent Compliance, and Creating Shared Value (CSV). Our goal is to become a Partner for Life.



To be a global leader, Thailoil has conducted business sustainably with transparency, sharing benefits with all stakeholder groups, and caring for the environment and the happiness of communities. To do so, we have developed an environmental management plan that considers both internal and external environmental factors (Environmental Outlook), alongside the needs of stakeholders, such as communities, government agencies, management executives, employees who have expertise in environmental topics, as well as the rules, regulations, and global mega trends concerning the environment. All these factors are then reviewed and evaluated to identify opportunities and develop a plan for our work for the next five years. This “Environmental Master Plan” then becomes the main framework in driving Thailoil Group’s environmental management. It covers different operating conditions, as follows:

### Normal Operating Conditions :

Every year, Thailoil Group assesses environmental risks in production processes and determines measures to tackle the root cause of the impacts. As part of the ESG component of the O2Bx initiative mentioned above, the Company has increased the effectiveness and rigor of our management system through several ways. We have developed standards to control work productivity, increase efficiency in production processes, as well

as reduce water pollution, waste, air emissions, and greenhouse gas emissions, while minimizing impacts on biodiversity and optimizing resource use. Our practices are grounded in circular economy principles and supported by the 3Rs (Reduce, Reuse, Recycle) strategy. Furthermore, the Environmental Master Plan framework covers issues including:

- Governance Structure
- Technical Procedures
- Climate Strategy
- Water Resource Management
- Eco-efficiency
- Biodiversity
- Supplier and Contractor Program
- Environmental Audit, and
- Management Information System.

For the expansion project, Thailoil Group has applied the standard environmental specification, which covers rules, regulations, best practices, and stakeholder expectations regarding the environment, as guidance to implement green construction practices, in alignment with the requirements and expectations of all stakeholder groups.

Furthermore, in 2020, Thailoil Group implemented various projects, including but not limited to:

- The Thailoil CE WE GO (Thailoil Circular Economy WE GO) Project, which applies to water and waste water management (W), energy conservation (E), green label focus (G), waste management and opportunity for upcycling (O);
- The Environmental Management Accounting (EMA) Project, which was designed to improve our practices in recording and reporting costs, revenues, and investments relating to the environment, and is currently in the phase of IT Development;
- The Carbon Price Study Project, which was initiated to study carbon prices to inform investment decisions;
- A project to revisit PTT Group's Biodiversity and Ecosystem Service Management Manual with PTT Group, and conduct additional biodiversity risk assessment for Thailoil Group – although the 2020 results showed that Thailoil's operational site has low risks, the Company will continue to diligently manage impacts on biodiversity in accordance with the mitigation measures reported in the environmental impact assessment (EIA), and ensure that our operations do not create adverse impacts on the ecosystem, which we recognize is an invaluable resource to everyone in Thailand;
- A project to conduct life cycle assessment (LCA) for all products of the Thailoil Refinery;
- The Thailand Voluntary Emission Reduction Program (T-VER) organized by the Thailand Greenhouse Gas Management Organization (Public Organization); and
- The Renewable Energy Project at the Engineering Building Center.

Moreover, as a demonstration of our commitment to environmental and social responsibility, Thailoil has continued to participate in the CSR-DIW Project. Environmental quality monitoring and assessment are aligned with the environmental management framework of ISO 14001:2015. Our processes are robust and subject to continuous improvement actions, as recommended by external auditors from the Thai Industrial Standards Institute. The environmental data reported in this Integrated Report has been verified and assurance for management approach and performance information in accordance with the Global Reporting Initiative (GRI) Standard. The Company has been developing internal data collection and validation processes to reduce inaccuracy in data transmission and increase convenience for data assurance. The Compliance Unit remains active as the main unit responsible for driving

compliance assessment and creation of new tools or systems to increase efficiency in existing working processes.

### Abnormal Operating Conditions :

Thailoil Group has established the Environmental and Community Relation Committee (ECRC) to collaborate with government agencies, academic institutions, and communities surrounding the operational areas to think, act, correct, learn, and develop together. This ranges from proactively planning initiatives to resolving issues as a team during abnormal operating conditions. Additionally, the team monitors conditions along 24 hours and 7 days. The ECRC also plans activities and communication platforms to track and monitor environmental performance for compliance with rules, regulations, and targets. This ensures that surrounding communities will receive the fewest impacts. To that end, the ECRC convenes monthly to evaluate concerns and suggestions submitted by communities in order to improve performance, and conducts annual community feedback surveys.

In 2020, Thailoil implemented projects to develop and increase efficiency in managing abnormal operating conditions, such as :

- The TOP Green Tracking Project for Air Pollutant Management to increase efficiency in investigating potential source of pollutant;
- The TOP Green Tracking Project to develop the database and dashboard for oil and chemical spill movement forecast by using real time data on water and wind currents provided by the coastal radar station and satellite imaging that is accurate and fast. This allows the system to analyze and report important information needed to effectively respond to abnormal operating conditions or incidents. As a result, the project won the Silver Award from the PTT Group OpEx Award 2020.

### Environmental Emergency Conditions :

Oil and chemical spill prevention is another issue of significance for Thailoil Group. Over the past 10 years since 2010, Thailoil Group has not had a single case of significant oil and chemical spill, as defined by the standards of the Oil Industry Environmental Safety Group Association (IESG). Our success can be traced to our robust management approach, which comprises of three main parts, as follows.



## Prevention of Environmental Impact

- Commit to only using ships that pass the safety standard assessment of the PTT Group Ship Vetting System. To that end, the captains of Thailoil Group and PTT Group assess the safety documents of every ship. Documents assessed include documents from the Ship Inspection Report Program (SIRE) of the Oil Company International Marine Forum (OCIMF), information shared from international organizations, and information of ships serving PTT Group. We review information gathered and assess ship quality to ensure that Thailoil Group operates marine transportation of petroleum or petrochemicals in accordance with international safety standards.
- Regular maintenance of ports, buoys, and equipment used for oil transfer, such as oil pipelines at the piers and offshore on buoys, safety joints, and ship ropes is conducted by Thailoil engineers.
- Conduct random Tanker Safety Audits, where the port manager sends responsible persons to both domestic and foreign ships at Thailoil ports to conduct the audit. Any detected defects will be notified to the respective ship captain and manager to review and establish corrective actions, as well as preventive measures to ensure the issue is not repeated. If findings suggest there is non-compliance with safety standards, the tanker may be put on temporary suspension.
- Regularly send port division employees to attend meetings and participate in activities organized by the Oil Industry Environmental Safety Group Association (IESG)-Marine Safety to encourage employees to exchange knowledge on marine safety and align Company practices with international standards.
- Organize annual meetings between Thailoil and ship owners (Thailoil – Ship's Owner Meeting) to ensure that information on ship and port safety, port rules in the event of maintenance and construction, and gaps identified through the random tanker safety audits are communicated to relevant parties, and that corrective actions needed are being implemented to maintain safety in the operations and prevent incidents and environmental damage on ships and ports.



## Mitigation

Thailoil's highest aspiration is to operate without making errors that may lead to oil or chemical spills. We schedule regular

maintenance of our tools and offshore equipment – such as the oil pipelines, safety equipment, and the marine break away coupling (MBC) system – to make certain that the equipment is not faulty and is ready for use. However, if an unforeseen incident were to occur, Thailoil has also prepared management measures to respond and resolve the incident as follows:

- The emergency response plan will outline measures to contain the oil or chemical spill and cleanup all residue as fast as possible. The plan is regularly reviewed and updated according to the changing environment and newly developed technologies. We also organize annual oil spill and chemical spill exercises for operators on duty (TOP Group Duty), as outlined in the corporate emergency plan. The exercises ensure that all operators on duty understand their roles and can act in accordance with the emergency plan with accuracy, speed, and efficiency.



- The emergency response team will take action to ensure that all oil removal equipment, both within Thailoil's equipment warehouse and on vessels, are readily available at all times to be used to respond to unforeseen incidents. We regularly organize equipment maintenance, such as starting the engines and inspecting the spinning systems and hydraulic oil, on a monthly basis. The Occupational Health & Safety and Quality teams also conduct random audits to ensure that the equipment is always ready to use at all the time.



## Personnel Development

Thailoil Group heavily prioritizes personnel development programs to ensure that our employees are ready to execute the oil spill and chemical spill response plans. In 2020, we delegated our employees to the training sessions and seminars, located both in Thailand and overseas, as detailed below.

- In April 2020, Thailoil officially opened the newly contructed Jetties No. 7-8 for operation, expanding from our existing 6 jetties. In line with measures detailed in the Company's emergency plan, the Company organized the oil spill and chemical spill table top and field exercise training for operators on duty (TOP Group Duty) and loading masters to ensure

that all operators on duty understand their roles and can act in accordance with the emergency plan with accuracy, speed, and efficiency.



- The Company organized a demonstration of oil spill cleanup at sea with the Center for Coordinating Efforts to Secure National Marine Interests in Area 1 (SR.CN 1) and the Oil Industry Environmental Safety Group Association in Sriracha (IESG-SASC) through the Joint Crisis Management Exercise (C-MEX 2020) on 24-25 August 2020. The exercise results were positive and helped build good relations between the public and private sectors.



- As part of the “Oil and Chemical Spill Health Check” Project, the Company conducted internal audits of marine oil and chemical spill management through engaging relevant functions such as the Occupational Health and Safety function, Environment function, Quality Management function, and Government Relations function. Findings from the Project were then used to identify key gaps and improvement actions needed to strengthen the Company’s oil and chemical spill cleanup plans.
- In October 2020, due to the widespread outbreak of the COVID-19 pandemic in many countries, the Company had to cancel plans to send employees to the Regional Industry Technical Advisory Group meeting in Vietnam to build employees’ capabilities in oil spill cleanup.

For 2021, Thailoil Group has the following activities planned as follows:.

- Thailoil will organize an oil spill cleanup exercise with the Oil Industry Environmental Safety Group Association in Sriracha (IESG-SASC), whose members include Thai Oil Public Company Limited, PTT Public Company Limited, and Esso

(Thailand) Public Company Limited. We had to postpone the exercise from 2020 to 2021, as the C-MEX exercise was organized with government agencies in 2020. For 2021, ESSO will be the appointed host, with the exercise simulating an incident wherein a marine oil spill happens in Esso, but spill containment was unsuccessful and Esso has to request additional support from Thailoil and PTT. The objective of this exercise is to test communication plans, coordination between companies, and the first line support promptness and ability to control the situation as fast as possible and prevent the incident from escalating. Additionally, we will also practice oil spill equipment mobilization to work areas and collaboration in marine oil spill cleanup.

- The Company will arrange oil spill cleaning equipment in the oil removal equipment warehouse at Jetty No. 7-8 to ensure readiness of the equipment and enable the Company to handle oil spill promptly, more efficiently, and reduce the time for transporting the equipment from the main warehouse to the sea.



## Performance 2020



### Social and Relationship Capital

compliance with ISO 14001:2015

**100%**

compliance with environmental laws and regulations confirmed through environmental quality monitoring

**100%**

compliance with all relevant laws and regulations

**100%**

compliance with environmental governance excellence of petroleum and petrochemical oil refineries

**100%**

Remark: TOP TLB TPX LABIX



### Natural Capital

**Zero** case of significant oil and chemical spill since 2005

Remark: Significant spills are defined as oil and chemical spills that leak more than 1 barrel into the ocean or more than 100 barrels on the land.







# CLIMATE CHANGE RISK



## CHALLENGES, RISKS, AND IMPACTS

As the impacts of climate change become more intense, the impacts have led to catastrophic natural disasters such as floods, droughts, storms, forest fires, and temperature changes in various locations. Consequently, many national and international agencies have placed climate change risk and impact reduction at the forefront of their agendas. With the Paris Agreement, multiple countries around the world have ratified their commitments to the agreement to limit global temperature rise below 2 degrees Celsius. The Thai government in particular ratified the Agreement in 2015, and has since then set a national target of 20 – 25% greenhouse gas emission reduction from baseline year 2015 by the year 2030. To propel the country towards accomplishing this target and drive greenhouse gas management in the public and private sectors, the Thai government is currently in the process of drafting the National Climate Change Act, or Global Warming Act, which will come into effect in the near future. The new legislation will cover economic mechanisms to incentivize greenhouse gas reduction in the private sector, as well as measures to promote change in the behaviour and lifestyles of the population to help mitigate climate change. Examples of mechanisms and measures include developing and promoting public transportation, incentivizing the production and consumption of renewable energy, and advancing the Thailand Integrated Energy Blueprint in the long term.

Climate change has become a priority issue of increasing interest to the Company's stakeholders. We have witnessed this trend from movements in the civil society sector, investors, and other agencies that have pushed for climate action, illustrated by initiatives such as the Science-Based Targets Initiative (SBT) and the Task Force on Climate Related Financial Disclosures (TCFD). These initiatives outline short- and long-term expectations for the oil and gas industry, specifically noting that companies should have measures to respond to business transition risks and the development towards a low carbon society in the future. Thailoil Group duly recognizes the climate change risks and the challenges that confront the organization. We have made sure to include these risks in our enterprise risk assessment processes, while also defining an organizational strategy to determine the most efficient response measures and ultimately grow our business sustainably alongside consideration for our environment and communities. Our processes cover business transition risks, regulatory risks, and physical risks.

## COMMITMENT

Thailoil Group monitors climate change impacts through assessing risks and opportunities, and has defined an environmental sustainability strategy, with established short- and long-term greenhouse gas reduction targets. The Company has action plans that support our commitment to business excellence, while also maintaining readiness to adapt when confronted with climate change impacts – such as those related to changes in legislation, the occurrence of natural disasters, water scarcity, and changes in consumer behavior. At the same time, we have supported research and development initiatives to increase energy efficiency and reduce oil loss to minimize impacts from production processes. In our investment in the Clean Fuel Project, we have opted to use technologies that are highly efficient at the international level to lessen impacts to the environment and communities. Our investment strategy has also been adapted to prioritize new business opportunities in innovation and green businesses in the future.



## Targets



In the short term, to reduce greenhouse gas emissions by

**4%**

from business-as-usual baseline scenario in 2017 by the year 2022.



In the long term, to reduce net greenhouse gas emissions by

**15%**

from business-as-usual baseline scenario in 2023 by the year 2030.

## MANAGEMENT APPROACH



### Governance and Oversight

Thaioil Group regularly reviews our business strategy against the context of climate change every year under the supervision of the Board of Directors, and assesses for potential impacts to our business through a risk management process. We also track corporate key performance indicators related to climate change. More specifically, we use the Energy Intensity Index (EII) to evaluate performance of management executives and employees, with the performance is then reported to the Board.

In 2020, the Board of Directors agreed to strengthen the long-term net greenhouse gas emission reduction target to 15% from business-as-usual baseline scenario in 2023 by the year 2030. As noted in the environmental sustainability strategy, Thaioil will work towards this target by continuing to increase energy efficiency. We will also build capacity by investing in renewable energy projects.



### Climate Risk Identification and Assessment

Thaioil Group assesses climate change impacts on the business through risk management processes. Due to the uncertain nature of climate change, the climate change is in consequence considered as an emerging risk due to the risks and opportunities associated are uncertain. For this reason, the company has conducted scenario analysis for two potential scenarios, including:

**The baseline scenario** which is based on the nationally determined contributions currently agreed to in the Paris Agreement, and of which Thailand has ratified and committed to a national target of 20 – 25% greenhouse gas emission reduction from baseline year 2015 by the year 2030, and

**The transition scenario** or the 2 degrees scenario (2DS), of the International Energy Agency, where the global emission reduction target does not fall below 2 degrees Celsius.

For each scenario, the Company assesses regulatory risks, physical risks, and transition risks for the years 2030 and 2040. Findings regarding the risks are then used to define strategic plans and long term action plans for 2030. To that end, Thaioil Group consistently monitors external changes and implements

management measures for the three groups of risks. Details are outlined below.



### Regulatory risks

that may impose impacts on current operations and future investments, including the forthcoming National Climate Change Act or Global Warming Act, greenhouse gas reporting requirements, private sector responsibilities in supporting the achievement of national greenhouse gas reduction targets (nationally determined contributions: NDCs), economic mechanisms that will be included in the Climate Change Act such as carbon taxes and emission trading systems, developments and improvements in public transportation systems, and government initiatives to incentivize the production and consumption of clean energy.

Thaioil Group has closely monitored government direction on these risks, and subsequently assessed risks and impacts to maintain our readiness to respond to such changes. Upon completing the risk assessment and determining that the risks were at medium level, the Company has therefore developed the “Thaioil Group Clean and Green Strategy” as part of our environmental sustainability strategy to drive our business operations towards the green economy in order to achieve our Partner for Life goals through rigorous ESG management.

For the **2020-2022 short-term strategy**, Thaioil Group will continue to benchmark our energy efficiency performance with other international companies to identify gaps and improvement opportunities. The Energy and Loss Committee, established in 2012, comprises of representatives from operations and management who come together to assess risks, evaluate opportunities, and develop action plans to manage production and operations and systematically monitor performance to increase energy efficiency and reduce greenhouse gas emissions in production processes. Furthermore, we have also limited fuel consumption in the production process, with the aim to increase the share of consumption from fuels with lower greenhouse gas emissions compared to fuels with higher greenhouse gas emissions. In addition, Thaioil is currently in the process of considering use of internal carbon pricing in our investment decision.

For the **2023-2030 long-term strategy**, Thaioil Group has been making preparations for the Clean Fuel Project (CFP). We have selected highly efficient technologies and stopped production in old production units. This will help us to achieve significant increases in energy efficiency in our refinery. Additionally, the CFP will be contributing towards greenhouse gas reductions as it does not rely on emission-intensive fuel during the operating processes, and have the special capability of processing the refined fuel oil into value-added products with lower emissions, in effect directly reduce greenhouse gas emissions from end consumption. Furthermore, the Company has established a target to seek more investment opportunities in renewable energy businesses and green businesses to support our long term greenhouse gas emission reduction target. To efficiently manage greenhouse gas emissions from end consumption, the Company has set a target to maintain revenue portion of green products (green revenue growth) by 25% of total sales revenue by 2030. This will also help reduce indirect greenhouse gas emissions and mitigate regulatory risks or changes in consumer behavior and interest towards more environmentally friendly products and services in the future.

Thaioil Group closely monitors development in greenhouse gas reporting requirements and government economic incentives through studying and participating in different initiatives led by governmental and other agencies. Some of the initiatives we participated in the past year are listed below.

- The Company maintains ongoing participation in the Thailand Voluntary Emission Reduction Program (T-VER) organized by the Thailand Greenhouse Gas Management Organization (Public Organization).
- The Company maintains ongoing participation in the Low

Emission Supporting Scheme (LESS) to support organizational and national efforts to reduce greenhouse gas emissions through initiatives that increase energy efficiency.

- The Company has completed the Life Cycle Assessment (LCA) project of all products produced by Thaioil refinery as database for the Carbon Footprint project. This database serves as a platform for consumers to access data regarding product greenhouse gas emissions to support their decision-making process.
- The Company has completed installation of the renewable energy system at the Engineering Building Center, and is in the process of completing the designs for the installation of another renewable energy system at the Satthiwatsawirun Building to advance renewable energy consumption in the organization, and reduce greenhouse gas emissions and regulatory risks from climate change in the future.
- The Company will be continuing the Thaioil CE (Thaioil Circular Economy) Project to increase efficiency in energy consumption and resource use, and reduce greenhouse gas emissions across production processes, procurement, services, events and seminars, product manufacturing, and waste management.



#### Physical risks

The risks that may affect the Company's ability to source water to use in the production process and the Clean Fuel Project in the future.

Water is a natural resource that is absolutely vital to securing livelihoods and maintaining industrial activity. The need for water is especially pronounced in periods of industrial growth, as demonstrated in the significant increase in water demand across Eastern Thailand resulting from the Eastern Economic Corridor development. In response to this increase in water demand, alongside climate change impacts that may result in water scarcity, Thaioil Group is ready to reduce risks and mitigate potential impacts that may affect production processes and our communities.

At present, Thaioil Group does not withdraw fresh water from natural water sources. The company sources raw water from two different water distributors – the Bang Pra Reservoir by the Royal Irrigation Department, and the Nong Kor Reservoir by the Eastern Water Resources Development Public Company Limited – for use in our production processes, such as in the cooling tower system, water demineralization systems to produce steam, and other production processes. In addition, both water distributors maintain an integrated water management system alongside with Thaioil Group through aligning practices with government policies, or the local context of water use in the

area. To minimize impacts on ecosystems, we consistently improve water quality to appropriate levels and strictly maintain water quality at levels above regulatory standards before discharging into the environment. At the same time, we integrate circular economy principles and the 3Rs (Reduce, Reuse, Recycle) in our water management systems to maximize efficiency in water consumption.

Furthermore, Thailoil Group annually monitors, forecasts, and assesses water risks by using the Aqueduct Water Tool – an internationally accepted tool developed by the Water Resource Institute. We also join external and public agencies – such as the PTT Group Eastern Regional Water Committee, the Eastern Regional Water War Room, and the Water and Environment Institute for Sustainability – to build networks for integrated water management across all parties. To reduce risks of creating adverse impacts on the production process or on communities, the Company uses proactive measures. For instance, Thailoil has set a target to divert water from Bang Pakong and Klong Pra-ong Chaiyanuchit canal to the Bang Pra Reservoir, which enhances water supply capacity for Chonburi City, reduces consumption of municipal water from Chonburi City, and increases water transported from Rayong Province. To ensure that we balance business interests with the needs of all stakeholder groups, Thailoil Group has made a clear commitment with priority given to communities in the event of drought and water shortage. During droughts, the authorities will first supply water to surrounding communities. Then, only after their needs for daily consumption and agriculture activities are satisfied, the authorities will supply water to Thailoil Group. The Company has also established water consumption targets and implemented projects to increase efficiency in water consumption and mitigate water scarcity risks (For more details, please see reporting on Water Management in the Operational Eco-Efficiency section.) In addition, the Company has installed a total of six desalination units that are readily available to operate to reduce our freshwater consumption and support our water demand.

Moreover, to support the Clean Fuel Project (CFP) operations in the future, Thailoil Group has assessed risks and water demand, and established risk mitigation measures. To that end, we have implemented various projects, including a project to construct a new reservoir, a project to build a new water pipeline from Bang Phra Reservoir in Chonburi Province, and a project to develop a water diversion network through a water company.



#### Transition risks

Stemming from fast advancements in technology that will facilitate replacement of oil consumption with alternative energy may affect business in the future. It can be seen that presently,

the development and improvement of alternative energy technology has speedily driven oil substitutes in various types and forms, such as electronic vehicles and hydrogen fuels. Governments in several countries have passed different rules and regulations that together promote use of alternative energy in replacement of oil, leading to several car-manufacturing companies in Europe setting targets to reduce or cease manufacturing internal combustion engine vehicles. In Thailand, the government has set a target to have 250,000 electric vehicles, 3,000 buses, and 53,000 electric motorcycles running by 2025. In the long term, the government has also set a target for 750,000 electric vehicles by 2030. To support these targets, the government has provided corporate income tax cuts as benefits to private companies that invest in the electric vehicle industry. Meanwhile, a number of public transportation groups have commenced pilot projects to shift towards the electric system. With these factors in action, the oil industry may not be able to adapt accordingly and may face decline in income and growth rates in the long term. Thus, Thailoil Group has determined a plan to make the necessary adjustments in gasoline production to ensure that future production will appropriately respond to forecasted demand reduction. We have also made improvement plans regarding production efficiency through an investment strategy that prioritizes diesel and aviation fuels, which will be realized through the CFP.

Furthermore, the Company has revisited organizational strategic directions and plans, including business plans for the short, medium, and long terms, for the years 2021-2030. As a result, we have developed three main business directions and strategies, including:

- Value Maximization through further developing the refinery business – the current core business – and further expanding towards high value products that are centred on customer needs;
- Earnings Diversification, including diversifying our investment portfolio to build earnings stability, while seeking opportunities in environmentally friendly businesses and creating new innovative businesses that align with future trends; and
- Supply Chain Management as a Growth Platform, to integrate joint operations within Thailoil Group – from raw material sourcing, customer service, to product delivery within the region – through managing product distribution and logistics system, both in the present and in the future, and within Thailand and in the region. (For more details, please see the Strategy Outlook section.)

In line with our Earnings Diversification strategy, the Company has investment plan in renewable energy businesses. We expect that this investment will help us achieve our long-term target of 15% net greenhouse gas emission reduction from business-as-usual by 2030.





## Performance 2020



### Natural Capital

Reduced greenhouse gas emissions by

# 51,084

tons of carbon dioxide equivalents from the energy efficiency improvement projects.



### Manufactured Capital

# 100%

of operations were subjected to climate risk assessment

**No** disruption in the production process caused by water scarcity

## Direct Greenhouse Gas Emission Reduction (Scope 1)

In 2020, Thailoil Group implemented additional initiatives to reduce greenhouse gas emissions, based on the organization's energy intensity index (EII), through investing 57.40 million THB in a total of 19 energy efficiency improvement projects. This has further contributed to the reduction of greenhouse gas emissions by 51,084 tons of carbon dioxide equivalents (For more details, please see the "Operational Eco-Efficiency" section). Furthermore, we have completed the LCA project of all products produced by Thailoil refinery. The information gathered for this project will be served as part of the Thailoil Carbon Footprint Database to effectively plan for the reduction of greenhouse gas emissions from key sources. In the future, we aim to expand the scope of this project to cover all companies in Thailoil Group. Furthermore, we have studied carbon pricing to complement our investment decisions and ensure our readiness to participate in carbon credit trading schemes in the future.

Thailoil Group has also implemented renewable energy projects and participated in greenhouse gas reduction activities alongside government agencies, as briefly noted above, to support greenhouse gas reduction within Thailoil Group and for national greenhouse gas reduction targets. The projects and their details are described below.

**The Solar Rooftop for Sustainability** Engineering Project at the Engineering Building Center has now been completed. The Company is now in the process of completing the designs for the installation of another renewable energy system at the Satthiwatsawirun Building to promote renewable energy consumption in the organization, and reduce greenhouse gas emissions. The total production capacity is approximately 1,000 kW.

**The Low Emission Supporting Scheme (LESS) Project**, Thailoil selected three of the organization's energy conservation projects that were designed to improve energy efficiency in 2019. These included: a research project to change the catalyst used in the Continuous Catalyst Regeneration Platformer Unit to reduce fuel consumption in the heater and overall energy consumption; a project to reduce the ratio of hydrogen to hydrocarbon to minimize energy consumption in the Hydrocracking Unit 1; and a project to increase heat exchanger efficiency through anti-scalant injection in the heat exchanger of the Crude Oil Refinery Unit 3 to reduce fuel consumption in the heater. Together, these projects contributed to the reduction of greenhouse gas emissions by 49,773 tons of carbon dioxide equivalents.

**The Thailand Voluntary Emission Reduction Program (T-VER)**, which is organized by the Thailand Greenhouse Management Organization (Public Organization), the Company participated through the 239-MW Combined Cycle Co-Generation Power Plant at Sriracha District, Chonburi Province of TOP SPP Company Limited. The Project passed the assessment process and obtained certified carbon credits for second time this year. In 2020, the Project reduced over 315,387 tons of carbon dioxide equivalents of greenhouse gas emissions, thus bringing the accumulated amount of carbon credits to over 643,271 tons of carbon dioxide equivalents. Through this Project, the Company supports the transition to a low carbon society in the future.

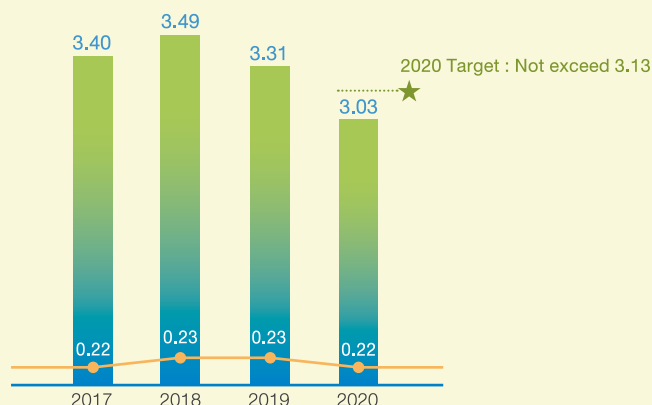
As a result of our rigorous management of greenhouse gas emissions, Thailoil Group achieved our targets for Scope 1 greenhouse gas emissions in 2020.





#### Direct greenhouse gas emissions (scope 1)

- Million tons of carbon dioxide equivalents
- Ton of carbon dioxide per ton throughput



### Indirect Greenhouse Gas Emissions Reduction (Scopes 2 and 3)

Thaioil Group does not have any indirect greenhouse gas emissions (Scope 2) resulting from generation of electricity and steam purchased externally, as none of the production units in Sriracha District, Chonburi Province depend on external energy sources.

Measures taken to manage other indirect greenhouse gas emissions (Scope 3) in the value chain are listed below.

- The Energy and Loss Committee (E&L Committee) assessed risks and established action plans to reduce oil loss during transportation of crude vessel to refinery (ocean loss). The E&L Committee has also designed a system to transport the product through a network of oil pipelines to reduce greenhouse gas emissions generated from production and transportation through vehicles and tanks.
- The Company reduced greenhouse gas emissions from end consumption through selling low carbon products, such as gasohol, biodiesel, and bioethanol.
- The Company controlled greenhouse gas emissions resulting from waste disposed to landfill. In 2020, through exploring for opportunities to add the value to waste that would be disposed to landfills and integrating the 3Rs, Thaioil Group was able to achieve the Company's target of zero waste to landfill.
- The Company supported employees in using Company vehicles instead of personal vehicles to travel to work or other locations within Thaioil Group. The Company has standards to maintain efficiency in business travel, as implemented through our car rental contracts, our carpool program, and employee service vans. We also encourage employees to use bicycles for travelling into the production plant and to conduct meetings through video calls instead of commuting to the meeting to minimize travel.
- The Company reduced indirect greenhouse gas emissions through the Digital Transformation Project, which increased work efficiency and reduced paper usage.
- The Company promoted procurement of products and services that are environmentally friendly through the Thaioil CE WE GO Project (Thaioil Circular Economy).
- The Company continued to advance projects for communities and the environment to promote sustainable management of environmental resources and to drive towards a low carbon society way of living. For instance, through the Renewable Energy Project, a part of our "Sustainable Energy for Healthcare" theme, Thaioil completed installation of a 40-kW solar power system at Thanyarak Hospital and a 53-kW solar power system at Koh Sichang Hospital, and is currently in the process of installing a solar power system for Laem Chabang Hospital.

# OPERATIONAL ECO-EFFICIENCY



## CHALLENGES, RISKS, AND IMPACTS

Thaioil Group is aware of the various external factors and environmental changes facing the world, including the limitation of resource, increasingly severe air pollution in various locations, freshwater demand and consumption, the sharp rise in waste generation that has resulted in significant environmental impacts, and the increase in energy consumption, that have resulted from socio-economic growth. These factors, alongside increased expectations from stakeholders in Thailand and abroad to manage environmental impacts, have specifically resulted in several countries to adopt the principles of circular economy to respond to these challenges. We have observed a trend towards more stringent policy making and enforcement from the Thai government, as demonstrated in the various draft environmental legislation expected to come into effect in the future, such as the Draft Notification of the Ministry of Industry on the Control of Volatile Organic Compounds in Oil Tanker Storage Businesses, and the Draft Notification of the Ministry of Natural Resources and Environment on the Amendment of the Notification of the Ministry of Natural Resources and Environment on Emission Standards for Petroleum Refinery Plants. All the aforementioned therefore challenges Thaioil Group to have appropriate risk assessment, management measures, and action plans to reduce risks and potential impacts.

## COMMITMENT

In response to the challenges described above, Thaioil Group intends to accomplish our “Partner for Life” goal to operate our business alongside communities. The O2Bx (Operation Excellence to Business Excellence) initiative, which covers the organization’s medium-and long-term management of operational eco-efficiency, was designed to serve these objectives while pushing forward excellence in three main areas, including:



### The environmental dimension

which drives excellent impact management, such as air quality management, water quality management, and waste management.



### The social dimension

which drives the organization in creating shared value for society through projects such as the Thaioil CE WE GO (Thaioil Circular Economy WE GO) Project and its priorities in using resources efficiently, reducing environmental impacts, and contributing business value to society.



### The governance dimension

which drives the organization in operating with excellent and complete compliance with regulations.

Furthermore, Thaioil Group has adopted national and international environmental management standards, such as ISO 14001:2015, guidelines for excellence in environmental governance, guidelines for operational excellence according to internally accepted standards, and the Operational Excellence Management System (OEMS), to ensure systematic environmental management and continuous improvement.



## Targets



Energy efficiency ranking in the Solomon Benchmarking of energy efficiency performance of refining businesses in the Asia-Pacific region

2020 Target:

**2<sup>nd</sup> Quartile**

2030 Target:

**1<sup>st</sup> Quartile**



Total waste disposed to landfill from 2020 onwards

**0%**

## MANAGEMENT APPROACH

To implement circular economy principles in our operations, Thailoil has established a working committee and developed an operational plan for the “Refinery in the City” model, which is part of the “Thailoil CE WE GO” Project. We have integrated the BS 8001 management system and ISO 14001 to ensure that our practices follow international circular economy principles, whether that be in framing, scoping, idea generation,

conducting feasibility studies, implementing, monitoring, and reporting. Our aim is to ensure that all Thailoil Group’s activities sustainably use resources with the utmost efficiency, and limit and reduce impacts from the business on ecosystems and communities. As we partake on our path towards the “Partner for Life” goal, performance in all areas are regularly reported to management executives and stakeholders.

### “Thailoil CE WE GO” Project



#### Water and wastewater management

To focus on efficiency of water consumption both inside and outside the refinery.

To study the feasibility of water discharge and seawater utilization.



#### Energy conservation

To use energy resources wisely.

To carry out projects for promoting the sustainable use of renewable energy both inside and outside the organization.



#### Green label focus

To set target of Green Label Product usage.

To establish green procurement.

To set Green Office / Green Meeting for sustainable management of office and meeting.



#### Opportunity for upcycling

To sustainably manage waste.

To carry out projects of waste upcycling for use in the organization’s activities.

To expand the Circular Economy project for communities and society.



## Water and wastewater management



### Water and Wastewater Management

The ‘W’ in Thailoil CE WE GO stands for water and wastewater management, and represents Thailoil Group’s integrated water management, a key aspect in operating in line with the principles of circular economy. The Company uses a holistic management approach based on the 3Rs (Reduce, Reuse, Recycle) to reduce risks and potential impacts, as well as increase the efficiency of water consumption throughout production processes.

In 2020, Thailoil Group implemented and completed several water conservation projects. They are categorized into three areas, including:

### 1 3Rs in Process Water Management Projects, including:

- A project to swap the Sour Water Stripper 2 (SWS-2) to the Sour Water Stripper 5 (SWS-5) (APU-C) for condensate recovery and to save low pressure steam;
- A project to reuse the boiler blowdown condensate at X-4002 and G-5001-UT;
- A project to reuse the condensate at X-4003 and B-101-UT;
- A project to fix the leakage in the Pipeline-UT of APU-F;
- A project to reduce the water consumption through minimizing backwash frequency of the Water Treating Unit-UT of TOPSPP Company Limited;
- The TOP SPP Water Recovery Project (Heat Recovery Steam Generator (HRSG) Blowdown & Sand Filter Backwash);
- A project to reduce the water consumption at U-2230 of APU-C (U-2230: APU-C);

### 3 Projects to raise awareness of employees and subcontractors as well as collaboration to promote the importance of water efficiency within the organization, including:

- The '1 Pic to 1 Price' activity, where participants capture photos of water leaks in Thailoil Group operations to identify areas of improvement;
- The 'You Save, We Safe' Project to conserve water consumption in households; and
- The IDEA I Share Project to encourage participants to share good water conservation ideas.

Additionally, Thailoil has developed other projects to increase stability in raw water management, such as our projects to construct new raw water pipelines and water storage tanks as well as new water pump systems. The Company has also renovated water drains to manage flooding in the refinery and surrounding areas. We continue to use the desalination unit to increase the share of water consumption from renewable resources, or seawater, instead of raw water from natural sources, to ultimately reduce water scarcity risks.

### 2 Pilot Projects for Sustainable Water Management, including:

- The TOP SPP Blowdown RO Project to study the use of reverse osmosis (RO) systems to filter blowdown water to freshwater in TOP SPP Company Limited;



- The Effluent Treatment Plant RO Project to study the use of reverse osmosis (RO) systems to filter wastewater to freshwater at the Thailoil Effluent Treatment Plant;



- The Seawater RO Project to study the use of reverse osmosis (RO) systems to filter seawater to freshwater;



## Wastewater Management

Thailoil Group is committed to preserving the state of ecosystems. To that end, we maintain the quality of discharged water above relevant rules and regulations before discharging the treated water outside our operational areas. The Company reduces water consumption in the beginning stages of the production process in order to reduce the volume of wastewater generated. Furthermore, Thailoil Group also designed the wastewater management system to maximize resource and energy efficiency. Since different types of wastewater have varying levels of contamination, we have classified three types of wastewater to reduce resource and energy consumption. The three types include:

- Process effluents;
- Continuously oil-contaminated (COC) water: water used for washing or rainwater runoff at production sites; and
- Accidentally oil-contaminated (AOC) water: rainwater runoff in Thailoil Group's operation sites, water used for washing without oil contamination, water used in fire drills, water from cooling towers, or water from steam generators.

Moreover, Thailoil Group regulates treated wastewater throughout the day and maintains 24-hour monitoring. The chemical oxygen demand is reported to the Department of Industrial Works in real time through the Chemical Oxygen

Demand Online (COD Online), while the quality of wastewater is tested by the Thailoil Group Laboratory and inspected by independent third parties to ensure that the organization only discharges treated wastewater with higher quality than required by regulatory standards. The Company also prioritizes ongoing human capital development through initiatives such as training operators to oversee the wastewater treatment system in order to enhance their capabilities to efficiently manage wastewater. In 2020, Thailoil Group was able to reduce freshwater withdrawal, maintain wastewater quality above regulatory standards, and avoid creating impacts on the quality of life of communities and ecosystems.



## Performance 2020



## Natural Capital



# 46%

of freshwater consumption replaced by distilled water from desalination.



# 31%

reduction in total freshwater withdrawal, when compared to the previous year.

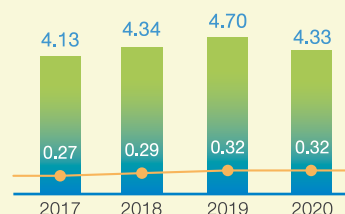


# 3.88%

reduction in total water discharge, when compared to the previous year.

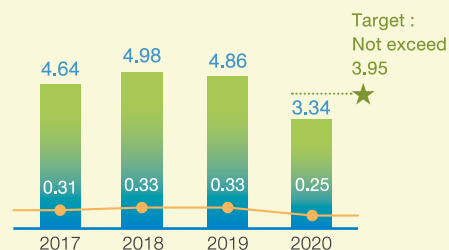
### Total water consumption for industrial use

- Million cubic meters
- Cubic meters per ton refinery throughput



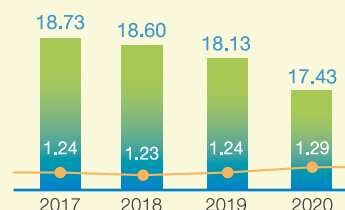
### Total freshwater withdrawal

- Million cubic meters
- Cubic meters per ton refinery throughput



### Total wastewater discharge

- Million cubic meters
- Cubic meters per ton refinery throughput







## Energy conservation



### Energy Management

Thaioil Group's energy consumption for 2020 was approximately 27.5 million gigajoules, a reduction of 10 % from the previous year. Energy consumption reduced primarily because Thaioil Group had to decrease production rates following the decline in demand for petroleum and petrochemical products resulting from the COVID-19 pandemic. The pandemic had impacts on all parts of the economy, including the petroleum refining and petrochemicals industry.

As some of the refining units operated at significantly lower rates than the designed production capacity, resulting in a deterioration in energy efficiency, as most equipment will operate at the highest efficiency when the operating capacity produces closer to the designed capacity. Nonetheless, Thaioil Group viewed this as an opportunity. During the time that the refining units produced at lower rates than the capacity, we took the chance to improve the efficiency of our machinery and equipment to ensure the readiness of our refining units when production rates return to high levels, and achieve maximum energy efficiency. In 2020, Thaioil Group invested 57.4 million THB and implemented a total of 19 energy conservation projects, effectively reducing energy consumption by 762,264 gigajoules, equivalent to 51,084 tons of carbon dioxide.

#### **In 2020, Thaioil Group implemented energy efficiency improvement projects as follows:**

**Improved the production process to increase the energy efficiency of Crude Distillation Unit 1** by reducing pressure in the crude distillation column, and controlled steam consumption by steam stripping at appropriate levels;

**Improved the production process to increase the energy efficiency of Crude Distillation Unit 2** by installing a new air pre-heater in the Crude Distillation Unit 2 to increase heat exchange efficiency, and controlled steam consumption by steam stripping at appropriate levels;

**Improved the production process to increase the energy efficiency of Crude Distillation Unit 3** through controlling steam consumption by steam stripping at appropriate levels, and established a cleaning schedule for the heat exchanger to reduce fuel consumption and ensure that the unit can always operate at the maximum capacity;

**Reduced pressure levels in the split-shell column** (the column that separates raffinate materials from desorbent materials) of the isomerization unit to reduce the consumption of medium pressure steam at the reboiler in the distillation unit;

**Improved the production process to increase the energy efficiency of Continuous Catalyst Regeneration Platformer Units 1 and 2** by adding chloride to the catalyst at levels that will increase the efficiency of the catalyst and henceforth reduce the reaction temperature, curtailed energy consumption through decreasing pressure in various splitter distillation columns in the production units, and lessened consumption of high pressure steam for driving the gas compressor through minimizing the amount of recycle gas, while controlling the elimination of coke in the catalyst according to targets.

**Controlled steam consumption for vacuum creation of Vacuum Distillation Units 1, 2, and 3** at appropriate levels;

**Improved the production process to increase the energy efficiency of the Hydrocracking Unit 1** by making plans to use part of the compressor at higher levels in order to be able to avoid using part of the compressor when production rates are low and ultimately bring down electricity consumption in the production process, and maintained the pressure levels of different split distillation columns at appropriate levels to reduce fuel consumption;

**Improved the production process to increase energy efficiency of the Hydrocracking Unit 2** by maintaining hydrogen for the hydrocarbon feed substances at

sufficient levels to reduce the acceleration rate of the gas compressor, which allowed Thailoil to reduce consumption of high pressure steam used for driving the gas compressor, and maintained the pressure levels of different split distillation columns at appropriate levels to reduce fuel consumption;

**Partially stopped operating cooling fans** in the Fluidized Catalytic Cracking Unit (FCCU) when production levels were low;

**Maintained excess air in the feed heater (F-8701) of the Catalyst Cracked Gasoline** Hydrodesulphurization Unit (CCG-HDS) at appropriate levels;

**Evaluated the production efficiency levels of Hydrogen Manufacturing Units 1 and 2** to support decisionmaking on operating only one hydrogen unit at a time during periods of low hydrogen demand due to lower overall production levels, rather than running two hydrogen units simultaneously. The evaluation included a comparison of the efficiency levels and the limitations of each unit, which based on the approach to ensure that enough hydrogen was produced for the Company's needs while minimizing energy consumption and production costs;

**Reduced energy consumption through installing a heat exchanger** for the MP Refining Unit of Thai Lube Base Company Limited to recover the heat released and reuse it in the production process;

**Established a cleaning schedule for the heat exchanger of the Vacuum Distillation Unit** of Thai Lube Base Company Limited to reduce fuel consumption and ensure that the unit can always operate at maximum capacity;

**Adjusted the levels of non-Aromatics substances in Mixed Xylenes** to optimize energy consumption of the Parex Unit of Thai Paraxylene Company Limited and the Continuous Catalyst Regeneration Platformer Units 1 and 2

of Thailoil Company Limited, following the market situation of the gasoline and aromatics markets, in order to maximize economic value gained;

**Limited the solvent recovery** of the ED Sulfolane Unit of Thai Paraxylene Company Limited at levels that appropriate for the production process and product quality to reduce energy consumption in the production unit;

**Increased the efficiency of paraxylene recovery** to reduce the amount of paraxylene in the process, and adjusted the amount of extract used in the Paraxylene Unit of Thai Paraxylene Company Limited to reduce energy consumption in the production unit;

**Controlled reactor inlet temperature of the Isomar Unit** of Thai Paraxylene Company Limited at levels fitting with catalyst efficiency to reduce fuel consumption of the heater;

**Controlled recycle gas levels of the Isomar Unit** of Thai Paraxylene Company Limited at appropriate levels to reduce fuel consumption of the heater and electricity consumption of the gas compressor;

**During the turnaround period of LABIX Company Limited** in July and August, energy efficiency improvement projects were implemented with key outcomes outlined below:

- **Changed the absorbent used in the Paraffin Splitter Unit (Molex Unit)** to increase the efficiency in splitting and enhance the ability to recover paraffin. This resulted in greater LAB (Linear Alkyl Benzene) production capacity, reduced the amount of desorbent per feedstock, and thereby reducing the overall energy consumption; and
- **Changed the pressure control valves of the distillation column of the Paraffin Splitter Unit (Molex Unit)**, which in turn reduced pressure levels in the split-shell column (the column that separates raffinate materials from desorbent materials), in order to reduce energy consumption in the reboiler of the distillation column.

### Heat exchanger cleaning to increase heat transfer efficiency and reduce fuel consumption



Before



After



The project that conserved the largest amount of energy in 2020 was the evaluation of production efficiency levels of Hydrogen Manufacturing Units 1 and 2 to support decisionmaking on operating only one hydrogen unit at a time during periods of low hydrogen demand due to lower overall production levels, rather than running two hydrogen units simultaneously. This project helped reduce energy consumption by 133,543 gigajoules, equivalent to 7,412 tons of carbon dioxide per year. This accounts for 17.9% of total energy conserved.

Furthermore, Thaioil Group has implemented energy conservation projects in the workplace. We supported and encouraged employees to be more aware of the importance of energy conservation through organized activities and communication channels, such as sharing articles or news about energy conservation projects in the Energy and Loss column of the Company's Akanee monthly magazine, running energy conservation awareness campaigns, and sharing energy conservation tips in shared spaces around the office.



## Performance 2020



### Manufactured Capital

Energy consumption reduced from last year by  
**10%**  
maintained our energy efficiency ranking at the 2<sup>nd</sup> Quartile group in comparison to other companies in the Asia-Pacific region.



### Financial Capital

Operational cost savings of  
**112.4** million THB  
from investments in energy efficiency improvement projects



### Natural Capital

Reduced energy consumption by  
**762,264** gigajoules  
from energy efficiency improvement projects

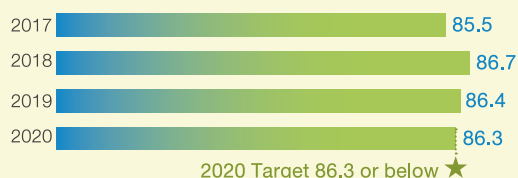
#### Energy Intensity Index (TOP, TP, TOP SPP)



#### Energy Intensity Index (LABIX) (Gigajoule / ton of LAB)



#### Energy Intensity Index (TLB)



#### Energy Intensity Index (TPX)



As demand for petroleum products continues to decline as a result of the COVID-19 pandemic, especially jet fuel demand, which has not recovered due to the travel restrictions in various countries. Thail Public Company Limited has had an extreme reduction in production capacity compared with the expected production target, causing the energy intensity index to be higher than the target as the refinery has been operating at a much lower production capacity than the designed capacity, although the Company has continuously strived to implement various projects to improve energy efficiency of the refinery. Similar challenges have also been experienced across Thail Group companies, but to a lesser extent as they are downstream businesses. And, with their hard work in implementing energy efficiency improvement projects, Thail Group's energy intensity target was achieved in correspondence with the set targets.

In 2020, Thail Group received a certificate of honor from the Thailand

Greenhouse Gas Management Organization (Public Organization) for our continuous participation in the Low Emission Support Scheme (LESS), where we have continuously taken actions to increase energy efficiency and reduce greenhouse gas emissions.



The certificate of honor for participation in the Low Emission Support Scheme.

The Solomon Benchmarking report, which benchmarks energy efficiency across companies, ranked Thail Public Company within the 2<sup>nd</sup> Quartile in comparison to other companies in the Asia-Pacific Region. With the completion of the Clean Fuel Project in 2023, Thail Public Company Limited will be able to increase its competitiveness and compete for the 1<sup>st</sup> Quartile.

For Thai Lube Base Company Limited, the company was able to maintain its energy efficiency level within the 1<sup>st</sup> Quartile group in comparison with other lubricant manufacturers globally.

For Thai Paraxylene Company Limited, with the completion of its energy efficiency projects by replacing the absorbent of the Parex Unit and the catalyst in the Isomar Unit during the turnaround period in 2019, the company resulted in a better energy efficiency level. The company's energy efficiency performance level is expected to increase from the 3<sup>rd</sup> Quartile to the 2<sup>nd</sup> Quartile in accordance with Philip Townsend's latest benchmarking report.

For LABIX Company Limited, the company had exceptionally improved its energy efficiency level after the turnaround in mid-2020 by replacing the absorbent material used in the Molex Unit, which separates paraffin, the primary compound for the production of linear alkyl benzene (LAB) products.



**Green label focus**



**Opportunity for upcycling**



### Industrial Waste Management

Maximizing resource use efficiently and minimizing waste disposal are key enablers in running operations with circular economy principles. Thail Group uses the Green Label Focus (G) and Opportunity for Upcycling (O) priorities to propel the organization to meet the zero waste to landfill target by 2020. The Company has applied the 3Rs (Reduce, Reuse, Recycle), which focus on recycling and reducing the amount of waste disposed and amount of waste to landfill

in the most effective and efficient way possible, in all stages of our production process. Details are outlined below:

**Green Label Focus (G):** Thail has established the "Green Procurement Taskforce" to oversee and steer procurement practices towards selecting raw materials, equipment, services, and products that are environmentally friendly, in order to reduce waste from sourcing. In 2020, Thail Group

received the certification for ISO 20400:2017 Sustainable Procurement for all non-crude procurement processes. Furthermore, the Company has studied the requirements needed to organize sustainable events and meetings to reduce waste and increase resource efficiency, and developed plans for implementation accordingly.

**Opportunity for Upcycling (O):** The Waste Management Committee is the primary body responsible for driving waste management in Thailoil Group. Our aspiration is to upcycle waste through one of three management approaches:

#### 1. CE in Process (Circularity in process):

The Company controls and manages waste from the production process with operational excellence to minimize waste from the production process. For waste that has already been generated, Thailoil Group uses the 3Rs to seek the best ways to add value to the waste generated. As a result of our efforts, in 2020, Thailoil Group achieved the zero waste to landfill target, and was able to manage more than 99.7% of wastes generated with the 3Rs. An example of our project includes:

- A project to create value for the spent catalyst I-80 and

the CCR-1 catalyst through using platinum reclamation, which has value as potential benefit for use in other industries instead of sending it for disposal or landfills – the financial returns generated to the Company were 4.1 million THB and 8.0 million THB, respectively.

#### 2. CE in Office (Circularity in office):

The Company adds value to waste management in our offices and cafeterias through projects, including:

- The Thailoil Group Zero Waste Project, which raised awareness and educated employees as well as subcontractors in correctly sorting and handling wastes;
- The Fertilizer from Food Project; and
- The Office Waste Donation Project, which added value to unused office items through reusing them.

#### 3. CE for Society (Circularity for Society):

The Company adds value to waste by turning them into community products through various ongoing projects, including:

- A project to produce shirts from plastic bottles;
- A project to produce monk robes from plastic bottles; and
- A project to produce cloth bags from plastic bottles.



## Performance 2020

As a result of the management measures detailed above, Thailoil Group achieved our waste management targets in 2020.



## Natural Capital



**27%**

reduction  
in total waste  
generated



**0**

waste  
disposed  
to landfills



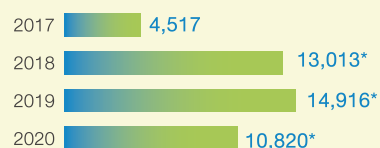
Greenhouse gas emission  
from waste disposed to landfills

**0**

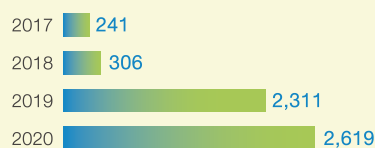
tons of carbon dioxide equivalent



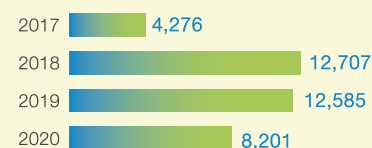
#### Total waste generated (Ton)



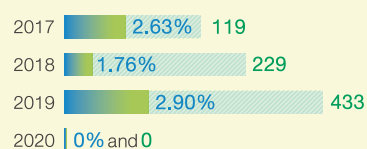
#### Total non-hazardous waste generated (Ton)



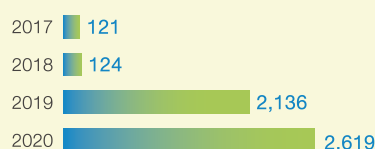
#### Total hazardous waste generated (Ton)



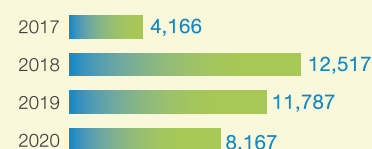
#### Total waste disposed to landfills ■ % of total waste generated ■ Ton



#### Non-hazardous waste recycled or recovered (Ton)



#### Hazardous waste recycled or recovered (Ton)



\*Includes waste generated outside the production process – namely, waste from demolition to prepare for the construction for the expansion project

Furthermore, under the “Refinery in the city” model, Thaioil is committed to grow sustainably alongside communities. Thereby, Thaioil Group places great importance on environmental impact mitigation, as detailed below:



### AIR QUALITY MANAGEMENT

Amidst rapidly growing communities surrounding the refinery in the future, Thaioil Group manages air pollution through assessing risks, implementing control measures, designing and installing technologies that are efficient in international standards, maintaining excellent process control, and monitoring air quality at source as well as in surrounding areas. The air quality monitoring process is also being audited by an external air quality inspector, with data measured in real-time through the Continuous Emission Monitoring System. Furthermore, Thaioil complies with the Shell International Practice Standard 2007, including the standard of practice for monitoring air quality.



### NO<sub>x</sub> AND SO<sub>x</sub> MANAGEMENT

The International Maritime Organization’s (IMO) announcement in 2020 to limit sulfur content in the fuel oil used on board ships to below 0.5% – a significant change from the previous limit of 3.5% – posed a major challenge to control air emissions, especially sulfur dioxide. Thus, to control emissions, Thaioil Group

had to adopt the fuel oil we previously sold and distributed, and instead use that fuel oil in our production processes. Thaioil Group has conducted an environmental assessment, established prevention measures, and installed technologies of high international standards. For instance, the Sulphur Recovery Unit is a modern and highly efficient technology that recovers sulphur from acid gas and turns the sulphur into sulphur liquid products, which can then be used in other industries instead of being released into the atmosphere. Meanwhile, the ultra-low NO<sub>x</sub> burner technology, which in 2010 replaced 100% of changeable burners, enables efficient combustion and reduces NO<sub>x</sub> emissions. Furthermore, Thaioil monitors air quality at source and in the surrounding community areas through air quality monitoring technology of the Continuous Emission Monitoring System (CEMS) and the Air Quality Management System (AQMS). The Company also organizes air quality inspection by external parties, and reports performance to relevant agencies through the Environmental Daily Dashboard on a daily basis.

In 2020, Thaioil Group continued to maintain a higher proportion of environmentally friendly and low-emission fuel combustion over other fuels with higher emissions. The Company operated the White Smoke Monitoring Project to manage impacts from key sources (environmental impact potential source management), implement control measures, and monitor sulfur oxide emissions and smoke from combustion to prevent impacts on communities.

As a result of our commitment and actions described above, Thail Group was able to control SO<sub>x</sub> and NO<sub>x</sub> emissions at levels better than what is required by standards and established targets.



## VOC EMISSIONS MANAGEMENT

Thail Group controls volatile organic compound (VOC) emissions through assessing environmental impacts, determining preventive measures, and monitoring VOC emissions from various sources of the production process, including from flares, combustion, tanks, loading processes, effluent treatment plant (ETP), and fugitives, through operational excellence.

**Flares and fuel combustion:** The Company strictly operates according to determined procedures or guidelines of the production process to maintain combustion with the highest possible efficiency levels and to prevent undesirable incidents that may lead to flares from occurring.

**Tanks and loading processes:** The Company selects tanks that are appropriate for the type of chemical or oil stored, and installs vapor recovery units with 99% efficiency to treat VOCs released from continuous product movement;

**Effluent Treatment Plant (ETP):** The Company regularly tracks and monitors VOCs released from the effluent treatment plant to seek improvement opportunities such as the project to cover the effluent treatment plant.

**Fugitives:** The Company controls and monitors ventilation, and detects leak points, through the use of the VOC leak detection camera. Our practices comply with the rules, regulations, and international standards that have been defined in alignment with the US Environmental Protection Agency standards since 2012. Based on our findings, the Company then seeks improvement opportunities to eliminate leakage.

Furthermore, in 2020, Thail Group implemented additional projects to control volatile organic compound emissions, including:

**A research project on the development of emission standards in petroleum refineries (benzene fenceline)** in conjunction with the Petroleum Institute of Thailand to study the database of benzene emissions in oil refineries to determine the feasibility of establishing standards to control, and seek opportunities to improve the production process to control benzene emissions in the future;

**A research project on good practices** in conjunction with the Petroleum Institute of Thailand to increase efficiency in controlling VOC emissions from flares, tanks, and turnaround periods;

**A project to increase the efficiency** of the “TOP Response” – a response procedure for when the Company is notified of an abnormal incident – through determining the work flow process in responding to the notification, investigating the cause, and establishing prevention measures in the event of abnormal incidents;

**The TOP Green Tracking Project** – a system to manage air pollution – to increase efficiency and speed in locating potential pollutant source, responding, and implementing control measures; and

**A project to cover the effluent treatment plant** to reduce and control VOCs and odor from wastewater treatment. The Company is currently overseeing the engineering design phase for this project.



## PARTICULATE MATTER (PM) MANAGEMENT

In light of the prevalence of PM 2.5 crisis in various locations across Thailand and abroad, Thail Group has established the “PM 2.5 Taskforce” to determine the Company’s management approach, drive implementation, and communicate corporate initiatives to control PM 2.5. The Company uses the 4C approach – which stands for control, contain, clean, and check – to reduce impacts on the environment from sources such as the Company’s offices, operations, construction, and communities. Additionally, Thail supports the government’s initiatives and measures. We also regularly track PM 10 and PM 2.5 levels in real time through the Air Quality Management System (AQMS) and with third party inspectors.

In 2020, Thail implemented various initiatives, including:

- Installing the PM 2.5 Online meter to monitor real time data and automatically report to the application;
- Controlling white smoke from stacks;
- Preparing and distributing dust masks to employees and subcontractors;
- Organizing the 5S program / Big Cleaning Day and Top Green Road to clean and repair roads to reduce and limit dust levels;
- Installing water sprays to control dust from traffic in the main road and the Thail Group Community Health and Learning Center; and

- Communicating and campaigning to increase awareness, and promoting collaboration between employees, subcontractors, communities, and public agencies through initiatives such as the “Same Direction, Shared Journey” campaign to reduce PM 2.5, and the water sprinkler project on the main roads in collaboration with government agencies.



## Performance 2020



### Natural Capital

#### NO<sub>x</sub> emissions

■ Metric ton

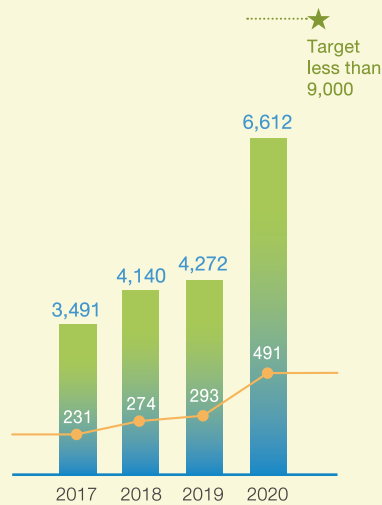
— Ton per million refinery throughput



#### SO<sub>x</sub> emissions

■ Metric ton

— Ton per million refinery throughput



#### VOC emission

■ Metric ton

— Ton per million refinery throughput



# SUSTAINABLE PROCUREMENT



## CHALLENGES, RISKS, AND IMPACTS

Conducting business with partners in a way that does not create adverse environmental, social, and governance (ESG) impacts is vital to ensuring a strong core business, enriching stakeholders' well-being, and delivering sustainable returns. To that end, Thailoil has a supplier management process that includes sustainability risk management in the supply chain. We have also implemented additional supplier management measures during the COVID-19 pandemic, including communicating measures to prevent transmission to suppliers, implementing outbreak controls for Thailoil Group suppliers, providing work from home options to contractors, assessing risks and tracking of long lead items, and managing suppliers during maintenance.

## COMMITMENT

Thailoil is committed to implementing sustainable procurement practices that align with the Thailoil Group Sustainability Management Structure. This means we carry out our work with due consideration towards sustainability in the economic, social, and governance dimensions, and comply with our procurement principles – namely, Clear, Fair, and Professional – in line with the Sustainable Code of Conduct for Suppliers of Thailoil and Subsidiaries (SCOC). Since 2015, all newly registered suppliers onto the system are required to sign their acknowledgement of the SCOC, and we continue to monitor and drive improvement in supplier performance in this area. The Company takes action to ensure that our procurement processes support the realization of the corporate business strategy, while also following international standards of practice such as ISO 20400: Sustainable Procurement. We recognize that sustainable procurement will help reduce supply chain disruption and delay risks resulting from unforeseen events, contribute to efficient resource management, which will increase our competitive advantage and generate long-term benefits for Thailoil Group and our partners as well as build stakeholder confidence and trust. Furthermore, Thailoil supports critical suppliers and key suppliers in becoming certified members of the Collective Action Coalition against Corruption (CAC).

## Targets 2020

Zero non-compliance in procurement processes for important projects, which are governed by an internal audit process to demonstrate transparency in fair business conduct

Promote registered suppliers to acknowledge of the SCOC in order to reduce risks of non-compliance with environmental, social, and good governance principles

Target

**100%**

of critical suppliers

**80%**

of key suppliers

**100%**

of newly registered suppliers

Ocean Loss Index, a measurement of crude oil loss during marine transportation, at

**0.19%**

or below by volume

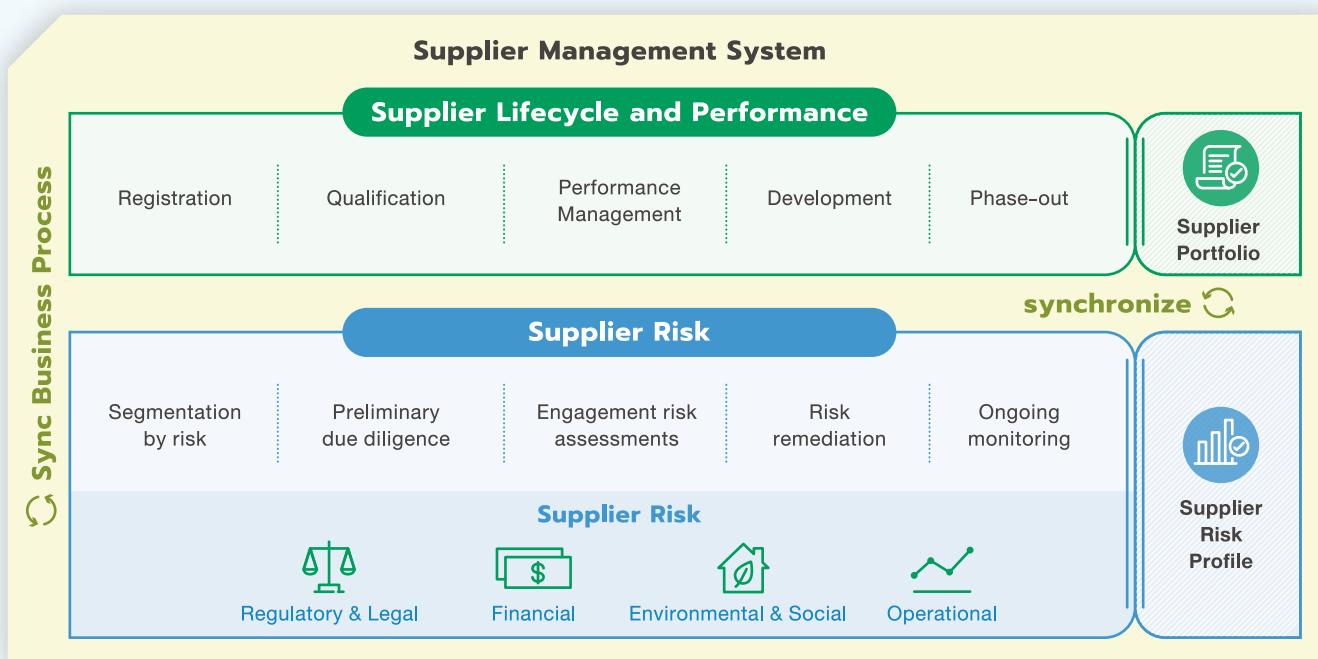


## MANAGEMENT APPROACH

Thaioil Group has established a supply chain management approach that is comprehensive of and in alignment with ISO 20400: 2017 Sustainable Procurement standards for petroleum and petrochemical businesses (not including crude procurement). This covers 9 product groups and 11 service groups. Thaioil has applied this standard to procurement processes for all key product and service groups (non-crude procurement) to increase confidence in the Company's sustainable procurement processes in line with international standards. The Sustainable Procurement Guidance has been helpful to the Company in integrating sustainable operating principles into organizational policies, objectives, strategies, and procurement processes. It is also a tool that can be used to increase productivity, reduce costs, and increase innovation. We recognize that the products and services we purchase

can affect our organization – specifically in our capabilities, the welfare of our employees, our reputation, and stakeholder relationships – as well as other impacts on the economy, environment, and society.

In 2020, Thaioil started using a supplier management system that covers the entire supply chain through an ESG risk assessment. The risk assessment is carried in the process of vendor registration, vendor qualification, and supplier risk management that is comprehensive of regulatory, legal, environmental, social, and other information on operations from external information sources. The Company will then review findings gained from this system and regularly monitor associated risks, such as non-compliance with legal regulations, use of child labor, or adverse environmental impacts.

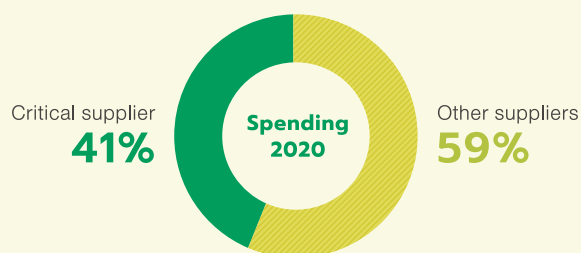


## EFFECTIVE COST MANAGEMENT

Thaioil manages procurement processes to achieve effective cost management, while prioritizing the management of environmental, social, and good governance (ESG) risks in the supply chain, and promoting green procurement. At the same time, Thaioil gives importance to supplier engagement and satisfaction.

In 2020, Thaioil conducted business with a total of 1,095 active suppliers.

The share of spending on critical suppliers is shown below:



Remark: covering non-hydrocarbon suppliers and hydrocarbon (or crude) suppliers

Thaioil has determined targets to reduce costs in the procurement processes. In 2020, these targets were successfully achieved, which enabled the Company to gain effective cost management and have competitive costs in the market. We were able to increase the efficiency of our procurement processes while upholding our commitment to reduce impacts on the environment. Our main actions are listed below:

- Arrangement of framework agreements: Thaioil uses framework agreements, or long-term contracts of 5-6 years, for suppliers of product groups that are high in value and essential to Thaioil, which helps the company to gain standard prices and maintain continuous trading in the long term. Framework agreements have also helped to establish good relationships with our business partners, and are considered mutually beneficial, resulting in cost savings of approximately 30-50%.
- Demand management based on historical data: In planning for the procurement process, Thaioil has established and developed an annual contract arrangement with partners. For goods and services with continuous purchase volumes, through the analysis of historical data, providing the Thaioil with a bargaining power to negotiate and reducing time required for procurement activities, resulting in cost savings of approximately 14%.
- Budget analysis: In planning for the implementation of various projects, Thaioil has developed a procurement sourcing plan for the delivery of goods and services in accordance with the project timeline, resulting in cost savings of 10-15%.
- Contract analysis: Thaioil conducts contract analysis once

the purchase/service requisition has been issued in order to plan for strategic sourcing, resulting in cost savings of 7-10%.

- Procurement in collaboration with PTT Group: Thaioil collaborates with other companies in PTT Group to develop contracts with suppliers. Through collectively combining orders, Thaioil and other PTT Group companies are able to develop high volume contracts and increase bargaining power. Furthermore, this initiative helps foster good relations with other PTT Group companies and suppliers.
- E-Auctions: Holding e-auctions for products of similar standards have increased the efficacy of the procurement process, the diversity of bidding suppliers, and the competition.
- Co-Loading collaboration: For crude oil sourcing, Thaioil has a co-loading collaboration program with oil refineries across Thailand, especially refineries in the PTT Group, and suppliers, to reduce transportation costs. In addition, we have also reduced procurement costs through using the Company's crude oil buoys to distribute crude oil to other refineries in Thailand. In 2020, through collaboration with refineries and suppliers in co-loading, and distribution of crude oil through the Company's crude oil buoys, resulting in cost savings of 207 million THB.
- The Russia-Saudi Arabia oil price war, in combination with the COVID-19 pandemic, contributed to oil price volatility and uncertainty in demand of petroleum products. Thus, Thaioil adjusted our crude oil sourcing approach for more flexibility through aligning the volume and type of crude oil inventories with the market conditions at that point in time. Additionally, we have sold some of the crude oil we had in storage while sourced and refined crude oil with higher value (crude re-optimization), generating additional value by 330 million THB.



## Financial Capital

- Cost reduction by approximately 30-50% through long-term contractual agreements (framework agreements) of important product groups for Thaioil Group
- Cost reduction of 207 million THB as a result of collaboration with refineries and business partners in co-loading and distribution of crude oil through Company's crude oil buoys
- Generate profits of 330 million THB through crude oil inventory management and crude re-optimization



## Human Capital

49 hours of procurement training for procurement staff



- ISO20400 Workshop
- Human Rights Workshop
- Category Management & SRM in collaboration with PTT Group

## ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) RISK MANAGEMENT IN THE SUPPLY CHAIN

Thaioil has developed a supplier management system that regularly monitors supplier environmental, social, and good governance (ESG) risks based external information sources and communicates the company's expectations to the suppliers. The system includes risk assessment, performance monitoring and evaluation, and other forms of support to help suppliers operate their business sustainably. During the COVID-19 pandemic, Thaioil has continued to assess risks across the supply chain, monitor performance, and implement management measures.



### Thaioil's Expectations Regarding Suppliers' Environmental, Social, and Governance (ESG) Performance

Thaioil has specified expectations regarding suppliers' ESG performance in the Sustainable Code of Conduct for Suppliers of Thaioil and Subsidiaries (SCOC). Furthermore, we have recently revised this document for stronger alignment with

the International Bill of Human Rights and the Declaration on Fundamental Principles and Rights at Work of the International Labour Organization.



Thaioil expects that all suppliers will acknowledge these principles. To ensure supplier understanding of the SCOC, Thaioil communicates the SCOC through the Thaioil website and the supplier conference every year.

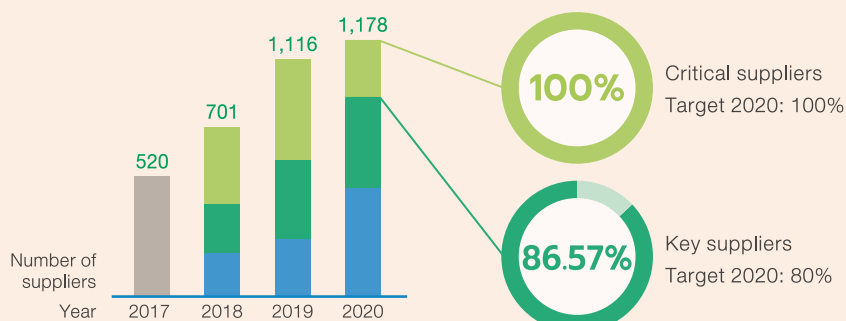
Thaioil has continued to communicate our expectations to suppliers. We have observed a consistent increase in supplier response, and have achieved our target of acknowledgement by 100% new suppliers and critical suppliers, and 80% key suppliers, as shown below.

### Non-hydrocarbon group

All suppliers that have acknowledged the SCOC

New suppliers  
**100%** as target

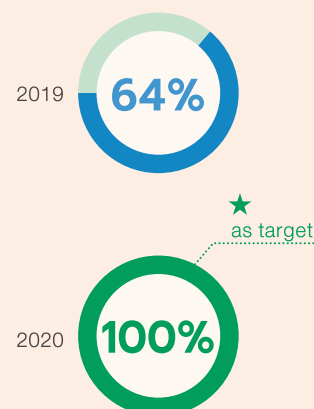
Suppliers that have acknowledged the SCOC



Remark: Accumulated data 2017 - 2020

### Non-hydrocarbon group

Crude suppliers





### Suppliers' Environmental, Social, and Governance (ESG) Risk Assessment

Thaioil has a preliminary risk assessment process in the supply chain that covers all suppliers in order to identify suppliers with high ESG risks. The risk assessment is conducted on an ongoing basis for all newly registered suppliers, and once every three years for all suppliers.

In 2020, the Company assessed supplier risks relating to the ESG issues listed in the SCOC for 100% of newly registered suppliers, and completed the triennial risk assessment for 100% of suppliers. The risk assessment is conducted based on product and service group, with the relevant function responsible for the product or service group taking on the role of assessing risk levels. The risk assessment covers all 7 topics identified in the ISO 20400 Sustainable Procurement standard, namely:

- Governance;
- Human Rights;
- Labour Practices;
- Environment;
- Fair Operating Practices;
- Consumer Issues, and
- Community Involvement & Development

During the COVID-19 pandemic, the Company assessed risks across the supply chain and considered supplier performance in quality, occupational health and safety, and timeliness in product and service delivery. For long lead items, the Company has monitored the spread of the pandemic in Thailand and abroad. For product distribution and onsite subcontractor management, we have maintained close communications with contractors, especially those operating during maintenance. Thaioil has also prepared plans to ensure our readiness should an outbreak occur. We have considered the management of impacts on maintenance work. Nonetheless, the Company was able to operate successfully and completed maintenance tasks prior to the established deadline.



Based on the 2020 preliminary risk assessment, the Company identified

**22** suppliers  
with potential sustainability risks



Environmental  
risks  
**12** suppliers



Social  
risks  
**7** suppliers



Governance  
risks  
**5** suppliers

Upon reviewing the risk assessment results, Thaioil will select suppliers with high ESG risk levels and critical tier-1 suppliers to participate in the ESG Verification Program, in order to verify that the identified risks are being properly managed. The ESG Verification Program has been initiated since 2017, and consists of three phases:

- 1 Verification by Thaioil Group consists of assessing suppliers on a criteria based on "alignment" of supplier conduct with our Procurement Policy; Business and Human Rights Policy for Suppliers; Anti-Corruption Policy; Quality, Security, Safety, Health, Environment, Energy Management, and Corporate Social Responsibility Policy; and Thaioil Supplier Code of Conduct. The main steps of verification include verification through email and onsite verification to ensure that supplier complies with the Company's criteria and guidelines.
- 2 Third party assessment is undertaken for suppliers whose verification results reveal high ESG risk levels. Selected suppliers who have been chosen, and are important to Thaioil, will be assessed by an external party in order to achieve sustainable development in accordance with Thaioil's code of conduct, and in order to build trust in business partnerships.
- 3 The capacity building, or capability development, project for suppliers began in 2017, and Thaioil has continued to lead this project until 2019. We have presented additional recommendations to increase the capacity and enhance the capability of suppliers for each individual supplier. The selected supplier under this development and improvement plan is then considered in accordance to the needs and readiness of the supplier.



In 2020, Thailoil revisited the ESG Plus Verification project in light of the COVID-19 pandemic, and adapted the approach for third party assessment towards the use of audit reports and certifications such as ISO 14001, ISO 18001, ISO 26000, ISO 20400, and CAC certification for verification. Based on this approach, 37 suppliers – 95% of high risk suppliers and 65% of critical suppliers – passed the verification.



#### Number of suppliers assessed through ESG Plus Verification

Nuber	8	+12	+14	+37
Year	2017	2018	2019	2020

Other than directly providing recommendations to suppliers who have high risk levels and/or non-compliance with the SCOC, Thailoil also gives opportunities for suppliers to join other activities to promote capability and capacity in managing environmental, social, and governance (ESG) performance, such as:

**Inviting 52 key suppliers** that have expressed interest through the annual supplier survey to listen to the SME Executive Briefing in the CAC SME Certification Project;

**Inviting 169 key suppliers** to attend the PTT Group CG Day with PTT Group;

**Verifying information related** to corruption reported by suppliers with external information sources for bids over 100 million THB;

**Communicating CSR in Supply Chain through our website** – a set of Thailoil Group rules and guidelines on corporate social responsibility across 7 topics, including corporate governance, human rights, labour practices, environment, ethical conduct, consumer, and community engagement and development;



**Communicating the Company's corporate vision**, procurement principles, construction plans, approach to supplier performance evaluation and awards giving, Thailoil Group Supplier Code of Conduct and expectations relating to ESG aspects, as well as Thailoil's approach to circular economy, human rights in the supply chain, and corporate governance, during the annual supplier conference, in which the theme for this year is "Partner for Life";



**Organizing meetings between contractors and Thailoil Group's executives** to reiterate the importance of safety in the workplace and prepare readiness for the major turnaround to ensure that tasks can be completed as planned;



**Reviewing supplier evaluation results** – which reflected supplier performance in meeting Thailoil's expectations regarding work quality, occupational health and safety, and timeliness of product/service delivery – and awarded certificates and plaques of honour to contractor companies who successfully fulfilled their duties during the 2020 major turnaround; and

**Organizing supplier relationship building activities** to ensure that suppliers are aware of, understand, and follow Thailoil's commitment regarding transparency in procurement processes, such as the No Gift Policy.



## Overall Monitoring and Performance Evaluation

After having conducted the risk assessment in accordance with ISO 20400 : Sustainable Procurement, Thaioil has set relevant targets and established the Working Committee for Green Procurement, which will commence its work in 2021. The Company has also developed a plan to review procurement criteria and conditions in 2021, while continuing our work to develop sustainable procurement practices with processes to assess supplier risks.

### Promoting Green Procurement

Thaioil conducts procurement with consideration towards environmental impacts. For our purchase of catalysts to replace expired catalysts in the past year – a transaction equivalent to approximately 91 THB in value – we ensured that catalyst attributes relating to the environment were accounted for throughout the process, including aspects such as energy and resource consumption. We also considered catalyst life cycle management, as evidenced through sending the expired metal catalysts for metal reclamation, in effect generating roughly 20 million THB in value, and reusing metals or useful metals to add value to the business and reduce dependence on natural resources. We also have plans to continue exporting in 2020. Furthermore, we have completed a 1 million THB purchase of

non-asbestos gaskets to use as a substitute to reduce impacts on the environment and on the health of our employees and communities surrounding the refinery.

For procurement of materials, equipment, and office supplies, we have revisited our purchases to seek opportunities to use green products. We believe this will also motivate our suppliers to take action to develop their production processes to create environmentally friendly and avoid adverse environmental impacts in their supply chains. The share of spending in this product group has increased to 25% since 2019, and is equivalent to a greenhouse gas reduction of 3,100 KgCO<sub>2</sub>.

In addition, Thaioil has indicators measuring supplier social and environmental performance. For social performance, we monitor total recordable work-related injury rate (TRIR) for contractors, while for environmental performance, we monitor the ocean loss index – an indicator that measures crude oil loss during marine transportation and reflects efficiency in marine transportation. In 2020, our targets were fulfilled. Furthermore, Thaioil has also established a working group to monitor and analyze the causes of oil loss during marine transportation for each trip, and is continuously making improvements to maintain oil loss index below target levels.



### Social and Relationship Capital

Supplier compliance with SCOC

**100%**



### Financial Capital

Spending on environmentally-friendly products for materials, equipment, and office supplies product group was increased from the previous year

**25%**



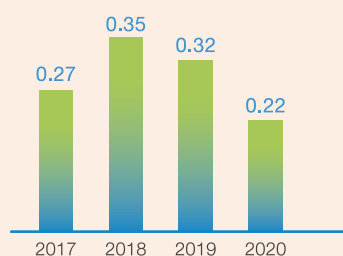
### Natural Capital

Greenhouse gas emission reductions resulting from purchases of environmentally-friendly products (kilogram of carbon dioxide equivalent)



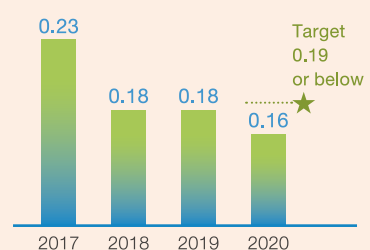
### Human Capital

Total recordable work-related injury rate for contractors (case per million hour works)



### Natural Capital

Ocean Loss Index (Percent by volume)



## Supplier Engagement and Satisfaction

Thaioil takes the necessary actions to ensure that procurement processes are transparent and clear to suppliers. In the tendering process, suppliers submitting tenders can use the proposal tracking system to check progress. This supports clarity and transparency within the procurement process for suppliers. Additionally, we have developed the Thaioil Group Tendering System (TOP TEN) to support the procurement team in ensuring that the tendering process is aligned with corporate rules and practices. Furthermore, we use e-Auction, an online auction system, to give suppliers the opportunity to compete and bid more than once, resulting in Thaioil being able to procure goods and services at an appropriate price and securing fairness to all involved parties. We have also developed price submission through the PO online system, and applied the E-Catalog system in order to reduce the number of steps in procurement processes,

and resource and energy consumption. Our adoption of the RPA system in conducting supplier performance evaluation, including ESG performance, has helped reduce time needed in completing performance evaluations.

Moreover, in order to ensure that Thaioil is aware of the needs of our suppliers, the Company has continued to engage, communicate, and listen to supplier opinions on different issues. We collect such information through conducting surveys and gathering feedback on our procurement management, service quality, and transparency and fairness. Supplier inputs are then integrated to the Company's decision-making and management process. In 2020, Thaioil conducted a survey on the perspectives and opinions of suppliers through the support of a company with expertise in research. The findings from the survey on suppliers' views towards working with Thaioil are presented below:

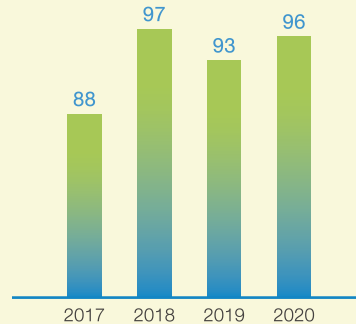


### Social and Relationship Capital

Overall satisfaction with Thaioil (%)



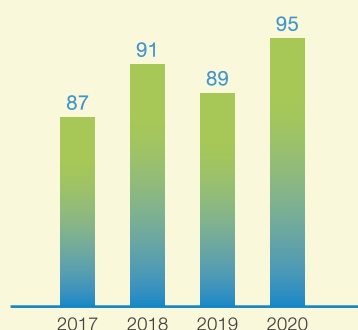
Overall image of Thaioil (%)



Satisfaction with service (%)



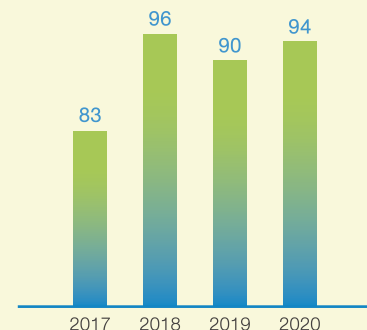
Satisfaction with the services of the procurement function (%)



Satisfaction with pricing and procurement policy (%)



Satisfaction with transparency and fairness (%)



# PRODUCT AND SERVICE STEWARDSHIP



## CHALLENGES, RISKS, AND IMPACTS

It is evident that the global change is changing more rapidly than in the past. In this modern age, businesses are required more than ever to adapt to respond to various changing factors. This includes consumer behavior, which continues to change with global trends. Business success is thus dependent upon the capability and speed in responding to the changing consumer and market demands.



### Target 2020



**25%**

of total sales revenue in Thaioil Group generated from environmentally friendly product sales.



At least

**92%**

customer engagement towards Thaioil Group's performance.

## COMMITMENT

The majority of Thaioil's products consists of different petroleum product types, which are regulated under legislative requirements on the quality of distributed petroleum products. Henceforth, product research and development efforts have been directed towards increasing the efficiency of the production process. Nonetheless, Thaioil is currently initiating a research project in conjunction with a leading institution to develop high quality and environmentally friendly products in the future, such that we may be responsive to market trends and fulfill our Towards Green Economy strategy.



## PRODUCT STEWARDSHIP

In line with government direction, Thaioil has increased the volume of high diesel fuel sales. Since Q4/2018, we have also been distributing diesel B20 for use by large trucks and public buses, in effect contributing to the reduction of air pollution and environmental problems resulting from incomplete combustion. Furthermore, we started distributing the high speed diesel B10 in December 2019 as an option for personal vehicles. This is supportive of the government policy to increase crude palm oil content in biodiesel to support palm oil farmers and achieve demand and supply balance in the palm oil industry. At the same time, Thaioil has improved our petrol stations to ensure we are ready for the transition to distributing high speed diesel B10 instead of high speed diesel B7 by 1 October 2020, as required by government regulation. It is important to note that the petrol stations of the Company are adaptable, and can support the distribution of high speed diesel B7, B10, and B20.











As for fuel oil products, Thaioil has started producing and distributing low sulfur fuel oil products with sulfur content at 0.5% and below since Q4/2019 to ensure that the quality of our marine fuel products comply with the marine fuel quality standards stated in the Convention for the Prevention of Pollution from Ships of the International Maritime Organization (IMO), which came into effect on 1 January 2020. The Company was able to adjust the production process for more flexibility, and produced fuel oil products of different grades, including fuel oil A, fuel oil C, fuel oil IMO, and fuel oil 3.5%S 380 CST.



Moreover, Thailoil's Clean Fuel Project (CFP) is currently undergoing construction. With the CFP, we will be able to produce Euro 5 diesel fuels with lower sulfur content at 10 ppm, and convert fuel oils from our production process to fuels that are higher in value and more environmentally friendly. This will lead to different refined oil products for Thailoil, which will also respond to the future needs of the market. Additionally, our subsidiaries in the petrochemicals group, such as TOP Solvent

Company Limited, have expanded business to new markets – for instance, Vietnam and Indonesia. We have continued to plan to increase the share of speciality products that are environmentally friendly, and promote research and development to support product development in the future.

In 2020, Thailoil had 14 types of environmentally-friendly products, as shown below:

Green Product Type	Green Products Sold by Thailoil Group	Company	Sales Value (Million Baht)	Sales Volume
 Products that use plants or agricultural outputs in replacement of petroleum (Bio-based Products)	Ethanol from cassava		4,256	186 Million Liters
	Denatured Ethanol (from corn)		1.96	31.1 Tons
	Glycerine (from palm)		1.98	100.8 Tons
 Biodegradable Products	Linear Alkyl Benzene (LAB)		4,293	126,500 Tons
	Heavy Alkyl Benzene (HAB)		29	1,700 Tons
 Compostable Products	Cleaning products (KEEEN)		0.6	3.6 Tons
 Products that reduce emissions released to the environment (Emission Reduction)	Benzene-free solvents, including:			
	TOPSol BF : Benzene Free		45.8	1,620 Tons
	Xylene (Isomer) : Low Ethylbenzene		10.7	360 Tons
	Low-polycyclic aromatic hydrocarbons solvents (TOPSol A 150 ND : Low PAHs)		31.5	724 Tons
	Rubber oils (TDAE, TRAE, AROS) with PCA content lower than international standards – thus non-carcinogenic and does not cause gene mutation in humans		1,685	85,345 Million Tons
 Products with lower greenhouse gas emissions than products of the same group in the market (Avoided GHG emission products)	Low Sulfur Fuel Oil (LSFO or Fuel Oil IMO) with sulfur content at 0.5% or below		5,474	631 Million Litres
	Cyclopentane CP80, which can replace use of CFCs and HCFCs		4	35.7 Tons
	Gasohol		27,866	1,572 Million Litres
	Biodiesel		66,578	3,776 Million Litres



## Performance 2020



### Intellectual Capital

**3** new environmentally friendly products developed in 2020



### Natural Capital

Reduction of greenhouse gas emitted by end users, equivalent to

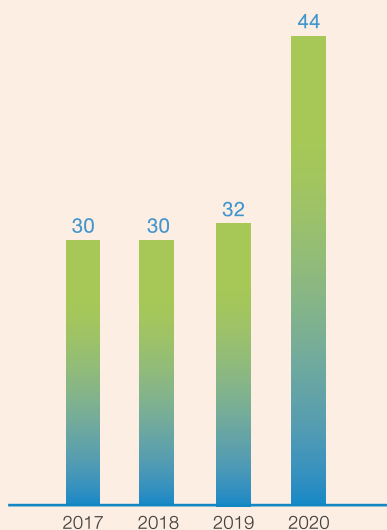
**852,409**

tons of carbon dioxide through avoid emission products

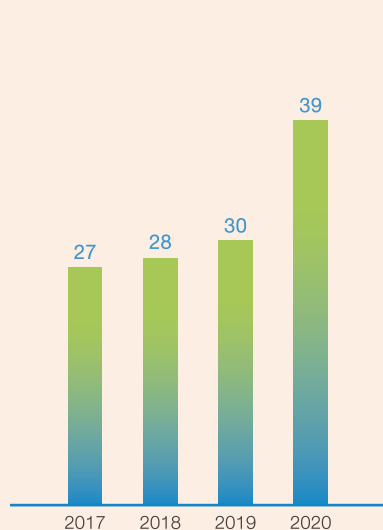


### Financial Capital

Revenue share of green products out of total sales revenue  
(Percentage by THB)

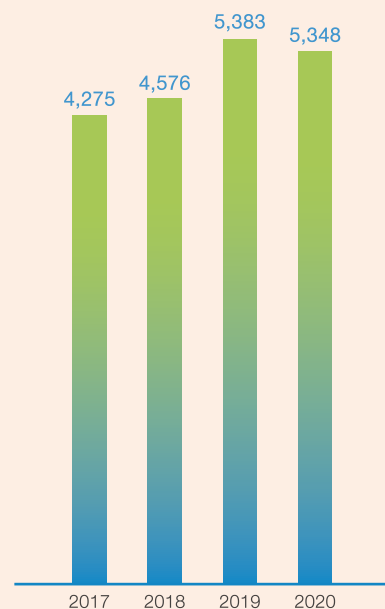


Revenue share of avoided emission products out of total sales revenue  
(Percentage by THB)



### Natural Capital

Sales volume of avoided GHG emission products  
(Million Litres)



## CUSTOMER SERVICE

Thaioil continues to maintain regular communications with customers, even during the COVID-19 pandemic. Even though our employees have to work from home during the pandemic, the Company has continued to reach out to our customers through different communication channels – such as LINE, email, telephone, and online meetings – as well as informing of our COVID-19 controls and preventive measures to customers who

come to our area of operations for product pick-ups through vehicles and ships.

Thaioil and subsidiaries give importance to working closely with customers, both in terms of collaborating with customers to deliver products according to customer needs, and most importantly, providing excellent customer service (Customer Excellence).

Thaioil has developed the service level agreement (SLA) to give customers confidence that they will receive all products on time and as ordered, and trust that Thaioil will resolve any complaint or issue that arises. The SLA applies to all products and services delivered by the Company, including processes in taking orders, managing product delivery such that customers receive all products on time and as ordered, as well as receiving complaints, resolving issues, and closely monitoring progress. The Company aspires to align all service activities with the aforementioned SLA in order to increase the satisfaction and engagement of customers with the Company.

Thaioil prioritizes customer satisfaction at the forefront of our business through serving, listening, and responding to customers promptly and effectively, and increasing convenience for customers in reporting issues and suggestions. Customers are able to report issues and share suggestions through Thaioil's website, telephone, and email. Thaioil will notify the progress in resolving the issue to customers within 24 hours. Our Voice of Customer system collects information in a database and can be accessed to recall documents, find the status of request submitted, and locate the summary of request types. The database is then used to determine the actions needed to improve different services.

In 2020, Thaioil Group started conducting weekly customer feedback surveys as an additional channel to collect customer feedback regarding product pick-ups. We then promptly take improvement actions based on this feedback.

Thaioil remains committed to regularly meeting customers to gather opinions and exchange perspectives in order to improve upon and develop our performance in the future. This includes:



Meeting customers online and offline to build good relations and report on current market situation, both in Thailand and internationally, on a monthly and quarterly basis.



Organizing customer visits to our refinery, and providing information to enhance customer understanding of the production process and oil distribution by vehicle, ship, and pipeline.

For Thaioil Group's petrochemicals business, Thaioil is committed to run our production process, product delivery, and services that are safe for our customers and that are environmentally friendly. We will accomplish this through developing products and services, advancing new innovations, and increasing product and service value to continuously respond to customer demands. We have also managed all processes to reduce risks and impacts to the environment, as well as ensure that our customers are provided with the necessary information and knowledge to support their decision-making and to guide them in using and maintaining our products safely. We disclose relevant information to our customers without withholding or changing facts. Furthermore, we are also open to receiving feedback and suggestions and applying them to develop improvement plans and operation plans, as well as to develop products and services that appropriately match the needs of each customer group.



## Performance

The results of the customer engagement survey demonstrate that our work over the past year, including work related to products and customer service, has allowed us to achieve performance beyond our target – a customer engagement score of 98. For TOP Solvent Company Limited, the customer engagement score was 4.85 out of 5.0, which was better than the set target. In the current state of a rapidly changing environment, Thaioil Group remains determined to be attentive to customers in product and service delivery.

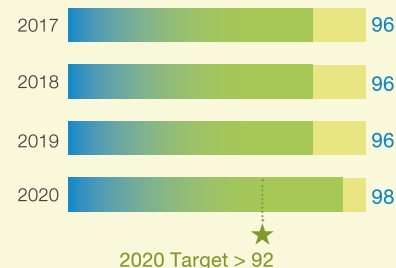


## Social and Relationship Capital



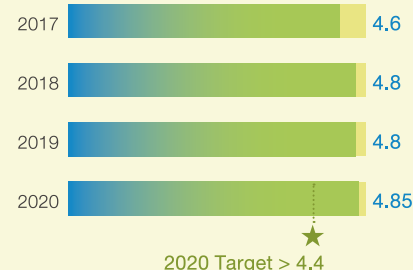
### Customer engagement – Thaioil Group

Percent (Out of 100)



### Customer satisfaction – TOP Solvent Company Limited

Score (Out of 5.0)







# Towards Better Quality of Life

The Towards Better Quality of Life strategy guides Thailo in advancing quality of life through applying digital technology to work processes and enhancing capacity of people in our communities around the refinery and society at the national level. Our strategic areas of focus include education, job creation, quality of life, public healthcare, and access to clean energy; all of which contribute to strengthen our relationships with communities and improve their quality of life to ensure sustainable shared growth in the long term.



## Key Performance Indicators



### Social and Relationship Capital

Creating business partnerships for sustainable growth together in the long term

98%

customer engagement with Thailo Group

94.89%

community engagement with Thailo Group

92%

employee engagement with Thailo Group



### Intellectual Capital

Building an organizational knowledge management system and applying digital technologies in the organization to generate revenue and reduce production costs

96

innovation projects showcased by employees in the Thailo Innovation Awards 2019-2020 event, equivalent to 1,025 million THB



### Human Capital

Achieving excellence through managing human resource and organizational efficiency in order to become a high performance organization

284

hours/person/year Average hours of training and development for the employees.



### Financial Capital

Generating revenue through efficiently managing the six capitals of the organization

No cyber-attacks

that impacts on business



# OCCUPATIONAL HEALTH AND SAFETY



## CHALLENGES, RISKS, AND IMPACTS

In addition to the production process expansion plan that aligned with the normal business plan such as Clean Fuel Project, Thai Oil Sriracha Building Project and New CFP Crude Oil Tank Project that bring about an increasing in number of activities and workers. By addressing the spread of COVID-19 in 2020 that entails a new normal way of working and challenges to business goal achievement, Thailoil Group needs to review and strengthen safety control measures to effectively ensure that the company is able to operate without any incident that would lead to business suspension.

## COMMITMENT

Thailoil Group is committed on strengthening the foundation our management system that covers occupational health and safety management, emergency and crisis management, quality management, environment and complaint management, and the compliant assessment. This is enforced through the policy that emphasizes on quality, security, safety, occupational health, environment, energy management and corporate social responsibility to prevent, control and mitigate impacts that may arise in normal operating conditions, abnormal operating conditions and emergency situations in both the current business and future business expansion contexts. Furthermore, Thailoil remains committed to support our suppliers from the potential regulatory risks associated with the enforcement of laws, regulations and requirements, while striving to achieve our operational goal of being “an organization without accident (No Harm No Leak Goal Zero)”.

### Targets



Promote safety  
**maturity  
to level 4**  
by 2022



Maintain safety performance of total recordable work-related injury rate (TRIR) that is comparable to  
**the top 10%**  
in the oil and gas industry by 2022

## MANAGEMENT APPROACH



### Quality, Safety, Health, and Environment (QSHE) Management

Thaioil Group has established management guidelines for quality management, security, safety, occupational health, environment, energy management and social responsibility through Thaioil Group Quality, Security, Safety, Occupational Health, Environment, Energy Management and Corporate Social Responsibility or QSHE Policy as an implementation framework under TOP Group QSHE Excellence 2019 – 2023 strategy to drive and strengthen the potential of Thaioil Group to continuously and sustainably achieve QSHE excellence with the integrated management system as follows:

- Quality Management System according to TIS 9001:2015 standard
- Environmental Management System according to TIS 14001:2015 standard.
- Occupational health and safety management system according to TIS 18001: 2011 standard.
- Occupational health and safety management system according to ISO 45001: 2018
- Integrated Management Systems (IMS)
- Management System for the Competence of Testing Laboratories (ISO / IEC 17025: 2017)
- CSR Social Responsibility Standard (ISO 26000) under the CSR - DIW Program.
- Information Security Management System (ISO / IEC 27001: 2013)
- ISO 50001: 2018 Energy Management System
- Operational Excellence Management System (OEMS)
- Process Safety Management

From 1996 to present, Thaioil Group continue to maintain and develop all management systems, which covers:

**Establish a plan, set a goal and put it into practice,** according to international standards, in order to control and reduce impacts that may arise from the business processes include issues related to water, air, noise, heat, solid waste, greenhouse gas emissions, energy management and

conservation; along with reviewing, monitoring and examining the processes for continuous system improvement.

**Implement systematic risk management** and impose measures to control and reduce risks arising from operations and production processes. Establish guidelines for emergency management during a crisis to ensure business continuity in term of physical, chemical, biological and psychosocial and to prevent incidence that may cause loss, injury and illness of workers, communities and other stakeholders, to protect assets, corporate information and raise awareness on security threats.

**Promote and create awareness among stakeholders** to realize the importance of maintaining and enhancing the quality, security, safety, occupational health, environment, energy management and social responsibility, while underlining appropriate labor practices through consistent communication of policies and procedures to encourage comprehension within organization and public.

**Promote the development,** execution, monitoring and update of work plan in accordance with policy and practice to accommodate changes in laws, technological developments, information technology, energy consumption and conservation, and environmental and social contexts.

**Produce quality product** and deliver services that meet customer's needs and expectations as well as enhance their satisfaction with Thaioil Group integrated management system and excellence management, which comply with international standards, law, regulations, relevant standards and requirements.

**To achieve business operational excellence and results,** the Company has allocated appropriate resources, supported digital information systems, and promoted innovation within the Company. This is aimed at enhancing the Company's capability to comply with business policies and practices in designing, manufacturing products and providing services, with an emphasis on continuous improvement on quality, security, safety, occupational health, environment, energy management and social responsibility.

At present, Thailoil Group has revised its strategic plan, called the House of Business Excellence (O2Bx), intending to pave our way towards becoming a world class refinery by 2022. Safety is considered one of the pillars that must be developed and enriched. Thailoil Group has set the new corporate safety target, so called “No harm, No leak, Goal Zero”, resulting in a revised operational strategy from Safe White Green to All SAFE White Green in order to raise awareness and enhance leadership in occupational safety with details as follows:

**All**

All employees and contractors

**S**

Standard of Works

**A**

Awareness on Hazards and Risk Assessment

**F**

Full Compliance to Work Standards with Proper Site Supervision

**E**

Ensure continues improvement

**White**

Drug free

**Green**

Environmental impact mitigation

**No Harm**

Organization without injured

**No Leak**

Free from leaks of hydrocarbons or hazardous chemicals from primary container

In addition, Thailoil Group continues to emphasize on the implementation plan or proactive strategy through Management Walk and Talk campaigns led by senior management and QSHS Roll Out activities with a focus on raising worker’s awareness on quality, security, safety and working environment or within operational areas. At the same time, the scope of these activities have extended to include work areas that emphasis the participation of workers in the work environment at that time. Thailoil Group also strives to apply appropriate management systems to achieve sustainable development. The performance of such activities are then reported to the management and jointly discussed for solutions when required. In addition, there is an annual management review process to determine guidelines for further improvements and an annual work plan. The process has been consistently communicated to employees for their acknowledgment to ensure effective practice.



## Security Management

Thailoil Group has implemented security measure that emphasis on the protection of property, personnel, information and image according to the Universal Declaration of Human Rights to prevent effect that may arise from security threat related to social, economic, politics and natural disaster. In 2020, Thailoil Group has executed security actions as follows;

- Reviewed the Security Management Manual in accordance with International Best Practice.
- Conducted an assessment review on security threat that covered the imposing and reviewing of implementation plan for physical security and security management, which aligned with the current risk or threat level. In addition, there is a collaboration plan that connect news networks, both public and private, and external support agencies, as well as training for emergency response team in order to assess and improve work plans to maximize effectiveness.
- Cultivated and applied technology in security management during the maintenance downtime of production unit in 2020, For example, the application of Radio Frequency Identification to specify various information, the use of face recognition system and drone to monitor the area outside the distillation unit as well as studying Anti-Drone systems to prepare and support in the event of an area intrusion by drone.
- Updated CCTV system from the old Analog system, which deteriorates and inefficient in site surveillance, to IP system that is more modern and efficient. The CCTV that has been improved in 2020, accounting for 18% of total CCTV Analog system. The rest will gradually be improved in 5 years time.
- Improved access control software that was deteriorated and inefficient to be highly effective, more accurate and faster in information processing.
- Controlled and promoted compliance in alignment with Thailoil Group’s security and safety manual for employees, which served as a guideline to achieve safe living, both during work hours and in daily life.
- Imposed security management through the All SAFE White Green strategy to ensure the Company is free drugs and security incidents as defined in “White”. This strategy is executed through contractor and partner engagements from initiating policy to planning a security awareness campaign

for prevention of all kind of illegal drugs and substances, while preventing violation of security regulations.

- Integrated a security management system with Clean Fuel Project in terms of physical security and security management to ensure the efficient and effective security management.
- Implemented the International Ship and Port Facility Security Code (ISPS) drill in collaboration with governmental agencies within the area to allow operation team to review working procedures, control and prevention measures, as well as to prepare a response for potential security threats.
- Due to the spread of COVID-19 pandemic, Thail Group initiated prevention measure and established the I-COVID Center, which serves as a virus screening and inspecting center for employees, contractors and visitors. The security department would be a screening team provides guidance for employee, shift workers, contractors and visitors entering

Thail Group building and nearby sites in order to raise awareness on self-care and promote social responsibility.

Furthermore, Thail Group has adopted Defense in Depth as a strategy to guide the security management by categorizing the scope of monitoring area into restricted zone and semi-restricted zone. Both zones will be supported by Thail Group threat prevention system, control system and management system. The company also initiated the guideline to create networking association to manage the external area, which locate closely to community and company nearby. In addition, the integration of security strategy is formed with several local government agencies, such as Disaster Prevention and Mitigation Provincial Office of Chonburi Province, The Royal Thai Army (14<sup>th</sup> Military Circle, Chonburi Province), Laem Chabang Provincial Police Office, Explosive Ordnance Disposal Division, Commando, Royal Thai Navy (1<sup>st</sup> Naval Area Command, Sattahip District), Air and Coastal Defense Command, and Diving and Explosive Ordnance (Ammunition) Disposal Division under the Royal Thai Navy.



## Occupational Health and Safety Management

Being “an organization that is free from accidents (No Harm) to employees, contractors, and related stakeholders” is the business goal that Thail Group management is committed to achieve through the provision of resources to support the Five-Year “Occupational Health, Safety, Emergency and Crisis management” Plan, while arranging a specific function to be responsible for controlling and driving the implementation of the master plan. In addition, Occupational Health Safety and Environment Committee is appointed, which consists of representatives from employees involved in operations that make up at least 50% of the committee (excluding the Chairman). The committee meeting is scheduled at least once a month to regularly update performance and future operations plans.

In 2020, the Five-Year “Occupational Health, Safety, Emergency and Crisis management” Plan has been implemented, representing the commitment to achieve corporate safety goals, which is No Harm, No Leak, and Goal Zero. A review is conducted on occupation health, safety, potential risk of serious accident, work permit system and work processes related to high risk and potential to cause an accident. Moreover, there was an implementation of work procedure, check-list form before work, contractor safety management, and worker’s skill and knowledge enhancement especially for those who are involved

with specific safety tasks. All the procedure has been communicating to relevant parties to ensure operational effectiveness and efficiency, ability to analyze the operation result and systematically learn from past incident. The indicator is proactively determined to monitor compliance regarding to the imposed working procedure and the performance is regularly reviewed by the top management.

Safety culture is considered to be a key success factor towards achieving business goal at Thail Group. The company has adjusted the operational strategy from Safe White Green to All SAFE White Green in order to develop awareness and strengthen workplace safety leadership for employees and contractors at all levels through Management walk and Talk by top management and QSHE Roll Out, which organized in various areas of operations, especially during the annual turnaround an in areas of operations undergoing construction. In addition, to raising awareness and strengthening safety culture for workers in operations, these activities also enhance worker engagement in real working conditions and work environment.

Thail Group has executed occupational health and safety actions as follows:



- With the determination to promote safety awareness, the Board of Director assigned senior management to present case studies and issues that are material to safety from both inside and outside of the Company to the Board on a monthly meeting to ensure continuous development and improvement of the Company's safety measures.
- The onsite visit of Chief Executive Officer and senior management to local workers during work hours, maintenance downtime and at construction sites to build morale, which reflects our commitment to and advocates for occupational safety as well as sets a good example of safety leadership,
- Adjusted the existing Strategic Plan in alignment with Business Excellence (O2BX) in order to become a world-class refinery by 2022 and re-align the corporate safety target with the new strategy of No Harm, No Leak, and Goal Zero.
- Reviewed the Five-Year "Occupational Health, Safety, Emergency and Crisis management" Plan to align with both internal and external environment, relevant risks, new strategic plans and corporate targets.
- Reviewed, identified and assessed risks that may lead to serious accidents, along with establishing control and preventative measures that are continuously monitored to ensure its effectiveness. And, conduct safety audit and analysis, including proposing recommendation actions and preventative measures to avoid recurrence. The performance review by management is scheduled on a monthly basis.
- Reviewed Permit to Work System, especially in regard to work permits for work with ignition sources near flammable materials, or hot work, as well as relevant checklists in accordance with international best practice.
- Upgraded contractor safety management in accordance with international best practice. The electronic contractor safety passport is initiated to record profiles and significant safety information of individual contractor and contracting company for use as information in hiring contractors and safety management purpose.
- Developed and evaluate employee skills and competencies, whose function is related to safety, work permit system and crisis management, through Competency Assurance System.
- Improved Chemical Management, covering work with chemicals used in the production process, product testing, machine maintenance and manufacturing of Thaioil Group's

product or by-products, in accordance with International Best Practice.

- Organized All SAFE White Green MTA during maintenance downtime of the production unit in 2020
- Organized 60 Day with No Harm No Leak project at the end of 2020 to prevent and reduce accidents at work as well as to promote safety awareness among employees and contractors in the workplace. This event is organized to serve the goal of not having any Medical Treatment Case (MTC), which the Company successfully achieved the set target. However, the company would provide additional measures as follows:

**Contractor Company:** Senior Executives and safety managers were invited to join the workshop to formulate an accident prevention and reduction plan, review relevant working procedure, re-assess associated risks and communicate to contractors for their acknowledgment and adjust numbers of supervisors to meet the workload.

**Contractor supervisor:** Set up forms and topics for Toolbox Talk as well as preparing for daily reports with an emphasis on adherence to checklists for 9 types of high-risk tasks, inspection of work tools and ensuring that 100% of contractors wear personal protective equipment.

**Workers:** Ensure workers adhere to safe working practices and wear appropriate personal protective equipment while working.

**Supervisor:** Refining Operations Function, Engineering Function, Asset and Development Function and Quality Management Function are responsible for inspecting the safety in the operational area, including checking compliance with the practice and exercising command to stop the work when it is found that the operation is not safe

**Organize campaign activities** though publishing QSHE Newsletter on a weekly basis, placing campaign banners throughout the workplace, and arranging publicity vehicles to communicate about safety throughout the operation sites.

- Raise awareness of the danger and promote strictly adherence to the 12 Life Saving Rules as well as encouraging submission of Potential Incident Report (PIR) by emphasizing on unsafe act and unsafe condition as a preventive safety measure.
- Review health risk assessment during annual maintenance turnaround by focusing on proactive measures or prevention

of occupational diseases. In addition, the effectiveness of prevention measures is examined and monitored by occupational health experts and specialists in occupational health medicine. Moreover, risk-based health and physical examinations are available for employees and contractors who are performing specific duties at high risk, while systematically analyzing and suggestions solutions to prevent recurrence.

- Evaluate Health Performance Indicators according to the criteria and guidelines of internationally accepted standards, International Association of Oil and Gas Producers (IOGP). In 2020, the company received the score of 3.56 out of 4.00 in 2020, and has developed an improvement plan to close the remaining gaps in the management system in accordance with the IOGP criteria and requirements.
- Review emergency and crisis plans, including preparing response plans in advance that are consistent with international best practice as well as improving the existing emergency control center to be more modern and effective.
- Establish COVID-19 surveillance plan, which divides into 3 phases. Phase 0 underlines prevention and surveillance as

no infected case identified. Phase 1 focuses on controlling and preventing the spread of the virus as suspected cases are identified, but it does not affect the business operations. Phase 2 emphasizes on recovery plan and requires the establishment of emergency control center as the number of suspected cases are identified and impacted on the business operations.

- Enhance knowledge and capabilities of fire and emergency rescue team, improve fire water supply systems and fire retention reservoirs to be able to respond to emergency or fire incidents in both the production sites and the product storage tanks, including procuring high performing water guns to strengthen firefighting capability of Thailoil Group.
- Conduct risk assessment and review safety control and prevention measures by establishing plans and measures for security and safety at various levels (Defense in Depth), which covers all high-risk activities, especially chemical spills from marine transportation. The emergency drill is therefore extended to the level of crisis management in collaboration with external and local governmental agencies in order to prevent and reduce serious impact on the business operations, while ensuring Thailoil Group can continue to manage and control high-risk activities at an acceptable level at all times.



Thailoil's safety team during the inspection of fire fighting equipment.



## Performance 2020



Fatality as  
a result of work

**0** case



Occupational illness  
frequency rate (OIFR)

**0** case



Total recordable work-related injury rate (TRIR)

**0.29**

cases/million work hours  
better than the set target  
at below

**0.4**

cases/million work hours

Safety statistics  
are among

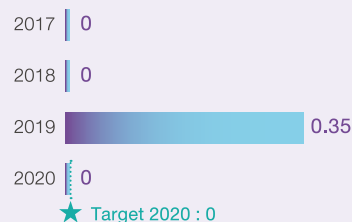
**the top  
10%**

of the oil  
and gas industry.

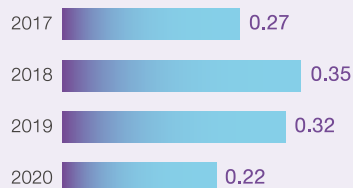
### Total recordable work-related injury rate (TRIR) - employees (Case/Million work hours)



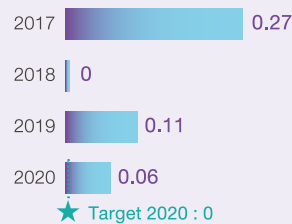
### Lost-time injury frequency rate (LTIFR) - employees (Case/Million work hours)



### Total recordable work-related injury rate (TRIR) - contractors (Case/Million work hours)



### Lost-time injury frequency rate (LTIFR) - contractors (Case/Million work hours)





## Process Safety Management

Process safety is one of the component in the Safety Pillar of business excellence strategic plan, hence, it must be continuously developed.

The main operational goal is to operate the business continuously without hydrocarbons or hazardous chemicals leakage (Loss of Primary Containment: LOPC) or any abnormal events related to production that can lead to the loss of life, property, environmental and Thailoil Group's reputation. Therefore, Process Safety Management (PSM) is a key success that drives and strengthens Thailoil Group's capability in accomplishing the No Harm, No Leak, Goal Zero target, while moving towards operational excellence and world class process safety.

Since 2018, the Company has established a Technical Safety to develop and upgrade Thailoil Group process safety management in order to be comparable to an international standard, Occupational Safety and Health Administration (OSHA) standard by underlining a proactive risk management to prevent serious accidents. As a result, Thailoil Group can operate business sustainably and become an organization with security throughout the operational chain.

Thailoil Group has executed process safety in accordance with international standard and best practice as follows:

- Reviewed current status of safety management in production process against the OSHA standard requirements and international best practices.
- Formulated Five-Year process safety work plan to develop and upgrade safety management in production process that aligned with international best practices.
- Implemented Process Safety Culture Survey, which aims to assess the perception level of safety in the 9 dimensions, according to international standards and with assistance of consulting firm. The findings indicated that the level of safety awareness in the 9 dimensions of the Company's production process was higher than the Global Average from 2014 to 2019.
- Reviewed and upgraded the Safety Critical Equipment (SCE) to comply with the Mechanical Integrity requirements, which is one the components of the Process Safety Management (PSM).
- Enhanced the Management of Change (MOC) process in the production process that aligned with international best practices to prevent incidents and reduce potential impacts as a result of changes in the production process, which might occur after the operations. This includes review of related issues such as engineering design, risk rating, and safety measures in which any change must be considered by person with the authority before any amendments or improvements can be made. And, after completion of the improvements, a testing must be conducted before proceeding the actual production process.
- Reviewed risk and control measures to prevent serious hazards that may occur at each production process through a systematic Hazard Effect Management Process (HEMP). This ensures that the preventative measures or safety devices that have been designed and installed remain effective and efficient, and that risks associated with the process safety can be controlled at an acceptable level at all times.
- Developed and upgraded Technical Authority (TA) system to align with international best practices, and applied it in the Management of Change (MOC) process. This ensures that every change related to the production process is systematically reviewed and certified by a technical expert so that all concerted parties involved able to operate safely and sustainably.
- Reinforced process safety awareness through 19 Process Safety Fundamental and Process Safety Management and Bearer Thinking.
- Inspected process safety with determined inspection plans, inspection checklists, reporting, monitoring corrective actions, and systematic performance evaluation.
- Established the Process Safety Competency Development Matrix according to the Community of Expert (COE) guidelines, which cover significant process safety roles, process safety training, assessment of knowledge and capabilities in accordance with the specific criteria to ensure employees are equipped with process safety knowledge and capabilities for the assigned tasks, and contribute towards sustainable process safety performance.



- Developed Pre-startup Safety Review (PSSR) in terms of procedure and safety survey (PSSR checklist) that aligns with international best practices in preparation for the Clean Fuel Project that will starting operating in 2022.
- Encouraged employees and contractors to study lessons learnt from the accident and international best practices, and apply the acquired knowledge to improve the safety of the production process and emergency management within the Company. This aims to prevent serious accident, while developing the emergency and crisis management to the levels that are comparable to the international standards.
- Raised awareness and prevent hydrocarbons or hazardous chemical leakage from heavy containers (Loss of Primary Containment Prevention: LOPC Prevention) by reviewing and developing LOPC chain and management process to cover reporting, investigating, analyzing and learning from the past

LOPC (Learning from Incident: LFI). Thus, the proactive prevention and management is executed, for example, Corrosion under Insulation inspection, flange assurance and gasket control. In addition, the steering committee is formed to drive and support LOPC prevention project to achieve required safety goal.

- Determined process safety performance indicators, both leading and lagging, in accordance with American Petroleum Institute Recommended Practice 754 (API RP 754) requirements, such as, hydrocarbon or hazardous chemical leakage tier 1 and tier 2 (LOPC Tier 1 and Tier 2). The High Potential Incident (HPI) or an event that have the potential to cause serious accidents is instead focused on investigating the root cause in order to systematically set measures to prevent such events from occurrence as well as building effective safety awareness. Furthermore, the Company's safety performance is review on weekly basis by top management.



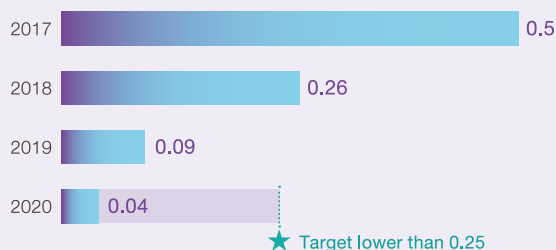
## Performance 2020

In 2020, there was a case of flammable or chemical leakage from the main container or production process, which resulted in the severe impact (Tier 1) according to API 754 requirement. The incident was accounted for 0.04 events per million work hours, which is not exceeding the 2020 target of lower than 0.25 events per million work hours.

However, Thailoil has investigated the cause of incident and determine mitigation and preventative measures to prevent the recurrence in the future. Investigations of the incident revealed that the implemented detection system and the authority in charge were able to detect the incident early that allowed a quick control over the incident, which led to no interruption of the production process.

### Process safety incident from leakage of flammable or chemical substances, or loss of primary containment, that caused severe impact in accordance with API RP 754 standard (LOPC Tier1)

(Event/Million work hours)



# HUMAN AND ORGANIZATION DEVELOPMENT



## CHALLENGES, RISKS, AND IMPACTS

**A key internal challenge facing Thailoil Group is the challenge of transforming our business to match our new vision, which aspires towards a business model that extends beyond oil refining to cover energy, chemicals, and other innovations. To confront this challenge, we must determine an appropriate human and organization management strategy to ensure readiness to accomplish the new business strategy. Our people and organization management approach must have the capabilities and readiness to drive our business towards our vision. We must accelerate human capital development to increase capacity in operating with excellence and creating readiness for new businesses.**

Furthermore, we are currently facing external challenges, especially in the COVID-19 pandemic, that require us to revisit our human and organization management strategy. These challenges are discussed as follows.



### Attraction

The demand for workforce to support business expansion, combined with changes in the labour market – wherein the proportion of working age population has decreased while the proportion of gig workers has increased – require the organization to change the recruitment strategy to attract more talent people to the organization. In the context of the COVID-19 pandemic, recruitment strategy must also be safe and have measures to prevent infection.



### Development

Amidst business competition and rapidly changing factors in the global business environment, the Company must accelerate workforce productivity improvement in order to proactively achieve corporate strategic targets. Thailoil is faced with the imperative of upskilling to strengthen employees' existing skills, and reskilling to increase employees' new skills, to ensure readiness for changes and new business models in the future.

In 2020, Thailoil had to hold off trainings and seminars in Thailand and abroad due to the COVID-19 pandemic. Thus, the Company adjusted the people development approach and applied technology appropriately so that employees might still benefit from capacity development without interruption.



### Knowledge Management

Retirement of highly skilled employees and competition in operational excellence both drive the organization in retaining existing knowledge and expertise through efficient knowledge management and transfer between generations. While business expansion leads us to new businesses, the organization must also expand the scope of knowledge management to ensure that each business in Thailoil Group has resources to access accumulated knowledge and expertise.



## Retention & Culture

A rising challenge in business management is accommodating generation diversity, especially the difference in behavior and lifestyle of Millennial and Generation Z employees, who will be the next generation of leaders in the organization. Thus, Thailoil has had to adjust the strategy for employee well-being in all dimensions (financial, health, social, and mental). The organization has also had to build an organizational culture and environment that is appropriate for the generation, while fostering collaboration and communication between different employee groups. Ultimately, the strategy must respond to the diversity in age and lifestyles of employees to elevate employee engagement within our organization.

As a result of the COVID-19 pandemic, the organization had to establish various measures to prevent infection within employees. We have maintained continuous communications with all employees to reassure their confidence regarding their health, well-being and job security.

## COMMITMENT

Thailoil Group continues to strive to care for and manage our people with the belief in the value of human resources and the ideology that “stability comes with determined people and refined energy creates value”. We have defined long-term goals to be achieved by 2026, including: become a leading organization in employee productivity management; maintain the ability to retain talents within the organization; and keep the workforce productivity in comparison to competitors in the same industry. Thailoil has set the Human Capital Index (HCI) as a corporate key performance indicator to measure human and organization management. The index covers competence development, availability of opportunities to perform, and engagement.



Furthermore, during the COVID-19 pandemic, Thailoil also adopted a “zero staff infection” target to prevent 100% of our employees from infection. We have promptly adapted the business plan to respond to the changing business context, in order to maintain productivity in our operations and ensure that the organization can still accomplish established business targets.

With the aforementioned commitment towards human capital management, Thailoil Group has determined a human and organization management strategy that covers human resource planning, organizational structure design, recruitment, employee engagement, human capital development, as well as improvement of processes and application of technologies in creating a digital ecosystem. These actions support us in developing our people and organization towards efficiency, and strengthening their capabilities in delivering work to meet organizational goals.



### Target by 2026



Voluntary resignation  
rate less than

**2.5%**



Workforce productivity at

**75<sup>th</sup>**

percentile in comparison to  
companies in the same industry



Raise the HCI score  
to

**84** points

## MANAGEMENT APPROACH

### Human Capital Management Strategy and Policy for 1–3 Years

Thaioil Group has adjusted the human and organization management plan for the next 1–3 years, which covers strategic workforce planning, recruitment of quality personnel, capacity development, and fostering employee engagement and retaining talent in the long term, with a focus on instilling corporate culture and the TOP Core Competencies, including:



Leadership



Commercial Excellence



Digitalization



Business Excellence



Innovation



Agility and Resilience

Our aim is to support the organizational vision and strategic plan, and develop Thaioil Group towards becoming a high performance and healthy organization that can grow sustainably. We have implemented our main plans, as presented in the following sections:



### ATTRACTION: Strategic Workforce Planning and Recruitment

#### Management Approach

To support the corporate strategy in business expansion, Thaioil conducts strategic workforce planning while enhancing the capacity and competitiveness of our workforce (Workforce Productivity Improvement) in all functions. For example, the Company has adopted technology into working processes and considered the job fit of candidates. This helps support the recruitment strategy, and efficiently advances organizational productivity.

For recruitment, the Company has built capacity in recruiting and selecting high quality personnel who are talented, good, and care for the organization, to support our business expansion. We use four recruitment process types (4B), as detailed below.

- Build : Accept and develop new graduates.
- Buy : Recruit experienced employees with high potential.
- Borrow : Borrow employees with fixed-term contracts from affiliate groups.
- Bring-in : Employ with defined duration.

In 2020, the Company developed a proactive recruitment and selection strategy called “SPRINT” to increase our capabilities in attracting the interest of target groups in joining Thaioil Group. The strategy is designed to help the organization recruit quality individuals to support the existing business, as well as preparing to build organizational readiness for future businesses. The Company has revisited the strategy consistently to ensure that it is not disrupted by the COVID-19 pandemic. We continued to efficiently carry out recruitment and selection, as described below.

**Strategic Sourcing:** To enlarge our pool of potential candidates, Thaioil increased recruitment channels and made our content more attractive through enhancing the existing recruitment channels and increasing our use of social media channels such as Facebook, Instagram, LINE, and Twitter, to reach our target, the new generation. The Company also adjusted corporate image such that the Company might inspire the target group to join and work for the company. Furthermore, The COVID-19 pandemic also played a part in accelerating our transition to use more recruitment channels and efficiently communicate job opportunities through the use of social media and online postings to replace traditional job fairs or roadshows normally organized in various academic institutes, which were no longer viable options for this year.

**Partner for Recruitment:** Thaioil continued to advance professional partnerships and promote opportunities to gain life experiences by collaborating with academic institutes – particularly academic institutes hosting our target groups, including those in bachelor’s, master’s, doctoral, and vocational programs – to organize a variety of activities to share information, knowledge, and expertise. Furthermore, these partnerships help academic institutions train individuals with the qualifications needed in the industry, while also benefiting Thaioil through matching us with partners for recruitment that can help the Company better reach the talent pool.

**Recruitment by Values:** Beyond searching for technical knowledge and talent, Thaioil Group places great emphasis to



the “values” of the candidate that correspond with the organizational values. To recruit the “right” candidate (a candidate who will be care for the organization) who is truly willing to join us and step forward with us sustainably, Thailoil has developed a tool that tests candidates’ aptitudes through a game format rather than the traditional multiple choice format. We also use the core value card tool to glean the values of the candidate, while providing interviewers with guidebooks and training sessions to equip them with the necessarily skills and knowledge in using these tools in an efficient and standardized way. We believe these initiatives and tools will help the organization recruit candidates with high potential who are talented, good, and loyal to join the organization and work alongside us with happiness and sustainably.

**Integrated Digital Recruitment:** Thailoil applied digital technologies to all recruitment processes, from smart attraction and smart selection to smart on-boarding. These components make up our full online recruitment process, and help increase the efficiency of recruitment and selection processes. Furthermore, our integrated digital recruitment also offers a channel to prepare new employees before their first day at the job. Besides being convenient, the system creates a modern experience that will appeal to our target group, the new generation.

**New Normal Recruitment:** To promptly respond to business needs, Thailoil made improvement actions to expedite recruitment, selection, and onboarding processes. However,

in 2020, much of the Company’s efforts were directed towards adapting recruitment and selection processes to ensure protection from infection. We adjusted communication channels, established COVID-19 protection measures, and adopted different technologies to provide alternative job application options. It is of the utmost importance to the Company that while we efficiently carry out our recruitment tasks to fulfill the large workforce demand needed by the business, we do not compromise the safety of our applicants and employees. We accomplish this through measures such as organizing interviews through Microsoft Teams, training new employees through online channels, and allocating safe spaces for visiting candidates.

**TOP Seed Incubator:** Thailoil partnered with one of the leading academic institutes of Thailand to create an incubator program for students. Through this partnership, we support master’s and doctoral business and innovation programs to promote the development of individuals with the new knowledge and capabilities that Thailoil Group needs to fulfill our strategic direction and drive growth in future businesses. Furthermore, this partnership helps Thailoil Group identify students with potential to join our business in the future.

The various initiatives implemented to support the SPRINT strategy allowed Thailoil Group to achieve our targets and recruit the needed personnel to accomplish our short and medium term business strategies.



## Performance 2020



### Human Capital



Ability to recruit  
**100%**  
of total number  
of vacant positions



Application rate (potential candidates)  
increased by 91% in comparison to  
the 2019 plan, and **100%**  
in comparison to the 2020 plan



Reduced time to filled  
from 60 days to  
**50** days



### Social and Relationship Capital



**91** scholarships  
awarded to students  
from 46 academic  
institutions



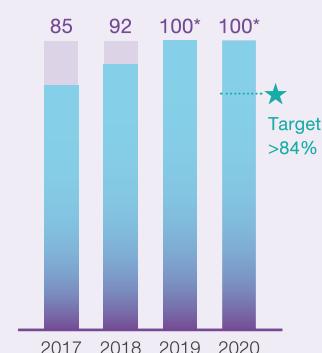
**63** student  
interns received the opportunity  
to intern with the Company during  
the COVID-19 pandemic



**43** academic  
institutions that the Company  
visited to share knowledge  
and give career advice

### Ability to recruit

(Percentage of total vacant positions)



Remark: \*In 2020, the Company was able to recruit employees to support the current business, meeting 100% of the target set, and was able to recruit 59% more employees than vacant positions to support business needs for future business expansion in the next 1-2 years.



## DEVELOPMENT: Human Capital Development

The development of human capital is challenged with an uncertain context and rapidly changing environment, whether that be employee diversity, business expansion, or the increasing use of digital technologies. To respond to these challenges, Thaipol Group uses the AGILE development framework to build employee capabilities and readiness. The AGILE framework is a framework for employee development that starts from before they join Thaipol Group and extends to their retirement. It rests upon the 70-20-10 development principle, and emphasizes the importance of applying knowledge gained to increase value in their work and add business value to the organization. (Please see more details on the AGILE framework in the Human and Organization Development section in the Integrated Report 2019.)

In 2020, Thaipol Group faced major challenges like many organization around the world and was affected by widespread economic and social impacts. These impacts pushed us to change our way of work. In regard to human capital development, we have viewed these rising challenges as opportunities to inspire employees to independently and continuously pursue learning. To that end, we adjusted our approach to human capital development to fit with the new normal for working. Thaipol Group developed a digital learning platform, which we call the Thaipol Academy, to host online courses and materials that employees can access through their phones or

computers. The training materials cover a variety of technical and management topics, and are designed to motivate employees to continuously learn anytime and anywhere.

As of the present, the Thaipol Academy has over 2,000 subjects, with online courses developed externally by other institutions, as well as courses internally developed by Thaipol. The Company encourages employees to share the knowledge and experience they gained from work through the KM E-Learning Creation Award 2020. Through this award, employees were encouraged to share knowledge and experience through the format of video clips, which more than 80 courses were submitted, to act as a resource for internal knowledge sharing in the organization. 70% of employees from Thaipol and Thaipol Group companies – including Thaipol Energy Services Company Limited (TES), TOP Solvent Company Limited (TS), Sak Chaisidhi Company Limited (SAKC), Thaipol Marine Company Limited (TM), and TOP Maritime Service Company Limited (TMS) – benefited from learning through the Thaipol Academy, and overall, this platform successfully served the purposes of employee development during the context of the new normal.

In 2020, Thaipol Group continued to prioritize the development of leadership capabilities to ensure that employees are ready to drive the organization whilst surrounded by an uncertain context and rapidly changing environment. Our leadership courses include:

Course	Objectives	Target Group
<b>Executive Coach</b>	To develop leadership skills to drive teams and the organization, while prioritizing work efficiency and human resource management.	Management executives at the vice presidential level
<b>Digital Transformation for Executives</b>	To build leadership skills needed for digital transformation.	Department managers and above
<b>Empathetic Leadership Development Workshop</b>	To strengthen leadership skills in “understanding, being accessible, and developing” to build a happy workplace and move the organization towards being a HPO.	Section managers and above

Besides the leadership courses, Thaipol Group has also redesigned the soft competency management program to focus on the six core capabilities of the organization needed to drive the organization forwards. These include operational excellence, commercial excellence, agility and resilience, leadership, digitalization, and innovation. The Company has developed an online course on this topic and shared it on the Thaipol Academy to make it easier for employees to access this content and deepen their understanding of the organization’s core competencies.

We have also disseminated communication materials through various channels, such as the Learning and Innovation Day and the knowledge market, to increase awareness of the core competencies. These materials will serve as content that can be referred to in the future. Furthermore, the Company has provided awards to employees who have demonstrated their ability to apply knowledge gained to innovate and improve production processes or products to create value for the organization.

Nonetheless, Thail Group still equally prioritizes functional competencies that strengthen employee ability to perform tasks and maintain excellence in their duties. We have adjusted the format of employee development programs to increase variety, while still encouraging employees to apply the knowledge they have received from these opportunities to increase efficiency and productivity in the organization. Some of the courses are detailed in the following table:

Course	Target Group	Development Approach	Benefits Created
<b>Increasing Production Efficiency</b>	Refinery employees	Training and on-the-job training	To increase production efficiency and reduce energy consumption and pollutants released to the environment.
<b>Operational Excellence to Business Excellence (O2Bx)</b>	Refinery employees	Training, learning through simulation, and on-the-job training	To prevent unplanned shutdown and reduce costs of damage.
<b>Oil Transport</b>	Refinery employees	Training, further educational opportunities, instructor-led training, and on-the-job training	To reduce safety risks in oil transport.

In 2020, the Company developed individual development plans for 100% of employees. All employees completed their development plans.

As Thail Group recognizes the importance of evaluating employee competencies, the Company has strengthened the capacity in employee development and evaluation through digitalization of the processes, resulting in P-Success System. The system is a career management and development system that was designed based on the competencies required in each career track. Supervisors can use this system to perform holistic competency evaluations, plan career tracks that align with competencies, develop individual development plans for the specific career track and requirements of the job at the time,

and connect the development plans to various development approaches that respond to different needs. Furthermore, this system gives employees a platform to manage their learning and development plans by themselves, while providing supervisors with a more efficient and accurate way to monitor performance and evaluate results.

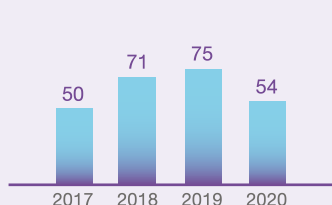
Through adapting our human capital development approach to fit with our context, our employees were able to continue on their development paths, and the organization was able to continue preparations for business expansion and forthcoming challenges. Over the past year, Thail Group employees participated in 284 training hours per person per year, with our budget being 422 million THB.



## Performance

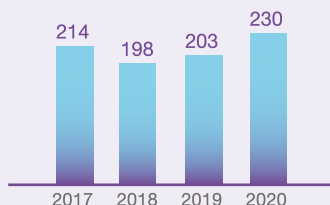
### Training (10%)

(Hour/head/year)



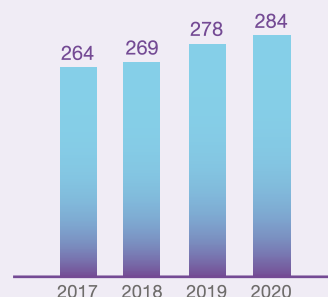
### Coaching (20%) and On the Job Training (70%)

(Hour/head/year)



### Average development hours

(Hour/head/year)





## KNOWLEDGE MANAGEMENT: Organizational knowledge management

### Management Approach

In 2020, Thailoil has continuously driven the collection, sharing, and application of knowledge from the day-to-day work experiences of specialized employees and employees who are nearing retirement. We have used a variety of approaches in collecting data, such as online documents, videos, interviews, summaries, and short clips, to ensure that accessing, learning, and applying this knowledge is convenient and appropriate for all age groups. The Company has also undertaken additional initiatives to collect important knowledge on operating the Clean Fuel Project, which is a large-scale refinery expansion project, and expand our database towards more companies in Thailoil Group – namely, TOP Solvent Company Limited, Thailoil Marine Company Limited, and Sak Chaisidhi Company Limited, to support expansion in the chemicals business; Thailoil Power Company Limited and TOP SPP Company Limited to support expansion in the power business, and Thailoil Treasury Services Center Company Limited to support future business expansion.

Thailoil ensures ongoing knowledge management through the Knowledge Management Committee, also called the KM Ranger, which consists of 31 members representing all functions in the organization. The Committee is tasked with implementing knowledge management according to the organization's knowledge management roadmap (KM Roadmap), and regularly reviewing the plan to ensure that the organization can store important and relevant knowledge amidst constantly evolving business directions. Furthermore, the Committee is responsible for enhancing knowledge management through integrating knowledge management into day-to-day activities, in order to ensure that knowledge management is convenient and requires little time. The KM Ranger is also charged with developing knowledge management plans for each function, aligning the function plans to the KM Roadmap, and supporting employees in their function in knowledge management and transferring knowledge between generations, with support from the Knowledge Management Function.

Moreover, Thailoil encourages the creation of joint learning networks within and outside the organization. The KM Workshop was organized for KM Rangers to exchange good practices and lessons learned from their work. Workshop attendees can then apply applicable lessons to their own work. We have also joined external knowledge management networks to seek new

knowledge from other parties that might benefit our organization, and share them to internal functions. For example, information on unplanned shutdowns from all companies in the Thailoil Group from the PTT Group OpEx was shared to production teams to help them communicate within their team members, build awareness, and drive the application of good practices in their own work to reduce unplanned shutdown rates and damage to the Company.

To motivate and promote employees to store, share, and apply knowledge continuously, and integrate these habits into a learning culture within Thailoil Group, the Company has selected important and interesting topics to be created into learning content that employees can access and learn from at anytime and anywhere. The Thailoil Academy online learning application has a total of 138 of these subjects. The Company also provides incentives through awarding recognitions for functions with exceptional knowledge management, and sends these teams to compete in the PTT Group Knowledge Management Contest, so that they might be awarded onstage for their efforts. The Thailoil functions that received Excellence CoP awards including the CoPs of accounting, engineering, and quality management.



### Performance 2020



### Financial Capital

**2,257** million THB  
in benefits generated from utilized  
organizational knowledge





## RETENTION & CULTURE: Employee Retention

### Management Approach

Thaioil Group gives importance to the opinions of employees through various channels - CEO Connect, a quarterly event where our CEO meets and chats with employees; ongoing conversations between supervisors and employees; and the annual employee engagement survey, where results are used to complete an in-depth analysis to guide us in implementing both individual and collective initiatives projects to care for our people. We undertake these initiatives as a way to continuously improve upon our human and organization management, and promote employee satisfaction and engagement from the first day of employment to retirement. Initiatives are developed to suit the diversity in each generation.

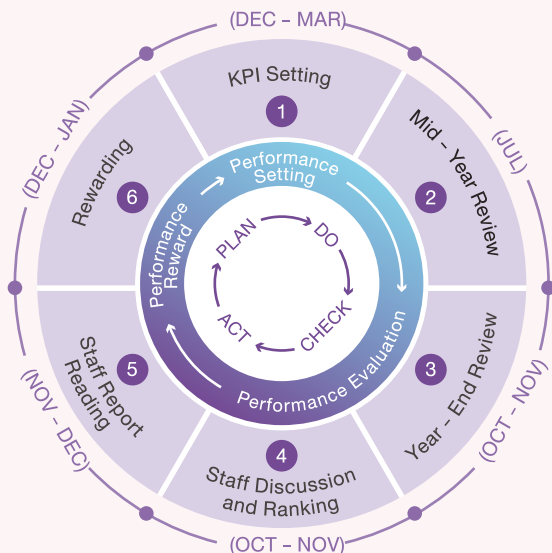
Upon evaluating survey results and the recommendations given by employees in the 2019 annual employee engagement survey, Thaioil conducted the following activities in 2020 to increase employee satisfaction and engagement:



### Performance Management System

We reviewed and developed tools in evaluating employee performance to ensure that there is clarity and transparency. We also promoted communication to create mutual understanding between supervisors and employees. We used the six steps demonstrated in the image. (For more details, please see the Human and Organization Development section in the Integrated Report 2019.)

### Performance Management System



Furthermore, the Company encouraged line managers to deepen their understanding of the performance management system and strengthen their ability to communicate with employees to maintain a shared understanding. We expect managers to communicate with employees directly and following the standards of the organization. The Intensive Performance Management System Briefing for Line Managers was organized, and achieved 82.14% success rate.



### Career & Development

The Company has developed the specialist career track and extended the technical center of excellence to support and retain specialists and technical experts within the organization. We have updated our processes to ensure that these individuals can access their desired career development opportunities. The Company has also re-designed the organizational structure that will accommodate career growth for specialists and technical experts in the future.



### Rewards and Recognitions

Thaioil Group promoted the retention of quality employees within the organization in the long term. Beyond providing welfare and benefits that are competitive with other leading companies in the industry, we have initiatives to motivate and demonstrate appreciation for employees who have completed a particular number of service years through the long service emblem ceremony for employees who have reached 10, 15, 20, and 40 years of service. During the ceremony, these employees will be awarded with souvenirs and thanked by Thaioil's executive team.



### Employee Well-being

Thaioil promoted employee well-being through caring for employees in every dimension of life, including health well-being, financial well-being, social well-being, and mental well-being, to respond the needs of employee that change with the times. Our initiatives are listed below.





### Health Well-being:

The Company designed the Health Meter application to promote employee physical well-being. The application evaluates annual health check-up results from the past three years, and provides employees with relevant information and recommendations about health, while also helping remind employees to care for their physical health and well-being. Furthermore, the Company organized different activities to promote physical well-being, including but not limited to walking, running, fitness, and yoga. During the COVID-19 pandemic, we organized live stream physical exercise events – such as aerobics – to motivate employees to care for their physical well-being.



### Financial Well-Being

The Company promoted employees' financial stability through organizing wealth management programs for each age group. Some examples of these programs include the Wealth Program for New Staff, the Life Planning Aged 41–45, the How to Lead a Wealthy Life Above 50, and the Wealth Program for Pre-Retirement. Moreover, we developed the Flexible Benefit Program to give employees the option to trade unused benefits for other benefits fitting with their lifestyle, gender, and age. Employees can choose to swap their unused benefits for other benefits in health care, or learning and development in various areas, such as languages, music, sports, or travel.



### Social Well-Being

The Company developed a social well-being application, the Zap Jam application, to connect employees with similar interests and lifestyles. We believe this can help promote collaboration within the organization and contribute to happy social lives in the work environment. Other initiatives include the Mindful Leader Program, the Retired Employees Association, and other activities to help employees creatively contribute to society, such as the project to collaborate to create masks for COVID-19 protection and donate to communities surrounding the refinery.



### Mental Well-Being

The Company developed mental well-being programs for employees to manage stress from work and increase their happiness. For example, we helped employees analyze the causes of stress, raised employee awareness of ways to take care of themselves while working, encouraged supervisors to give employees advice, recommended motivational and inspirational podcasts that can help create happiness in the workplace – especially as employees work from home – and supported employees in accessing mental health consultations through the OOCA Application and from professional therapists or psychiatrists.

### Upgrading employee communication efficiency

As employee behavior has largely changed during the digital era, the Company has adapted employee communication channels to accommodate these changes. We have applied digital technologies to create new communication channels that provide employees with access to information at all times. For example, the Company has developed the Rhino Bot, created two-way communication channels with employees through LINE Official Account – PM4U, and developed the PMPE Partner for Life as a more accessible channel for younger employees to foster understanding regarding human resource management.

### Continuously creating a corporate culture

The values of iTOP+.is identified as one of the human and organization management strategies that must be continuously strengthened and driven. Especially in 2020, Thail Group has focused on creating values of innovation and digitalization to ensure that our organization can drive our vision, mission, and growth strategy. We also encouraged supervisors in all functions to organize activities that are appropriate for the employees of each function in order to foster good relationships and connections of employees towards the function, and therefore the organization.

In 2020, to build employee engagement and satisfaction with the organization, Thail implemented the following initiatives to boost employees' quality of life.

**The Company prevented COVID-19** infection through establishing the I-COVID Center to control the outbreak of COVID-19 and act as the central body in managing the COVID-19 crisis through defining different measures to prevent infection in the organization, including but not limited to:



Communicating and encouraging employees to maintain personal hygiene, protect themselves, and be socially responsible



Distributing essential personal protective items



Cleaning and sanitizing offices and operations



Checking the body temperatures of individuals entering office spaces and operations



Assessing the risks of outsiders prior to allowing them entry to office spaces and operations



Requiring self-quarantine for individuals with risks of infection



Enforcing the work from home policy

**Additionally**, Thailoil established measures to prevent virus infection in critical areas of operations that may cause business disruption. For instance, we developed the Thailoil Chana Application as a platform to record and track those entering and using the space. This also helps reassure employees that they can their well-being and job security are not threatened during this time.

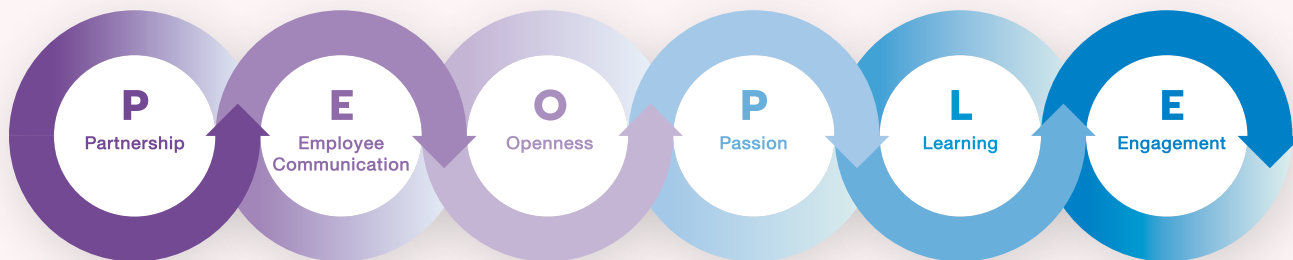
**Through the New Office Building Project**, we designed office spaces and working environment with synergy spaces for employees to come together to learn, brainstorm new ideas, and collaborate. Synergy spaces also allow employees to ideate new projects and increase success in their work with the highest efficiency possible. The Company has organized basic facilities to accommodate the convenience and lifestyle of employees of all gender and ages, including but not limited to fitness spaces, yoga rooms, and lactation rooms, to increase the happiness and convenience of employees.

**The Human and Organization Management System Development Project**, or the P-Success System, utilizes digital technology

to integrate human and organization management. The system connects recruitment and selection processes with processes in capacity development, career management, performance evaluation, as well as employee well-being. Moreover, this system provides employees with experience of using a modern and highly efficient tool for human and organization management.

Thailoil Group surveys employee engagement every year to track how engaged and satisfied employees are with the organization. Employee survey findings are then evaluated to determine the appropriate strategy and approach to elevate employee engagement. The developed strategy and approach are then cascaded to all Thailoil Group companies through organization-wide activities to increase engagement levels. We also encourage all supervisors to organize activities that are appropriate for employees in their function through the PEOPLE Model, which aims to continuously strengthen employee relationships and engagement with the organization in each function.

### PEOPLE Model





## Performance

The Company's management of employee engagement has been hugely successful, as reflected on our performance for employee engagement, employee satisfaction, and turnover rates, all of which achieved our set targets. Notwithstanding, Thailoil remains committed to strive and drive our performance to advance employee engagement and satisfaction to achieve levels comparable with leading companies in Thailand.



The Human Capital Index (HCI) score in 2020 was

**75** points

better than the set target of 73 points.



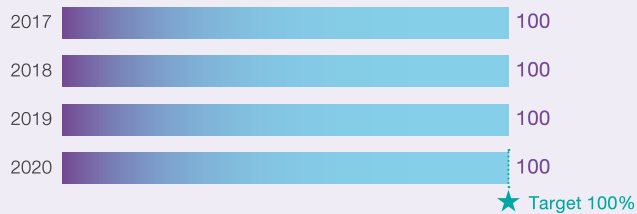
## Human Capital



**100**

of employees received performance evaluation

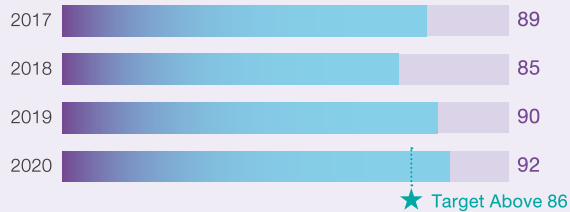
### Proportion of employees who received performance evaluation (Percent)



**92**

employee engagement

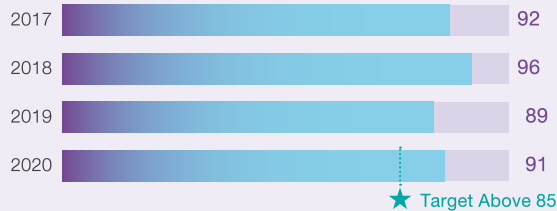
### Employee engagement (Percent)



**91**

employee satisfaction

### Employee satisfaction (Percent)



**1.03**

employee voluntary turnover rate

### Employee voluntary turnover rate (Percent)





# DIGITAL TRANSFORMATION



## CHALLENGES, RISKS, AND IMPACTS

Thaioil Group has been developing a Digital Transformation Roadmap since 2017 in response to the Thailand 4.0 policies of the government and of PTT Group. Thaioil has identified the key challenges facing our business as we confront various changes, and the main opportunities to adopt a bottom-up approach of increasing competitive advantage through establishing processes to improve operational efficiency.

To increase competitive advantage, the Company has applied the use of digital technologies across activities in the value chain, from crude oil sourcing, sales, production processes, human capital development, and data collection. We have developed agile projects to accommodate new user experiences, fostered a digital culture in the organization, and promoted safe use of technology to strengthen organizational agility and employee engagement. Additionally, the Company has reviewed and updated the policies and guidelines setting the standard of practice in using information technology systems, and established an enterprise architect to connect our business needs to our use of digital technologies. This will then inform the development of improvement plans for system programs.

Furthermore, Thaioil recognizes the value and importance of big data in industry. Data use in the organization is controlled under data management and governance systems. The Company has also integrated a centralized data platform to enable data analysis that will help maximize business benefits for Thaioil in the present and the future. However, the increasing digitization of information comes with risks in cyber-attacks and cybersecurity. This is another area that Thaioil has prioritized to make certain that all data will be safe and adequately secured, and do not affect the business operations of Thaioil Group and the confidence of all stakeholders.

The COVID-19 pandemic in 2020 contributed to speeding up digitalization in the Company. In response to the “new normal” operating conditions of all relevant stakeholders, Thaioil Group established additional measures to support our digital transformation and increase cybersecurity.

## COMMITMENT

Thaioil Group is committed to taking action in digital and cybersecurity. The Company has established a Digital Master Plan for 2019–2021 and published the Digital Technology and Communication Policy and the Cyber Security Policy. Both policies are applicable to the entire Company. Moreover, Thaioil has developed plans to ensure compliance with the Personal Data Protection Act, B.E. 2562 (2019) (PDPA), which will come into effect in the near future.

Thaioil has also conducted a cybersecurity gap analysis across the organization, and proceeded to close all identified gaps. Even though, the Company has established preventive measures in all relevant areas, but to completely avoid external cyber threats are of course impossible – such as phishing emails/websites and system hacking. Thus, Thaioil is driven to increase readiness in our systems and employees to reduce the risks of such cyber-attacks succeeding and creating impacts on our business activities, whether that be through training employees, raising awareness, conducting cyber-attack drills, and establishing a security operating center (SOC) to oversee incidents with cyber risk incidents.



## Target 2020



No case of cyber-attacks that create damage to business operations  
(Zero Damage to Business)

## MANAGEMENT APPROACH

Thaioil Group has established the Thaioil Group Digital Committee and the Cyber Emergency Response Team (CERT) to drive forward our work in digital and cybersecurity issues with efficiency. The Company has appointed staff with expertise to oversee cyber management throughout the management level and the operational level. Performance is regularly reported to management executives, including reporting of information security and cybersecurity risk management to the Risk Management Committee.

Thaioil Group has further developed the Digital Master Plan for 2019 – 2021 into a long-term plan (Digital Transformation Roadmap) extending to 2030. The Roadmap has five main phases, as follows.

## Digital Transformation Roadmap

### Proof of Concept and Digital Transformation Master Plan



#### 2017-2018

Establish a Digital Transformation Master Plan based on the corporate vision for digital transformation in order to adopt digital technologies in work processes to fundamentally bring change to business activities and the workforce. Increase competitive advantage through consolidating and assessing initiatives with a bottom-up approach. Focus on initiatives that increase competitive advantage in safety, plant reliability, cost reduction, and productivity – all of which will contribute to the achievement of 1<sup>st</sup> Quartile Performance ranking among peers in the industry.

### High Value Initiatives, Foundation & Data Platform



#### 2019-2020

Apply digital technologies throughout the activities in the value chain – from crude oil sourcing, sales, production processes, human capital development as well as data collection for the procurement of raw materials and equipment. The Company has also used technology to adjust production plans to ensure safety and maximize returns. For example, we used artificial intelligence (AI) technology to conduct price analyses of crude oil and other products, as well as equipment life cycle analyses, to better plan equipment maintenance. By integrating technology into management systems, the Company was able to increase work efficiency and reduce operational costs. Last but not least, Thaioil has continued to advance upon cybersecurity initiatives with efficiency.

## Digital Transformation Roadmap

### Data Driven Organization



2021-2022

Continuously drive implementation of data-driven projects, such as the advisory dashboard project, which is a tool that recommends value adjustments for important variables in the production process to achieve the most appropriate value, maximize operational efficiency, and minimize production costs. Achieve commercial excellence with data-driven solutions by applying such solutions to plan production and sales, manage product storage, and expand product distribution networks to Thaioil customers, according to plans.

### Digital Excellence as Competitive Advantage



2025

Focus on implementing autonomous processes and applying digital technologies throughout the organization.

### TOP Digital COE for Business Excellence



2030

Achieve digital excellence through collaboratively learning from the various projects implemented by the Company over the years since 2017. Promote an organizational culture that will drive the Company towards fully integrating the use of digital technology in the organization and, in effect, increasing competitive advantage in all areas, enabling organizational security and sustainability, and supporting the business in the present and onwards into the future.



## Performance



### Digital Transformation

Thaioil has adapted digital technologies to increase efficiency throughout the value chain. For example, for crude oil sourcing, which has the highest economic value among other value chain activities, Thaioil has a program that supports safe crude oil testing (Within Operating Windows). In the context of oil price and product demand volatility over the past year, Thaioil has also applied digital technologies to increase the efficiency of production processes. Details are shown as follows.

#### Clean Fuel Project Support Center

The Clean Fuel Project Support Center is a center for consolidating and analyzing all the information relating to the monitoring and management of the Clean Fuel Project, or CFP, one of Thaioil's major projects. Thaioil has developed this system to inspect and report on the status of security and safety at the workplace at all times. The Clean Fuel Project Support Center oversees safety, transportation systems, permit request systems, grievance monitoring systems submitted through online channels, as well as other operational activities, with a payback period of 2-3 years.

#### Predictive Maintenance

Thaioil digitalized our process for conducting equipment life cycle analysis in order to plan equipment maintenance. We have established a management approach to increase efficiency and reduce costs of operating. This project has a payback period of 2-3 years.

#### Operation / Engineering Handheld

Thaioil has used digital technology to propel us towards becoming the "Operation and Engineer of the Future". We have digitalized our work inspection and maintenance processes through the Operation & Engineering Handheld tool. This tool helps our production and maintenance employees perform their tasks with even more efficiency and with less time, while also ensuring occupational safety and reducing equipment damage. The project has a payback period of 2 – 3 years.

### Terminal Automation Management: TAM

For product distribution, Thaioil uses the Terminal Automation Management system to provide digital connectivity to customers ordering product deliveries through vehicles. The system also provides online check-in services, and serves to facilitate convenience in fuel loading. During the COVID-19 pandemic, the system has been helpful in reducing contact between individuals. As a result of the system's efficient queue management process, the Company was able to reduce the average fuel loading time from 75 minutes per vehicle to 45 minutes per vehicle – equivalent to a reduction of 40%. Furthermore, the TAM Anywhere program supports back office customers who have sent the vehicles to the Company by allowing them to check online for the fuel loading status of each vehicle in real time through their phones. This helps customers manage their vehicles, and increases the efficiency of the oil distribution process for customers as well.

### Enterprise Letter of Guarantee on Blockchain

The use of enterprise letters of guarantee on blockchain was inspired by a collaboration within the Thailand Blockchain Community Initiative. Participating banks are connected, through cloud technology, on one shared platform that covers all the relevant procedures, including requesting the letter of guarantee, applying for extension, and issuing the letter of guarantee. Here, the platform allows the letter of guarantee to be delivered directly and immediately to the beneficiary (Thaioil). This greatly streamlines the process, which traditionally involved much effort in exchanging paper documents, and effectively makes the process paperless. This protects against document counterfeiting, manages data in real time, is convenient and fast, limits repetitive tasks, and increases business opportunities.

### Robotic Process Automation: RPA

Thaioil has plans to further develop and automate our work processes. The Robotic Process Automation system will be used in warehouse management and procurement processes. We expect that this system will help reduce time spent doing manual work by 80%, and lower the rate of human error. For this reason, Thaioil set a target to have zero human error in the work processes accordingly.





## Cyber Emergency Response

Over the past year, Thailoil has responded to cyber security hazards and threats through analyzing our cyber security gaps and closing all identified gaps of the organization. We have been working on firewall protection measures to prevent external attacks through applications, using a virtual private network (VPN), and inspecting emails from outside the organization. Furthermore, we have restricted access to unsafe sites, established measures to protect companies from viruses, and backed up organizational data to prevent damage from data theft or other incidents that might create impacts on Thailoil's data systems in the event of an emergency. In this respect, Thailoil has also conducted emergency response plan drills to maintain response readiness if an incident were to occur.

### Measures to Ensure Cyber Safety

To make sure that Thailoil can control cyber risks adequately and fitting with the size and variety of our business, Thailoil has referred to the Cybersecurity Framework of the National Institute of Standards and Technology of the United States (NIST Cybersecurity Framework) to develop our cybersecurity management approach and control measures, which comprise of six areas, as follows:

#### Governance

The Cyber Emergency Response Team (CERT) is responsible for governance to achieve cyber resilience. The CERT, alongside Thailoil's management executives, determine the Company's cyber resilience strategy and policy, risk management, internal auditing, and human resource allocation and development, to ensure that Thailoil has a governance and risk management framework and approach that is aligned and standardized across all functions within Thailoil Group.

#### Identification

Risk identification includes the approach used to identify the scope and methodology of the cyber risk assessment, the gap analysis used to correct system inspection and conduct penetration test with experts, and management of information technology assets. IT asset management is comprehensive of adding, reducing, moving, and setting up hardware, software, data, and relevant systems to ensure

that Thailoil is aware of and can identify the IT assets that may pose risks, and that we can adequately and promptly manage such risks to control and reduce risk levels.

#### Protection

Thailoil has developed cyber-attack response procedures that are in line with the NIST Cybersecurity Framework, and has received the ISO 27001 certification for all operational sites with cyber threats. Our procedures act as control and protection mechanisms against risks in our IT infrastructure. This includes our network systems, hardware, software, data, and operating system, such as system settings, system access and control, data security management, system security development, and management of patches – sets of commands used to correct or fix bugs in computer programs, update the program data, or increase the program capabilities or efficiency. All these measures serve to ensure that Thailoil will have the necessary processes, tools, and controls or other measures to reduce cybersecurity impacts and maintain them at levels that are fitting with the variety of our operating tasks.

#### Detection

Thailoil has set up a Cybersecurity Center to monitor abnormal cyber behavior. The Center has been working closely with PTT Group's PTT Digital Center to find, test, and manage information technology-related gaps, in order to detect, analyze, monitor, and report abnormal cyber incidents to the responsible functions or persons, so that they might take immediate action to resolve the issue.

#### Response and Recovery





Thailoil has established a Disaster Recovery Plan, and conducts drills of this plan 1 – 2 times every year. We have a disaster recovery site that has been certified against standards, a management approach, and cyber incident response measures, which includes developing and conducting drills of the emergency plan, investigating and analyzing the root cause, and reporting findings to the Board of Thailoil and management executives. These measures allow Thailoil to respond and manage risks in time. At the same time, we also have damage recovery measures and measures that protect against significant impacts on our operations and services.

### Third Party Risk Management

Thaioil has a management approach for third parties that covers processes such as contract drafting, evaluating qualifications, monitoring and assessing performance, and reviewing performance, to ensure that external service providers are capable of performing tasks for Thaioil while meeting established targets and conditions without creating or contributing to cyber risks that might lead to impacts on our operations and services.

### Actions taken to ensure compliance with the Personal Data Protection Act, B.E. 2562 (2019)

Thaioil has improved organizational working processes and systems related to digital technologies in order to ensure compliance with the Personal Data Protection Act, which will come into effect on 1 June 2021 and onwards. We are committed to continuously improving upon the management systems and controls governing the use of personal data in our organization to ensure efficiency and secure the confidence of the stakeholders whose data we own. Details are outlined below.

Topic	To be completed before the Act comes into effect	To be completed to achieve sustainability in our operations
 <b>Governance and Improvement of Working Process</b>	<ul style="list-style-type: none"><li>• Revise different policies related to digital technology, such as the Digital Technology and Communication Policy, the Social Media Use Policy, and the Personal Data Use Policy.</li><li>• Prepare employees and test their knowledge of working processes.</li></ul>	<ul style="list-style-type: none"><li>• Build knowledge related to personal data use and create privacy-consciousness.</li></ul>
 <b>Personal Data Management System</b>	<ul style="list-style-type: none"><li>• Develop a database to specifically host personal data, and develop a system to notify use of this database, request consent, revoke access, and send other requests to the data owner.</li></ul>	<ul style="list-style-type: none"><li>• Consistently organize initiatives to assess risks, develop improvement plans, and reduce risk levels.</li></ul>
 <b>Personal Data Loss Prevention System</b>	<ul style="list-style-type: none"><li>• Develop a system to protect data, with password controls for data use external hard drives.</li></ul>	<ul style="list-style-type: none"><li>• Develop password controls for personal data, and protection from revealing personal data.</li><li>• Establish a data hierarchy to protect personal data or prevent leak of confidential information.</li></ul>
 <b>Data Use Inspection and Monitoring Systems</b>	<ul style="list-style-type: none"><li>• Keep records of access and use of personal data.</li><li>• Conduct penetration testing for programs that use personal data.</li></ul>	<ul style="list-style-type: none"><li>• Apply advanced technologies to strengthen protection systems and counter external cyber-attacks.</li></ul>



## Operating during the COVID-19 pandemic

### Work from Home: WFH

To safeguard employees against the health risks and impacts prevalent during the COVID-19 pandemic, Thailoil has established work from home measures for over 60% of all employees. Thailoil established a digital infrastructure to support employees in carrying out the Company's business operations while not compromising their safety. This includes working collaboratively through the cloud platforms, using online meeting programs for big and small meetings, and providing access to important work systems for employees, such as SAP and Ariba, through the use of the organization's VPN to ensure safety of privacy during use.

### Human Capital Development

Thailoil gives importance to employee and organizational development, and is committed to motivating employees to continuously learn and deepen their knowledge, even during challenging times such as the COVID-19 pandemic. As transportation and training seminars have been restricted, we have developed a digital platform to promote learning for employees. Through this platform, employees can access information relating to best practices and online courses, as well as arranging training simulators for employee in the production function to ensure their readiness for actual operations.



## Performance 2020



### Financial Capital

Number of cyber-attacks that created impacts on the business operations **0** case



### Financial Capital

All IT infrastructure with cyber threats have been certified with the ISO 27001, including:

1. The Data Center, SAP and LIMS services – under the control and management of the Digital Function.
2. The Advanced Process Control Network – under the control and management of the Technology Process Control Function, which supports the organization of various activities and working processes within Thailoil Group.
3. Instrument Network – under the control and management of the Instrument Engineering Function.
4. The Telecommunications System and ELICS – under the control and management of the Electrical Engineering Function.

**100%**

# INNOVATION



## CHALLENGES, RISKS, AND IMPACTS

In 2020, the COVID-19 pandemic created dramatic and rapid changes around us, including consumer behavior, wherein social distancing requirements led to reduced transportation and increased use of digital communications. As a result, changes such as these transformed the nature of work. Nonetheless, Thaioil's innovation activities have continued as planned, albeit with adjustments to better fit the context of our time, which the emergence of crises also come with the emergence of new opportunities.

## COMMITMENT

Thaoil has continued to prioritize innovation in the organization. To that end, Thaioil Group employees are encouraged to think creatively and take actions to create innovation for benefit of the Company, customers, as well as other stakeholders. In the past year, we organized a contest for employees across Thaioil Group to submit distinguished innovation projects. In total, the contest gathered 96 project submissions from employees. Together, these projects were valued at 1,025 million THB.

For 2021, Thaioil will continue to build upon innovation initiatives in the organization. Furthermore, the Research and Development team, alongside the Innovation team, have already made plans with employees in other functions to study the feasibility of developing new products, and especially with the sales function to gather additional insights on customer needs, and develop Thaioil products and services to meet the needs of customer even more.

Additionally, the feasibility study for establishing a corporate venture building team has been completed, with the findings suggest that the venture building process for establishing a new business venture may not be the best match for the organization's needs. However, in 2021, we may consider applying some parts of the process – as appropriate – in order to test them out and gather more feedback and data on outcomes.

### Targets 2021



Number of innovation projects submitted by employees for the 2021-2022 innovation contest to increase by

**20%**

compared to 2019-2020



**3**

New high value products to be developed.

## MANAGEMENT APPROACH



### Innovative Culture

Following the 2019 Thailoil Innovation Awards contest, which gathered various project entries from employees, Thailoil's innovation function has been focusing on going through those submissions to finalize the contest results in 2020, and taking further developments for some of the submitted projects so that they can be practically applied to Thailoil's operations and generate benefits for the Company. A committee was selected to act as the judging panel for the contest for distinguished innovation projects. However, due to the COVID-19 pandemic, we had to adapt our approach and became the first time we held a full online event. The owners of the projects submitted for the contest and passed the first round of selection presented their work to the committee remotely. The event received a lot of

interest, with a large audience tuned in to watch the team's presentations.

Additionally, the CEO and President himself handed awards to all the distinguished innovators to boost the spirit of employees who came together to create outstanding contributions in innovation. The innovation function will continue to work alongside employees who have submitted their work for the contest and presented interesting projects to move the projects forward to create the highest benefit for the Company.

The aforementioned activities are conducted in alignment with the 3E+E (Educate, Execute, Exhibit + Evaluate) principles. The detail are as follows:



### Educate



Thailoil shared noteworthy information on technology and innovation through Company communication channels, such as the monthly "Akanee" magazine, and invited speakers with recognized experience and work. For the Learning and Innovation Day on 5 November 2020, we invited Mr. Ken Nakarin Wanakijpaibul to share his knowledge and thoughts on the topic of "Listening and Question Technique in Digital Era" to our employees.



An innovative culture can only have sustainable outcomes if the development is continuous and never ceased to explore for new innovations. To promote this, Thailoil organized initiatives to provoke an awareness of innovation and increase employee ability to rapidly adapt to a fast-changing world resulting from the COVID-19 pandemic by arranging the employees who submitted their projects in the 2019-2020 Thailoil Innovation Awards contest to present their work through a virtual pitching for the first time. The event received widespread positive responses, with 345 attendees tuned in for the presentations.



### Execute

It's great to have good ideas, but no benefit will be incurred unless the ideas are executed to yield tangible outcomes. Thus, Thailoil values the importance of acting upon employees' ideas to transform them into prototypes, and pursuing continuous improvement to create innovation outputs that are beneficial to the organization. An example of the research project that has been successfully completed and applied to generate outcomes for the organization in 2020 is the research to select suitable catalyst for the kerosene hydrotreating unit in the hydrotreating unit process of LABIX Company Limited (or the LABIX Union unit). The application of this research project to the production process allowed the Company to reduce production costs by 24.5 million THB per year.





## Exhibit



Outstanding employee project submissions for each award category that received the highest awards in the 2019 Thail Innovation Awards were exhibited during the Learning and Innovation Day event on 5 November 2020 at Thail Refinery.



Additionally, in 2020, we showcased innovative products in various national and international exhibitions for publicity and commercial benefits, such as:

REFINING & PETROCHEMICALS WORLD  
on 16-17 January 2020 at Amari Pattaya Hotel



VIPTTEL TECH SEMINAR VISIONEERING 20:20  
on 24 January 2020 at Holiday Inn Pattaya



THAILAND INDUSTRIAL FAIR  
on 12 – 15 February 2020 at BITEC Bangna



Seminar on Production Processes with Technology and Innovation 4.0 organized by the Department of Industrial Works on 17 February 2020 at Golden City Rayong Hotel



The 10 Year Anniversary of the  
"Thail Group Community Health and Learning Center"  
on 10 August 2020  
at the Thail Group Community Health and Learning Center



## + Evaluate

Once a creative idea is emerged, Thailoil will evaluate the outcomes if the idea can be successfully applied, the value of the expected benefits, as well as the type of benefits created – for example, whether it will reduce production costs, increase revenue for the organization, or facilitate productivity in the workplace.



### Performance

The overall benefit of the

**96** projects

submitted in the Thailoil  
Innovation Awards 2019-2020  
is valued at approximately

**1,025** million THB

comprising of

**843** million THB

in benefits from reduction in production  
costs and losses

**182** million THB

in benefits from reducing safety risks.

To promote and support a culture of innovation in the organization, Thailoil held a Learning and Innovation Day on 5 November 2020. As part of the event, all outstanding innovators were recognized in the 2020 Thailoil Innovation Awards ceremony for the following categories : Idea for Innovation, Prototype, Innovation, Innovator, and the Most Contribution.



### In 2020, Thailoil submitted a total of 2 patent applications.



Patent for the design of the  
“control valve tool”

Thailoil submitted an industrial design patent application in Thailand for the “control valve tool” in order to guarantee the rights to the shape and design of the tool. The tool assists in the opening and closing of large gate valves with planetary gearboxes, and was designed to replace the use of the handwheel with a pneumatic air wrench. The use of the control valve tool can reduce the number of workers needed to open and close large gate valves, from ten workers to only one worker is required.



Petty Patent for the  
“Precise Loading Arm Connection Enhancement (PLACE) system”

Thailoil submitted a petty patent request in Thailand for the “Precise Loading Arm Connection Enhancement (PLACE)” system to protect the use, design, components, mechanics, structure, and process of the PLACE system. This system helps prevent mistakes in loading, specifically in the mismatch of oil type with the receiving hole in the oil trucks. The premise is that the system controls oil loading through determining the location of every oil truck, loading hole, and dispenser for each oil type. The system applies image recognition technology to photos taken from high definition cameras. In case of the nozzle installation of the dispenser does not match the assigned loading hole, the system will deny the request to load the product and immediately notify the recipient of the error. This eliminates the problems resulting by the driver’s mistake in filling the wrong type of oil during the process.



## Process Innovation

Thaioil encourages all functions to create process innovation to improve efficiency in their work processes, reduce production costs, or increase revenue for the organization. Some examples of the process innovation achievements include:



### Lorry Queue Algorithm Improvement

Between 2017 and 2018, the number of trucks visiting the lorry to load oil reached high levels and resulted in longer wait times for our customers in queue. At certain times, customers had to wait for more than one day for their queue. To solve this problem, Thaioil studied ways to improve the queue algorithm system to develop a new way of organizing the loading oil queue at the lorry. We used a stable matching algorithm to develop a new system that is highly efficient and led to shorter wait times for our customers. This completely solved the problem of waiting for more than one day, increased our customers' satisfaction in our service, and enabled Thaioil to increase the sales volume of oil sold by trucks by 471 million liters per year compared to before the system improvements.



### Development of Ultrasonic Scale Preventer

The efficiency of the heat exchanger used in crude oil refining decreases with time. To return the efficiency to original levels, the heat exchanger must be cleaned at a certain point. In 2014, Thaioil adopted the ultrasonic scale preventer (USP) technology to reduce the fouling rate in the heat exchanger and increase its lifetime. However, the application of USP technology did not yield expected results. Thus, since 2019, the Thaioil's research and development team has been studying the application of ultrasonic waves in extending the lifetime of the heat exchanger. The findings of this research have been successfully applied, and the team was able to extend the lifetime of the heat exchanger and achieve good outcomes in 2020. Furthermore, this has contributed to cost savings in the production of ultrasonic scale preventer equipment.



### Evaluation of the Kerosene Hydrotreating Catalyst (LABIX Union)

We have tested the effectiveness of various leading manufacturers' catalysts for kerosene hydrotreating in order to select the most suitable one for LABIX Union. To conduct this testing, we used modelling equipment for testing that Thaioil's research team developed alongside the Petroleum and Petrochemical College of Chulalongkorn University. The research succeeded according to plan. Furthermore, the application of this catalyst in the production process allowed us to increase the precursor of the linear alkyl benzene production unit of molex and reduce loss of sorbents. The benefits are valued at 24.5 million THB per year.

# CORPORATE SOCIAL RESPONSIBILITY



## CHALLENGES, RISKS, AND IMPACTS

In 2020, the outbreak of the COVID-19 pandemic posed challenges to Thailoil Group in maintaining organizational stability and operating with adaptability and resilience. These challenges extended to our work in corporate social responsibility. Thailoil has then reviewed important environmental, social, and governance (ESG) targets to reduce risks resulting from the changes we have observed over the past year – both before and during the outbreak of the COVID-19 pandemic – to maintain management within our organization and of impacts on the industry during lockdown measures. The Clean Fuel Project (CFP) in particular required due care for Thai and foreign employees and contractors. The Company has established strict measures to restrict and test individuals and workers entering and leaving our operations. We have taken action to manage financial liquidity, and prioritized caring for communities surrounding our operations and for hospitals in the Chonburi Province area through promptly providing support for the purchase of tools and equipment needed to prevent COVID-19 infection.

## COMMITMENT

“Thailoil aspires to operate a petroleum and petrochemical refinery business under a framework of management excellence and in compliance with principles of good governance, while also upholding responsibility towards stakeholders, the environment, communities, and society, in order to be an organization that grows sustainably.”

In 2020, our community engagement score was 94.89%. Thailoil has established 2021 plans to support knowledge development for various groups, including projects to develop the skills and capacity in academics and other areas of youth living around Thailoil Group operations; projects to support local religion, culture, and traditions; projects to advance the local economy (course training) and build local community enterprises; and projects to promote and apply volunteer knowledge and experiences to further develop community health efforts. The Company has also established specific targets to assess our strategic social investments for the “Sustainable Energy for Health Care” strategy. We will use the social return on investment (SROI) by setting a 2 : 1 SROI target – in other words, a 2 baht return to society for every 1 baht of investment – for every designated project. Hospitals in Chonburi Province will serve as the pilot project to be tested and evaluated to inform long term planning.



### Target 2021



Community engagement score at

**85%**

or above

## MANAGEMENT APPROACH

The Company has developed and established a policy and strategy for our work in corporate social responsibility. Results and performance are reported to the Corporate Governance Committee on a quarterly basis.



### Corporate Social and Environmental Responsibility Policy

- Strive to develop business's sustainable growth coupled with environmental stewardship and care with due regards to the impact on the community and society as a whole.
- Bring upon knowledge, experience, and expertise in engineering and energy business to support social development with focus on the use of natural resources for utmost benefits under the Sufficiency Economy Philosophy for self-reliance sustainably.
- Implement corporate social responsibility projects by focusing on community's participation in collaboration with local organizations in the public sectors.
- Promote Thailoil Group employees' participation while instill corporate social responsibility values and corporate culture.



### Corporate Social Responsibility Strategy

- Conduct social activities by focusing on projects that affect Thailoil Group's business.
- Cover the four areas: education, energy and natural resources, conservation of the environment, and quality of life. The strategy is to achieve self-reliance and sustainability.
- Manage networking and collaboration with PTT institutions, and agencies with expertise and are highly respected by society
- Promote the participation of stakeholders, such as government agencies, customers, suppliers, and employees in the CSR.

## Community Needs Analysis and Engagement

Thailoil Group conducts community relation activities with communities surrounding the refinery according to the "3-synchronization model" and the "5 Together" conceptual framework.



### The 5 Together conceptual framework



\*Public agencies cover Laem Chabang District, Laem Chabang Hospital, and academic institutions.

This ensures communities are engaged in their own development, and are self-sufficient and able to become strong communities. Activities are categorized into four themes, comprising of social, religion, traditions, and culture; health; education; and environment. Thailoil adheres to the principle of holistic development, and has the following mechanisms to acknowledge community's needs.





### 3 Synchronization Model Meeting

Aside from ensuring that communities can access accurate and reliable information relating to the Company, the meeting also offers a 'community speaking' session. This session gives community representatives the opportunity to raise issues or feedback regarding Thaioil's operations, enabling the Company to immediately look into and resolve the issue, and ultimately develop long-term solutions and preventive measures.



### Small Group Public Hearing

Through the platforms with smaller mobile units or public discussions, communities eager to request for information or clarification on any project can do so through the head of the community committee. The head will then inform on-site officers so that they might take action, and update results to the community.



### Community Engagement Survey

Conduct by an independent, third-party agency, and covers topics related to community satisfaction with the community relations activities that the Company organizes alongside communities. Survey results are then analyzed and utilized to make further plans for the following years.



### Onsite Visits to Communities Surrounding Construction Sites

Communicate the progress of the expansion project to communities, explain the mitigation measures the Company has established to prevent impacts on communities, and gather feedback and opinions from communities living around the construction site.



### Grievance Mechanisms for Surrounding Communities

Thaioil Group has a central office that provides 24-hour access to communities to report incidents or grievances. In the event of an incident, the office will coordinate with internal functions to reduce the severity of impact on communities, and resolve the root cause of the impact. The office uses the VOS (Voice of Stakeholders) Management system as the primary tool in collaborating and resolving submitted grievances.



## Performance 2020



### Input

Total contributions to society

**118** million THB

Management overhead costs at approximately

**33** million THB

Employee volunteering time valued at approximately

**12.4** million THB

**1,328**

volunteers together contributed  
16,470 volunteer hours



### Output

Total CSR projects/activities

**35** projects/activities

Beneficiaries

**94** organizations

and

**30,000** persons

The Community Health  
and Learning Center's Visitors

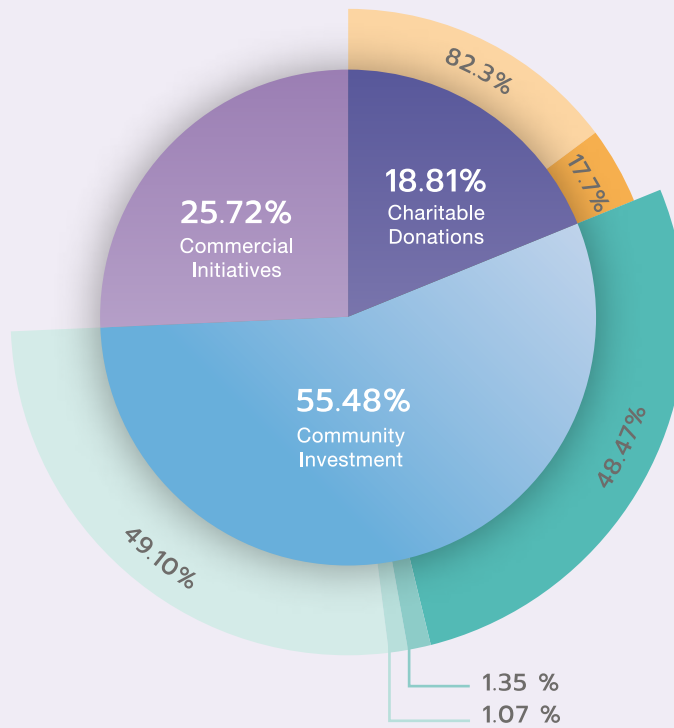
**53,642** visits



## Performance 2020

### Social Investment Types and Proportion

(% of cost incurred)



### Donation Types

- Cash contributions of approximately 24.6 million THB
- In-kind giving of approximately 5.3 million THB

### Strategic Community Investment Framework

- Promotion of Education
- Environmental Conservation
- Energy & Natural Resource Development
- Community Well-being



## Outcome



### Social and Relationship Capital

The overall SROI was on target of 2 : 1. This SROI was estimated from the 3 solar power system installation projects under the "Sustainable Energy for Health Care" strategy, as follows:

The 53.46-KW Koh Sichang Hospital Rooftop Solar Power System Project at Koh Sichang District, Chonburi Province (in honor of the King). The SROI (estimated for 25 years) was

**2.45**

In 2020, community engagement score at

**94.89%**

The 40.5-KW Thanyarak Mae Hong Son Hospital Rooftop Solar Power System Project. The SROI (estimated for 25 years) was

**2.98**






Achieved target identified at

**85%**  
or above










The 80-KW Laem Chabang Hospital Rooftop Solar Power System Project at Sriracha District, Chonburi Province. The SROI (estimated for 25 years) was

**2.95**

## Value Creation through Community and Social Development Projects

Priority	Education (SDG target 4.3) 	Environmental Conservation (SDG target 13.1) (SDG target 13.3) 	Energy and Natural Resources (SDG target 7.2) 	Quality of Life (SDG target 3.8) (SDG target 8.3)  
Approach	Support projects in partnership with academic institutions, and grant scholarships.	Manage operational processes and develop initiatives to reduce greenhouse gas emissions.	<ul style="list-style-type: none"> <li>Develop alternative energy options.</li> <li>Promote efficient energy consumption.</li> </ul>	<ul style="list-style-type: none"> <li>Support access to employment opportunities and promote public health for local communities.</li> </ul>
2022 Target	<ul style="list-style-type: none"> <li>Support and develop skills for teachers and youths in areas ranging from general education, English language, science, sports, arts, and other subject areas to generate benefits for more than 5,000 beneficiaries.</li> </ul>	<ul style="list-style-type: none"> <li>Plant more than 200,000 trees.</li> <li>Support greenhouse gas reduction, equivalent of 2,000 tons of carbon dioxide</li> </ul>	<ul style="list-style-type: none"> <li>Install solar power systems in more than 50 hospitals and medical centers.</li> <li>Generate more than 3,000 megawatts of energy from solar sources.</li> <li>Reduce at least 5 million THB of electricity costs per month (applicable to all hospitals with installed power systems).</li> </ul>	<ul style="list-style-type: none"> <li>Organize over 100 additional job training programs.</li> <li>Over 500 local beneficiaries participate in job training programs.</li> <li>Create work opportunities for more than 200 community members who have disabilities and/or who are underprivileged.</li> </ul>
Social Value Created in 2020	<ul style="list-style-type: none"> <li>Employed 4 teaching assistants for each of the 14 schools participated in the Restart Thailand Project.</li> </ul> <p><b>(Teach for Thailand)</b></p> <ul style="list-style-type: none"> <li>Developed 2 changemaker science and English teachers.</li> </ul> <p><b>(Thaioil Youth Athletic Development Project)</b></p> <ul style="list-style-type: none"> <li>A total of 200 youths participated in 10 Youth Football Coaching Clinic sessions</li> <li>A total of 100 youths participated in 3 Youth Futsal Coaching Clinic sessions</li> <li>A total of 500 youths participated in the "Rescue Lives...Fight the Drowning Crisis" Project. The project taught youth ages 7-15 years how to swim, survive in the water, and rescue drowning victims.</li> <li>A total of 300 youth participated in The Thaioil Swimming Championship</li> </ul>	<ul style="list-style-type: none"> <li>Planted 500 trees across a 5-rai area.</li> <li>Planted 500 mangroves in Pak Nam Prasae in Rayong Province.</li> <li>Planted 200 mangroves with the Lumpoo Bangkrasob Conservation Group at Khung Bang Kachao.</li> <li>Sowed seeds and planted 200 seedlings on Phubai Hill at Thaioil.</li> <li>Planted 500 mangroves at the Bangpu Nature Education Center of the Royal Thai Army.</li> <li>Sowed 500 seeds to spur forest growth.</li> </ul> <p>These initiatives resulted in greenhouse gas emissions, equivalent of 24 tons of carbon dioxide.</p>	<p><b>(Sustainable for Health Care)</b></p> <ul style="list-style-type: none"> <li>Installed an 80-KW rooftop solar power system at Laem Chabang Hospital in Sriracha District, Chonburi Province, in effect helping the Hospital reduce electricity costs by approximately 450,000 THB per month.</li> </ul>	<p><b>(Additional Jobs for Increased Incomes Project: Year 2)</b></p> <p>Organized 4 job training courses, attended by a total of 159 community members;</p> <ul style="list-style-type: none"> <li>A training course on brewing 10 types of herbal beverages, attended by 40 community members.</li> <li>A training course on crafting decoupage soap, attended by 39 community members.</li> <li>A training course on making small curry puff with fish filling, attended by 40 community members.</li> <li>A training course on making Jelly Cake and Fruit Salad, attended by 40 community members.</li> </ul> <p>The community received support from Thaioil for the <b>Dental Health Project</b>, with support of 2,454,462 Million THB annually for free dental services. A total of 3,809 community members benefited from this Project.</p> <p>A total of 210 athletes and trainers competed in the <b>Laem Chabang Youth Training for Jump Rope Championship Project</b>.</p>
Business Value Created in 2020	<ul style="list-style-type: none"> <li>Generated a total of 40 million THB of corporate public relation (PR value) from social development projects in 2020.</li> <li>Created corporate volunteering culture in contributing back to society. In 2020, a total of 1,328 Thaioil Group employees volunteered 35 activities, which was equivalent to a total of 16,470 volunteer hours.</li> </ul>			

## Priority CSR Projects in 2020, Categorized by CSR Framework

Project Type	Priority	Objectives	Progress in 2020
<b>Community Management Projects for Communities Surrounding the Refinery</b>			
The Forest Growth and Green Space Expansion Project, in Honor of the His Majesty the King's Birthday	Environmental Conservation 	To increase green spaces, grow permanent forests, and advance collaborations between different agencies to facilitate development of projects that promote healthy land and marine environments for communities.	The Company, together with the Community Network Committee representing the 10 communities surrounding Thaioil Group operations, the Laem Chabang District Administrator, and the Clean Fuel Project subcontracting companies, joined hands to plant 500 trees across an area spanning 5 rai. The average tree survival rate was 80%.
Dental Health Promotion Project for Schools Around Thaioil Group	Quality of Life 	To promote students' oral health.	The Company provided dental services to primary school students from Years 1 to 6 in eight schools located around the refinery. (See below for more details.)
Laem Chabang Youth Training for Jump Rope Championship Project	Quality of Life 	To get young people involved in physical exercise, while helping them gain strong physical health, increase bone density and muscle strength, and reduce the risks of heart disease in the future.	Participants joined the virtual National Jump Rope Royal Cups Championship, named the Jump for Heart Virtual School Game 2020, and competed for the medals and awards offered by the Thailand's Heart Foundation under the Royal Patronage of H.M. the King. (See below for more details.)
Community Economic Support Project	Quality of Life 	To strengthen community's capacity through job training for local residents living in the Sriracha area. The project is operated through the Thaioil Group Community Health and Learning Center.	The 2nd year of community economic support project continued to increase income for community, which helped the 10 communities surrounding the refinery to develop small-sized community enterprises.
"Thaioil Youth Athletic Development" Project	Quality of Life 	To spark an interest in sports amongst youth, and develop the skills, knowledge, and capabilities they need to become professional athletes in the future.	The Company organized a joint-activity project with the Laem Chabang District and three reputable sports institutions. (See below for more details.)
The 10-Year Anniversary Celebration of the Health and Learning Center for Our Communities	Quality of Life 	Thaioil organized the "Health and Learning Center for Our Communities" event on 10 August 2020 to celebrate the 10-year anniversary of the Thaioil Group Community Health and Learning Center.	The Company organized a variety of activities with communities. (See below for more details.)
<b>CSR Management Projects</b>			
CONNEXT ED Leadership Project for Sustainable Education Development in collaboration with PTT Group	Education  	To develop teachers and educators through the STEM (Science, Technology, Engineering, and Mathematics) Education system, and to strengthen skills in teaching English.	The Company sponsored the employment of 4 teaching assistants for each participating school, with 1-year contracts that require the employed teaching assistants to support teachers in developing learning systems. The Company also helped stimulate employment within the country, as outlined in the Restart Thailand Project.
Teach for Thailand Project	Education  	To develop changemaker teachers that will drive new approaches to learning and teaching with digital systems during the COVID-19 pandemic.	The Company provided 1 million THB to support the costs of developing 2 changemaker teachers.

Project Type	Priority	Objectives	Progress in 2020
Sustainable Energy for Health Care Project (Strategic CSR)	Energy and Natural Resources  	To enhance energy security for medical services, reduce hospital electricity expenses, and promote development of the Low Carbon Community, Smart City Project in remote areas.	<b>The Company completed and delivered 2 projects, including:</b> <ul style="list-style-type: none"> <li>• The Thanyarak Hospital Rooftop Solar Power System Project, and</li> <li>• The Koh Sichang Rooftop Solar Power System Project.</li> </ul> <b>(The following project is still in progress for 2021)</b> Thailoil has one project in progress to install an 80-KW rooftop solar power system for Laem Chabang Hospital. (See below for more details.)
The “Thailoil Refines Happiness Market” Project to Refine Jobs and Refine Smiles for Communities in Sriracha District, Chonburi Province	Quality of Life 	To utilize the space in the connecting pathway of the Thailoil 60-Year Building for a community market that will allow communities affected by the COVID-19 pandemic to sell products. The space will also be used to promote local products made by communities in Chonburi and across Thailand to support sustainable development.	The Company organized the first pilot during 8-9 December 2020 at the Thailoil 60-Year Building, with 18 vendors participated in the project. (See below for more details.)
“OUR Khung Bang Kachao” Green Space Development and Bang Kachao Conservation Project	Environmental Conservation and Quality of Life 	To develop a water database and to establish community water management mechanisms. The plan comprises of three components, including human capital development through science and technology, detailed mapping of Khung Bang Kachao, and installation of automatic water telemeters.	The Company participated in working committees, namely, the “Water Management and Bank Erosion Committee” and the “Integrated Management Committee (Forest and Water)”, and provided 3.2 million THB to sponsor the costs of installing automatic water telemeters to measure water status and quality in 8 locations.
<b>Projects to Cultivate an Employee Voluntary Culture</b>			
“You Initiate...We Fulfill” 60-Year Thailoil Project	Quality of Life 	To inspire volunteerism in employees and subcontractors, and encourage them to carry out volunteer initiatives on their own.	Employees recorded good deeds in the Thailoil Hub Application. In honor of the Company’s 60-year anniversary, Thailoil will provide financial donations to five foundations. (See more details below.)
Thailoil Group Zero Waste Project	Environmental Conservation 	To cultivate environmental consciousness and energy-saving habits in employees, and create positive attitudes that support collaboration in the organization.	The Company organized a campaign to get employees to sort their wastes before disposal. We set up different colored trash bins and a food waste compost machine. (See more details below.)
<b>Partnership Projects to Promote Corporate Reputation (CSR Networking &amp; Branding)</b>			
Together We Fight COVID-19, With PTT Group We Overcome the Crisis Project	Quality of Life 	To help those affected by the COVID-19 pandemic.	The Company was responsible for procuring face shields for PTT Group and organizing the volunteer project to produce 10,500 face shields and distribute to public health agencies and hospitals across Thailand, and providing other public health support and activities. (See more details below.)
Helped develop the “PTT Group Manual for Providing Aid to Affected Individuals”	Quality of Life 	To function as a manual to guide PTT Group in efficiently aiding affected individuals.	The Company helped develop innovation to provide aid during public health disasters.



## Projects for Communities Surrounding the Refinery 2020



### Recognitions and Awards

Thaioil received the 2020 Prime Minister's Industry Award for Outstanding Achievement in Corporate Social Responsibility in recognition of our community and social development projects. The award also recognizes Thaioil's commitment to conduct business while advancing the quality of life for communities and society through the use of both proactive and passive strategies that care for community health. Since the establishment of the Thaioil Group Community Health and Learning Center ten years ago, the Dental Health Project has provided dental health check-ups for over 50,000 youth around the refinery. Meanwhile, the Community Pathology Project has surveyed and looked after the health of over 23,000 community members across all age groups.

### Dental Health Promotion Project with Schools around Thaioil Group



#### Objectives

To promote students' oral health.



#### Background

Cavities and other oral conditions affect people of all ages, but they are especially prevalent in children aged 6-12 years old. Children in this age range face various physical and social changes. Furthermore, this period is when their full set of 28 adult teeth will grow and mature. Since the COVID-19 pandemic in 2020 has delayed school opening for the 2020 academic year, we had to delay our timeline in providing dental – moving the starting date from May to August – and increase control measures for those receiving dental services at the Health Center.

#### Activity

Thaioil has been providing dental health care services, free of charge, to primary school students in Years 1 to 6 in 8 schools located around the refinery since 2010.

#### Progress in 2020 :

Thaioil offered services including dental health check-ups, cavity filling, tooth extraction, tooth gap filling, fluoride treatment, plaque scraping, and other services related to cavity prevention. As shown in the table below, we found that students' oral health have improved.

#### Key Statistics for the "Dental Health Project"

Detail	2017	2018	2019	2020
Number of beneficiaries	4,831	6,154	5,894	3,809
Average expense/person	530	513	552	535
Total expense	2,563,178	3,153,510	3,252,404	2,454,462
DMFT Rate	1.57	0.92	1.88	2.25
Percentage of non-gingivitis	11.91	17.11	15.92	19.76

**Note :** The DMFT and percentage of non-gingivitis statistics only cover Year 6 students. In 2020, we completed 7 out of 8 schools due to the delay in dental service resulting from the COVID-19 pandemic.

## Laem Chabang Youth Training for Jump Rope Championship Project



### Objectives

To get young people involved in physical exercise, while helping them gain strong physical health, increase bone density and muscle strength, and reduce the risks of heart disease in the future; to tackle the issue of tooth decay resulting from consuming sugary foods without brushing teeth after consumption; to lessen child obesity resulting from consumption of sugary foods without exercise through motivating young people to exercise through rope jumping, which is an activity that is low cost and requires minimal space. And, it can be played individually or in teams, and is a productive way to spend their leisure time.



### Background

This Project was started in 2012 by the Thailand Heart Foundation under the Royal Patronage of H.M. the King. Since then, it has created new athletes every year, and continues to develop and build new skills for the athletes and trainers in each school.

### Activity

Thaioil had a joint-meeting with directors and health education teachers from eight schools in Laem Chabang District – namely, Wat Mai Nern Payom School, Wat Manorom School, Wat Laem Chabang School, Wat Chak Yai Jeen School, Laem Chabang School 1, Laem Chabang School 2, Wat Baan Na School, and Boon Jittawittaya School.

### Progress in 2020 :

In 2020, the Thailand National Jump Rope Royal Cups Championship was changed to a virtual competition, with score results shared through video clips. The championship, titled the Jump for Heart Virtual School Game 2020, challenged participants to compete for medals and awards from the Thailand Heart Foundation under the Royal Patronage of H.M. the King.

Project	Date	Project Participants		Total
		Athletes	Trainers	
1 Youth Training for Jump Rope Championship Project	12,19, 26 Sept. 2020	115	10	125
2 Jump for Heart Virtual School Game 2020	30 Sept. 2020	63	10	73
3 Joined the Thailand national athletic team selection for the IJRU 2021 Virtual World Championships	31 Jan. 2021	9	3	12

Remark : Athletes can participate in all competitions.



### Medal of Thaioil Jump Rope Team from the Jump for Heart Virtual School Game 2020

#### Single Rope Speed Spint 1x30 seconds (SRSS)

Gold medal 4 Silver medal 8 Bronze medal 18

Participants  
202 athletes



Win the medal  
30 athletes

#### Single Rope Double Unders 1x30 seconds (SRDU)

Gold medal 2 Silver medal 11 Bronze medal 15

Participants  
120 athletes



Win the medal  
28 athletes

#### Double Dutch Speed Spint 1x60 seconds (DDSS)

Gold medal 1 Silver medal 3 Bronze medal 1

Participants  
37 teams



Win the medal  
5 teams

#### No.8 Event - Novice

Gold medal 2 Bronze medal 1

Participants  
28 teams



Win the medal  
3 teams

## Thaioil Youth Athletic Development Project



### Objectives

To advance quality of life through investing in youth around the refinery, specifically in teaching them water sports/self-rescue techniques in the water, football, and futsal, as well as to spark an interest in professional sports careers amongst youth, and develop their skills, knowledge, and capabilities. Furthermore, this promotes the use of their leisure time productively while staying away from drugs.



### Background

Thaioil values, promotes, and supports the health and quality of life of communities. Thus, we have started investing in youth through using sports to advance their quality of life and create value for community members.

### Activity

Thaioil organized the project opening event with the Laem Chabang District and three reputable sports institutions – namely, the Thailand Swimming Association, the PTT Bluewave Chonburi Futsal Club, and the PTT Football Academy. We collaborated with these partners to share costs and develop project plans.

### Progress in 2020 :

1. The Youth Football Coaching Clinic held 10 coaching sessions for youth, with approximately 200 youths participating in the Project.
2. The Youth Futsal Coaching Clinic held 3 coaching sessions for youth, with approximately 100 young people participating in the Project.
3. The “Rescue Lives...Fight the Drowning Crisis” Project taught youth ages 7-15 years how to swim, survive in the water, and rescue drowning victims. There were 500 youths participated in the Project..
4. The Thaioil Swimming Championship offered swimming athletes in Chonburi Province and surrounding provinces the opportunity to participate in a competition of national standards. Approximately 300 youths joined the Championship.

- Corporate public relation value (PR Value): 10.7 Million THB
- Total volunteer hours: 3,024 volunteer hours



Thaioil Youth Athletic Development Project Press Release  
Time 04:19 minutes, MCOT Evening News, MCOT HD30 Channel  
17 Nov. 2020

## The 10-Year Anniversary Celebration of the Health and Learning Center for Our Communities



### Objectives

To organize the “Health and Learning Center for Our Communities” event to celebrate the 10-year anniversary of the Thaioil Group Community Health and Learning Center.

### Background

The Thaioil Group Community Health and Learning Center was founded in 2010 on a 6-rai plot of land. The opening of the Center marked an important step in the Company’s community development journey, especially with regards to our priority in caring for the health of our communities in the long term. The Center also functions as a learning center.

### Progress in 2020

On 10 August 2020, the Company organized a variety of activities at the Center. The event was attended by partners in our network of community work, including: Thaioil Group management executives; representatives of Laem Chabang District; Laem Chabang Hospital; the Faculty of Nursing and Faculty of Pharmacy of Burapha University; Kasetsart University Sriracha Campus; the Community Committee; village health volunteers; school directors, teachers and students and over 1,000 interested citizens. Activities organized included:



1. Booths with merit making and alms giving activities, including offering rice and dried foods to monks, led by different partners involved in community work;
2. The community market, with products from 10 communities;
3. Energy trivia game for primary school students;
4. Sports activities between the Community Committee and volunteer groups;
5. 2020 Mother's Day activities; and
6. Traditional Ramwong Laem Chabang folk dance activity to preserve and continue local folk dance culture.



Building Strong Communities through the 10-Year "Thaioil" Health Center  
Time 02:51 minutes, Kub Kao Tuk Praden News Show, MCOT HD30 Channel, 13 Aug. 2020



Onwards to the 11<sup>th</sup> Year of the Health Center  
Time 04:36 minutes, Kub Kao Tuk Praden News Show, MCOT HD30 Channel, 14 Aug. 2020



Thaioil and Communities Will Grow Together  
Time 06:33 minutes, Tok Mans Entertainment Show, MCOT HD30 Channel, 18 Oct. 2020

## CSR Management Projects in 2020

### Sustainable Energy for Health Care Project (Strategic CSR)

In 2020, Thaioil completed and delivered 2 solar power system installation projects.



**The 53.46-KW Koh Sichang Hospital Rooftop Solar Power System Project at Koh Sichang District, Chonburi Province (in honor of the King) - Thaioil & GPSC**  
Time 03:57 minutes, MCOT Evening News, MCOT HD30 Channel, 23 July 2020

- Corporate public relation value (PR Value): 3.9 Million THB
- Number of volunteer hours: 504 volunteerhours
- SROI (estimated for 25 years and before investment): 2.45 times



**The 40.5-KW Thanyarak Mae Hong Son Hospital Rooftop Solar Power System Project (The Thanyarak Hospital serves drug rehabilitation patients in Northern Thailand.) Thaioil & GPSC**  
Time 02:51 minutes, MCOT Evening News, MCOT HD30 Channel, 24 Feb. 2020

- Corporate public relation value (PR Value): 2.3 Million THB
- Number of volunteer hours: 176 volunteer hours
- SROI (estimated for 25 years and before investment) 2.98 times



**Happy Thailand EP. 7: Solar Cells for Lives and Communities**  
Time 02:00 minutes, Happy Thailand Show, NBT2HD Channel of the Government Public Relations Department 1  
7 Oct. 2020



Furthermore, Thailoil has one project in progress for 2020-2021, outlined below:

### **The 80-KW Laem Chabang Hospital Rooftop Solar Power System Project at Sriracha District, Chonburi Province**



#### **Objectives**

To enhance energy security for hospitals, promote efficiency in public medical services for the benefit of citizens, reduce greenhouse gas emissions, reduce hospital expenses, as well as support hospitals in making use of the cost savings to develop other projects to increase energy efficiency and conserve energy (Advanced Energy Efficiency), cover the maintenance costs of solar panels, and initiate other projects for the benefit of communities and society.



#### **Background**

Thailoil Public Company Limited has supported the Laem Chabang Hospital in securing sponsorship from the Thailand Energy Conservation Fund through the Sustainable Energy for Health Care Project. Thailoil has also allocated funds to help install an 80-KW rooftop solar power system for Laem Chabang Hospital at Sriracha District, Chonburi Province.

#### **Activity**

The Company used innovation in renewable energy (RE) and advanced energy efficiency (AEE) to implement this Project. The Project serves as an example of how hospitals might reduce energy consumption and electricity costs while also improving the quality of life of local community members. Upon installation of the 80-KW rooftop solar power system, the cost savings from electricity cost reduction can be used to manage operation and maintenance, as well as develop projects to increase the quality of life of patients, projects to purchase equipment for bedridden patients and patients with disabilities. The cost savings can also be used to increase energy efficiency and implement energy conservation initiatives through the “Energy Conservation and Solar System Maintenance Installed on the Thailoil Building Project”. We are currently conducting a feasibility study for these initiatives. Other potential initiatives that can be funded by the cost savings include initiatives to switch to LED light bulbs, replacing current air conditioners with high-efficiency ones, constructing solar street light posts around the hospital area to increase lighting during nighttime, and building solar water pump systems that also recycle water in the Thailoil Park.

#### **Progress in 2020**

The Company is currently in the process of installing the 80-KW rooftop solar power system. The budget is approximately 3 million THB, and we expect the Project to be completed within Q1/2021 under the 3 million THB budget with the payback period of 6 years (IRR 13.5%). Overall, the hospital is expected to receive an average annual cost savings of more over 450,000 THB.

- SROI (estimated for 25 years and before investment) : 2.95 times

### **The “Thailoil Refines Happiness Market” Project to Refine Jobs and Refine Smiles for Communities in Sriracha District, Chonburi Province**



#### **Background**

Since the outbreak of the COVID-19 pandemic in early 2020, the pandemic has created impacts to Thailand in different dimensions. The grassroots economy, especially small- and medium-sized enterprises, have faced severe disruption to their business and incomes. Thailoil therefore initiated the “Thailoil Refines Happiness Market” Project to Refine Jobs and Refine Smiles for Communities in Sriracha District, Chonburi Province. The plan is to develop the space by the Satthiwatsawirun Building (60-Year Thailoil Building) at the Refinery Office in Chonburi Province to organize initiatives to contribute to our society and take part in stimulating the economy.



## Objectives

To promote employment, mitigate economic impacts, increase sales channels for community products through diverse community networks, and generate incomes for communities. These objectives together constitute part of grassroots economic development based on the market mechanisms of the community market, and will help deliver sustainable development.



## Activity

The market is organized in the Company during the COVID-19 pandemic, and offers different community products and promotes unique products produced by communities in the Chonburi area. The market also contributes to the creation of a network of trading communities across Thailand. Products can be categorized into the following groups:

- Processed food products such as brown rice, white rice, snacks, chili sauces, and processed fruit products;
- Beverages that are non-alcoholic or extracted from illegal raw material products, such as marijuana;
- Fresh fruits and vegetables;
- Clothes and apparel, consumer products, decor items, and souvenirs; and
- Herbal products, such as herbal balm and herbal teas.

## Progress in 2020

The first "Thaioil Refines Happiness Market" Project to Refine Jobs and Refine Smiles for Communities was organized during 8-9 December 2020. There were a total of 18 participating vendors, including OTOP vendors, community enterprises, and other vendors selling products from communities in Chonburi Province and across Thailand. Overall, the Thaioil Refines Happiness Market was successful, and was positively received by Thaioil employees. And, the Company will continue to allocate this space for communities to sell products in the future.

- Corporate public relation value (PR Value): 1.1 Million THB
- Total volunteer hours: 222 volunteer hours

## Partnership Projects to Promote Corporate Reputation (CSR Networking & Branding)

### Together We Fight COVID-19, With PTT Group We Overcome the Crisis Project



## Objectives

To support Thai citizens and medical teams by providing protective equipment for health care workers to enable them to care for patients while not compromising their safety. Equipment has been speedily distributed to areas in need in order to support medical teams.



## Background

In early 2020, the outbreak of the COVID-19 pandemic created impacts on lives, economies, and societies all across the world. The Impacts were experienced by the general Thai population, and especially for those working in public health. With this in mind, Thaioil has joined hands with PTT Group to gather funds and expertise in engineering and technology, as well as in research and development, to help protect health care workers from risk of COVID-19 infection. We recognize that infection of health care workers count as great losses of critical resources needed to care for COVID-19 patients and the general public. Together with PTT Group, we have contributed over 120 million THB through the "Together We Fight COVID-19, With PTT Group We Overcome the Crisis" Project.

## Activity

Thaioil has delivered protective equipment to health care workers to enable them to safely care for patients. We have speedily distributed equipment to areas in need to support medical teams, including items such as alcohol, PPE suits, powered air-purifying respirators (PAPRs), and negative pressure beds. We have also helped develop anti-infection testing rooms, produced and distributed aerosol boxes, shield partitions, and face shields.



Thaioil provides kind packs to citizens in Laem Chabang area in Laem Chabang District, Chonburi Province  
Time 00:49 minute, MCOT Noon News, MCOT HD30 Channel, 1 June 2020



Thaioil donates protective gowns to 5 hospitals in Chonburi Province.  
Time 03:12 minutes, MCOT Evening News, MCOT HD30 Channel, 28 April 2020



### Progress in 2020

1. Thaioil took the lead in the PTT Group Task Force 6, supporting face shields.
2. Thaioil Group organized two volunteer events to produce Face Shields for Public Agencies and Hospitals in Chonburi Province and Hospitals in need Across Thailand". In total, we produced 10,500 face shields, and distributed 2,000 of them to Chonburi Provincial Public Health Office, 1,000 to Laem Chabang Hospital, 1,000 to Queen Savang Vadhana Memorial Hospital at Sriracha, 1,000 to the Bamrasnaradura Infectious Diseases Institute, 100 to PTT Pipeline Team Chonburi, 100 to Thailand Heart Foundation under the Royal Patronage of H.M. the King, 500 for OUR Khung Bang Kachao Project, 2,000 to community public health agencies located around the refinery, 700 to public agencies located around the refinery, 100 to the AGM support, and 2,000 for hospitals in need across Thailand, especially in the three southern border provinces.
3. Thaioil provided 14.5 million THB worth of public health support, including:
  - Donation of sanitizer gel to hospitals and communities surrounding the refinery, including 525 liters to Laem Chabang Hospital, 350 liters to Queen Savang Vadhana Memorial Hospital at Sriracha, and 175 liters to the 10 communities surrounding the refinery;
  - Donation of 3,000 liters of alcohol to the southern border provinces through the Ministry of Energy;
  - Donation of 70 liters of 70% alcohol to the Directorate of Civil Affairs of the Royal Thai Army;
  - Donation of 192.5 liters of sanitizer gel to the Faculty of Social Sciences at Kasetsart University and the Phra Nakhon Si Ayutthaya Vocational Education College;
  - Donation of medical equipment to the Bamrasnaradura Infectious Diseases Institute, including 525 liters of gel, 3,000 face masks, 10,000 nano-filtered masks, and 6,000 gown hoods;
  - Donation of ventilators to help those infected with COVID-19 in five hospitals in Chonburi Province;
  - Donation of 10,000 gown hoods 5 hospitals in Chonburi Province, and 200 gown hoods to Phramongkutklao Hospital;
  - Donation of food supplies to the Fourth Region Internal Security Operations Command in the three southern border provinces; and
  - Donation of 10,000 "kind packs" to citizens, which held essential supplies packed by Thaioil employee volunteers.
  - Corporate public relation value (PR Value): 18.9 Million THB
  - Number of volunteer hours: 6,176 volunteer hours

## Projects to Cultivate an Employee Voluntary Culture

### Background

In honor of Thailoil's 60-year anniversary, the Company's corporate social responsibility function has initiated two key internal CSR projects to cultivate volunteerism in employees and encourage them to contribute to society.

### "You Initiate...We Fulfill" 60-Year Thailoil Project

#### Objectives

To inspire volunteerism in employees and encourage them to contribute back to society, and to build the reputation of Thailoil employees as "Partners for Life" that contribute to society, in honor of Thailoil's 60-year anniversary, as well as to create value to society



#### Activity

Thailoil employees were encouraged to initiate their own volunteer activities between November 2020 – July 2021, and record their actions on the Thailoil Hub Application. The Company will then turn these activities into financial donations and distribute to 5 different charitable organizations. This is the main activity for promoting management and employee volunteerism, in honor of the Company's 60-year anniversary.



### Progress in 2020



#### Total Donation

As of 12 Jan 2021

Total donations

**470,200** THB

Total posts

**575** posts



Donation to Watphrabatnampu Foundation  
Capital district, Samut Prakan province

**178,000** THB



Donation to Waiwathananivas Nursing Home  
Paknam Capital district, Samut Prakan province

**74,600** THB



Donation to the Pattaya Orphanage  
Banglamung district, Chonburi province

**92,000** THB



Donation to Karunyawet Home for Persons  
with Disabilities Protection and Development  
Banglamung district, Chonburi province

**51,300** THB



Donation to Teacher Boonchoo Home for Special  
Children Sattahip District, Chonburi province

**74,300** THB



#### Application Thailoil Hub

"You Initiate...We Fulfill" 60-Year Thailoil Project

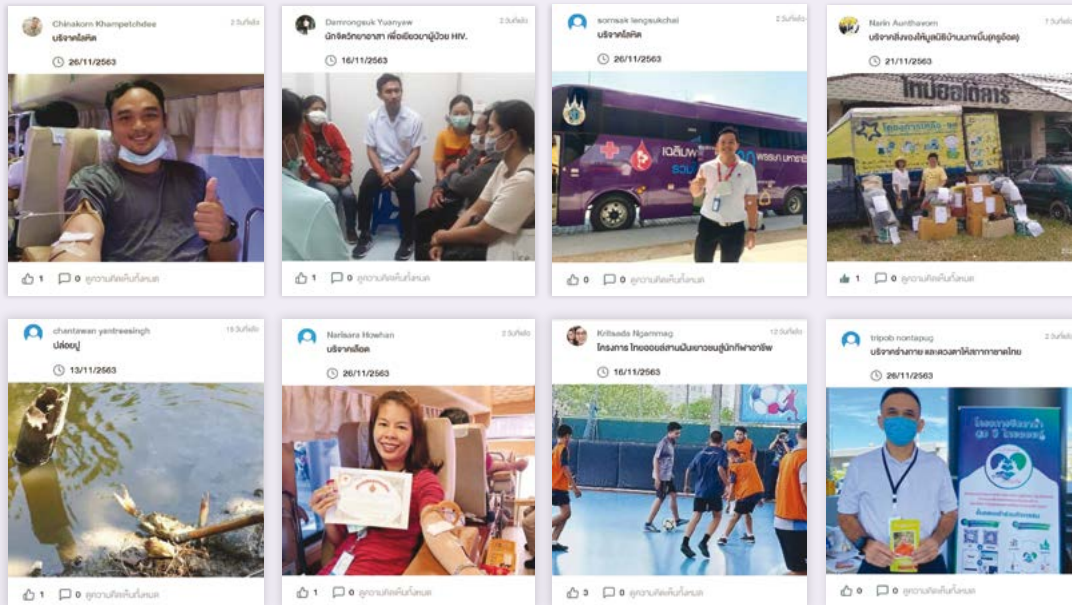




## Progress in 2020



### Example of employee participation



- Corporate public relation value (PR Value): 300,000 THB
- Total employee volunteer hours: 544 volunteer hours



60 Years, Thai Oil Volunteers  
"You Initiate... We fulfill"  
Time 02:23 minute, ONE Channel News,  
One 31 Channel, 13 Nov. 2020

## Thaioil Group Zero Waste Project, the Green Meeting and Green Office Project for Energy Conservation

### Objectives

To cultivate environmental consciousness and energy-saving habits in employees, and create positive attitudes that support collaboration in the organization, and to develop various projects to build good habits in Thaioil employees, such as waste sorting habits through the Thaioil Group Project Zero Waste Project, energy conservation habits through the Green Meeting Project, and the Green Office Project. The Project will lead to more recycling, which will reduce greenhouse gas emissions from landfill disposal or waste incineration.



### Activity

Organize activities to promote energy conservation across the organization as long term development plans.

### Progress in 2020 :

1. Conducted PR activities for the "Thaioil Group Zero Waste Project" in the Bangkok and Sriracha offices to encourage employees to sort their wastes before disposal;
2. Purchased different colored trash bins for waste sorting in the Bangkok and Sriracha offices;
3. Purchased a food waste compost machine; and
4. Produced monk robes from plastic bottles to donate in the annual Thaioil Group Kathin ceremony at Wat Mai Nern Payom Temple.

# PERFORMANCE SUMMARY



 Economic Performance <sup>(1)</sup>	Unit	2017	2018	2019	2020
<b>Economic Value Generated</b>					
Sales Revenue	Million THB	337,905 <sup>(4)</sup>	389,042 <sup>(4)</sup>	361,768	242,840
<b>Economic Value Distributed</b>					
Operating Costs <sup>(2)</sup>	Million THB	305,386	373,128	355,756	255,300
<b>Economic Value Retained</b>					
EBITDA	Million THB	36,925	20,239	14,149	(2,055)
Net Profit/ [Loss]	Million THB	24,856	10,149	6,277	(3,301)
<b>Financial Position</b>					
Total Assets	Million THB	228,108	268,613	283,445	306,188
Total Liabilities	Million THB	100,960	142,141	159,521	186,069
Total Equity	Million THB	127,148	126,472	123,924	120,118
<b>Financial Ratios</b>					
Interest Coverage Ratio	Times	11.2	5.1	4.3	(0.5)
Current Ratio	Times	3.8	4.3	3.5	4.0
Net Debt to Equity Ratio	Times	-	-	0.3	0.7
Return on Equity	Percent	21.7	8.3	5.2	(2.8)
Return on Assets	Percent	11.4	4.2	2.4	(1.0)
<b>Stock Data</b>					
Basic Earnings / [Loss] per Share	THB/Share	12.18	4.97	3.08	(1.62)
Annual Average Daily Closing Stock Price	THB/Share	84.23	86.88	68.26	43.95
Market Capitalization	Million THB	171,832	177,238	139,252	89,659
Dividend Payment	THB/Share	5.25	2.65	1.5	0.7
Dividend Yield <sup>(3)</sup>	Percent	6.2	3.1	2.2	1.6
Book Value	THB/Share	59.91	59.66	58.81	56.97

## Remarks:

(1) Scope of reporting Economic Performance is in alignment with information disclosed in the Thaioil Annual Report 2020.

(2) Operating costs are the expenses related to the operation of a business, or to the operation of a device, component, and piece of equipment or facility or location.

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

(4) Adjusted figures 2017 and 2018 due to regrouping.




 Contributions to Organizations and External Associations <sup>(1)</sup>	Organization name	Unit	2017	2018	2019	2020
Type of Organization						
Tax-exempt group	Global Compact Network Thailand	THB	-	35,000	35,000	35,000
Trade Association	Board of Trade of Thailand	THB	10,700	10,700	0 <sup>(2)</sup>	0 <sup>(2)</sup>
Trade Association	Investor Club Association <sup>(3)</sup>	THB	0	9,095	0	0
Trade Association	Oil Industry Environmental Safety Group Association (IESG)	THB	1,740,000	1,799,000	1,832,000	1,778,000
Trade Association	Oil Spill Response Limited (OSRL)	THB	1,973,293	2,187,097	1,779,211	1,736,839
Trade Association	International Fund for Compensation for Oil Pollution Damage	THB	0	0	1,007,946	833,016
Trade Association	Petroleum Institute of Thailand (PTIT)	THB	710,993	758,660	786,430	824,381
Trade Association	The Association of Private Power Producers	THB	40,000	40,000	40,000	42,800
Trade Association	Thailand Business Council for Sustainable Development (TBCSD)	THB	250,000	250,000	250,000	250,000
Trade Association	The Federation of Thai Industries	THB	121,980	121,980	121,980	216,800
Trade Association	Thai National Shippers' Council (TNSC)	THB	26,750	26,750	26,750	26,750
Trade Association	The Thai Chamber of commerce	THB	24,610	24,610	24,610	24,610
Trade Association	Water and Environment Institute for Sustainability	THB	-	53,000	53,000	0
Lobbying, interest representatives, or similar	-	THB	0	0	0	0
Local, regional, or national political campaigns/candidates	-	THB	0	0	0	0
Others (e.g., spending related to ballot measures or referendums)	-	THB	0	0	0	0
<b>Total</b>		<b>THB</b>	<b>4,858,326</b>	<b>5,275,892</b>	<b>5,916,927</b>	<b>3,990,196</b>


**Remarks:**

(1) The scope of reporting is 97% of total sales revenue of Thaioil Group.

(2) Exempted a membership fee


(3) Renew membership every 5 years


<div><div></div><div>Occupational Health and Safety Performance <sup>(1), (2)</sup></div></div>	Unit	2017		2018		2019		2020	
		Male	Female	Male	Female	Male	Female	Male	Female
Total hours worked • employees	Hour	2,214,031		2,072,882		2,861,233		2,887,982	
		1,822,245	391,786	1,844,465	228,417	2,632,203	229,030	2,625,891	262,091
Total hours worked • contractors	Hour	3,772,751		5,753,718		18,870,649		18,085,177	
		3,043,649	729,102	4,707,147	1,052,571	16,409,274	2,461,376	14,524,263	3,560,914
Work-Related Injuries <sup>(3)</sup>									
Fatality as a result of work-related injury • employees	Case	0		0		0		0	
		0	0	0	0	0	0	0	0
	Case / Million work hours	0		0		0		0	
		0	0	0	0	0	0	0	0
Fatality as a result of work-related injury • contractors	Case	0		0		0		0	
		0	0	0	0	0	0	0	0
	Case / Million work hours	0		0		0		0	
		0	0	0	0	0	0	0	0
Total recordable work-related injury rate (TRIR) • employees	Case	0		0		2		2	
		0	0	0	0	2	0	2	0
	Case / Million work hours	0		0		0.7		0.69	
		0	0	0	0	0.12	0	0.76	0
Total recordable work-related injury rate (TRIR) • contractors	Case	1		2		6		4	
		1	0	1	0	6	0	4	0
	Case / Million work hours	0.27		0.35		0.32		0.22	
		0.33	0	0.43	0	0.37	0	0.28	0
Lost-time injury frequency rate (LTIFR) • employees	Case	0		0		1		0	
		0	0	0	0	1	0	0	0
	Case / Million work hours	0		0		0.35		0	
		0	0	0	0	0.38	0	0	0
Lost-time injury frequency rate (LTIFR) • contractors	Case	1		0		2		1	
		1	0	0	0	2	0	1	0
	Case / Million work hours	0.27		0		0.11		0.06	
		0.33	0	0	0	0.12	0	0.07	0
Near miss <sup>(4)</sup> • employees and contractors	Case	3,138		3,393		3,418		4,521	
Work-Related Illness									
Fatality due to work-related illness • employees	Case	0		0		0		0	
		0	0	0	0	0	0	0	0
Fatality due to work-related illness • contractors	Case	0		0		0		0	
		0	0	0	0	0	0	0	0
Occupational illness frequency rate (OIFR) • employees	Case / Million work hours	0		0		0		0	
		0	0	0	0	0	0	0	0

 Occupational Health and Safety Performance <sup>(1), (2)</sup>	Unit	2017		2018		2019		2020	
		Male	Female	Male	Female	Male	Female	Male	Female
Occupational illness frequency rate (OIFR) • contractors	Case / Million work hours	0		0		0		0	
		0	0	0	0	0	0	0	0
Process Safety <sup>(5)</sup>									
Process safety events – tier 1	Event	3		2		2		1	
	Event / Million work hours	0.5		0.26		0.09		0.04	
Number of Process safety events – tier 2	Event	1		1		0		1	
	Event / Million work hours	0.17		0.13		0		0.04	

**Remarks:**

- (1) Thaioil and Subsidiaries follow standard statistical reporting of PTT Group in accordance with Occupational Safety and Health Administration (OSHA).  
(2) Occupational safety and health reports are broken down to employees and contractors in order to illustrate social responsibility of Thaioil and Subsidiaries to operational contractors.  
(3) Small injuries that only require first aid is not included in the accidents record.  
(4) Thaioil and Subsidiaries report 'Potential Incident Report (PIR)' in combination with Near Misses (see further in Occupational Health and Safety chapter)  
(5) Thaioil and Subsidiaries reported process safety in accordance with API RP 754 standard.

 People	Unit	2017		2018		2019		2020	
		Male	Female	Male	Female	Male	Female	Male	Female
GRI 405–1 Employees <sup>(1)</sup>									
Total number of employees	Person	1,447		1,482		1,637		1,749	
		1,059	388	1,089	393	1,222	415	1,329	420
	Percent	73	27	73	27	75	25	76	24
Number of employees by level									
All Employees									
Executives <sup>(3)</sup>	Person	10	2	9	1	9	1	9	2
	Percent	80	20	90	10	90	10	82	18
Management <sup>(4)</sup>	Person	91	51	97	58	94	63	90	64
	Percent	64	36	63	37	60	40	58	42
Non-Management	Person	958	335	983	334	1,119	351	1,230	354
	Percent	74	26	75	25	76	24	78	22
Permanent Contract									
Executives <sup>(3)</sup>	Person	8	1	8	0	8	0	8	1
Management <sup>(4)</sup>	Person	91	50	96	55	90	60	87	61
Non-Management	Person	958	334	983	334	1,118	351	1,229	354
Temporary Contract <sup>(7)</sup>									
Executives <sup>(3)</sup>	Person	2	1	1	1	1	1	1	1
Management <sup>(4)</sup>	Person	0	1	1	3	4	3	3	3
Non-Management	Person	0	1	0	0	1	0	1	0
Number of employees by age group <sup>(1)</sup>									
Below 30 years old	Person	246	93	261	80	374	70	492	79
30– 50 years old	Person	522	238	548	259	554	284	524	278

 People	Unit	2017		2018		2019		2020	
		Male	Female	Male	Female	Male	Female	Male	Female
Over 50 years old	Person	291	57	280	54	294	61	313	63
Number of employees by area of work									
Permanent Contract									
Depot	Person	2	1	2	0	2	0	2	1
Bangkok	Person	49	131	48	135	52	145	53	143
Sriracha (Refinery)	Person	1,006	253	1,037	254	1,162	266	1,269	272
Temporary Contract <sup>(9)</sup>									
Depot	Person	0	0	0	0	0	0	0	0
Bangkok	Person	0	3	1	4	4	4	3	4
Sriracha (Refinery)	Person	2	0	1	0	2	0	2	0
ATTRACTION									
GRI 401-1 New employees hired <sup>(1)</sup>									
Total number of new employees hired	Person	55		70		197		148	
		32	23	53	17	166	31	127	21
Below 30 years old	Person	27	17	50	10	157	18	122	14
30- 50 years old	Person	5	6	3	7	8	13	5	7
Over 50 years old	Person	0	0	0	0	1	0	0	0
Total new hire rate	Percent of total number of employees	3.80		4.72		12.03		8.46	
		3.02	5.93	4.87	4.33	13.58	7.47	9.56	5.00
Ability to recruit employees	Percent of the total number of position available for recruitment	85		92		100		100	
RETENTION									
GRI 401-1 Employee turnover <sup>(1), (5)</sup>									
Total turnover	Person	47		43		40		47	
		33	14	27	16	32	8	30	17
Below 30 years old	Person	9	4	8	7	8	3	6	6
30-50 years old	Person	3	5	7	5	6	4	4	4
Over 50 years old	Person	21	5	12	4	18	1	20	7
Turnover rate	Percent of total number of employees	3.25		2.91		2.44		2.69	
		3.12	3.61	2.48	4.08	2.62	1.93	2.26	4.05
Voluntary resignation	Percent of total number of employees	1.60		1.75		1.16		1.03	
		1.32	2.32	1.29	3.05	1.06	1.45	0.6	2.38
DJSI 3.5.4 Employee Engagement									
Employee engagement score	Percent	89		85		90		92	
	Percent	na	na	85.5	91	94	92	91	94
Employee satisfaction score	Percent	92		96		89		91	
	Percent	na	na	96	87	93	92	87	93

 People	Unit	2017		2018		2019		2020	
		Male	Female	Male	Female	Male	Female	Male	Female
GRI 401–3 Parental leave									
Employee taken parental leave	Person	40		35		36		37	
		24	16	20	15	17	19	22	15
Employee returned to work after parental leave	Person	40		35		36		37	
		24	16	20	15	17	19	22	15
Rate of employee return to work and stay after using the parental leave	Percent of employees taken parental leave	100%		100%		100%		100%	
		100%	100%	100%	100%	100%	100%	100%	100%
DEVELOPMENT									
GRI 404–1 Average training hours <sup>(1), (2)</sup>									
Total training hours	Hours	71,644		105,032		124,222		94,716	
		52,340	19,304	81,804	23,228	100,030	24,192	78,454	16,262
Average training hours for all employees	Hour/Person/Year	49	50	75	60	81	58	59	39
• Average hours of training for executives <sup>(3)</sup>	Hour/Person/Year	42	269	110	27	94	687	138	201
• Average hours of training for management <sup>(4)</sup>	Hour/Person/Year	46	71	74	84	71	69	46	54
• Average hours of training for non-management employees	Hour/Person/Year	50	45	75	56	82	54	60	37
Individual Development Plan									
Employees who developed Individual Development Plan (IDP)	Percent	97		100		100		100	
IDP Progress	Percent	85		99		90		100	
Employees who have a Career Path	Percent	95		98		98		98	
Rate of promotion <sup>(5)</sup>	Percent	20.18		15.36		17.15		13.87	
Expenses for employee development	Million THB	417		447		474		422	
	THB/Person	288,182		302,640		289,795		242,529	
HUMAN RIGHTS									
Employee Grievances									
Number of grievances about human rights	Case	0		0		0		0	
• Resolved grievances	Case	0		0		0		0	
• Grievances under investigation	Case	0		0		0		0	
Number of grievances about labour practices	Case	0		1		0		0	
• Resolved grievances	Case	1		1		0		0	
• Grievances under investigation	Case	0		0		0		0	
GRI 102–41 Labour Union <sup>(6)</sup>									
Number of employees represented by a trade union	Percent	74		72		74		75	

Remarks: NA: Not Available

(1) Consolidated data of employees assigned from external organizations, both permanent contract and temporary contract.

(2) The data excluded paid education leave funded by Thaioil-supported scholarships.

(3) Executives include CEO, president, executive vice president, and assistant executive vice president.

(4) Management includes vice president and section manager.

(5) Turnover rate includes employees with voluntary resignation, retired employees, employees who were asked to resign, employees laid off, and fatalities.

(6) Scope of reporting includes only Thaioil Public Company Limited.

(7) Employees on temporary contracts are full-time employees since Thaioil does not hire any part-time employees.


(8) In 2013-2017, as Thaioil has been operating according to the strategy to expand the business, numerous employees have been hired in preparation, whereby majority of the employees do not have experience. Nonetheless, employees who have been working with Thaioil for a certain period of time and have experience illustrated an improvement in performance. Thus, in 2017, the number of employees promoted was higher than any other years as employees from both categories were seen to be qualified for a promotion and further growing in the organization.




Social and Community Development	Unit	2017	2018	2019	2020
Percentage of operations with implemented local community engagement, impact assessments, and/or development programs	Percent	100%	100%	100%	100%
Number of beneficiaries who used Thaioil's Health and Education Center in Sriracha	Visit	51,649	55,304	69,324	53,642
Community Engagement Score	Percent	93.5	97.25	93.32	94.89
Number of employee volunteer hours	Hour	17,672	8,376	10,416	16,470
Value of employee volunteering during paid working hours	Million THB	4.7	3.3	6.5	12.4
Management overheads	Million THB	27.6	28.3	24	33
Value Chain Management	Unit	2017	2018	2019	2020
<b>GRI 308-1 and GRI 414-1 Suppliers</b>					
New suppliers that were screened using environmental and social criteria	Percent	100	100	100	100
Suppliers covered under a high-level environmental, social, and governance risk assessment	Percent	0	100	100	100
Number of grievances received regarding suppliers' and contractors' social and environmental management	Case	0	0	0	0
Ocean Loss Index	Percent by Volume	0.21	0.2	0.18	0.16
Supplier Satisfaction	Percent	93	96	93	94
<b>GRI 414-8 Customers</b>					
Customer Engagement <sup>(1)</sup>	Percent	96	96	96	98

**Remarks:**

(1) Scope of reporting for performance on customers covered Thaioil, Thai Lube Base, Thai Paraxylene, and Thaioil Marine.

 Environmental Performance	Unit	2017	2018	2019	2020
Refinery throughput <sup>(1)</sup>	Metric ton	15,121,269	15,132,708	14,600,280	13,478,448
Investment on energy projects	Million THB	26	0	28	57
<b>Energy Management and Greenhouse Gases <sup>(2), (4)</sup></b>					
Total energy consumption <sup>(2)</sup>	Million GJ	29.41	31.6	30.7	27.5
Refinery energy intensity	GJ/ton throughput	1.95	2.09	2.10	2.04
Total fuel consumption <sup>(2)</sup>	Million GJ	57.33	58.89	56.01	50.26
Refinery fuel consumption intensity	GJ/ton throughput	3.79	3.89	3.84	3.73
• Natural gas	Million GJ	35.11	37.28	36.39	33.10
• Fuel oil	Million GJ	2.53	3.19	2.91	5.20
• Fuel gas	Million GJ	18.72	17.48	15.39	10.85
• Coke	Million GJ	0.97	0.92	1.28	1.09
• LPG	Million GJ	Less than 0.01	Less than 0.01	Less than 0.01	Less than 0.01
• Diesel	Million GJ	Less than 0.01	0.015	0.029	0.021
• Benzene	Million GJ	Less than 0.01	Less than 0.01	Less than 0.01	Less than 0.01
• Ethanol	Million GJ	Less than 0.01	Less than 0.01	Less than 0.01	Less than 0.01
Electricity consumption	Megawatt Hour	1,026,841	1,053,509	987,424	972,237
Electricity purchased from external supplier	Megawatt Hour	0	0	0	0
Electricity sold <sup>(4)</sup>	Megawatt Hour	1,583,839	1,580,035	1,580,492	1,556,176
Reductions in energy consumption	GJ	383,009	562,075	1,396,728	746,264
Investments in renewable energy	Million THB	1,212	1,381	1,374	1,442
Direct Greenhouse Gas Emissions (Scope 1) <sup>(3)</sup>	Million ton CO2 equivalents	3.4	3.49	3.31	3.02
Indirect Greenhouse Gas Emissions (Scope 2) <sup>(3)</sup>	Million ton CO2 equivalents	0	0	0	0
Greenhouse gas intensity (Scopes 1 and 2)	Ton/throughput	0.22	0.23	0.23	0.22
Greenhouse gas emissions reductions (Scope 1) from the energy efficiency improvement projects.	Ton	21,487	32,151	84,265	51,084
Indirect Greenhouse Gas Emissions (Scope 3) <sup>(3)</sup>					
• Business partners: Landfilling industrial waste	Million ton CO2 equivalents	254	542	1,014	0
• Business partners: Crude oil losses during marine transportation	Million ton CO2 equivalents	1,924	2,121	1,268	1,346
• Customers: Fuel	Million ton CO2 equivalents	19.9	24.8	27.2	26.5
<b>Air Emissions <sup>(5), (6)</sup></b>					
• Nitrogen oxide (NO <sub>x</sub> ) emissions	Thousand Tons NO <sub>x</sub>	4.44	4.50	4.36	4.53
• Sulfur oxide (SO <sub>x</sub> ) emissions	Thousand Tons SO <sub>x</sub>	3.49	4.14	4.27	6.62
• Volatile organic compound (VOC) emissions	Thousand Tons	1.42	1.43	1.35	1.30

 Environmental Performance	Unit	2017	2018	2019	2020
<b>Waste Disposal by Type</b>					
Total hazardous waste disposal	Ton	4,276	12,707	12,585	8,201
• Landfills	Ton	18	47	237	0
• Recycle	Ton	1,031	1,425	4,615	1,312
• Recovery	Ton	3,134	11,092	7,173	6,854
• Others <sup>(7)</sup>	Ton	92	143	560	34
Total non-hazardous waste disposal	Ton	241	306	2,331	2,619
• Landfills	Ton	100	182	195	0
• Recycle	Ton	82	57	2,086	2,448
• Recovery	Ton	39	67	49	171
• Other <sup>(7)</sup>	Ton	20	0	0	0
Total waste generated	Ton	4,517	13,013	14,916	10,820
Total waste disposed to landfill	Ton	119	229	433	0
	Percent of total waste disposed to landfill	2.63	1.76	2.9	0
<b>Oil and Chemical Spills <sup>(8)</sup></b>					
• Significant oil and chemical spills on land	Incident	0	0	0	0
• Significant oil and chemical spills at sea	Incident	0	0	0	0
<b>Compliance with Environmental Laws and Regulations</b>					
• Fines for non-compliance with environmental laws and regulations	Million THB	0	0	0	0
• Number of incidents of non-compliance with environmental laws and regulations	Incident	0	0	0	0

Environmental Performance			Unit	Water				Areas with water stress
				2017	2018	2019	2020	2020
Water <sup>(9)</sup>								
Water withdrawal by source	Total Seawater <sup>(10)</sup>		Million m3	18.23	17.96	17.96	18.41	0
	• Freshwater (≤1,000 mg/L Total Dissolved Solids)		Million m3	0	0	0	0	0
	• Other water (>1,000 mg/L Total Dissolved Solids)		Million m3	18.23	17.96	17.96	18.41	0
	Total water withdrawal from other sources		Million m3	4.63	4.98	4.86	3.34	0
	• Freshwater (≤1,000 mg/L Total Dissolved Solids)		Million m3	4.63	4.98	4.86	3.34	0
	• Other water (>1,000 mg/L Total Dissolved Solids)		Million m3	0	0	0	0	0
	Total third-party water withdrawal by withdrawal source	Surface water	Million m3					0
		Ground water	Million m3					0
		Seawater	Million m3					0
		Produced water	Million m3					0
Total Water Consumption	From all water sources		Million m3	22.86	22.94	22.82	21.75	0
Water discharge by destination	Discharged into the sea		Million m3	18.73	18.6	18.13	17.43	
Total water discharge <sup>(10)</sup>	All discharge destinations		Million m3	18.73	18.6	18.13	17.43	0
Water discharge by level of treatment	Freshwater (≤1,000 mg/L Total Dissolved Solids)		Million m3	0	0	0	0	0
	Other water (>1,000 mg/L Total Dissolved Solids)		Million m3	18.73	18.6	18.13	17.43	0
Water consumption	Total water consumption		Million m3	4.13	4.34	4.69	4.33	0

**Remarks:**

- (1) Refinery Throughput includes crude oil and other feedstock.
- (2) Total energy consumption covers TOP, TPX, TLB LABIX, TP, and TOPSPP. The amount of fuel, steam, and electricity was accounted as per GRI G4 Manual of EN3. All energy conversion factors were specific value from Thaioil and Subsidiaries' laboratory.
- (3) Thaioil and Subsidiaries follow standard statistical reporting of PTT Group in accordance with WBCSD GHG Protocol. The greenhouse gases include CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.
- (4) There was no steam sold to outside the organization.
- (5) Thaioil and Subsidiaries follow the Shell International Practice Standard (2007) in monitoring occupational health and safety and environmental performance.
- (6) Thaioil and Subsidiaries do not purchased ozone depleting substances including CFCs, HCFCs, Halons, and Methyl bromide.
- (7) Other waste disposal covers industrial waste incineration and external wastewater treatment services.
- (8) Oil and chemical spill greater than 1 Barrel is considered significant.
- (9) Data excludes water consumption in office building, which has very small volume compared to water consumption in production process.
- (10) Seawater withdrawal and discharge include excess seawater that has been desalinated from the desalination unit and discharged as freshwater.

# AWARDS AND RECOGNITIONS



Member of  
**Dow Jones**  
**Sustainability Indices**  
Powered by the S&P Global CSA

**01**

**Thaioil was named as a DJSI member for the eighth consecutive year, and recognized as the industry leader in the Oil and Gas Refining and Marketing industry**

**13 November 2020**

Thai Oil Public Company Limited was named as a member of the 2020 Dow Jones Sustainability Indices for the eighth consecutive year, and was recognized as the industry leader in the Oil and Gas Refining and Marketing industry through sustainable management of economic, social, and environmental aspects in alignment with international standards.

  
**Sustainability Award**  
**Gold Class 2020**

**02**

**Thaioil was named as a global leading company in sustainability for the sixth year from the announcement of the 2020 SAM Sustainability Award**

**30 January 2020**

Thai Oil Public Company Limited received a Gold Class rating in sustainability for the Oil and Gas Marketing and Refining industry for the sixth year, demonstrating the international standard of our work in sustainability and economic, social, and environmental aspects.





**03**

**Thaioil received three Asian Excellence Awards at the 10<sup>th</sup> Asian Excellence Awards 2020**

20 October 2020

Mr. Wirat Uanarumit, the President and CEO of Thai Oil Public Company Limited, received the Asia's Best CEO award at the 10<sup>th</sup> Asian Excellence Awards 2020. The event was hosted by Corporate Governance Asia, a leading media agency in Hong Kong and across Asia that reports on economic and good corporate governance issues. Ms. Pattaralada Sa-ngasang, Executive Vice President of Finance and Accounting of Thai Oil Public Company Limited, also received the Asia's Best CFO award and the Asia's Best Investor Relations award.



**04**

**Thaioil received the 2020 Asset ESG Corporate Awards**

17 December 2020

Thai Oil Public Company Limited received a Platinum Award at the 2020 Asset ESG Corporate Awards. The award recognizes outstanding corporate performance in conducting business with responsibility towards environmental, social, and governance, or ESG, in all business areas. The award was organized by The Asset magazine, the leading financial magazine in Asia.



**05**

**Thaioil was selected as one of the "sustainable stocks" of the year and included in the Thailand Sustainability Investment (THSI) for the sixth consecutive year**

15 December 2020

Thai Oil Public Company Limited was awarded with the 2020 Thailand Sustainability Investment plaque. The Company was listed as one of the stock options with sustainable returns for the sixth consecutive year, reflecting the Company's persistent prioritization of sustainable business growth with consideration towards environmental, social, and governance aspects.

# AWARDS AND RECOGNITIONS



**06**

**Thaioil received the 2020 Prime Minister's Industry Award for Outstanding Achievement in Corporate Social Responsibility**

14 December 2020

Thai Oil Public Company Limited received the 2020 Prime Minister's Industry Award for Outstanding Achievement in Corporate Social Responsibility, recognizing Thaioil's commitment towards conducting business while advancing the quality of life for communities and society through the use of both proactive and passive strategies in community health care. The award ceremony was organized by the Department of Industrial Works of the Ministry of Industry.



**07**

**Thaioil received the 2020 Human Rights Award**

25 September 2020

Thai Oil Public Company Limited was selected as a role model organization for outstanding human rights management in 2020 in the category of large business group by the National Committee on Driving Forward Human Rights Affairs in Thailand, a committee under the Rights and Liberties Protection Department, at the 2020 Human Rights Awards ceremony.



**08**

**Thaioil received the CSR-DIW Continuous Award for the 12<sup>th</sup> consecutive year**

17 November 2020

Thai Oil Public Company Limited received the 2020 CSR-DIW Continuous Award for the twelve consecutive year at the 2020 CSR-Beginner and CSR-DIW Project Result Summary event organized by the Department of Industrial Works of the Ministry of Industry.



**09**

**Thaioil received the 2020 Sustainability Disclosure Award**

22 December 2020

Thai Oil Public Company Limited received the 2020 Sustainability Disclosure Award the second consecutive year. With this recognition, it reaffirms our identity as an organization that appreciates the importance of transparently disclosing information on sustainability performance, whether that be environmental, social, or corporate governance issues, to the public and our stakeholders. The award ceremony was organized by Thaipat Institute.



**10**

**Thaioil Group received the 2020 Certificate of Honor for Role Model Organizations in Greenhouse Gas Reduction**

16 September 2020

Thaioil Group received a certificate of honor at the "100 Hearts Together to Reduce Global Warming" event organized by the Thailand Greenhouse Gas Management Organization (Public Organization), or TGO, in 2020. The event is organized to support national greenhouse gas reduction initiatives (Low Emission Support Scheme: LESS). Thaioil Group received this award for our accomplishments in increasing energy efficiency and reducing greenhouse gas emissions.



**11**

**Sak Chaisidhi received the 2019 Award for Environmental and Safety Governance Excellence.**

25 September 2020

Sak Chaisidhi Company Limited received the Award for Environmental and Safety Governance Excellence, or the Gold Star Award for the fourth consecutive year, from Mr. Somjin Piluek, the Governor of the Industrial Estate Authority of Thailand. This award is given to companies that have consistently demonstrated their ability to uphold high standards of good governance principles in their operations, which is considered as a good practice example of environmental management that follow an effective pollution reduction and elimination plans.

# LRQA Independent Assurance Statement

## Relating to Thai Oil Public Company Limited's Environmental and Social Disclosures within the Integrated Report for the calendar year 2020

This Assurance Statement has been prepared for Thai Oil Public Company Limited in accordance with our contract but is intended for the readers of this Report.

### Terms of Engagement

Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by Thai Oil Public Company Limited (TOP) to provide independent assurance on the environmental and social disclosures within its Integrated Report 2020 ("the Report") against the assurance criteria below to a limited level of assurance and at the materiality of the professional judgement using LRQA's verification procedure. LRQA's verification procedure is based on current best practise and uses the principles of AA1000AS (2008) - inclusivity, materiality, responsiveness and reliability of performance data and processes defined in ISAE3000.

Our assurance engagement covered TOP's operations and activities in Chonburi, Thailand, including six subsidiary companies and specifically the following requirements:

- Reviewing whether the selected environmental and social disclosures within the Report have taken account of the GRI Sustainability Reporting Standards
- Evaluating the reliability of data and information for the selected environmental and social disclosures listed below: <sup>1</sup>:
  - Environmental: GRI disclosure 302-1, 303-3, 303-4, 305-1, 305-2, 305-7, 306-2, 306-3
  - Social: GRI disclosure 403-9a and 403-9b, 403-10a and 403-10b

**Note:** For safety performance data (disclosure 403-9, 403-10), it also covered TOP's operations and activities in Bangkok, and 4 expansion projects e.g. New Crude Oil Tanks (C-COT), Thai Oil Sriracha Building (TSB), Concurrent Work and new Jetty 7/8 within TOP's Operation.

Our assurance engagement excluded TOP's operations and activities outside Chonburi, Thailand, any project expansion within Chonburi, Thailand and the data and information of its suppliers, contractors and any third-parties mentioned in the Report.

LRQA's responsibility is only to TOP. LRQA disclaims any liability or responsibility to others as explained in the end footnote. TOP's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the Report and for maintaining effective internal controls over the systems from which the Report is derived. Ultimately, the Report has been approved by, and remains the responsibility of TOP.

### LRQA's Opinion

Based on LRQA's approach nothing has come to our attention that would cause us to believe that TOP has not:

- Met the requirements above
- Disclosed reliable performance data and information for the selected environmental and social disclosures as no errors or omissions were detected
- Covered all the issues that are important to the stakeholders and readers of this Report.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

**Note:** The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

### LRQA's Approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing TOP's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- Reviewing TOP's process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by TOP and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether TOP makes informed business decisions that may create opportunities that contribute towards sustainable development.
- Auditing TOP's data management systems to confirm that there were no significant errors, omissions or mis-statements in the Report. We did this by reviewing the effectiveness of data handling procedures, instructions and

<sup>1</sup> GHG quantification is subject to inherent uncertainty.

systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the Report.

### Observations

Further observations and findings, made during the assurance engagement, are:

- **Stakeholder inclusivity:**  
TOP has continued engaging with stakeholders to collect and understand their different needs and expectations. However, we believe that TOP should also engage with Non-Government Organizations (NGOs). NGOs play an important part in improving society, local communities, and the environment. Engaging with NGOs would enable TOP to enhance their sustainable development plan and together, TOP and the NGO, will likely accomplish more than they could alone.
- **Materiality:**  
Although TOP has identified and prioritized its material issues, we believe that TOP should re-evaluate the process of determining materiality to better reflect stakeholders' perception of these issues.  
TOP's report when compared to its peers has deemed certain issues, like climate change, as not currently critical. This does not mean that TOP has no plans to tackle climate change / reduce energy, just that TOP believe that their efforts should be focused on other material issues for now. However, we believe that as part of the materiality determination process TOP should increase their awareness of sustainability context and how issues impact operations. This should allow TOP to substantiate their material issues and then explain the development of their sustainable development plan to stakeholders.
- **Responsiveness:**  
TOP has implemented policy and procedures to address their material issues and improve their performance. These controls have been effective in not only achieving TOP's zero landfill policy but also at delivering the 3Rs of recycling - thereby minimising operational impact on the environment.  
However, we believe that TOP should disclose performance in a sustainability context i.e., how the issue impacts on the planet. TOP should consider including in future reports data and information on GHG intensity, water intensity and air emission intensity.
- **Reliability:**  
TOP has implemented and maintained the internal system to determine the reliability of reported data. However, we believe TOP should strengthen the level of QA/QC in its data management system: for example, to improve accuracy of consolidated data from subcontractors TOP should review these companies' data collection methods.

### LRQA's standards, competence and independence

LRQA implements and maintains a comprehensive management system that meets accreditation requirements for ISO 14065 Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition and ISO/IEC 17021-1 Conformity assessment – Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

The verification is the only work undertaken by LRQA for TOP and as such does not compromise our independence or impartiality.

Signed

Dated: 14 February 2021



Nit Tanasuthiseri,  
LRQA Lead Verifier  
On behalf of Lloyd's Register Quality Assurance  
Lloyd's Register International (Thailand) Limited  
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# GRI CONTENT INDEX AND UNGC PRINCIPLES COP



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## TOPIC SPECIFIC DISCLOSURES

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		403-9	104-106, 148-149		Yes
		403-10	104, 148-149		Yes
	G4 Sector Disclosures for Oil and Gas	G4-OG13	104-106, 148-149		
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## TOPIC SPECIFIC DISCLOSURES

Thaioil Material Matters	GRI Topics	Disclosures	Page or Website	Comments/Omissions	External Assurance
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		GRI 303:	303-1	67-68	
		Water and Effluents 2018	303-2	67-68	
			303-3	67-68, 155	Yes
			303-4	67-68, 155	Yes
	GRI 305: Emissions 2016		305-1	69-71, 153	Yes
			305-2	69-71, 153	Yes
			305-3	69-71, 153	
			305-4	69-71, 153	
			305-5	69-71, 153	
Operational Eco-efficiency	GRI 103: Management Approach 2016	103-1	72		
		103-2	73-83		
		103-3	73-83		
	GRI 302: Energy 2016	302-1	76-79, 153	To avoid double counting, Thaioil does not report energy consumption/ sold of electricity, heating, cooling, and steam, since all were self-generated from primary fuel. Only electricity was sold out to external.	Yes
		302-30GSD	78		
		302-4	76-79, 153		
		302-5	76-79		
	GRI 303: Water and Effluents 2018	303-3	73-75, 155	The standard, methodologies and consumptions used to calculate water withdrawal are not reported.	Yes
		303-4	73-75, 155		Yes
		303-5	73-75, 155		
	GRI 305: Emissions 2016	305-7	81-83, 153		Yes
	GRI 306: Effluents and Waste 2016	306-1	79-81, 154		
		306-2	79-81, 154		Yes
		306-3	79-81, 154		Yes
		306-4	79-81, 154		
		306-5	79-81, 154		
Sustainable Procurement	GRI 103: Management Approach 2016	103-1	84		
		103-2	85-91		
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	GRI 308: Supplier Environmental Assessment 2016	308-1	87-90		
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	GRI 414: Supplier Social Assessment 2016	414-1	87-90		
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## TOPIC SPECIFIC DISCLOSURES

Thaioil Material Matters	GRI Topics	Disclosures	Page or Website	Comments/Omissions	External Assurance
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Business Performance	GRI 201: Economic Performance	201-1	5, 14-15, 146		

## UNGC Principles COP

### UNITED NATIONS GLOBAL COMPACT PRINCIPLES

Principles	Page
Human Rights	<p><b>Principle 1</b> : Businesses should support and respect the protection of internationally proclaimed human rights 42-47</p> <p><b>Principle 2</b> : Businesses should make sure that they are not complicit in human rights abuses 42-47</p>
Labor	<p><b>Principle 3</b> : Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining 42-47</p> <p><b>Principle 4</b> : The elimination of all forms of forced and compulsory labour 42-47</p> <p><b>Principle 5</b> : The effective abolition of child labour 42-47</p> <p><b>Principle 6</b> : The elimination of discrimination in respect of employment and occupation 42-47</p>
Environment	<p><b>Principle 7</b> : Businesses should support a precautionary approach to environmental challenges 60-83</p> <p><b>Principle 8</b> : Undertake initiatives to promote greater environmental responsibility 92-95</p> <p><b>Principle 9</b> : Encourage the development and diffusion of environmentally friendly technologies 92-95</p>
Anti-corruption	<p><b>Principle 10</b> : Businesses should work against corruption in all its forms, including extortion and bribery 48-56</p>

# SDGs PROGRESS



Thaioil assesses the significance of environmental and social impacts in our business activities through the materiality assessment. We prioritize the material matters based on both negative and positive impacts, and define targets that are in alignment with the United Nations' Sustainable Development Goals (SDGs). Thaioil's assessment, monitoring, and reporting processes have been developed with reference to the GRI's and UNGC's "Integrating the SDGs into Corporate Reporting: A Practical Guide".

## Thaioil's Commitment



(12.7) The Company prioritizes sustainable procurement by adopting green procurement practices and enhancing suppliers' ESG performance.



(7.3) The Company prioritizes energy efficiency improvements with our long-term goal of achieving the top quartile performance in energy efficiency within the oil and gas industry by 2023.



(9.5) The Company prioritizes enhancing national scientific R&D, and will increase the share of profits generated from innovation and technology business to 5% by 2030.



(8.8) The Company prioritizes human rights and occupational health and safety by implementing human rights due diligence and reducing accident rate for all workers.



(12.2) The Company prioritizes efficient use of natural resources by achieving operational eco-efficiency targets; and  
(12.4) minimizing environmental impacts released to the air, water, and soil.



(13.1) The Company prioritizes climate resilience and adaptive capacity with our target of 15% net direct GHG emission reductions from BAU by 2030.



(16.5) The Company prioritizes preventing risk on non-compliance and ABC by maintaining zero fraud and corruption incidents.



(3.8) The Company prioritizes community health and safety by supporting quality healthcare service accessibility.



(4.3) The Company prioritizes supporting equality of educational opportunity for communities.



(7a) The Company prioritizes supporting access to clean energy for communities and society.



(8.3) The Company prioritizes supporting job creation for communities and society.



(11.1) The Company prioritizes supporting basic service accessibility in remote areas by providing infrastructure and building local capabilities for sustainable living.



(11.6) The Company prioritizes preventing environmental impacts to society by conducting public hearings and EIAs for all significant projects.

Creating value

Mitigating adverse impacts




Raw Materials



Company Operations



Society and End-Product Use





## 2020 Progress

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2020	More Information
<b>SDG 3:</b> <b>Good Health and Well-being</b> 	3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality, and affordable essential medicines and vaccines for all.	To support public health service accessibility of communities in Laem Chabang district, Chonburi Province, and other remote communities.	Thaioil Group's Health and Learning Center for Community <ul style="list-style-type: none"> <li>53,642 beneficiaries accessed to the Thaioil Group's Health and Learning Center</li> <li>3,809 beneficiaries participated in the Thaioil's Dental Clinic Project</li> </ul> <hr/> Supported a total of 210 students and trainers in joining the Laem Chabang Youth Training for Rope Skipping Championship Project.	Corporate Social Responsibility, pages 130-145
<b>SDG 4:</b> <b>Quality education and lifelong learning opportunities for all</b> 	4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.	To support educational opportunity for community members of every gender and age, and promote the development of the quality of basic education.	Sponsored the employment of 4 teaching assistants for each participating school, totally 14 schools, in the leadership project for sustainable educational development program (CONNEXT ED). <hr/> Developed 2 change-maker teachers teaching science and English in grades 7-9 at Wat Manorom School in Sriracha, Chonburi, through Teach for Thailand. <hr/> Supported approximately 1,100 youth in participating in the Thaioil project to help youth realize their dreams in becoming professional athletes.	Corporate Social Responsibility, pages 130-145
<b>SDG 7:</b> <b>Affordable and Clean Energy</b> 	7.3 Double the global rate of improvement in energy efficiency.	To be ranked as the top quartile of Energy Intensity Index (EII) among the global oil and gas industry by 2023.	Refinery Energy Intensity Index (EII) at 85.1 and ranked among leading companies in the oil and gas industry globally. <hr/> Installed solar power systems on 2 hospital buildings – Koh Sichang Hospital and Thanyarak Hospital – with a combined capacity of 95 MW, and in the process of installing an 80-MW solar power system for Laem Chabang Hospital.	Operational Eco-Efficiency, pages 72-83  Corporate Social Responsibility, pages 130-145

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thailoil Targets	Progress in 2020	More Information
<b>SDG 8:</b> <b>Decent Work and Economic Growth</b> 	8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small and medium-sized enterprises, including through access to financial services.	To support job creation and sustainable self-reliance in local communities and other remote communities through social enterprise projects.	Organized 3 job training courses, and conducted the courses 4 times for Laem Chabang communities, with a total of 159 community members attended. The activity was part of the increased incomes project: Year 2 Project.  Organized the “Thailoil Refines Happiness Market” Project to allow communities surrounding refinery to sell products in the Thailoil area.	Corporate Social Responsibility, pages 130-145
	8.8. Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.	To achieve a total recordable injury frequency rate (TRIR) among the first 10% of the oil and gas industry by 2022.	TRIR at 0.29 cases per million working hours for all workers, better than the 2020 target of less than 0.40 cases per million working hours, and continued to maintain performance in the leading 10% of oil and gas companies	Occupational Health and Safety, pages 98-106
		To maintain zero incident of Process Safety: Loss of Primary Containment (LOPC) Tier 1.	One LOPC Tier 1 event, equivalent to 0.04 cases per million working hours	
		To implement the human rights due diligence process for 100% of Thailoil operations and to assess human rights risks for all critical suppliers.	Human rights risk assessment covered 100% of the business activities of Thailoil Group and of suppliers, and all risks have been assigned adequate mitigation measures.	Human Rights, pages 42-47
<b>SDG 9:</b> <b>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.</b> 	9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, including encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.	To promote an innovative culture and enhance business opportunities in the area of innovation.	The new knowledge and ideas gained from the Wisdom and Innovation Award 2019-2020 Project have been applied to 96 improvement projects, which generated value equivalent to 1,025 million THB.	Innovation management, pages 125-129
			345 employees participated in the Wisdom & Innovation Award, an increase of 77% from the previous year.	
			Granted a patent for the “control valve tool” and a petty patent for the “Precise Loading Arm Connection Enhancement System”.	
			Researched and developed 3 new environmentally friendly products. In total, Thailoil now has 14 environmentally friendly products, which contributed to 44% of total sales revenue of Thailoil Group.	Product and Service Stewardship, pages 92-95

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2020	More Information
<b>SDG 11:</b> <b>Sustainable Cities and Communities</b> 	11.1 Ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slum.	To enhance communities' quality of life through promoting basic infrastructure and knowledge on energy and engineering to ultimately create self-resilience.	More than 30,000 beneficiaries and 94 organizations benefited from Thaioil Group's corporate social responsibility projects.	Corporate Social Responsibility, pages 130-145
	11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	To minimize environmental impact to communities and conduct proper public participation for all significant capital projects.	100% of significant capital projects passed public participation hearings from concerned stakeholder groups.	Human Rights, pages 42-47
<b>SDG 12:</b> <b>Responsible consumption and production</b> 	12.2 Achieve the sustainable management and efficient use of natural resources.	To achieve target of environmental parameters and to maintain zero environmental incidents.	Total water consumption was 4.33 million cubic meters.	Operational Eco-Efficiency, pages 72-83
			Ocean loss index of oil loss during marine transportation at 0.16% by volume, better than our target of less than 0.19% by volume.	Sustainable Procurement, pages 84-91
	12.4 Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water, and soil in order to minimize their adverse impacts on human health and the environment.	To achieve target of environmental parameters and to maintain zero environmental incidents.	4,526 tons of NO <sub>x</sub> emissions 6,612 tons of SO <sub>x</sub> emissions 1,279 tons of VOCs emissions Zero waste to landfill, according to target	Operational Eco-Efficiency, pages 72-83
			Zero significant oil and chemical spills according to target	Environmental Management, pages 60-65
	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.	To promote sustainable green procurement in the organization and enhance environmental, social and governance (ESG) practices with suppliers.	Accredited and certified by ISO 20400: 2017 - Sustainable Procurement	Sustainable Procurement, pages 84-91
			100% of new suppliers acknowledged the SCOC and responded to the ESG self-survey.  Increased spending on environmentally products for the materials, equipment, and office supplies product group by 25% compared to the previous year, equivalent to 3,100 kilograms of carbon dioxide reductions.	

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thailo Targets	Progress in 2020	More Information
<b>SDG 13:</b> <b>Climate Action</b> 	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	To reduce GHG emissions by 4% from business as usual in baseline year 2017 by 2022, and to reduce net GHG emissions by 15% from business as usual in baseline year 2023 by 2030.	<p>GHG emission intensity at 0.22 ton carbon dioxide equivalent per ton throughput, equivalent to 16% reduction from BAU in 2020</p> <p>852,409 tons of carbon dioxide equivalents of avoided emissions from use of low carbon products</p>	<p>Climate Change Risk, pages 66-71</p> <p>Product and Service Stewardship, pages 92-95</p>
<b>SDG 16:</b> <b>Peace, Justice, and Strong Institutions</b> 	16.5 Substantially reduce corruption and bribery in all their forms.	To have a clear, transparent, and fair compliance system in place and to maintain zero corruption and fraud incidents as well as to take position of no corruption acceptance in any cases, along with establishing a clear grievance system.	<p>Maintained zero corruption and bribery.</p> <p>100% of employees responded to the annual conflict of interest form, and no conflict of interest was found.</p>	<p>Fight Against Corruption, pages 48-57</p>

# SURVEY OF READER'S OPINION

Responses collected from the 2020 Integrated Report Survey of Reader's Opinion will be used to improve and develop the next annual integrated report.

Thank you for your cooperation.



Please mark an X in the box ☐ and provide your feedback and opinion in the blank space.

**1 Please mark the option that describes you best.**

- |   |   |                                   |  |
|---|---|-----------------------------------|--|
| <input type="checkbox"/> Shareholder/Investor | <input type="checkbox"/> Customer                     | <input type="checkbox"/> Employee | <input type="checkbox"/> Community member living around Thailoil's operation |
| <input type="checkbox"/> Supplier             | <input type="checkbox"/> Government                   | <input type="checkbox"/> Academia | <input type="checkbox"/> Student   |
| <input type="checkbox"/> Media                | <input type="checkbox"/> Other (Please specify .....) |                                   |  |

**2 How did you receive or access the 2020 Integrated Report?**

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Shareholders' Annual General Meeting | <input type="checkbox"/> Seminar/Exhibition/Lecture   | <input type="checkbox"/> Thailoil employees |
| <input type="checkbox"/> Thailoil Website                     | <input type="checkbox"/> Other (Please specify .....) |   |

**3 What is your objective for reading the 2020 Integrated Report?**

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> To gain information about Thailoil.                          | <input type="checkbox"/> To support an investment decision. | <input type="checkbox"/> For research and education purposes. |
| <input type="checkbox"/> To prepare your own Sustainability and/or Integrated Report. | <input type="checkbox"/> Other (Please specify .....)       |   |

**4 Please rate your satisfaction with the format and presentation of the 2020 Integrated Report.**

- |   |                               |                                 |                              |                                      |
|---|-------------------------------|---------------------------------|------------------------------|--------------------------------------|
| Language that is clear and easy to understand | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| Presentation of images, graphs, and tables    | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| Report design                                 | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| Overall satisfaction with the report          | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |

**5 Please rate your interest in each chapter of the 2020 Integrated Report.**

- |  |                               |                                 |                              |                                       |
|--|-------------------------------|---------------------------------|------------------------------|---------------------------------------|
| Group Overview                           | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Business Model                           | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Stakeholders and Material Matters        | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Strategy Outlook                         | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Corporate Governance and Sustainability  | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Strategy: Towards Good Governance        | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Strategy: Towards Green Economy          | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Strategy: Towards Better Quality of Life | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Performance Summary                      | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| Awards and Recognitions                  | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |
| SDGs Progress                            | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Uninterested |

**6 Please rate the 2020 Integrated Report on its reliability and completeness.**

- |  |                               |                                 |                              |                                      |
|--|-------------------------------|---------------------------------|------------------------------|--------------------------------------|
| Your understanding of Thailoil's material issues   | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| The relevance of the reported sustainability performance with Thailoil's sustainability strategy | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| The appropriateness and reliability of the reported contents                                     | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |
| The reported contents address your questions and concerns  | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Improvement |

**7 Do you think that the 2020 Integrated Report covers all of Thailoil's material sustainability issues?**

- ☐ Yes ☐ No

If not, please specify the issues you think are missing and need to be addressed.

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**8 Please provide other comments and suggestions for the improvement of Thailoil's next annual integrated report.**

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Please address this survey to:

**Corporate Governance  
and Sustainability Department**

**Thai Oil Public Company Limited**

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