

EMPOWER HUMAN LIFE

Through Sustainability Management



SUSTAINABLE
VALUE
CREATION



VALUE
ENHANCEMENT



VALUE
PROTECTION





Vision

Empower 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



About This Report

Thai Oil Public Company Limited is committed to disclosing all material information on corporate sustainable development to our stakeholders with the utmost accuracy and transparency. In line with this commitment, we have been publishing annual corporate sustainability reports since 2011. This Sustainability Report is the 8th of its kind, and covers our economic, social, and environmental performance from 1st January 2018 to 31st December 2018.

Approach to Reporting

The 2018 Sustainability Report follows the International <IR> Framework of the International Integrating Reporting Council (IIRC), and covers sustainability issues selected through a materiality assessment process. This Report has been prepared in accordance with the GRI Standards: Core Option, with additional indicators for the Oil and Gas Sector Disclosure (OGSD). In line with the United Nations' direction in sustainable development, we have also included our progress in following the United Nations Global Compact 10 Principles and our contributions towards the UN Sustainable Development Goals (SDGs)

Scope of Reporting

The scope of reporting has been determined based on business relevance, readiness of comprehensive and accurate information, and level of impacts towards Thaioil's core businesses – that is, our businesses in oil refining, petrochemical production, power generation, transportation, and other businesses. The scope of reporting on occupational, health, and safety (OHS) performance and environmental performance covers Thai Oil Public Company Limited (TOP), Thai Lube Base Public Company Limited (TLB), Thai Paraxylene Company Limited (TPX), Thaioil Energy Services Company Limited (TES), Thaioil Power Company Limited (TP), LABIX Company Limited (LABIX), and TOP SPP Company Limited (TOPSPP). This year, we have also expanded our scope of reporting to include TOP Solvent Company Limited (TS) in reporting information on product stewardship. In total, this determined scope of reporting covers 97% of all our revenues.

- For information on performance of companies not included in the scope of this Report, please refer to the 2018 Annual Report or <https://investor-th.thaioilgroup.com/ar.html>
- To download an electronic version of the 2018 Sustainability Report, please visit:
https://www.thaioilgroup.com/home/media_ebook.aspx?id=273



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Message to Our Stakeholders



For over 57 years, Thaioil has been proudly fulfilling our mission to run our petroleum refinery business to strengthen Thailand's national energy security. In 2018, Thaioil's refinery capacity was 113% of nameplate capacity, and the business accumulated 389,344 million THB of sales revenue. Thaioil-produced fuels supporting 30% of Thailand's fuel demand.



Mr. Atikom Terbsiri

Chief Executive Officer and President
Thai Oil Public Company Limited

Thaioil recognizes that support from all stakeholder groups is crucial to business success, and has continued to invest in developing our operational efficiency through a management system that aspires for operational excellence. Through connecting the administration of different business groups, including both our main oil refinery business and other supporting businesses such as the petrochemicals and lubricants businesses, Thaioil's collaborative planning across business groups supports maximum operational efficiency.

In 2018, Thaioil and Subsidiaries implemented over 25 programs for increased energy efficiency in the production process, and these programs collectively reduced our energy consumption by 759,147 gigajoules. This resulted in reductions of direct greenhouse gas emissions by 43,207 tons of carbon dioxide equivalents per year. Thaioil and Subsidiaries are also committed to the research and development of environmentally friendly products to further reduce global greenhouse gas emissions. Meanwhile, the past year has seen the effectiveness of Thaioil's organizational safety management system reflected in our maintenance of zero lost time injury frequency rate (LTIFR) and continuous operation availability. Together, our performance in the aforementioned areas explain why Thaioil is not only placed as one of the leaders of the oil and gas industry in safety management system, but also accepted as one of the most effective refineries in the Asia Pacific region.

Thaioil has reviewed the 2019-2023 Sustainable Development Master Plan, which covers the environmental and social dimensions, as well as governance along supply chain, and has adjusted our business strategy to respond to the United Nations' Sustainable Development Goals (UN SDGs) with the ultimate goal to create sustainable business development alongside value creation for our society and the environment, all the while remaining aware of future contextual changes and upcoming challenges of the petroleum industry. To align with Thaioil's new vision and mission, which have been updated over the past year to **"Empower Human Life through Sustainable Energy and Chemicals"**, Thaioil have adjusted directions of investment portfolio according to the new business strategies as follows.

STRENGTHEN THE CORE

Thaioil will focus on increasing our competitive capabilities in the energy industry through implementation of the Clean Fuel Project (CFP), which will help increase the quality and production capacity of diesel and jet fuel to meet the increasing demand for diesel – an increase which came with the expansion of travel alongside the announcement of the International Maritime Organization's (IMO) new regulation to limit the sulfur in fuels for maritime vessels to no more than 0.5%. With the Clean Fuel Project's enabled capacity in producing low-sulfur fuels that meet Euro 5 standards, Thaioil expresses our commitment to product stewardship to decrease and prevent the potential social and environmental impacts of our products.

VALUE CHAIN ENHANCEMENT

This reflects Thaioil's recognition of the importance of extending our business to several petrochemical products such as solvents and specialty products. Currently, Thaioil has expanded our portfolio to include new product types and new business areas in the ASEAN region, including Myanmar and northern Vietnam. Through this business expansion, coupled with the opening of commercial operations and new distribution centers, our goal of becoming a chemical products distributor may be realized.

SEED THE OPTIONS

Thaioil also searches for new innovative business opportunities through investing in venture capital funds. We use corporate venture capital (CVC) as a tool for seeking new industries (Step Out) to expand the business (New S-Curve) for Thaioil and Subsidiaries. Thaioil targets 3 types of businesses, including

1. Manufacturing Technology to increase production and management capabilities,

2. Green and Human Technology, and

3. Hydrocarbon Disruption Technology to search for opportunities and investment directions according to future economic, social, and environmental trends.

To increase the efficiency of our business activities, Thaioil and Subsidiaries have initiated a project to bring digital transformation to support several processes, such as an information systems management that acts as an Integrated Platform where information from refinery operations may be connected systematically, applying the online system for use with the procurement process, increasing efficiency in customer service through the Jetty Scheduling System (JSS), and creating a centralized information center for commercial operations through the Commercial Excellence program. To increase the speed of operations and accuracy for all stakeholders and to support the digital implementation of various operations, Thaioil has organized Cyber Security measures and developed our human resources for readiness in technological advancements.

With the cooperation of our executives and employees from all levels to drive Thaioil towards sustainability, Thaioil has been listed as a Dow Jones Sustainability Indices (DJSI) member for the 6th consecutive year. This achievement serves as an award for our operational success, and has brought all of us immense pride.

Lastly, on behalf of Thaioil and Subsidiaries, I would like to thank all parties that have enabled Thaioil to continue our business activities and achieve sustainable business growth. I strongly believe that the genuine dedication and determination from every side to do business with consideration of environmental, economic, and social impacts will empower Thaioil to continue to sustainably grow alongside society.

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Group Overview

Thai Oil Public Company Limited

the largest petroleum refinery business in Thailand, has been operating for 57 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

Empower 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



In 2018, Thaioil and Subsidiaries heightened our corporate vision, mission, and strategy in the short-term, medium-term, and long-term to ensure that our strategy can support changing internal and external contexts. Our new vision is to **"empower human life through sustainable energy and chemicals"**, where we aim to promote organizational growth, create a leading level of return on investment, and reduce the volatility of profits by diversifying the business. Thaioil and Subsidiaries take into account the benefits of stakeholders, the creation of a sustainable economy, society and environment, and the creation of shared value to stakeholders through our new 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,"** which is the business strategy for years 2018-2030 (Strategic Direction 2030).

Under the new business strategy, Thaioil and Subsidiaries have also studied and analyzed future business directions, and have arranged our investment portfolio to respond to critical issues in the short-term, medium-term, and long-term. The 3 implementation strategies include:



Strengthen the Core

Strengthen the core business in order to focus on the energy business that Thaioil and Subsidiaries have expertise in, namely:

Oil refinery business :

Further strengthening the oil refinery and petrochemical production businesses, and becoming the leading refinery and petrochemical plant in the region, as well as supporting Thailand's energy stability.

Power generation business:

Supporting the power stability and security, and generating stable income for Thaioil and Subsidiaries.



Value Chain Enhancement

Enhance our value chain and extend our business from petroleum refinery to various chemical products with high value, including:

Petrochemical business:

Extending the value chain to downstream businesses.

Chemical distribution business:

Becoming the leading chemical distributor in Asia through increasing the variety of types of products and areas of doing business.

Specialty products :

Aligning with industry trends and responding to customer needs.

Marine transport business :

Strengthening the stability of transporting raw materials and products in Thaioil and Subsidiaries and PTT Group with competitive principal costs.



Seed the Options

Seek new business opportunities to seed options and open the chance for innovative businesses, including:

Environmentally friendly businesses:

Paving the way towards future bio businesses and follow with corporate sustainability strategy.

New businesses :

Increasing the new business portfolio from innovation through investing in venture capital funds, promoting innovation for commercialization, and investing in start-ups.

To ensure that our business strategy is successfully implemented, Thaioil and Subsidiaries have developed strategies to become a high-performance organization. We especially focus on human capital development and using innovation and technology to develop the overall capability of the company. We are prepared to develop core competencies in operational and project excellence, commercial excellence, value chain & logistics excellence, leadership, agility, innovation, and digitalization to achieve our goals and targets.

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.
49.10%

Refinery Production in 2018
Approximately
310,000 BBL
per day

113% of nameplate
capacity at
275,000 BBL
per day

Domestic Distribution
30% of total domestic
finished oil demand

Location of operations
Thailand, Vietnam, and Singapore

VALUE CHAIN OF THAI OIL

Fleet Expansion Project
(feasibility study)

Jetty 7 & 8
Expansion Project
(Continued)

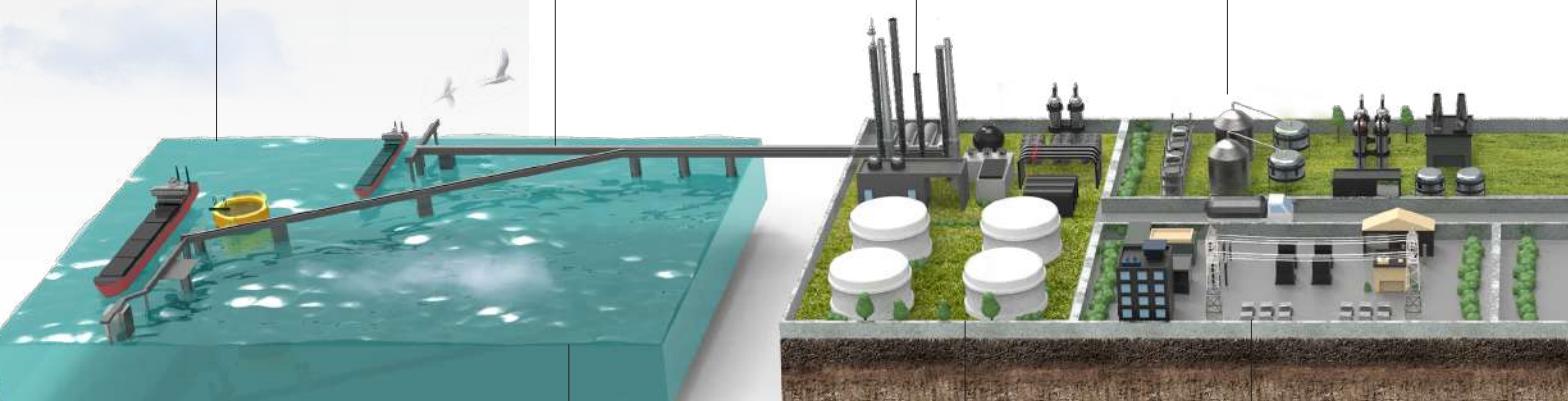
Clean Fuel Project: CFP
and New Crude Tank Project
(Continued)

06

ETHANOL

This business encourages
the production of ethanol
and renewable energy
through joint venture with
two ethanol plants.

600,000 liter
per day



01

TRANSPORTATION

This business supports marketing, efficiency improvement and potential opportunities including international marine transportation of petroleum and petrochemical products. Our fleet comprises of 10 vessels, transporting crude oil and petrochemical products, ranging from large crude carriers, medium-sized vessels to small-sized Tankers. Thai Oil also invests in petroleum product pipeline business.

Ship Transport Capacity

1,103,850
million liter per year

Pipeline Business Capacity

26,000
million liter per year

02

OIL REFINERY

The oil refinery is our core business which has been operated for more than 57 years.

Refining Capacity
275,000
barrel per day

03

POWER AND STEAM GENERATION

Co-generation power plant ensures the power stability of Thai Oil operations. The power plant utilizes natural gas as the resource for the production. The produced electricity and steam is mainly used internally.

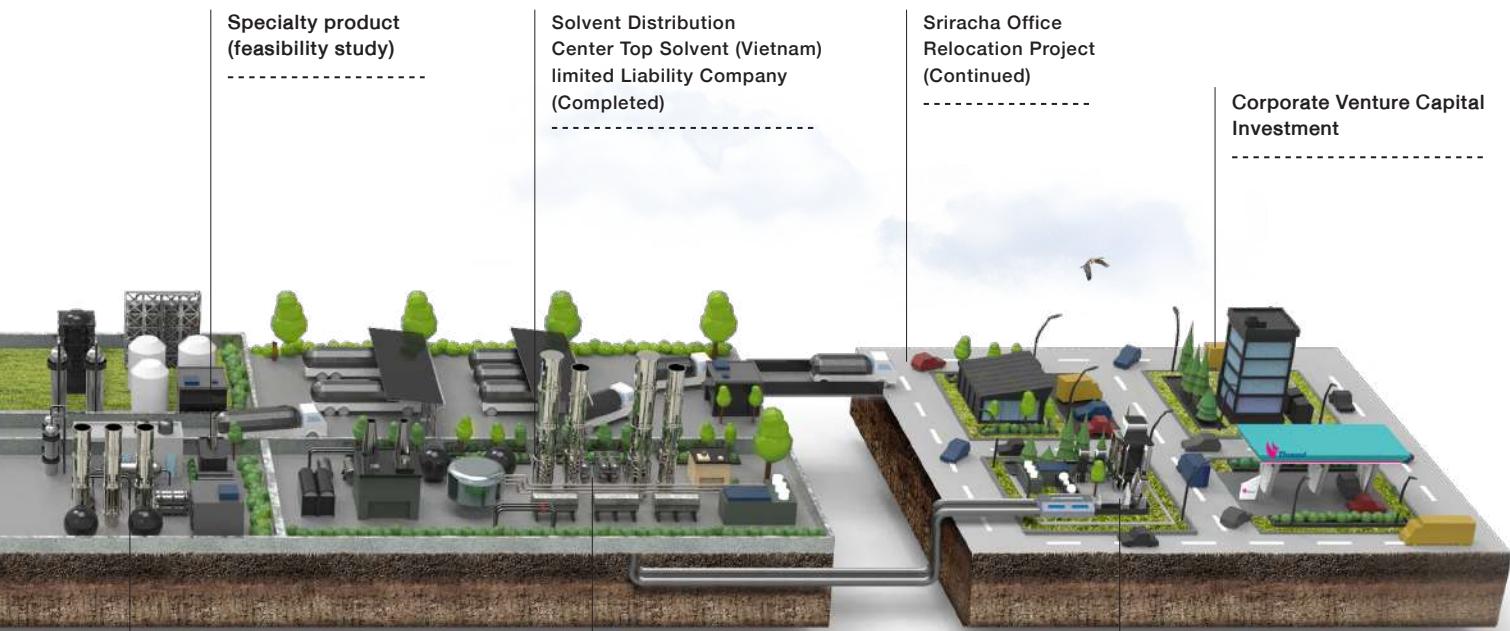
Power Generating Capacity

357
Megawatt

Steam Generating Capacity

713
tons per hour

Thai Oil Public Company Limited operates refinery business with the use of highly efficient and state - of - the - art production processes in order to produce and supply finished petroleum products to mainly the domestic market. The business of Thai Oil extends its value chain from the petroleum refinery to both upstream and downstream.



04

PETROCHEMICAL & LUBE BASE

This business utilizes by-products from our petroleum refinery and turn them into commercialized products such as aromatics, lube, bitumen, Treated Distillate Aromatic Extract (TDAE), and Linear Alkyl Benzene(LAB), adding values to our production line.

Aromatics

838,000 tons per year

Lube Base Oil

684,535 tons per year

LAB (Linear Alkyl Benzene)

120,000 tons per day

05

SOLVENT

This business produces solvent from Thai Oil petroleum refinery's by-products through collaboration with a subsidiary, and distributes within Thailand and to Vietnam.

Solvent

141,000 tons per year

07

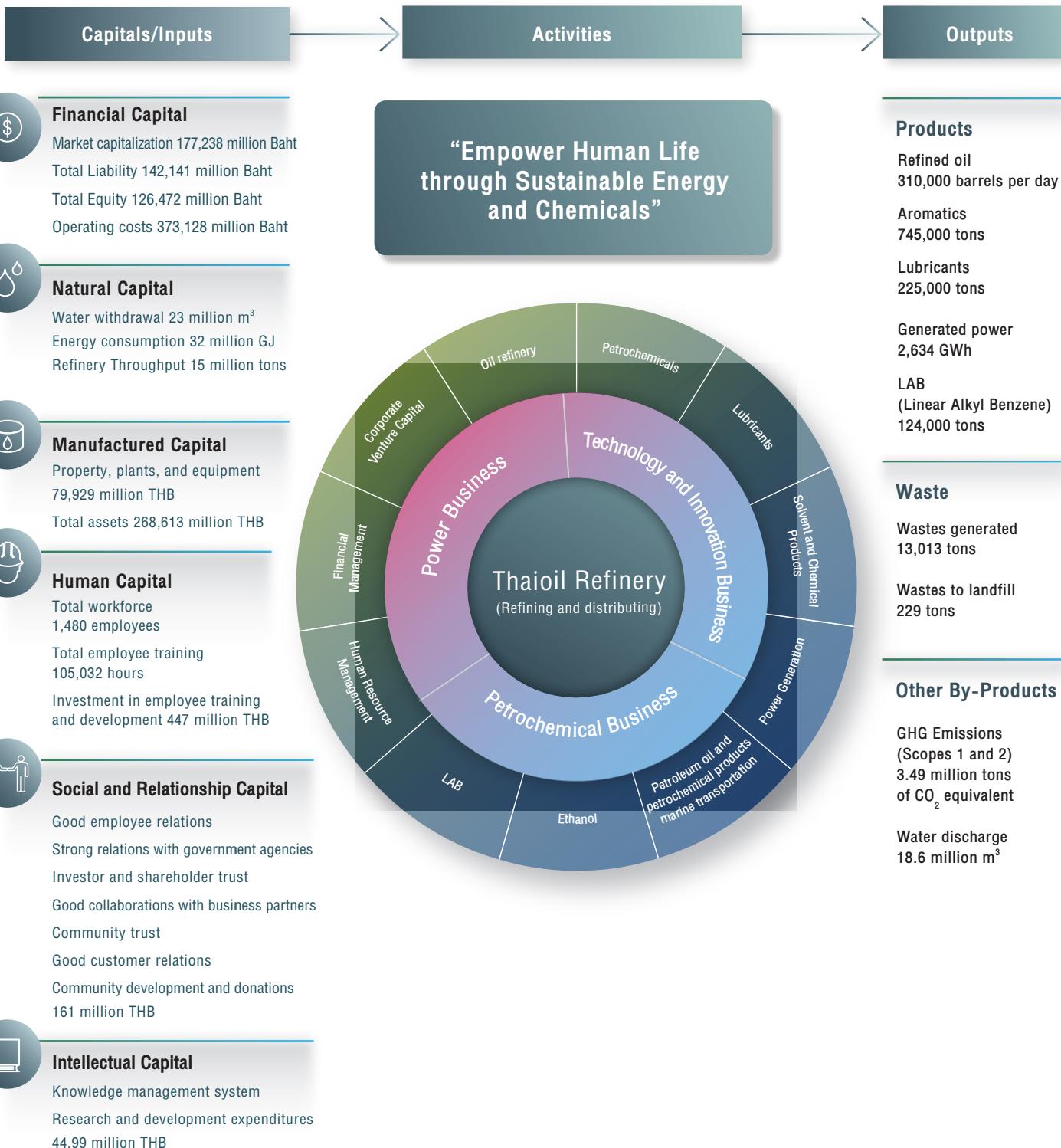
OTHER BUSINESSES

Supporting businesses such as

- Human resource management
- Treasury management
- Social enterprise
- Digital and Information
- Engineering solution service

Business Model

Thaioil's 2018 business strategy outlines our path towards sustainable development, which consists of strengthening our core businesses in energy, enhancing our value chain through expanding our petrochemicals and specialty products businesses, and increasing our competitive capabilities with technology and innovation. Integrated within this strategy is our dedication to sustainably create shared value for our stakeholders in three strategic priorities – value protection, value enhancement, and sustainable value creation. These three priorities will lead us towards good revenues while also creating value for communities, society, and the environment.



Thaioil's business activities rely on financial inputs as well as non-financial inputs, such as our assets, natural resources, property, plants and equipment, human capital, support from stakeholders, license to operate, brand value, technology, and information systems. All these inputs and capitals are managed through Thaioil's business activities to create value for the business and our stakeholders. While outputs such as products, services, and wastes released are outputs directly related to our business, our activities also create outputs that reflect shared value for communities, society, and the environment. At the same time, some of the outcomes created in our activities are key factors to moving our business forward and securing the future creation of value. For example, current investments in developing the skills and capabilities of our employees in technology and innovation can lead to future solutions for more production efficiency.

Outcomes to Thaioil

Outcomes to Stakeholders

Created and Shared Value by the Organization

Value Protection

Value Enhancement

Sustainable Value Creation



Financial Capital

- Revenues 389,344 million Baht
- EBITDA 20,239 million Baht
- Net profits 10,149 million Baht

- Earnings per share 4.97 THB per share
- 3.15% Increase in daily closing stock price to 86.88 Baht per share

- 1,983 Million Baht to government in taxes



Natural Capital

- Sustain 30% of freshwater consumption through desalination
- 172 Million Baht saving from energy efficiency improvement initiatives

- Greenhouse gas emissions from production processes through energy efficiency improvement initiatives reduced up to 759,147 GJ or 43,207 tons of carbon dioxide equivalent

- Around 700 thousand tons of carbon dioxide equivalent as a result of low-carbon product consumption in end use
- 0.69% reduction in water discharge
- 1.79% Reductions in waste to landfill to 229 tons



Manufactured Capital

- Operational availability to enhance 113% of name plate refining capacity
- New engineering office building and new warehouse
- Solvent distribution center in Vietnam

- Long-term benefits towards investors through investments in purchases, construction, and maintenance of property, plants, and other equipment, which is part of Thaioil's project activities



Human Capital

- Return on Employee Development Investment
- Zero Loss Time Injury Frequency Rate (LTIFR) for employee
- Zero Total Recordable Injury Rate (TRIR) for employee
- Employee turnover rate decrease from 3.26% to 2.91%

- 71 Average hours of training per employee
- 597 Training programs for employees
- 3,580 Million Baht of employee welfare



Social and Relationship Capital

- Zero cases of human rights complaints
- Increase in community engagement to 97.3% from 93.5%
- Maintain customer engagement at 96%
- Supplier satisfaction increased to 96%

- 721 employees who volunteered a total of 8,376 hours to work with communities
- 55,304 persons benefited from the use of the Health and Learning Center
- 6,154 persons benefited from participating in Thaioil's Dental Clinic Project



Intellectual Capital

- 2 Registered patents from gained knowledge on managing oil refinery efficiency
- Earnings from commercialized innovation 484 million Baht
- Equipment and management systems
- ISO certificates
- 94,454 Million Baht of revenues from low-carbon products
- 360 Knowledge sharing from Knowledge Management System

Our Material Issues and Stakeholders

Materiality Assessment and Stakeholder Relations

Thaioil reports material sustainability issues to our organization and stakeholders in accordance with the GRI (Global Reporting Initiative) Standards. The process presented in this Sustainability Report has also been externally verified.

Steps in the Materiality Assessment of Sustainability Issues



Step 1: Identification of material issues

In 2018, Thaioil identified material sustainability issues 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 direction, and our corporate risk profile, while *external drivers* reflect issues of interest communicated by the Dow Jones Sustainability Indices (DJSI), the United States Sustainable Development Goals (SDGs), and other global mega-trends. Upon compiling these internal and external drivers, we then integrate identified sustainability issues with results from our stakeholder engagement.

Thaioil continued to collect stakeholder concerns and issues of interest through the stakeholder engagement approach that is inclusive and comprehensive to all of our 6 key stakeholder groups as last year practice.

Stakeholder Engagement							
Frequency	Engagement Approach	Shareholders/ Creditors/ Financial Institutions	Customers	Suppliers/ Contractors	Employees	Community/ Society	Government and related public agencies
Annually	Annual Meeting	•		•	•		
	Meeting to voice concerns	•					
	Corporate performance exhibition	•					
	Company site visit	•	•	•			
	Engagement survey	•	•	•	•	•	•
	Annual reporting	•	•	•	•	•	•
Quarterly	Corporate performance announcement	•					•
	“CEO Update” Forum				•		
Bi-Monthly	Pamphlets					•	
Monthly	Meetings of representatives, such as meetings with employee welfare representatives or meetings with community leaders		•		•	•	•
	Magazines				•		
	Electronic news	•	•		•		•
Always	Engagement activities	•	•	•	•	•	•
	Grievance mechanisms	•	•	•	•	•	•
	• Hotline	•	•		•	•	
	• Email	•	•	•	•	•	•
	• Specific Functions	•	•	•	•	•	•



Step 2: Prioritization of material issues

Identified material sustainability issues of 2018 were then prioritized by high-level management from the Strategic Planning and Organizational Risk Departments. For each material sustainability issue, the changing business contexts were considered in light of two dimensions, ranked on a scale of 1- 5 :

1. Potential impacts on the economic, social, and environmental performance, including corporate governance-related impacts (impacts considered were impacts prior to mitigation measures) and the likelihood of these impacts being material towards the business performance of Thaioil and Subsidiaries, and
2. Stakeholders' issues of concerns and impacts that such issues may create towards stakeholders' decision-making.



Step 3: Validation of material issues

Sustainable Development function was the first line to review and validate the result of prioritized material issues then presented to the Sustainable Development Committee attended by management executives and chaired by the CEO for a final review and endorsement of the prioritized material sustainability issues. Additionally, an external 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 the environment performance were all done with accuracy and completeness.



Results of Materiality Assessment of Sustainability Issues 2018

Influence on Stakeholder Assessments and Decisions on Thaioil



Remarks:

- In 2018, there was no restatement of previous year performance
- In 2018, the scope of reporting was changed to include information related to the products of TOP Solvent Company Limited.



Material Sustainability Issues for Value Protection

Value Protection is realized through having the ability to operate in accordance with business principles, ethics, and regulations. It also has to do with having systems and processes that allow Thaioil to understand and assess economic, social, and environmental risks related to the Company's business and value chain in order to protect our value, secure the social license to operate, and ultimately maintain business continuity.



Material Sustainability Issues for Value Enhancement

Value Enhancement is realized through supporting and improving business practices and activities along the value chain to maximize effectiveness. Thaioil can increase our business competitiveness and cost efficiency. For example, continuous improving energy efficiency can lead to a reduction in required resources and then saving the costs. Also reducing pollution or emissions towards our society and environment while adding revenues to Thaioil.



Material Sustainability Issues for Sustainable Value Creation

Sustainable Value Creation is realized through building the Company's long-term capacity with technology and innovation, employee attraction, retention and development, and seeking for opportunity to research and develop more environmentally-friendly products with added value to society with mutual growth in the long run.

From the 2018 materiality assessment, it was found that there were internal and external drivers that together created impacts on stakeholder expectations. Thaioil's internal business changes in developing the Clean Fuel Project (CFP) especially has affected stakeholder expectations. Nonetheless, most of these expectations have to do with business continuity and Thaioil's ability to continuously create value without facing business disruption for our stakeholders despite the context of changes. Thus, the level of importance for these sustainability issues mostly remain the same. There were only changes for the issues of human rights and corporate citizenship and philanthropy, as our communities have come to expect more from us as our area of operation has expanded. The issue of innovation has also increased in importance, reflecting our new vision and business strategy. Meanwhile, the only new material sustainability issue that was not identified last year is the issue of low-carbon products. Thaioil identified this issue as a sector-wide issue for the petroleum and petrochemical industry, and overall a sustainable development goal for the global community.

Thaioil has thus developed a strategy to respond to the material sustainability issues based on the nature of value that is relevant. The issues are divided into three groups, including:

Details on the analysis of internal and external drivers in 2018 are presented as follows:

Results of Materiality Assessment of Sustainability Issues					
Changed Contexts, Challenges, and Opportunities	Stakeholder Expectations	Related Material Sustainability Issue	Level of Importance	Thaioil Response	Group of Issues
Increasingly stringent environmental regulations	<p>Investors and Shareholders:</p> <ul style="list-style-type: none"> Operating in compliance with regulations and without business disruptions or profit loss <p>Government and Relevant Public Agencies:</p> <ul style="list-style-type: none"> Regular communications Regular engagements with government-organized activities and projects 	Environmental Management System	High	QSHE Management pp. 32-39	
Risks from climate change, such as drought, floods etc.	<p>Investors and Shareholders:</p> <ul style="list-style-type: none"> Operating in compliance with regulations and without business disruptions or profit loss <p>Communities:</p> <ul style="list-style-type: none"> Environmental concerns 	<p>Water-Related Risks</p> <p>Climate Change</p>	<p>Medium</p> <p>Medium</p>	<p>Climate Change Risk pp. 40-43</p> <p>Climate Change Risk pp. 40-43</p>	
Clean Fuel Project (CFP) developments	<p>Investors and Shareholders:</p> <ul style="list-style-type: none"> Profits and dividends after CFP Transparency Communicating information to business analysts to forecast business profits Regular communications and timely responses <p>Suppliers:</p> <ul style="list-style-type: none"> Transparent and fair procurement practices <p>Employees:</p> <ul style="list-style-type: none"> Occupational health and safety <p>Communities:</p> <ul style="list-style-type: none"> Environmental impacts and issues resulting from business expansion and CFP Receiving accurate information with regards to Thaioil's operations 	<p>Process Safety and Integrity</p> <p>Fight Against Corruption</p> <p>Occupational Health and Safety</p> <p>Environmental Management System</p> <p>Human Rights</p> <p>Value Chain Management</p>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>High</p>	<p>QSHE Management pp. 32-39</p> <p>Fight Against Corruption pp. 20-25</p> <p>QSHE Management pp. 32-39</p> <p>QSHE Management pp. 32-39</p> <p>Human Rights pp. 26-31</p> <p>Value Chain Management pp. 52-57</p>	 <p>Value Protection</p>
Thaioil's new business strategy and external movements towards a low-carbon economy	<p>Investors and Shareholders:</p> <ul style="list-style-type: none"> Continuous business growth without business disruption <p>Employees:</p> <ul style="list-style-type: none"> Job security and career development <p>Customers:</p> <ul style="list-style-type: none"> Product quality and mutual growth <p>Communities:</p> <ul style="list-style-type: none"> Regular engagement through social development programs and activities. 	<p>Operational Eco-Efficiency</p> <p>Value Chain Management</p> <p>Human Capital</p> <p>Innovation</p> <p>Low-Carbon Products</p> <p>Corporate Citizenship and Philanthropy</p>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>High</p>	<p>Operational Eco-Efficiency pp. 46-51</p> <p>Value Chain Management pp. 52-57</p> <p>Human and Organization Development pp. 60-71</p> <p>Innovation Management pp. 72-77</p> <p>Product Stewardship pp. 78-79</p> <p>Our Society and Communities pp. 80-89</p>	 <p>Value Enhancement</p>
					 <p>Sustainable Value Creation</p>

Corporate Governance and Sustainability

Board Structure

In 2018, there were 14 members in the Board of Directors, including:

Executive Director
1 person



Non-Executive Directors
13 persons



7 Dependent Directors



6 Independent Directors

It is required that at least one third and no less than three of our Directors are independent. All of our Directors must have qualifications that completely comply with regulatory requirements and must not violate the requirements of the Public Limited Companies Act, B.E. 2535. Additionally, in order to ensure that all Directors will most effectively devote their time to guaranteeing the success of Thaioil, we have established a policy to prohibit any of our Directors from being a Director for more than 5 publicly listed companies.

Thaioil has developed a Board Skill Matrix according to our Board Diversity Policy that requires diversity of skills, professions, and expertise, especially with regards to



Industry



Finance and accounting



Law



Social science



Engineering



Business administration and management



Political science



Science



Economics

This diversity is designed to support the success of our business strategy and Thaioil also nominates the Directors without discrimination on the basis of gender, nationality, or religion.

Corporate Governance and Code of Conduct Manual

Thaioil has developed a Corporate Governance and Code of Conduct Manual to guide our Board of Directors, executives, and employees in applying our principles 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.



Roles and Responsibilities

Our Board of Directors and executives have always prioritized good corporate governance. In fact, a part of Thaioil's mission is to "aspire towards good corporate governance and uphold principles of corporate social responsibility". The Board has appointed 4 Committees to oversee specific responsibilities and regularly report performance and progress to the Board. All Directors in these Committees must have qualifications that satisfy the requirements of the Securities and Exchange Commission of Thailand (SEC) and the Stock Exchange of Thailand (SET).



Audit Committee

The Audit Committee provides oversight of Thaioil's operations, financial reporting process, system of internal controls, connected transactions, and appointment of the external auditor.



Nomination and Remuneration Committee

The Nomination and Remuneration Committee evaluates the performance of the Chief Executive Officer and the President, develops the criteria and process for performance evaluation, selects qualified director(s) to take position in the Board of Directors and the Committees, and oversees the remuneration of Board Directors.



Corporate Governance Committee

The Corporate Governance Committee defines, develops, and improves upon Thaioil policies and practices such that our operations maintain compliance with regulations and align with good practices. The Committee also supervises and monitors Thaioil operations to promote the implementation of designated policies on good governance, anti-corruption, business ethics, as well as sustainable development and corporate social responsibility.



Risk Management Committee

The Risk Management Committee reviews important projects before its presentation to the Board of Directors, determines Thaioil's risks, and reviews risk management policies, plans, and accepted risk levels.

The names and additional details of the members of the Board of Directors can be followed in the 2018 Annual Report, or at <https://investor-th.thaioilgroup.com/ar.html>

Sustainable Development Structure

Each material sustainability issue of Thaioil and Subsidiaries is driven by specific designated working group or sub-committee. Then the issues will be monitored as an integrated oversight under responsibility of Sustainable Development function, reporting overall performance quarterly to The Sustainable Development Committee, reporting quarterly to the Corporate Governance Committee, and annually to the Board of Directors. However, if there should be a pressing material issue that requires immediate attention, the Corporate Governance Committee will communicate to the Board of Directors immediately.

Sustainable Development Committee

consists of the Chief Executive Officer and all Executive Vice Presidents, 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 the integration of sustainability strategy into business strategy with short-term and long-term plans
- 3 Support relevant functions in the identification and assessment of risks related to the environment, society, and governance (ESG), as well as the development of action plans
- 4 Provide consultation and the necessary resources and staff, and to provide suggestion for decision-making on material issues
- 5 Promote employee awareness of sustainability issues and an organizational culture that embodies sustainability.

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 the analysis and assessment of risk levels, and the development of risk mitigation measures
3. Review, monitor, and oversee risk management performance, and regularly reports results and progress to the Risk Management Committee (RMC)
4. Provide feedback on plans, processes, and guidelines, and provides necessary resources.

Research & Development Steering Committee

1. Determine research and development direction and develops a strategic masterplan, with relevant targets and key performance indicators, to guide research and development efforts
2. Support the commercialization from results of research and development
3. Monitor progress and evaluate success
4. Provide research budget, manpower, equipment, facilities, and promote collaborations with other research institutes.

Energy Management & 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, monitors present energy performance, and evaluates performance in comparison to targets 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 and present results to lead the revision and improvement of policies and processes.

Energy Management & Loss Improvement Internal Energy Audit Team

1. Coordinate with the Energy Management & Loss Improvement Working Team to operate in compliance with regulatory requirements
2. Audit supporting documents, evidence, and performance results of the Energy Management & Loss Improvement Working Team to ensure that they satisfy regulatory requirements
3. Develop conclusive reports on the internal audit to submit to the Energy Management & Loss Improvement Working Team.

<p>Waste Management Taskforce</p> <ol style="list-style-type: none"> 1. Determine waste management approach and develop waste management plans 2. Drive appropriate waste management systems and tools 3. Monitor and reports progress such that they are in line with corporate targets 4. Review processes and shares lessons learnt. 	<p>Environmental and Community Relation Committee</p> <ol style="list-style-type: none"> 1. Provide 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, provides recommendations for improvements, and reports performance in line with Thaioil's principles on corporate social responsibility or international standards
<p>Ethical Cultivation & Communication Working Team</p> <ol style="list-style-type: none"> 1. Plan and strategize communications and ethical cultivation in the organization 2. Drive the implementation of developed plans and employee engagement in activities as planned 3. Communicate information on ethical cultivation in the organization. 	<p>Human Rights Working Team</p> <ol style="list-style-type: none"> 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 company interpretation of human rights 3. Monitor performance and progress, and assess potential of human rights risks relevant to the organization and regulatory context, and then develop mitigation measures 4. Report results of improvements taken on conflicts, issues, or risks related to human rights to executive-level of corporate human resource management.
<p>Compliance Working Team</p> <ol style="list-style-type: none"> 1. Manage, promote, and support the implementation of the Corporate Compliance Management System 2. Review the accuracy and relevance of the interpretation of new government-issued regulations, notices, standards, requirements, and commands to ensure that relevant functions can carry out implementation accordingly 3. Monitor performance and progress, and assess the likelihood of impacts and risks, and develop mitigation measures to reduce risk levels 4. Review and approve action plans, and provide feedback, recommendations, and support in developing appropriate mitigation measures 5. Report performance to executive-level meetings and the Audit Committee. 	<p>Occupational Health & Safety Committee</p> <ol style="list-style-type: none"> 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 monitors, reports, and evaluate performance 4. Conduct audits of occupational health and safety at operation areas and inspects statistics related to incidents in the area of operations at least once every month.



Climate change risk



QSHE Management



Human Rights



Fight against
corruption





"To protect business value as one of the main contributors of national energy security, and to respond to stakeholders' demands and expectations, Thaioil must strive for sustainable development by upholding principles of good corporate governance, exhibiting business ethics in all its activities, maintaining effective management of quality, security, occupational health and safety, environment, and efficient energy consumption to demonstrate corporate responsibility towards the environment and society, strictly comply with laws and regulations, and foster a sense of just and fair business practices in relation to the license to operate."

Mr. Bandhit Thamprajamchit

Senior Executive Vice President-Refinery and Petrochemical, taking a position of Executive Vice President-Operational Excellence (Act.)
Thai Oil Public Company Limited

VALUE PROTECTION

Value Protection strategy focuses on maintaining the compliance of systems and processes with business codes of conduct, laws and regulations, business ethics, and on managing risks and crises involving environmental, social, and governance issues. Through compliance and robust risk and crisis management systems, Thaioil and Subsidiaries ensure that all business activities across the value chain are transparent in every part of the process, and do not create adverse impacts to society and the environment. This strategy also serves to protect business value and build social trust such that the business may continue to operate sustainably.



0 case

of non-compliance with laws and regulations, as well as corruption and fraud incidents

100 %

of operation units undertaken human rights risk assessment

100 %

of new suppliers responded a self-declare of Environmental, Social, Governance performance

0.26 case

per million workhours of all workers for Total Recordable Injury Rate (TRIR), better than the target

100 %

of all significant capital projects undergone Public Participation.

Fight against Corruption

Challenges, Risks and Impacts

One of the main factors that has allowed Thaioil to maintain its leadership position as the largest petroleum refinery operator in Thailand for the past 57 years despite waves of economic and political turmoil, both in our country and in the global sphere, has been our unwavering commitment towards good corporate governance grounded in honesty, transparency, clarity, and a strong spirit of anti-corruption. Supporting the realization of this commitment are our goals to gain and secure the confidence, trust, and acceptance of all our stakeholders, as well as demonstrate our responsibility towards our society and environment, in order to ultimately achieve sustainable development.

Corruption may occur at any place or time. While each case may vary in type and severity, the general issue of corruption continues to be a nationwide challenge that has stood in the way of business, economic, and social development in Thailand. Thus, our Board of Directors and executives have placed heavy emphasis on the importance of complying with all principles of good corporate governance and ethical business conduct, as well as taking our own actions to fight against corruption. The Anti-Corruption Policy is strictly enforced throughout all our operations with the hopes that a culture of transparency may be fostered. Systems and processes have been put in place to ensure that information is accurately, timely, and justifiably disclosed. These established systems and processes, including their implementation, are also regularly reviewed for effectiveness in responding to this challenge – specifically their ease of access, clarity, fairness, timeliness, alignment with strategic, regulatory and contextual changes, and effectiveness – and necessary improvements and possible gaps that may lead to corruption.

Commitment

Thaioil is committed to operating our business activities 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 the principles of good corporate governance and ethical business conduct. We have referred to the internationally accepted OECD (Organization for Economic Co-Operation and Development) Principles of Corporate Governance and SEC (Securities and Exchange Commission) and SET (Stock Exchange of Thailand) guidelines to guide our practices. Thaioil's Corporate Governance and Code of Conduct Manual was published and distributed to Directors, executives, and all employees for their ease of accessing, understanding, and implementing all

principles in their daily duties and responsibilities. Additionally, Thaioil has also publically 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.

Thaioil's Board of Directors and executives recognize the importance of securing good corporate governance and fighting against corruption. To meet this challenge, they have established and disclosed Thaioil's Anti-Corruption Policy, alongside roles, responsibilities, guidelines, action plans, and measures to fight against corruption, with a clearly declared requirement that

• •

The Board of Directors, executives, and employees of Thaioil must not take part in nor accept any act of corruption of any form in any circumstance. This statement applies to all of Thaioil's businesses in every country and every working function. Thaioil has in place guidelines, action plans, roles and responsibilities, as well as regular monitoring and reviewing of the Anti-Corruption Policy to ensure that it is always relevant and can respond to business and regulatory changes.

The Board of Directors and executives have also established guidelines to support anti-corruption measures and ethical business conduct, such as the Code of Conduct regarding conflicts of interest and the giving and acceptance of presents, assets, or other benefits listed in the Corporate Governance and Code of Conduct Manual. This Manual also includes the Anti-Corruption Policy discussed here.

Management Approach

To honor our commitment to operate our business activities with good corporate governance practices grounded in fairness, integrity, transparency, and accountability, Thaioil has developed a list of organizational values named **POSITIVE** for 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. To develop frameworks and mechanisms that can support good corporate governance practices in our operations, we have referred to international best practices. The result of our efforts is the **REACT+E** framework, which stands for:

Responsibility



Responsibility for performing duties with due competence and adequate efficiency

Equitable Treatment



Fair treatment of all stakeholders

Accountability



Accountability for one's own decision-making and acts, as well as those of others under one's auspices

Creation of Long Term Value



Corporate vision for long-term value creation

Transparency



Transparency in conducting business, openness to scrutiny, and transparent disclosure of corporate information to related parties

Ethics



Ethically undertaking business operation, marked by a code of conduct

Performance Results from Management of Corporate Governance and Fight against Corruption

In 2018, Thaioil has organized the following activities to promote the awareness and understanding of principles of corporate governance and ethical business conduct:

Promoting REACT+E and POSITIVE

Thaioil has prepared itself to respond to future regulatory changes, especially with regards to the fight against corruption. 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 the “Honoring Employees with Ethical Conduct” Activity. These employees are selected by our executives and through a criteria based on our **POSITIVE** values. The **POSITIVE** value that most directly relates to corporate governance and ethical business conduct is “I” – **Integrity**, which reflects the importance of starting with one's own self to create positive impact in the world. Meanwhile, our “TOP” value represents the professional collaboration and a deep sense of loyalty towards the organization that can lead to transparency and sustainability. Selected employees earn the title of “Palung Akanee Honorees”, a title which represents admiration and respect for these “model employees” who have “behavior that is honest, transparent, grounded in ethical conduct, and fair”. We believe that honoring these employees can serve as a way to encourage other employees to act similarly with ethical conduct. Through inspiring one employee at a time, we believe we may strengthen corporate governance and ethical business conduct in our company culture.



REACT+E

POSITIVE

- Professionalism
- Integrity
- Ownership
- Teamwork

Thaioil has developed a series of short skits called “Integrity the Series”. Through this series, 6 stories of the Palung Akanee employees who have demonstrated integrity were adopted to inspire and instill a culture of honesty, integrity, and fairness in our employees.

Fight against Corruption

To demonstrate our commitment to fight against corruption, Thaioil has joined as a member of the United Nations Global Compact (UNGC). We have applied the 10 UNGC Principles that promote proper management of the issues of human rights, labour, environment, and anti-corruption in our operations. Additionally, to gather and learn from others, as well as exchange lessons learnt, experiences, and good practices to fight against corruption, Thaioil has also joined the Partnership against Corruption for Thailand (PACT

Networking) which was formed under the leadership of the Thaipat Institute.

Thaioil's membership as a Certified Company of Thailand's Private Sector Collective Action Coalition against Corruption, or the CAC, has also been extended this year. The CAC was established and continues to be supported by the government and the Office of the National Anti-Corruption Commission (NACC), and our participation in this program has contributed to significant advancements in increasing

our own practices in transparency and corporate governance, as well as reducing the regulatory risks we may be exposed to as a result of the newly established 2018 Anti-Corruption Act (the Act Supplementing the Constitution Relating to the Prevention and Suppression of Corruption, B.E. 2561). Furthermore, our membership and active participation in the CAC demonstrates our commitment to doing our business transparently and constantly looking for ways to improve and strengthen our contributions towards the fight against corruption.

Sharing and promoting corporate governance and anti-corruption policies inside and outside of our businesses

In 2018, Thaioil hosted the 2018 PTT Group CG Day. We chose the "Born to be Real" theme to bring to our attendees' minds the idea of PTT Group's core identity as an organization embodying the ideals of CG 4.0, in line with Thailand's national development strategy. This CG 4.0 ideal consists of 4 main principles – that is, sufficiency, discipline, integrity, and volunteerism – and their application in the context of a digital world. During the event, we held 3 different activities. The first was an exhibition of good corporate governance practices, followed by a panelist discussion on the question, "When the world moves with technology, how should CG move forward?", with the panelists being the highest executives of each Company. Finally, the last activity was a short skit called "No, Thank You" presented by employees of PTT Group. The skit discussed issues of corruption and demonstrated the use of good corporate governance principles in solving the issue.



Mr. Atikom Terbsiri

President and Chief Executive Officer,
Thai Oil Public Company Limited

Panelist discussion on "When the world moves with technology, how should CG move forward?"



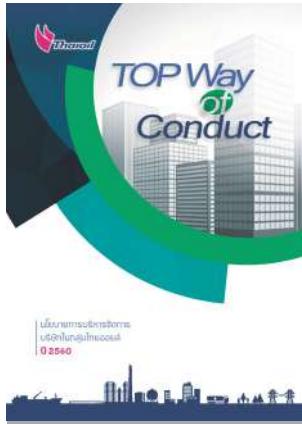
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"When we work, we often find that good processes can be linked to good outcomes. However, sometimes we may find that the target cannot be achieved because of too retard and complex of work processes, and leading to the use of "short-cuts" and misconducts that eventually result in bad outcomes. With this reason, Thaioil make use of information technology to increase efficiency and to speed up these processes. However, the selection of technology should rely on accuracy of data, timeliness, and highly efficiency in order to ultimately realize our ideal of good corporate governance through process and result in the desired outcomes."

Thaioil organized the CG KM Together We Share activity under the theme “INTEGRITY in using data at work”. We invited Dr. Sak Segkhoonthod, Chief of the Digital Government Development Agency (Public Organization) (DGA) to give a sharing on the importance of integrity and using data to create value for Thaioil. This event was attended by over 50 employees of Thaioil and Subsidiaries, and concluded with a session of knowledge sharing.

Thaioil developed the TOP Group Compliance System and established the Compliance Policy.

Thaioil reviewed and included the Corporate Governance Policy, Anti-Corruption Policy, and Whistle-Blowing Policy and Procedure as part of the TOP Way of Conduct to drive standardization of performance in corporate governance throughout all our businesses.



Thaioil communicated the No Gift Policy to all employees through internal channels such as our website, the corporate e-newspaper, the Akanee magazine, and other signs 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.



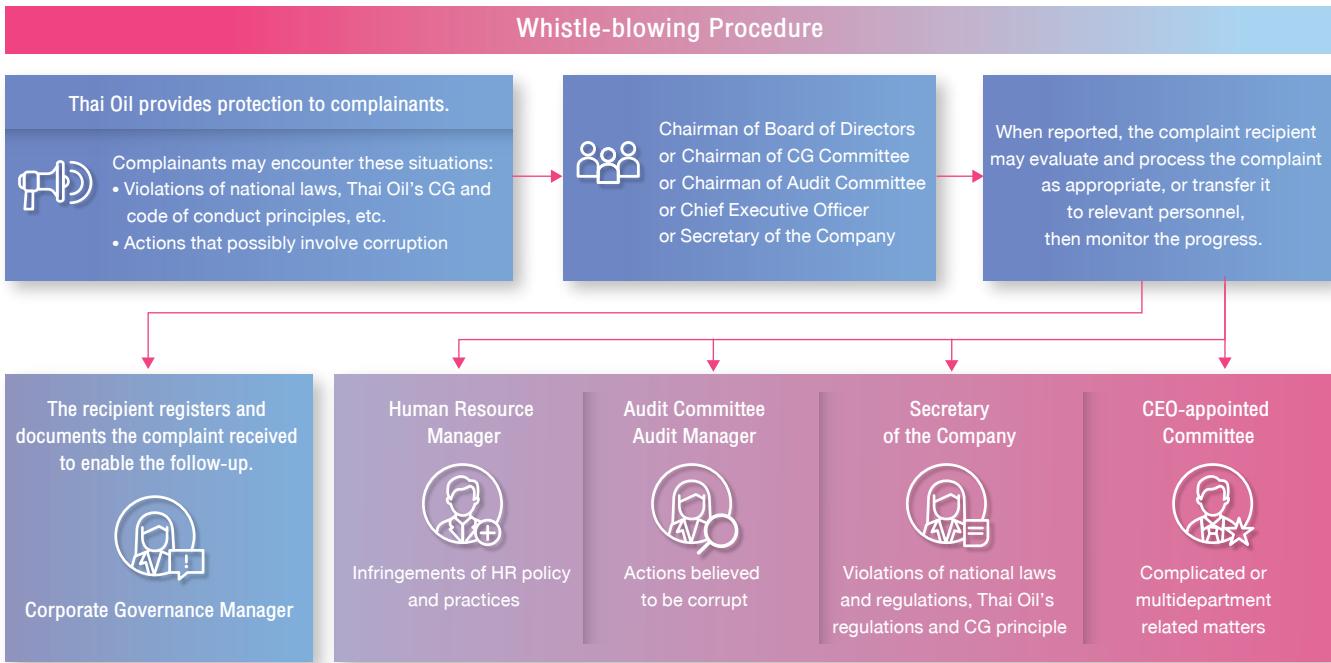
Thaioil developed the Supplier Code of Conduct to establish a mutual understanding between Thaioil and Subsidiaries and our suppliers with regards to sustainably operating our business activities. We used various means and activities, such as the PTT Group CG Day, to communicate our Corporate Governance Policy, Anti-Corruption Policy, and other practices to our suppliers. Our aim is to ensure that all of our suppliers are able to refer to the principles and practices that we use to achieve good corporate governance, and are ultimately able to apply them to improve their own performance.

Thaioil invited all suppliers identified in the target group to attend the CAC SME Executive Briefing (CAC SME) event, which was organized by the Thai Institute of Directors (IOD) to promote measures against bribery practices in the private sector. The event presented cases and lessons learnt that IOD has collected from working with large enterprises. The CAC SME was also supported by the Center for International Private Enterprise (CIPE) and the Thai CG Fund.

Thaioil communicated all policies, including the whistle-blowing procedure, whistle-blower protection mechanisms, and mechanisms to monitor and investigate complaints that are in line with Thaioil's Code of Conduct, to all business stakeholders through our website and various activities such as the quarterly analyst meetings to report performance and the quarterly investor meetings in the “Opportunity Day” event of the Stock Exchange of Thailand.

Whistle-Blowing Policy and Procedure

To increase the clarity and effectiveness of our whistle-blowing procedure, as well as follow the Stock Exchange of Thailand's guidelines, Thaioil has developed a whistle-blowing process that outlines whistle-blower protection mechanisms and mechanisms to monitor and investigate complaints that are in line with Thaioil's Code of Conduct. The process is outlined below:



Cases that count as non-compliances or illegal conduct and cases that pose risk of corruption are handed to the Corporate Internal Systems Audit Department for investigation. The Department is an independent body that reports directly to the Audit Committee, and is tasked with investigating the truth and reporting all findings to ensure that stakeholders can remain confident in Thaioil's ability to appropriately respond to all complaints.

Investigating, Responding, and Monitoring Complaints

In 2018, Thaioil received a total of 4 complaints. However, after these cases were thoroughly reviewed and investigated, it was found that they did not count as non-compliances or illegal conduct. There were no fines, non-monetary liability, nor case of corruption.

Nonetheless, Thaioil has taken additional measures this year to increase the effectiveness of responding and monitoring all submitted complaints. We have also developed plans to promote the awareness and use of these whistle blowing measures among employees.

Preventing Conflicts of Interest

Thaioil requires that all employees report conflicts of interest through the Conflict of Interest Disclosure Electronic System every year. This platform serves to track potential conflicts of interest in the organization. In 2018, 100% of our employees responded to the conflict of interest disclosure forms. There were 4 reported cases of potential conflicts of interest. However, after these cases were thoroughly reviewed and investigated, it was found that none of them posed conflicts of interest with Thaioil's business activities.



Performance

In 2018, Thaioil achieved the following accomplishments in managing our corporate governance and fight against corruption:



Operated without a single case of non-compliance or a case that may lead to corruption



Trained

100% of all new employees who joined Thaioil

and Subsidiaries on corporate governance and anti-corruption measures



Encouraged

100% of all business partners and suppliers

identified in the target group to take measures to contribute towards the fight against corruption and join relevant anti-corruption activities



Received **4** awards

from organizations that work on corporate governance in 2018.



Thaioil was awarded one of the TOP 50 ASEAN PLCs (TOP 11-30) based on an evaluation of CG performance by the ASEAN CG Scorecard Project for the 2nd consecutive year.



Thaioil received the 2018 Best Energy Corporate Governance Thailand Award by the British magazine Capital Finance International or cfi.co.



Thaioil was scored “97” and ranked “Excellent” (for companies scored 90-100 points) in the Corporate Governance Report of Thai Listed Company 2018 for the 10th consecutive year.



Thaioil received 100 full points for the evaluation of the quality of organized annual general meeting for shareholders (AGM Checklist) in 2018 by the Thai Investors Association.

Human Rights

Challenges, Risks and Impacts

Since the Universal Declaration on Human Rights established internationally agreed ideals on expected treatment of all individuals, the global community has been witnessing various developments in the area of human rights over the past 70 years. Mechanisms and tools, including those that allow proper assessment of human rights risks as well as those that promote monitoring to shed light on any violation that may occur, have been created and standardized to advance human rights. Nonetheless, despite unceasing efforts on the part of human rights advocates, we continue to see cases of serious human rights violations, such as the violations of the rights to privacy, family, food and shelter, equality before the law, and freedom of expression. To respond to this issue, both the private and the public sectors have had to step up their mode of operation to rise up to the challenge. It is also undeniable that the successful protection of human rights will not be realized without strong international partnerships and unwavering commitments from the UN member states, including, of course, Thailand as well. To that end, the Thai government has declared the human rights issue as a national agenda in 2017.

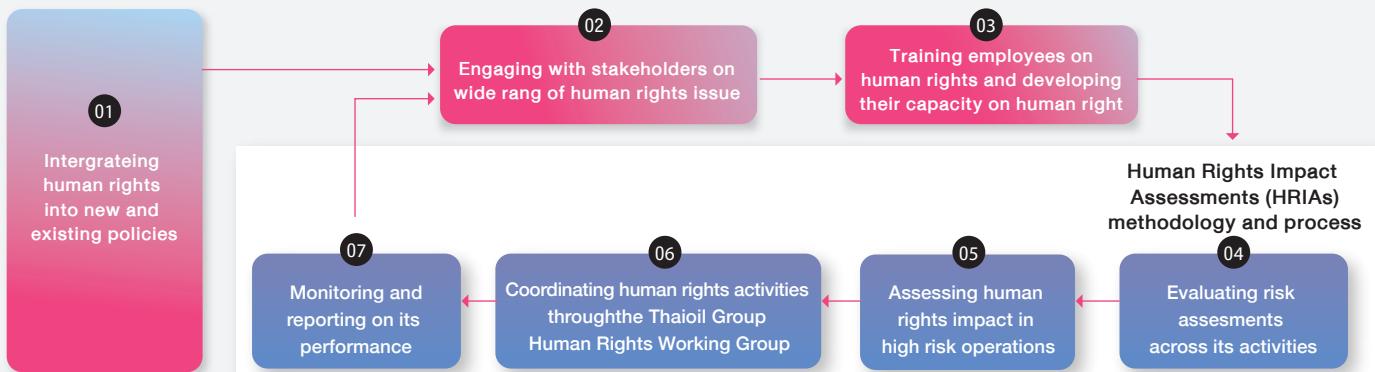
This underlying context places a demand on Thaioil and Subsidiaries to take responsibility with regards to our human rights performance. Furthermore, with our upcoming Clean Fuel Project (CFP), we are confronted with the challenge of managing a large-scale investment project that will rely on many workers to carry on labour intensive tasks for construction for a period of approximately 4-5 years. Thus, our duty to protect and promote human rights increases in scope and severity.

Commitment

To ensure that CFP construction could be commissioned on time for further enhancing national energy security, Thaioil and Subsidiaries remain committed to promoting good human rights practices throughout our value chain. We continue to operate as mandated by our Human Rights Policy and 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. business partners, subcontractors, customers), and local communities, as well as the human rights related to resource use (i.e. soil, land, forest, forestry products, fishery resources, and unpolluted environments). We uphold our commitment to ensure that our treatment of all stakeholders throughout our value chain meet and go above and beyond human rights standards, such that Thaioil may be looked to as a leading international practice on sustainability management.

Management Approach

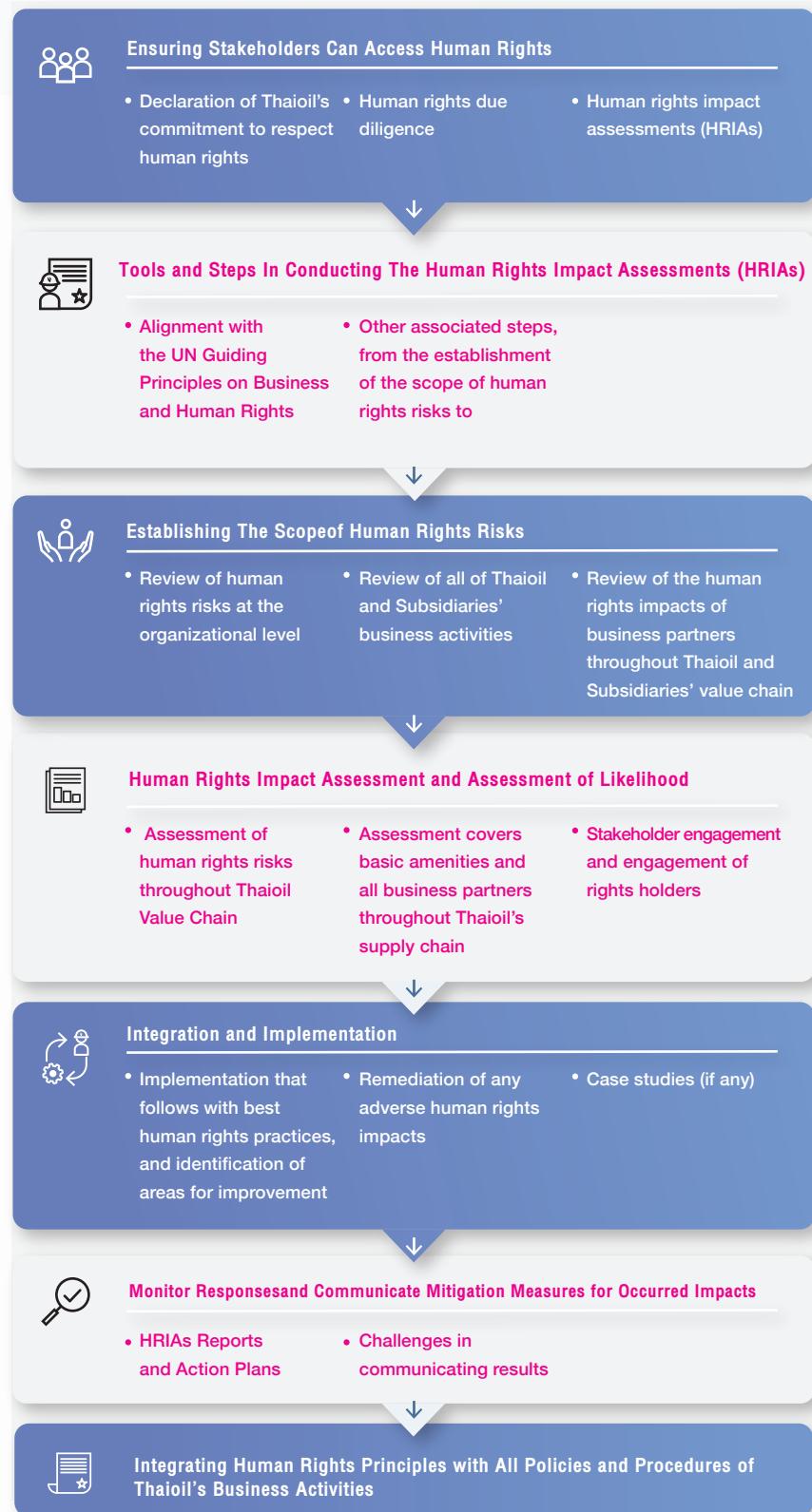
Policy Commitment



Thaioil's Human Rights Impact Assessment and Management

Thaioil and Subsidiaries have developed a process to assess human rights risks throughout our value chain based on 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 our 7 steps in conducting the human rights due diligence, namely:



Human Rights Risk Management in the Supply Chain

Thaioil is committed to build the capacities of our suppliers in assessing human rights risks and avoiding human rights risks that may lead to non compliance issues, business disruption, and reputational damages related to environmental, social, and governance (ESG) issues. To that end, we have developed the Thaioil Group Suppliers' Code of Conduct (SCoC) to guide our suppliers in building good human rights practices.

Thaioil also uses the ESG Plus Verification program as a platform to collect data on our suppliers' ESG performance, including the identification and management of ESG risks, as well as the alignment of such measures to related Thaioil policies, including but not limited to our Procurement Policy, Quality, Security, Occupational Health and Safety, and Environment Policy, Energy Policy, Social and Environmental Responsibility Policy, Anti-Corruption Policy, Business and Human Rights Policy for Suppliers, the Supplier Code of Conduct, and Guidelines on CSR Practices in the Supply Chain for Suppliers.

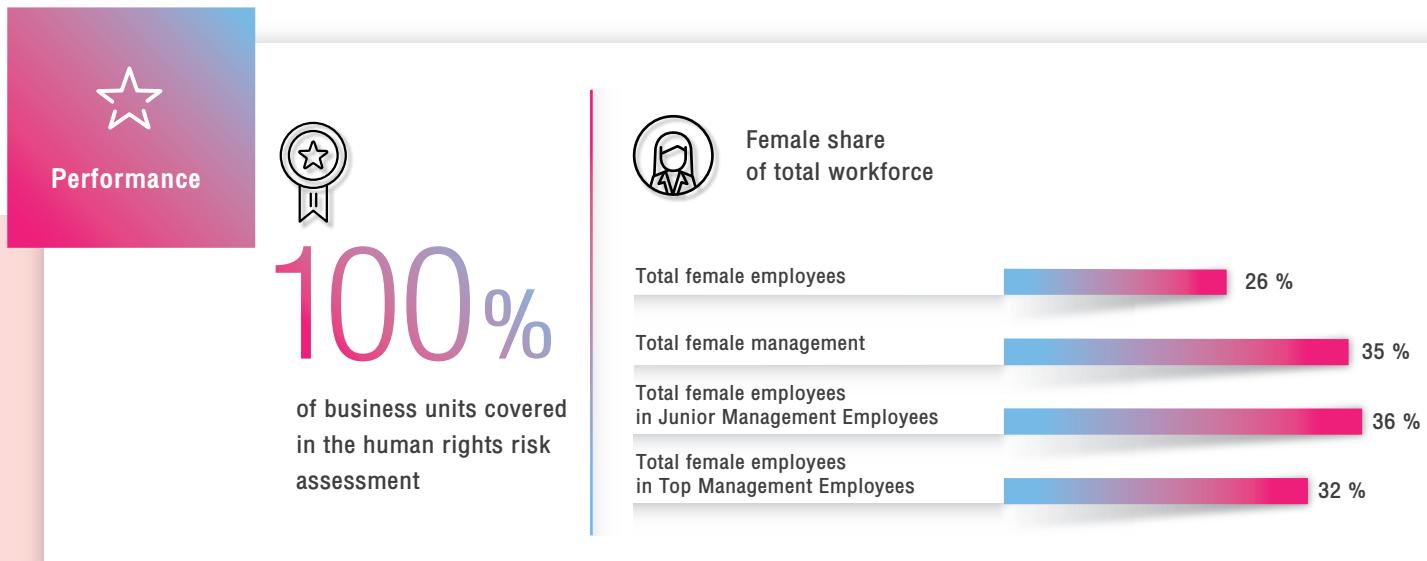
To manage human rights risks in the supply chain, Thaioil has focused on communications and activities that build up supplier engagement. Our CSR in Supply Chain online communication program engages suppliers on Thaioil's requirements for 7 CSR issues, including corporate governance, human rights, labor practices, environment, fair operations, customer practices, and community engagement and development. Subcontractors shall practice in accordance with the business contract built upon the expectations as general terms and conditions regarding occupational health and safety and environmental impacts.



Guidelines on CSR Practices in the Supply Chain for Suppliers



General Terms and Conditions for Subcontractors

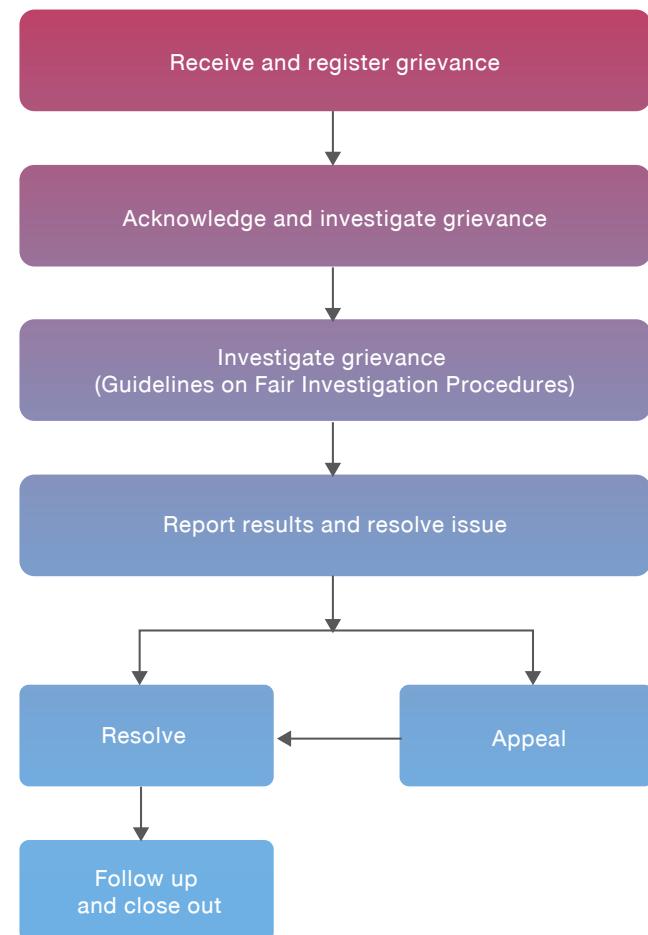


Grievance Mechanisms

Thaioil and Subsidiaries' grievance mechanisms have been designed to receive 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 appropriately handle conflicts and secure our social license to operate, as well as strengthen relations with our business partners.

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, Chief Executive Officer and President, Secretary, or to cgcoordinate@thaioilgroup.com. Our business partners can also submit grievances, concerns, or questions through the business partner relations website or to srm@thaioil.group.com.

Thaioil and Subsidiaries' Grievance Mechanism Procedure



0
case

No concerns or complaints submitted by stakeholders regarding human rights violations in 2018



100%

of new business partners completed an electronic self-assessment of environmental, social, and governance issues



30
of Thaioil and Subsidiaries' critical suppliers

were processed through the ESG Plus Verification programs planned. Results suggest 57% of critical suppliers have high ESG risks,

and will be further assessed by experts and included in the Supplier Development Program for the 2019 plan.

Salient Human Rights Issues

In 2018, Thaioil and Subsidiaries assessed the human rights risks 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. In addition to apply our enterprise risk management framework to assess these human rights risks, we also refer to the human rights risk assessment criteria on likelihood and severity.

The human rights risk assessment done in 2018 pointed to 2 main human rights salient issues. These issues have been

confirmed by related functions respond for each activity along Thaioil's value chain, and have been reviewed by the Human Rights Working Team as well.

Additionally, these salient human rights issues have been reviewed comprehensively in terms of impacts towards both internal and external stakeholders, such as our employees, business partners, customers, and communities. Results from assessing the salience of these human rights issues are as follows:

Human Rights Issue	Risk Description	Cases/Specific Risks	Mitigation Measures
1. Labour Practices and Working Conditions (Business Partners and Subcontractors)			
Labor Practices and Working Conditions	<ul style="list-style-type: none"> Business partners who do not have good labor practices and fair working conditions for their employees (i.e. wages that are lower than minimum wages, lack of occupational health and safety measures) Business partners who have illegal employment practices (i.e. use of child labor, migrant labor, and forced labor) 	Thaioil's Clean Fuel Project (CFP) <ul style="list-style-type: none"> Accidents during construction Likelihood of human rights violations of suppliers involved in oil refinery construction 	<ul style="list-style-type: none"> Integration of the requirements of the Working of Alien Act, B.E. 2551 as part of the supplier selection criteria Integration of Thaioil's Business and Human Rights Policy and Guidelines for Supplier Practices Regarding Business and Human Rights as part of supplier selection criteria Revision of the Manpower Supply Service Contract for further alignment with labor regulations and Thaioil's Human Rights Policy, as well as an extension of the Contract to include consequences should there be a non-compliance Revision of guidelines on proper labor practices for suppliers for the Procurement Team and the CFP Integrated Team to implement supplier management that aligns with regulations and Thaioil's Human Rights Policy Inclusion of new requirements for Thaioil suppliers to arrange safe and healthy working environments in compliance with regulations and the Occupational Safety, Health, and Environment Act, B.E. 2554. Supplier acknowledgment on Thaioil's Supplier Code of Conduct Vendor Risk Assessment Supplier Auditing
2. Safety, Security, Environment, and Communities (Migrant Labor)			
Supplier employment of migrant labor in the construction of Thaioil's Clean Fuel Project (CFP)	<ul style="list-style-type: none"> Supplier employment of security staff who have not received adequate training (i.e. safety training, training on the use of violence on handling protestors and criminals) 	Thaioil's Clean Fuel Project (CFP) <ul style="list-style-type: none"> Violation of human rights risks by security staff 	<ul style="list-style-type: none"> Organization of training sessions on basic Security, Safety, Health, and Environment (SSHE) for all types of work for CFP suppliers Development of training manual in different languages for suppliers Creation of safety signs and announcement boards in different languages Supplier acknowledgment on Thaioil's Supplier Code of Conduct Vendor Risk Assessment Supplier Auditing

Human Rights Training for Employees

In 2018, Thaioil organized human rights training for managers and employees to increase awareness and understanding of our policies and guidelines on human rights practices. It is our hope that through this training, we will further reduce human rights risks in our value chain, including the risk of having complicity in the human rights violations of our business partners.



100% of employees
received training on human rights



11,655 hours
of human rights training for
1,477 employees

Good Labor Practices (Labor Rights)

Thaioil and Subsidiaries respect the human rights of our employees and other stakeholders through refraining from discrimination on the basis of personal opinions, nationality, race, color, 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 practices, discrimination, threats, 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 should comply with regulations based on accurate understanding rather than personal interpretations.
2. Thaioil and Subsidiaries have 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 and Subsidiaries must strictly operate according to international human rights principles, increase the awareness and understanding of human rights principles for employees such that they may apply these principles in their daily duties and responsibilities, and must not support any activity that may violate human rights.
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 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 the management approach to one of our material sustainability issues - employee retention - we annually review the compensation and remuneration schemes for employees to ensure that they are competitive with 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 2018, Thaioil and the Thai Oil Refinery Workers' Union participated in collective bargaining based on a bilateral system that builds on good labor relations. We did not need a third party mediator to mediate any dispute, and were able to reach an agreement regarding working conditions.

QSHE Management

Challenges, Risks and Impacts

With the expansion projects such as the Clean Energy Project (CFP), the Jetty 7 and 8 Expansion Project, construction of new office buildings including the lab building, maintenance building, crude oil tank structure, all these projects require demolition to prepare the space for structural work. This includes areas that currently have to be operating, therefore, Thaioil and Subsidiaries need to review and increase safety control measures in order to ensure that normal operations can continue sustainably without any critical incidents or leakages of flammable or chemical substances from the main containers or production processes that will have a severe impacts (LOPC Tier 1), in accordance with API 754 requirements.

Additionally, there are environmental changes, changes to the standards in occupational health and safety, and other external factors that are challenges in operating with the goal of being "an organization that is free from accidents, extending to employees, contractors and related stakeholders, and responds to social expectations and environmental impact that may affect the health of the surrounding community.

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This year, to promote the quality of life of our employees, community members, and other stakeholders to reflect the emphasis on human life and stakeholders expressed in our new vision – "empower human life through sustainable energy and chemicals" – and our new 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". Furthermore, increasingly stringent regulations and global trends towards sustainability pose as additional pressures to improve our management of quality, safety, health, and environment, and corporate social responsibility in all business activities and future business expansion through the value chain.

Commitment

Thaioil and Subsidiaries are committed to running our business while carefully managing quality, safety, health, and the environment such that all our operations are in compliance with regulations and requirements, especially with regards to having comprehensive measures to prevent any environmental impact. Our management system covers the management of occupational health and safety, emergencies and crises, quality, environment, and complaints, and the assessment of regulatory risks and compliance. This management system is enforced by our Quality, Safety,

Health, and Environment Policy, Energy Management Policy, and Corporate Social Responsibility Policy, which all guide Thaioil towards preventing, managing, and mitigating any impacts that may occur from normal operating conditions, abnormal operating conditions, and emergency operating conditions in both the present context and future business expansion context.

Furthermore, Thaioil remains committed to protecting our business partners and suppliers from regulatory risks,

especially in relation to environmental regulations, that may result in business disruption. This is expressed in the Thaioil Group Supplier Code of Conduct (read more in our "Value Chain Management" chapter).

The executives of Thaioil and Subsidiaries give importance to risk management and loss prevention in business operations of the organization by supporting resources to develop a five-year plan in occupational health, safety, and crisis management. In 2018,

they reviewed the five-year plan to make sure it was aligned with the company's expansion plans. The policy guides that any activity that occurs in Thaioil business operations will have risk assessments, preventive measures, and compliance monitoring to check if operational practices are appropriate. And the policy also focuses on accident prevention by identifying and evaluating potential risks that could cause leakages (LOPC) in each area, along with defining preventive measures that include risk accounting, LOPC, and continuous monitoring of the effectiveness of the preventive measures.

Goal:

- Enhance level of Safety Maturity to be at level 4 within the year 2022
- Safety statistics on Total Recordable Injury Rate (TRIR) are amongst the top 10% of the global oil and gas industry by 2022
- Critical incidents or leakages of flammable or chemical substances from the main containers or production processes that will have a severe impacts (LOPC Tier 1), in accordance with API 754 requirements at Zero
- 100% compliance with environmental laws and regulations
- Zero case of significant oil and chemical spills

Management Approach

Occupational Health and Safety

Occupational Health and Safety Management System

Thaioil and Subsidiaries adopted the Enhanced Safety Management system, an international standard, to manage our safety performance since 1961, and has integrated with the BS OHSAS 18011 system. Operational Excellence Management System (OEMS) focuses on using PDCA cycle in every work process and has a safety policy, safety manual, and safe operation methods that cover all activities with risk performed by employees, contractors, and other stakeholders involved in operations of Thaioil and Subsidiaries

Identifying work-related risks, assessment of risk, and investigation of events with risk

Thaioil and Subsidiaries provide a methodology in identifying hazards, risks, and opportunities for improvement by using What If and HAZOP strategies that cover activities performed by employees, contractors, and external factors that could impact the company. Thaioil prepared occupational health and safety plans to decrease and contain risks to be in acceptable levels at all times. There is a plan to monitor and review risks every six months, and find opportunities to improve at least once a year or when there are changes.

For jobs that do not occur regularly, there are risk assessments that cover work activities and work areas by methods like 3 What and JSA, along with defining prevention methods aligned with risks. Electronic Permit, or the SAP Permit, requires communication through Toolbox meeting before starting work and there are safety checks consistent with requirements specified in the work permit. There is an analysis of results and recommendations of improvements.

Additionally, Thaioil has a campaign for employees in operation areas to write a Potential Incident Report (PIR) that focuses on Unsafe Acts and Unsafe Conditions that will be a preventative measure. In the event that the worker (employees and contractors) notices working conditions that are life-threatening or could affect his/her own health, the worker may stop working and report to the supervisor. The supervisor will check and find a solution that he/she is confident has improved the situation and is safe for the worker before the worker is allowed to continue working. As this is a campaign for workers to report on unsafe working conditions through PIR reporting, which means it is not wrong for workers to stop working when they notice unsafe working conditions,

but they will be appreciated through the PIR of the Month project, which will enhance safety practices at work and lead to the safety culture in Thaioil and Subsidiaries.

Thaioil gives importance to and has implemented projects to develop and raise awareness of safety practices through the Safe White Green strategy. This includes adding the Safe White Green strategy to the QSHE Roll Out, which circulates in various projects and work areas relating to construction in order to promote awareness of workers in the area, and fosters participation of workers involved in the activity under real working conditions.

Process of investigating work-related incidents

The reporting and investigation of accidents is the heart of safety management system. The objective is to find the true root cause and define preventative measures to avoid recurrence (OFI: Opportunity for Improvement) that occurs and is recorded systematically, which covers accident cases, abnormal event cases, near-miss cases, and potential incidents. However, when such events occur, people in the event or those who have witnessed the event must write a report to the supervisor of the area and others involved within

24 hours. After that, there will be an appointment of a group to investigate to find the root cause in order to systematically set measures to prevent such events from occurring again. Therefore, the TRIPOD incident investigation was introduced as a guideline in conducting investigations. Periodic follow-up investigations have been conducted to ensure efficiency and effectiveness of Lesson learned sharing to employees and contract employees through the company's various media channels.

Occupational Health Services

Maintaining and protecting the health of employees and contractors is the ultimate goal in the operations of Thaioil and Subsidiaries, especially operations in the refinery area, which is an environment that could cause harm to the worker's health at any time. If safety control measures are defective, or workers are not following the rules or guidelines, the Health Risk Assessment is one of the guidelines that are used internally to identify hazards and determine the impacts to worker's health in order to define appropriate safety measures and reduce risks.

Monitoring the work environment is one of the measures that the company has adopted to evaluate safety measures that may affect a worker's health in normal operations, project work, or maintenance work by comparing results against the standard value. In the case that the results are higher than the standard value, Thaioil will implement a plan to improve and monitor systematically.

Furthermore, Thaioil has arranged a specific function, occupational health experts, and specialists in occupational health medicine for consultation and guidance to employees and contractors.

Participation, consultation, and communication with workers on occupational health and safety

The company has appointed a safety, occupational health, and work environment committee consisting of representatives from employees involved in operations that make up at least 50% of the committee (excluding the Chairman) which will meet at least once a month for news update, and progress monitoring of future operations plans. In 2018, the occupational health and safety management system was reviewed, along with work permits and high-risk work processes. Operational safety checklists before working and risk assessments were also implemented, and have been communicated to relevant staff for them to be able to lead efficient and appropriate practices. There is a performance analysis and learning from serious accidents that is executed systematically. Additionally, there are consistent checks and identification of indicators to monitor compliance of recommended practices, including continuous reviewing of safety in operations by senior management.

Performance

Occupational Illness frequency
Rate of all workers

0
case
per million
workhours

Occupational health and safety training

Thaioil sets the criteria in identifying needs in occupational health, safety, and fire prevention training, which is necessary for employees, and contractors that are involved in high-risk activities. We have prepared a training plan, evaluation plan, and documentation in order to develop employees' knowledge, ability, and understanding on things that are dangerous or could cause accidents, as well as methods to protect themselves and contain hazards.

Promoting health of employees

Thaioil provides services and supports employees in accessing medical services for incidents that are not relating to work.

Scope

- Employees at office and operation areas at Sriracha, Chonburi province, and Bangkok office and operation units of pipeline distribution.
- Contractors at the refinery

Medical services

- Provide basic treatments and emergency treatments in the company medical unit by having a nurse available 24-hours every working day and doctor available on working days during 13.00- 16.00 hours.
- Provide advice relating to health through the company's public relations channels and arrange for a question-and-answer session or a way to contact nurses available 24 hours a day
- Provide annual health check-up and vaccination against influenza for employees at work points such as process control rooms, office buildings, and engineering buildings.

Thaioil has voluntarily arranged a health project for employees, which can reduce the health risks that are not related to work operations as outlined below:

- The "healthy by company doctors for employees with NCD disease" project
- Weight loss project
- A project for exercises in working and resting areas
- Organizing annual activities that are beneficial for health twice a year to create a Healthy Awareness
- Thaioil has provided a reminder for employees to get a physical examination prescribed by the doctor.

Furthermore, Thaioil also provides exercise equipment and facilities in places such as the fitness rooms at the office building of Thai Lube Base Public Company Limited, Phubai Office Building, and Thaioil Club.

Prevention and reduction of occupational health and safety impacts from business partners

Thaioil surveyed the needs and satisfaction of partners, carried out by a third party, which included occupational health and safety section. This includes defining indicators, defining units responsible in looking after partners, analyzing and summarizing results of the survey, providing suggestions to improve issues, if any, and systematic monitoring of corrections.

Performance

In 2018, Thaioil was able to manage occupational health and safety according to our plans for safety operations. TRIR was equal to 0.26 cases per million hours worked, which was better than our goal of 0.50 or below cases per million working hours, with no accidents that would cause lost time or illnesses from work that resulted in fatality.

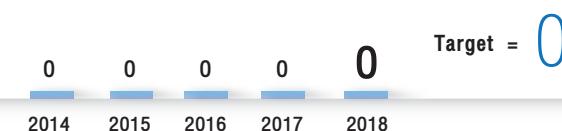
Contractors' Loss Time Injure Frequency Rate (LTIFR)

Cases per million hours worked



Employees' Loss Time Injure Frequency Rate (LTIFR)

Cases per million hours worked



Process Safety and Integrity

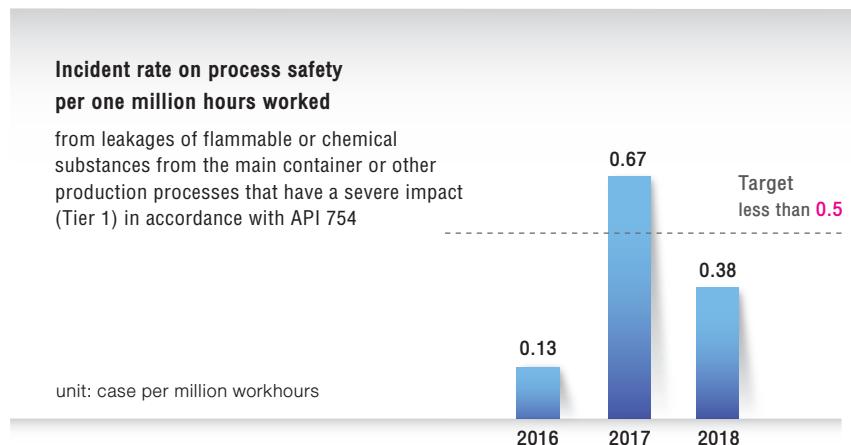
Thaioil and Subsidiaries have integrated safety systems in our production processes according to the OSHA requirements and Shell Group's practices, which helped us to operate business in a more sustainable way and become an organization that includes safety in our chain of operations.

- Established a Technical Safety function to supervise the safety management of production processes
- Reviewed the five-year management and planning to develop and enhance Thaioil and Subsidiaries management of safety against international standards by focusing on preventing serious incidents
- Identification and assessment of potential risk points that can cause leakages (LOPC) in each area, including defining prevention and protection measures, LOPC risk accounting, and continuous monitoring of effectiveness of the measures. This includes inspecting safety in production processes and suggesting preventative measures to avoid recurrence. Additionally, management also reviews the safety performance in production processes on a regularly on monthly basis.

- Risk assessment and review of preventive safety measures by defining plans and preventive safety measures at various levels to cover serious risks, especially chemical leaks while loading and unloading on ships. This is done by practicing emergency routines and crisis management with external parties and governmental agencies in the area to protect and reduce the impact on operations to ensure that Thaioil and Subsidiaries can manage and control serious risks.
- Campaign to write a Potential Incident Report (PIR) which focuses on unsafe acts and unsafe conditions which are preventative measures against accidents
- Campaign for employees to learn from incidents and best practices by reviewing and improving their knowledge on safety in production processes and in emergencies to prevent serious accidents and develop their crisis and emergency management skills.

Performance

In 2018, there were three incidents where flammable substances were leaked from the main container or production processes that have a severe impact (Tier 1 and 2) in accordance with API 754. However, after investigation, we found that the implemented detection system and authority in charge were able to detect and therefore contain the situation in a quick and safe manner.



Environmental Management System

Thaioil and Subsidiaries have referred to the ISO 14001:2015 environmental management approach to enhance our environmental management. This covers a series of steps, from assessing environmental impacts throughout the value chain of the production process to the final end product. We have established standards in operating, as well as preventive and remediation measures for the following conditions:

Normal Operating Conditions: Thaioil and Subsidiaries have established a set of standards to guide effective production processes, including reduce releasing of water pollution, waste, air and greenhouse gas emissions, and the efficient use of resources based on the 3Rs (Reduce, Reuse, Recycle).

Thaioil has also continuously improved and developed the environmental standard specification to reflect regulations and stakeholder expectations. We refer to a variety of sources, including but not limited to regulations, regulatory authorities, international agencies, and global best practices to guide us in performing all our activities,

from conducting feasibility studies and designing expansion projects to executing construction projects and production processes. Through aligning ourselves with sound references, we are able to effectively reduce environmental impacts and respond to regulations and stakeholder expectations.

Additionally, Thaioil's Energy and Loss Committee oversees and monitors production processes to ensure energy conservation and loss reduction. The Supplier and Contractor Program was organized to provide our business partners and suppliers with practical guidelines on environmental and social performance. This initiative, as well as the Safe White Green activity, serve to promote and support suppliers and business partners in aligning their practices with Thaioil's Supplier Code of Conduct. Thaioil has also continuously participated in the CSR – DIW Project to show our commitment towards corporate social responsibility, with our Procurement function developing a framework and guidelines for business partners to develop environmental management systems and together

create value chains that exhibit environmental responsibility throughout.

To monitor, inspect, and assess our environmental performance and its alignment with designated policies, Thaioil refers to the ISO 14001 : 2015 environmental management system framework. To that end, we are committed to continuous improvements based on inspection findings from the Thai Industrial Standards Institute (TISI), sustainability reporting audit and assurance based on the Global Reporting Initiative (GRI) Standards, and results from the Dow Jones Sustainability Indices (DJSI) assessments. We have also further developed our data collection and inspection system to reduce mistakes in data distribution and to increase convenience in organizational data use.

On top of that, Thaioil and Subsidiaries have a Compliance function that is the main function responsible for driving regulatory risk assessment and developing tools and/or processes that may enhance the efficiency of such assessment procedures.

Abnormal Operating Conditions: Complaints are managed through the Environment and Community Relation Committee, or ECRC. The ECRC works through the Community Engagement Program to increase community engagement. This includes conducting annual community perception surveys, tracking progress and performance, and monitoring environmental impacts to ensure minimum impacts to communities. The ECRC meets monthly to evaluate concerns and suggestions submitted by communities in order to continuously improve performance.

Environmental Emergency Conditions: Significant aspects such as oil and chemical spills are managed through preventive measures, mitigation measures that minimize environmental impacts, and oil spill response and restoration plans in the event of an incident. We annually conduct oil spill and chemical spill cleanup exercises to ensure the most effective levels of crisis management that will minimize resource, environmental, and social impacts towards communities. The 3 main components of our management approach are described as follows:

1 Prevention

- 1.1) All ship vessels' safety documents shall be reviewed and cross-checked by captains of Thaioil and PTT Group to ensure that each ship meets the safety standards of the PTT Group Ship Vetting System and general safety standards for oil transport.
- 1.2) The regularly maintenance of ports, buoys, and equipment used for oil transfer such as oil pipelines, safety joints and ship ropes to ensure safe practices shall be done regularly by our engineering team.
- 1.3) The port manager regularly conducts random Tanker Safety Audits for both domestic and foreign ships at Thaioil ports. Any detected defects will be notified to the ship captain and manager for further correction to ensure that defects will not be repeated.
- 1.4) The maps of coastal natural resource of the Eastern Gulf Coast has been studied to be aware our potential impacts. To monitor how oil pollutants may affect these resources, the sensitivity area maps are also followed.
- 1.5) Database development projects with spatial analyses, such as trajectory maps, has been

conducted to accurately assess oil spill movement for the event of an incident.

- 1.6) Port Division employees shall attend regularly meetings and participate in activities with the IESG-Marine Safety to exchange knowledge with expertise on marine safety, and align their practices with international standards.

2 Mitigation

Thaioil and Subsidiaries commit to do not create any oil or chemical spill into the ocean from our activities on maintenance and repair equipment in the ocean e.g. pipelines and buoys. However, in the event that an unforeseen incident happens, Thaioil has the following mitigation measures to appropriately respond and minimize our impacts are:

- 2.1) The emergency response plan allows us to contain the oil or chemical spill and cleanup all residue. This plan is also reviewed and updated with environmental changes or new technologies.
- 2.2) All oil spill response equipment, including both equipment stored in the warehouse and equipment on the vessel, is always ready to be used. Thaioil organize monthly equipment

maintenance, including starting up the engines and inspecting spinning systems and hydraulic oil, to guarantee equipment integrity. The Occupational Health and Safety Team and Quality Team also conduct random audits to ensure that the equipment is always ready to be used.

3 Personnel Development

Thaioil and Subsidiaries heavily prioritize personnel development programs to ensure that our employees are ready to execute our oil spill and chemical spill response plans. In 2018, we delegate our employees to the following training sessions and seminars, located both in Thailand and overseas:

- 3.1) The Oil and Chemical Spill Table Top and Field Exercise tests attendees' ability to respond to complex scenarios with high difficulty levels. In 2018, Thaioil brought the scenario of a fuel oil spill with petrochemical spill at the same time, which presented a difficult challenge for attendees to immediately strategize and respond to the situation appropriately. Based on their performance, we are able to appraise the challenges and gaps in response procedures that can be addressed and improved upon.



3.2) The 10th National Oil Pollutants Prevention and Cleanup Exercise was organized alongside the Marine Department, other related public agencies, the Oil Industry Environmental Safety Group Association (IESG), and other parties at the Sirindhorn Center for Geo-Informatics at Space Krenovation Park (Public Organization) in Chonburi on 23th-25th May 2018.



3.3) At the Oil Spill Table Top Exercise organized by Chevron on 14th-15th June 2018, attending employees were able to gain various benefits, especially through observing the use of the Incident Action Plan Software (Software IAP) developed by Chevron Exploration and Production (Thailand) Company Limited. This gave Thaioil a new perspective in further developing our emergency response plans from the currently manual system to IT system. We believe that the IT system may allow respondents to be able to understand the event

clearly for more convenient communication. Additionally, information in the system can also be linked to public and private agencies, which should overall lead to more efficient processes.

3.4) Representatives from Port Division were attended the On-Scene Commander (IMO Level 2) training. This created various benefits on comprehensive view of how oil cleanup procedures are implemented. Moreover, the in-depth details and techniques of oil spill practices, and how these details and techniques vary in different environments was shared. Meanwhile, the Oil Spill Response Management (IMO Level 3) enhance staff competency in forecasting to better manage an oil spill cleanup with necessary knowledge and abilities to carry out their work. Both trainings were organized by Oil Spill Response Limited (OSRL) from Singapore.

Thaioil Plan 2019

1. Provide Chemical Spill Management training by international experts for emergency teams which postpone from 2018 to 2019 due to preparedness of coaches and as the course was tailor made for Thaioil and Subsidiaries
2. Develop an Incident Management Program Software that can support the responding to emergencies such as oil and chemical spills, fires, etc.
3. Organize Loading Master Course and develop as an online course to develop, refresh, and update the knowledge and skills of loading masters who control oil vessel loading.

Performance

100%

of environmental quality monitoring found compliance with environmental regulations and requirements



Zero complaints about environmental impacts from communities

compliance with environmental laws and regulations

100%



zero major non-compliance from ISO Audit



zero case of significant oil and chemical spills since 2005

Climate Change

Challenges, Risks and Impacts

The significance of climate change has been increasingly recognized, as exemplified by the 23rd United Nations Climate Change Conference held in 6-17th November 2017. The conference was organized to establish standards, regulations, and new frameworks in order to undertake ambitious efforts to combat climate change and mitigate the emissions of greenhouse gases. Thailand took part in signing this agreement to reduce greenhouse gas emissions (compared to the 2015 base year) by 20-25% within the year 2030, in addition to being committed to monitor, review, and report targets contributing to tackling climate change every 5 years.

Resulting from this, on the 6th of April 2018, the Prime Minister's Office released a notification under the name "Country Reforming Plan" requiring related local authorities to develop and improve regulations regarding climate change for effective use within 3 years and then, after 5 years, to establish an appropriate mechanism to create economic incentives for the private sector to reduce greenhouse gas emissions and support actions against climate change, such as the development and promotion of mass transportation.

All these abovementioned risks can affect Thaioil's business transition approach. Which mostly comes from the way the local authorities are studying potential policies, regulations, and new requirements to develop mechanisms that will be used in the future, and together with physical risks in water management. Thaioil will need to adjust our activities, including but not limited to our production processes, expansion projects, and use of technology, to accommodate the impacts these changes may bring.



Commitment

Thaioil and Subsidiaries are aware of and committed to prevent and mitigate environmental and social impacts which may occur due to climate change, in order to support the national policies to reduce greenhouse gas emissions with a target of 20-25% from the business as usual (BAU) scenario within 2030, according to Thailand internationally ratified to the Paris Agreement, a part of the 23rd Conference of the Parties (COP 23), where the internationals together agreed to control global temperatures to be well below 2 degrees Celsius.

In line with Thailand commitment, Thaioil and Subsidiaries has developed a management approach through policies for quality, security, occupational health and safety, and environment (QSHE), energy management, and corporate social responsibility. Thaioil also use our corporate risk assessment to identify risks due to climate change, whether these changes are realized in the form of policies, government regulations, or introduced opportunities to replace fossil fuel use with alternative energy, and increase water stewardship practices to prevent potential impacts of water scarcity. Thaioil also support research and projects that can improve energy efficiency and effectively reduce oil loss. In the future, Thaioil will implement the Clean Fuel Project (CFP) with the use of internationally best-in-class technologies to increase efficiency and support the research to reduce social and environmental impacts. Thus, Thaioil takes a proactive approach to reducing greenhouse gas emissions by setting following target.

Short-term target

4%

Reducing from BAU
by 2022

Long-term target

6%

Reducing from BAU
by 2030

Management Approach

Thaioil used the risk assessment process as a tool to evaluate the business operation's impacts due to climate change, thus covering regulatory risks, physical risks, and transition risks.

Regulatory risks

Risks that may impose impacts on present operations and future investments include requirements for greenhouse gas reporting, implications of nationally determined contributions (NDCs) on businesses, future use of economic mechanisms such as carbon taxes and emission trading, and societal expectations on issues such as improving mass transportation.

Thaioil have established a strategy to control and mitigate greenhouse gas emissions to achieve our short and long-term targets, in efforts to preserve the environment and support the government's actions to reduce greenhouse-gas emissions. Since 2012, the Energy Improvement and Loss Reduction Committee has been set up, comprising of representatives from operations and managers in order to assess risks and develop an action plan to control production processes and systematically monitor the operational performances.

For the short-term strategy for 2018-2022, Thaioil has analyzed the differences between energy efficiency of Thaioil and other international companies to identify opportunities to improve, and appropriately plan for operating energy conservation projects (details of the 2018 projects can be found in chapter "Operational Eco-Efficiency"), including considering to control the usage proportion of fuel which emits low levels of greenhouse-gases during production to be higher than fuels which emits high levels of that gases. Furthermore, Thaioil is currently in the process of considering use of carbon pricing in our investment decision.

For the long-term strategy, Thaioil is currently expanding the CFP Project by selecting highly efficient technologies and prohibiting the production of old units to achieve significantly higher energy efficiency for the oil refinery plants. With new technological advancement, fuel oil can be changed into products with higher values such as diesel or aviation fuel, directly reducing greenhouse gas emissions associated with end consumption.

Moreover, Thaioil closely monitor progress and policy trends in reporting about greenhouse gas emissions, as well as the government's economic mechanisms, by studying and participate different government projects such as:

1. Using information gathered from the Life-Cycle Assessment (LCA) as basis for joining the Product Carbon Footprint Project in order to ensure that information regarding the product's greenhouse gas emissions is readily available for consumers and used as part of their decision making process,

2. Examining guidelines and methods suggested by Thailand Voluntary Emission Reduction Program (T-VER), such that Thaioil is prepared to handle regulations, economic mechanisms, carbon pricing, and carbon credits, and enter a low carbon society in the future, and

3. Continuously participate in the Low Emission Supporting Scheme (LESS) to support Thaioil's and Thailand's contribution in reducing greenhouse gas emissions.

Physical risk

Risks that may have effects on water sourcing for current production process and for the expansion unit under 'Clean Fuel Project (CFP).' Therefore, Thaioil and Subsidiaries have established a holistic water management system to minimize potential risks that may affect production and stakeholders, including the identification of methods to source water during periods which are in risk of water shortages. Although our area of production is located in the East of Thailand, where a moderate risk of drought could be faced in 2018, Thaioil and Subsidiaries proactively worked around this in collaboration with the PTT Group Water Management Committee to assess risks with mitigation measures to prevent and handle possible droughts.

Furthermore, our water management system has been strengthened with priority given to communities such that if a drought occurs, the community will have access to sufficient volumes of water for their daily requirements as well as agriculture work from the local authorizes. In other words, the water will be sent to communities before Thaioil and Subsidiaries. In efforts to mitigate such situation, Thaioil and Subsidiaries have installed 6 desalination units which readily available to operate to reduce the requirement of fresh water resources and secure water demand.

Many other projects have also been implemented such as the construction new reservoirs and pipelines to withdraw water from Nong Ko Reservoir at Chonburi Province to Nong Pla Lai Reservoir at Rayong Province. The pipe construction is undertaken in collaboration with a water distribution company to support operation of the Clean Fuel Project and prepare for potential water shortage situations.

Transition risks

Risks that may impact business operations due to the fast technology advancement in replacing oil with alternative energy. Thus, it can be seen that presently, the development and improvement of technologies for using alternate energy instead of oil come in all forms and occur speedily, such as electronic cars and hydrogen fuel. In 2018, some governments across the world announced regulations to support the consumption of alternative energy, directly pushing some car manufacturing businesses in Europe to reduce production targets or stop the entire production of internal combustion engine.

Due to such situation, the oil industry may not be able to adapt accordingly and be faced with decreases in incomes and growth rates in the long-term. Thus, Thaioil and Subsidiaries have determined a plan to adjust the production of gasoline to reflect the possible decrease in demand and improve production efficiency by investing in producing diesel and aviation fuel through the CFP. As well, investments in business which are not influenced by the fluctuation in oil price have been increased as well as restructuring the investment port for increasing competitiveness through identifying new opportunities for investments. This includes specialty products, the New S Curve Project, and researching on investment in startup businesses through our corporate venture capital team. Funds targeted for the venture capital are funds which develop manufacturing technologies in order to improve the operational efficiency, environmental-friendly and human-oriented solution, and businesses or technologies which will come in place of hydrocarbons. The objective of this investment is to enhance Thaioil and Subsidiaries' income growth target.

Performance

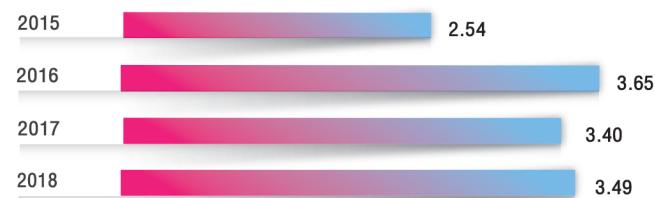
Direct Greenhouse Gas Emission Reduction (Scope 1)

In 2018, Thaioil and Subsidiaries implemented a total of 25 energy conservation projects to reduce the greenhouse gas emissions, which resulted in a total reduction of 43,207 tons of carbon dioxide equivalents. Moreover, continuous studies are conducted on the environmental impacts and life cycle assessment (LCA) for each refinery's product such that the information gathered serves as a carbon footprint database for Thaioil's product and strives to expand the scope of study to cover Thaioil and Subsidiaries in order to plan for effective greenhouse gas reduction measures. Nonetheless, the study of carbon pricing has been studied for considering as part of the investment decision and preparation for carbon credit trading in the future.

On the other hand, Thaioil has participated in the Low Emission Supporting Scheme (LESS) for implementing energy conservation activities which improves the efficiency of Thai Oil Public Company Limited, Thai Lube Base Public Company Limited, and Thai Paraxylene Company Limited. From selecting 5 energy conservation projects which help to increase efficiency, emissions of greenhouse gases was reduced more than 33,969 tons of carbon dioxide equivalent. In order to improve current statistics and further reducing emissions, Thaioil is currently in the process of studying to join the Thailand Voluntary Emission Reduction Program (T-VER).

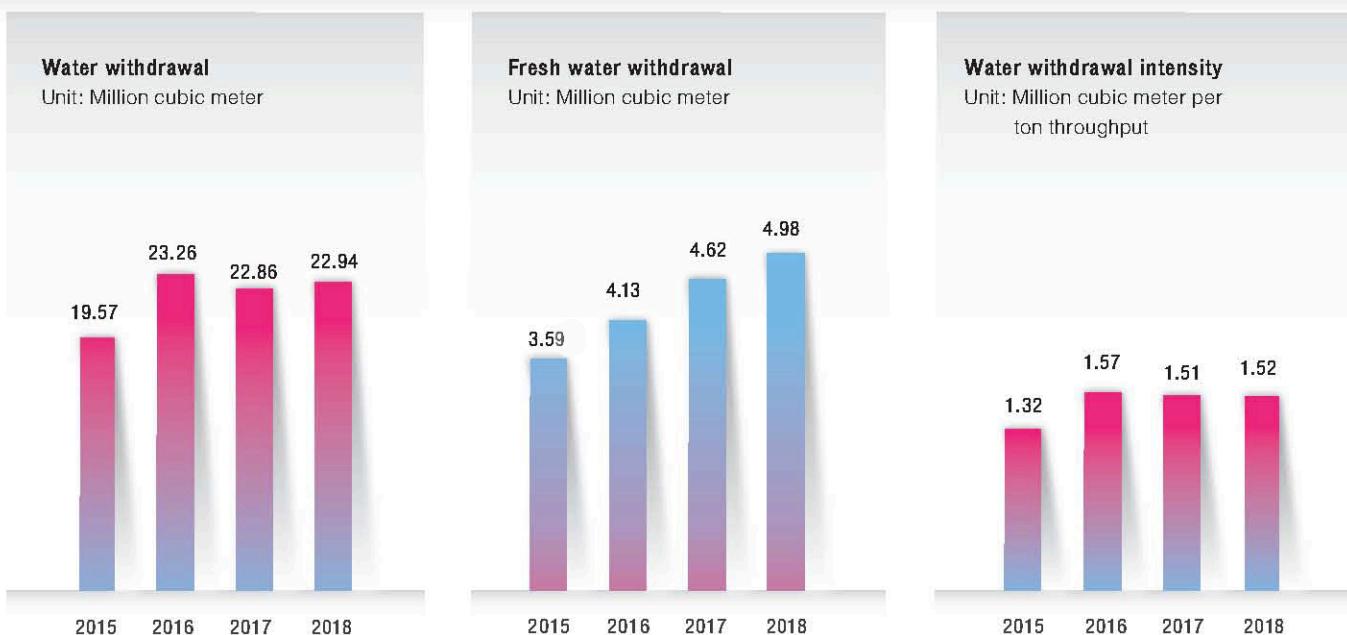
Direct Greenhouse Gas Emissions (Scope 1)

Unit: Million ton of CO₂ equivalent



Unit: Ton of CO₂ equivalent per ton throughput





Indirect Greenhouse Gas Emissions Reduction (Scopes 2 and 3)

Thaioil and Subsidiaries do not emit any indirect greenhouse gas (Scope 2) which originated from the consumption of external electric and steam power, as the facility at Sriracha district, Chonburi province does not depend on external energy sources.

As for other forms of indirect greenhouse gas emissions (Scope 3), the Energy Improvement and Loss Reduction Committee (E&L Committee) assesses risks, establishes a work process, then manages and monitors operations to reduce greenhouse gas emissions from indirect sources. Examples of this includes reducing crude oil losses during the transportation of crude vessel to refinery (i.e. ocean loss) and developing a network of pipelines to reduce greenhouse gas emission generated from vehicle in the product distribution.

Regarding waste management, greenhouse gases emitted from landfill disposal are also controlled. An

organization-wide target has been established to achieve zero waste to landfills by 2020. Other incentives implemented to help reduce indirect greenhouse gas emissions are in relation to transportation. The company supports employees to use the carpooling option, shared vans, and employee service vans which complies with the rental contract standards for rented vehicles. Additionally, employees are encouraged to use bicycles for travelling into the production plant and to conduct meetings through video calls instead of commuting to the meeting.

Ultimately, the CFP project which uses advanced technologies to increase the portion of produced diesel and aviation fuel hence, has a higher value than the divested fuel oil, will result in a reduction of greenhouse gas emissions at the end consumption phase.

Thaioil and Subsidiaries have enforced projects to reduce indirect greenhouse gases through Digital Transformation

consisting of projects such as Digital Workplace, Finance Transform, and Predictive Maintenance in order to escalate machinery efficiency and lessen the consumption of electricity and paper.

Furthermore, projects concerning the community and environment are conducted continually. These comprise of the Community Forest to reduce Global Warming Project at Bo Phloeng District in collaboration with Department of Forestry and Thailand Greenhouse Gas Management Organization (Public Organization), Maejo Hydro Power Plant Project, and the Mangrove Forest Planting Project. Finally, the "WE to WORLD" program advocates for less consumption of plastic bags and cups while also creating awareness about climate change to employees and subcontractors to help tackle this issue.



Operational
Eco-efficiency



Value chain
management



Energy

“Modern consumer needs are constantly changing. In order to preserve our society such that future generations can live good lives, and in order to drive Thaioil towards becoming a 100-year organization, we have developed a strategy for exceptional customer service excellence. Through this strategy, Thaioil cares for our customers, who constitute an important stakeholder group, and for suppliers who we consider as business partners that will grow with us. This strategy guides Thaioil in our management of organizational efficiency, in terms of managing costs and resources for maximum efficiency, as well as in terms of cooperation with our partners to achieve economic growth and contribute to energy security for society.”

—
Mr. Chatapong Wungtanagorn
Executive Vice President - Corporate Commercial
Thai Oil Public Company Limited

VALUE ENHANCEMENT

Value Enhancement strategy focuses on the development and improvement of operational efficiency and value chain management to build business competitive advantage and respond to customer demands.



82.5

Energy Intensity
Index of Thaioil
Refinery, better
than the target

759,147 GJ

of energy saving from energy
improvement projects,
equivalent to direct GHG
reduction of

113%

refining
capacity

54 million Baht

of cost reduction
from collaborative
loading transportation
of crude oil

96%

customer
engagement
with our group.

100%

of new suppliers
acknowledged
Supplier Code of
Conduct

43,207
tons carbon dioxides

Operational Eco-Efficiency

Challenges, Risks and Impacts

Increasing awareness of environmental changes and various external factors such as increasing water demand due to economic and social growth, increasing stakeholder expectations for environmental management, increasing limitations of natural resources in parallel with global economic and population growth, and the upcoming preparation for all the laws and regulatory requirements for expansion projects, together present a great opportunity for Thaioil to serve as a driver to help reduce environmental impacts affecting the community. Thaioil does so through management systems and policies covering quality, security, safety, occupational health and safety, and the environment (QSHE), energy management, and corporate social responsibility (CSR). On top of these core management systems and policies, Thaioil implements initiatives that increase our use of technologies that meet global standards of efficiency and environmentally friendly fuels, reduce our environmental impacts on air and water quality, increase Thaioil's awareness of the implementation of relevant regulations passed by public agencies, and keep us updated with global trends in environmental issues. Two of the main projects that illustrate these initiatives are the Energy Efficiency Project and the Clean Fuel Project (CFP). Together, these initiatives help Thaioil identify opportunities to improve our environmental management system with the utmost effectiveness and efficiency.

Commitment

Thaioil and Subsidiaries are committed to leading an environmental management system that can reduce environmental impacts and increase operational eco-efficiency to ultimately support:

Thaioil's business growth and our path towards becoming a global oil and gas industry leader in energy efficiency,

Environmental performance that comply with all environmental laws and regulations,

Comprehensive environmental impact assessment alongside the complete implementation of prevention and mitigation measures

The achievement of our zero industrial waste to landfill targeted by 2020.

Management Approach

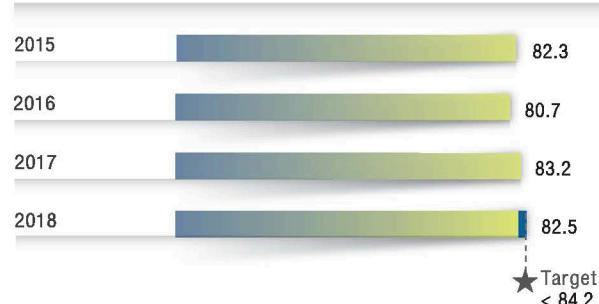
Energy Efficiency Management

Thaioil and Subsidiaries have implemented a total of 25 projects for energy conservation that successfully reduced our energy consumption by **759,147 kilojoules**. This is equivalent to **43,207** tons of carbon dioxide reductions per year.

In 2018, Thaioil and Subsidiaries implemented a number of noteworthy initiatives, including:

- Increased the capacity of high-efficiency steam turbine generators in order to stop operating low-efficiency steam turbine generators,
- Increased catalysts 1 and 2 to adjust incoming temperature from low to high at the octane unit
- Improved the cleaning process of plate heat exchanger in Crude Oil Distillation Unit 3
- Reduced the removal of lighter components from diesel fuel at the Diesel Quality Improvement Unit 2 and 3 (HDS-2/3)
- Sprayed steam into the air before entering gas turbine generator to increase efficiency in electricity generation
- Improved efficiency of the heating furnace by reducing excess air at the furnace at the Sulfur Production Unit 5 (SRU-5)
- Adjusted the level of steam at the vacuum chamber of Thai Lub Base Public Company Limited
- Adjusted the amount of extract used in the Parex Unit of Thai Paraxylene Company Limited
- Reduced the pressure level of the kerosene oil separator and the oil stripper in the cleaning agent unit or LAB of LABIX Company Limited

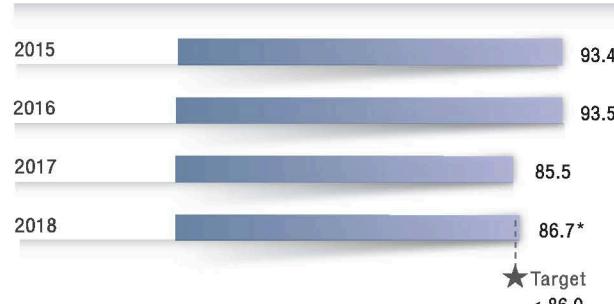
Energy Intensity Index (EII)



Remark

The data covers Thai Oil Public Company Limited, Thaioil Power Company Limited, and TOP SPP Company Limited.

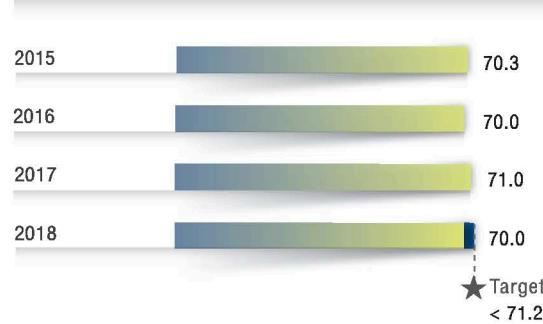
Energy Intensity Index for TLB



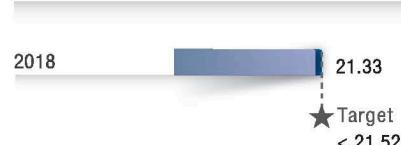
Remark

Energy efficiency of production unit decreased due to maintenance shutdown of the production unit. During the shutdown, the heat exchanger tool is cleaned and energy optimisation is controlled constantly, causing the energy consumption unit to be slightly higher than target.

Energy Intensity Index for TPX



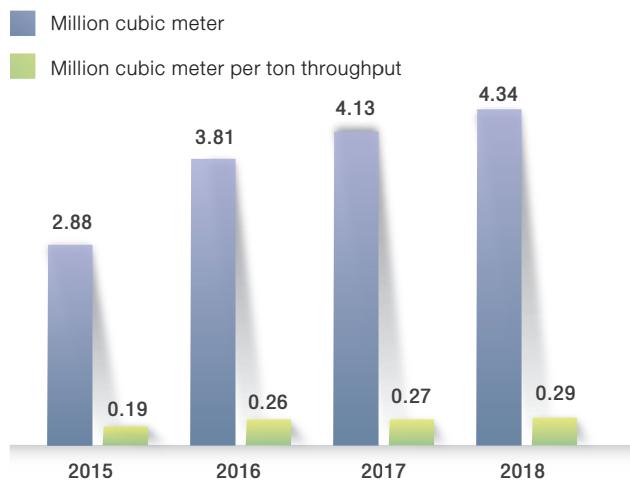
Energy Efficiency for Labix



Water Management

Thaioil and Subsidiaries have a water efficiency improvement framework based on the 3Rs (Reduce, Reuse, Recycle) to increase efficiency in water management. This framework drives Thaioil in efficient water use throughout the production chain. We have implemented a project to increase the cycle of water circulation in the Cooling Water Circulation System, as well as replaced old raw water pipes with new ones to decrease leakage from rusting and pipe deterioration.

Total water consumption



Industrial Waste Management

Thaioil and Subsidiaries systematically manage our industrial waste through the Waste Management Procedure and by our Waste Management Committee. Our Waste Management Committee drives the development and implementation of waste management policies, and also continuously monitor our waste management performance from source to disposal. Here, the 3R (Reduce Reuse Recycle) strategy is also implemented to help effectively and efficiently decrease the amount of waste to landfill.

Every industrial waste disposal company that Thaioil and Subsidiaries conduct business with subject to onsite visits and are assessed on their environmental, social, and good governance performance. This is to ensure that the standards outlined in Thaioil and Subsidiaries' Supplier Code of Conduct are met, and that all our subcontractors' waste management practices correctly aligns with international standards and do not pose risks that may affect surrounding communities or the environment.

In 2018, Thaioil and Subsidiaries conducted a study on metal recovery from spent catalyst to ceramic pigment. This is to increase the value of spent catalysts that are no longer reusable but still contain valuable metals. Through manufacturing these catalysts into ceramic pigment powder and various other color substances, Thaioil can gain about 283,000 THB of return on investment. (This estimation is based on the distribution of 3 types and 122 tons of spent catalysts.) We also improved our Environmental Database: Waste Management system in order to analyze data and improve our management system for more efficiency, and ultimately achieve our goal of zero waste to landfill by 2020.

Total Waste



Remark

Increasing of waste generated in 2018 was the result of demolition and ground preparation for the expansion project. Nonetheless, the amount of waste to landfill was controlled effectively as target.

Wastewater Management

Thaioil and Subsidiaries use a holistic wastewater management system that starts from applying the 3Rs to reduce water consumption all the way to ensuring that all treated wastewater have higher water quality than required standards. We use the Environmental Daily Dashboard to compile all data related to the monitoring and inspecting quality of the wastewater treatment system, as well as the quality of treated water. A designated team also measures and monitors chemical oxygen demand (COD) in the treated water throughout the 24 hours that we report to the Department of Industrial Works. Additionally, we also continuously implement human development programs

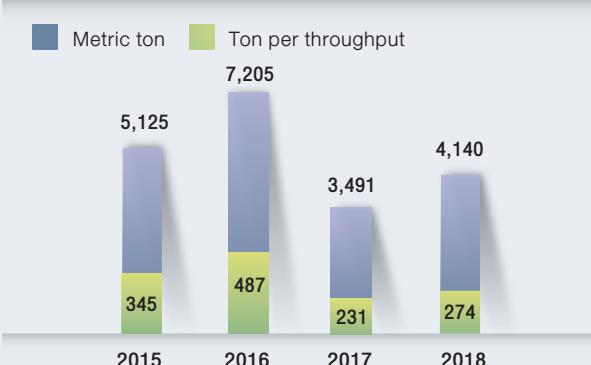
for our employees. We provided wastewater treatment system management training for relevant workers, and supported research on micro-organisms and the selection of micro-organisms that are most suitable for biological wastewater treatment in our operations. Furthermore, a bio-filter project has been implemented for the treatment of volatile organic compounds of treatment units with high concentrations of hydrocarbon in large quantities of wastewater. This project helps decrease the amount of hydrocarbons and odors that may affect surrounding communities and employees.

Management of NO_x and SO_x Emissions

Thaioil and Subsidiaries have assessed the environmental impacts of NOx and SOx and have thus established preventive and mitigation measures. These measures include employee training and education on environmental conservation, with a focus on important policies on environmental management. We communicate such policies to employees – especially technicians, engineers, and those working in operations – right at the beginning of their career with Thaioil during the employee orientation. With an aim to operate while also supporting sustainable development for surrounding communities, we strictly use high-performing technologies of international standards such as the Ultra-Low NOx Burner. Newer companies such as LABIX Company Limited, as well as Thaioil, have also come to use these Ultra-Low NOx Burners. The replacement of new burners with new technology allows for more efficiency and reduces NOx emissions. Moreover, Thaioil and Subsidiaries have controlled our emissions such that low-emission fuels that are environmentally friendly are used in more proportion than high-emission fuels. We have

installed a modern and high-efficiency Sulfur Recovery Unit (SRU) that can recover sulfur as liquid sulfur, thus reducing SOx emissions into the atmosphere. Monitoring emissions released is also carried out daily through the Environmental Daily Dashboard, which indicates that Thaioil and Subsidiaries still maintain the release of Nitrogen Oxides and Sulfur Oxides in accordance with regulatory requirements and limits set during the environmental impact assessment (EIA). Furthermore, Thaioil and Subsidiaries have commenced additional research studies in 2018. One of these studies explores air dispersion of stack emissions and potential solutions to reduce impacts of pollutant dispersion on communities. Thaioil and Subsidiaries also continue to use our Continuous Emission Monitoring System to inspect air quality from stacks every year, and move forward with our preparations to comply with upcoming oil standards established by the Pollution Control Department, which will require all oil refineries to produce fuels that meet Euro 5 standards, or fuels with sulfur content of no more than 10 ppm.

SO_x Emissions



NO_x Emissions



Management of Volatile Organic Compounds (VOCs)

In recognition of the possible impacts that volatile organic compounds, or VOCs, may have on surrounding communities, Thaioil has assessed environmental impacts and applied appropriate preventive and mitigation measures. Our measures include monitoring release of organic compounds from our production process through identifying as leaks with a photo ionization detector (PID). This complies with international standards and regulations. Findings are used to identify gas leaks that need to be addressed, as well as opportunities for improvement. Since 2012, we have been implementing VOC reduction measures that align with US EPA.

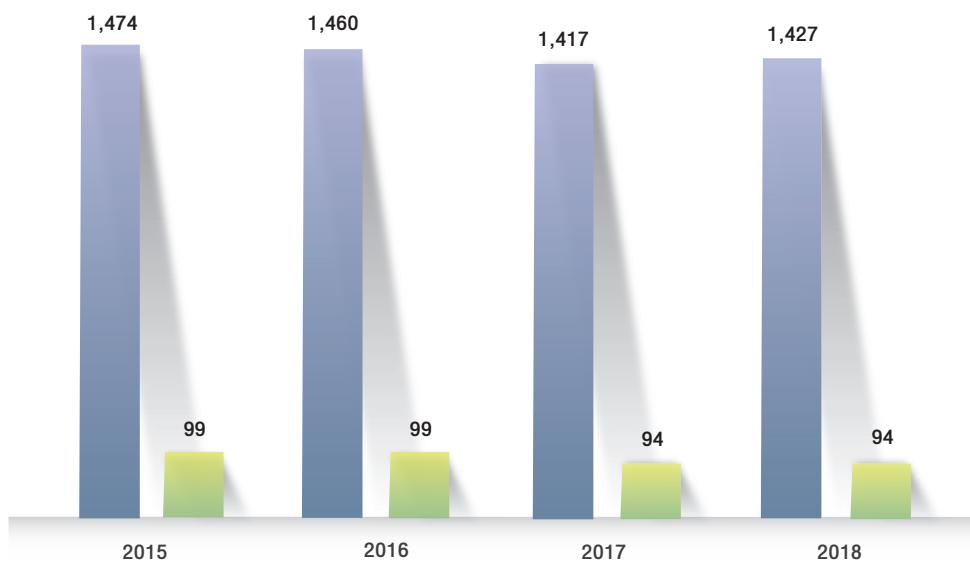
Thaioil and Subsidiaries continue to use the Bio-filter Project to reduce the amount of volatile organic compounds from production processes and wastewater treatment, while continuously implementing the Vapor Recovery Unit (VRU) system which is 99% effective in treating volatile organic compounds during product loading. More projects were also conducted

in 2018, such as the study of the level of benzene drainage in each source including the Effluent Treatment Plant (ETP), Flare, Combustion Units, Fugitives from operation, Tank, and Loading. We also study the air model to assess the pollutant dispersion, and appropriately establish preventive controlling and monitoring of dispersion to communities to take care of the overall communities' health.

In terms of future expansion projects, Thaioil and Subsidiaries have evaluated the impacts of VOCs as well as preventive measures through conducting an environmental impact assessment, and have chosen highly efficient technologies of international standards to reduce VOC emissions. In addition, a project has been implemented to cover the wastewater treatments to reduce odor impacts and the amount of VOCs in surrounding communities around Thaioil and Subsidiaries in the future.

Volatile Organic Compounds (VOCs)

Metric ton
 Ton per million ton of raw materials





Value Chain Management

Challenges, Risks and Impacts

The procurement strategy of Thaioil focuses on supplier sourcing and capability assessment such that our key construction projects and other works can be implemented with the desired quality and planned budget and timeline, and this is especially relevant to the context of our Clean Fuel Project (CFP) that has completed the supplier selection process in 2018. In order to be approved for the Approved Vendor List and Approved Contractor List, suppliers and contractors must pass a series of qualifications, including environmental, social, and governance (ESG) factors. Furthermore, to strengthen stakeholder trust, we have improved our procurement system for accountability, transparency, and ethics as committed to in our procurement guidelines.

Commitment

Thaioil is committed to conducting business according to procurement principles that are;



Clear



Fair



Professional

with the aim of zero non-compliance in the procurement tendering process for all of our significant projects which are supervised through the internal audit process.

Moreover, Thaioil is also committed to conduct business with suppliers according to the Thaioil Group Suppliers' Code of Conduct (SCoC), which envelopes environmental, social, and governance issues since 2015, which all new suppliers must sign their acknowledgement of the SCoC. Our goal is to have 100% of strategic suppliers and 80% of key suppliers sign their acknowledgement to the SCoC by 2019. We also are committed to support them in becoming a certified member of the Thai Private Sector Collective Action Coalition Against Corruption (CAC).

In terms of continuous performance development, Thaioil is committed to developing and enhancing the readiness of procurement staff by organizing training sessions and communications through the sharing of employee experiences within the company. Thaioil also develop our professional competency systems in accordance with guidelines of Thaioil and Subsidiaries' Future People 4.0, all within the Thaioil Procurement and Contract Excellence Framework.

Management Approach

Procurement Strategy

In 2018, Thaioil implements procurement strategies regarding sourcing for both crude oil, material and contractors to support long term business growth with partners, including:

Framework Agreements

a long term contracts of 5-6 years with business partners for product groups of high value and fluctuating prices. This is to help Thaioil gain standard prices and maintain continuous trading. Framework Agreements also help build good relationships with our business partners, and are considered beneficial for both sides. This can save the cost by 30-50%.

Collaboration with PTT Group

a collaboration within the PTT Group to sign contracts with partners in collaborative material purchasing, giving Thaioil the bargaining power of high amounts of trading, and create good relationship for both PTT Group and partners, which can save costs by 11-25%.

Procurement planning

by analyzing the M-Budget of each major projects for planning on sourcing and purchasing materials and services on time according to projects' plan.

Using Green Procurement

practices in catalyst purchasing to replace expired catalysts was valued at 2,000 million THB. We assess the catalyst qualities in terms of environmental effects such as energy and natural resource consumption as well as consideration of Catalyst Life Cycle Management, which is recovering metals or valuable metals from expired catalyst for further reuse. This enhanced value for business, and also reduce natural resource consumption.

Crude Oil Supply

Thaioil considers the impact of supply chain disruption, where crude oil is considered to be the initial factors of this supply chain procurement, and implement the procurement of crude oil from various sources around the world to decrease the volatility of crude oil levels by considering cost price competitiveness in the market.

In 2018, Thaioil implemented a project in collaboration with refineries in Thailand especially refineries of the PTT group to be co-loading partners for saving transportation costs. In addition, the supply of crude oil through the company's crude oil buoy to other refineries in Thailand also continually help to reduce procurement costs. In 2018, through collaboration with refineries as co-loading partners and through procuring crude oil through its crude oil buoy, we were able to reduce expenses by a total of 54 million THB.

Thaioil uses the level of Ocean Loss as an indicator of oceanic transportation. In 2018, our performance was slightly better than target, with Ocean Loss coming mainly from the main pumping port. Thaioil and Subsidiaries have assigned a working committee to monitor and analyze the cause of Ocean Loss during each trip and continually make improvement to control the level of Ocean Loss within target.

Ocean Loss Index



Procurement Transparency

In terms of procurement management, there has been a business ethic assessment, risk management, supply chain management such as the Procurement Compliance Unit, and announcement of policies supervising operations in accordance with company laws. The procurement system is also improved to be transparent and auditable to increase organizational efficiency to be competitive in global ground. The Proposal Tracking System for partners to submit bids, giving partners clearance while also supporting transparent and auditable procurement and proposal system, along with developing the Thai Oil Group Tendering System (TOP TEN)

which supports the operation of procurement employees in biddings to go according to company code of practices. Moreover, the e-Auction (Online) provides the opportunity for partners to propose prices several times, allowing Thaioil to procure at an appropriate price and fairness for all parties, while also developing price delivery through E-sourcing as well.

In sourcing crude oil, Thaioil uses the Commercial Excellence (COMX) System in approving procurement to ensure that the crude oil procurement process is transparent and auditable.

Supply Chain Risk Management

Supply chain disruptions result in business risks that come from legal issues and related regulations, which may have an impact on our reputation. Thaioil thus acknowledges the importance of managing the supply chain effectively in relation to environmental and social issues, and business ethics according to our SCoC. In 2018, Thaioil's procurement department had conducted Supplier Classification, a process that filter and group partners according to importance of product and service to manage the SCoC accordingly.

Supplier Assessment

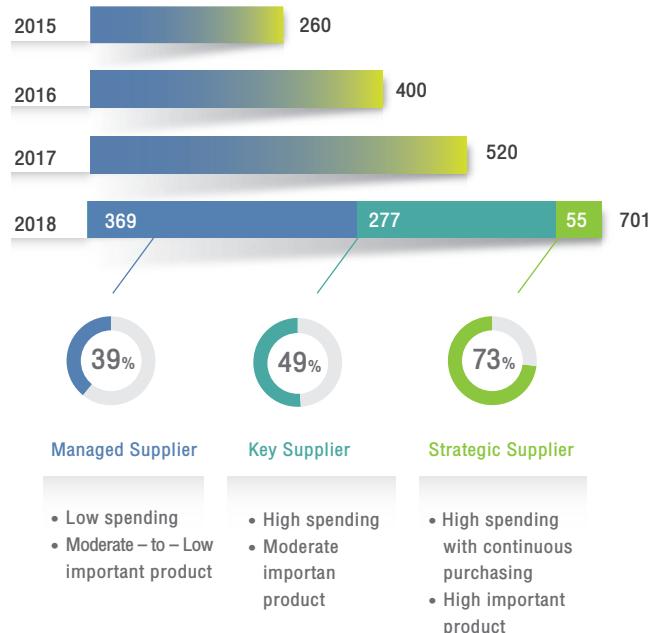
The supplier assessment process began in 2015, where Thaioil started the process through an electronic system that encapsulates suppliers and contractors. This process has a consistent and systematic approach where suppliers and contractors shall proceed as follows:

- **Sign their acknowledgement of Thaioil's Supplier Code of Conduct**
- **Complete the electronic self-assessment survey**

This process allows Thaioil to assess and identify environmental, social, and governance (ESG) risks and opportunities, including human rights risks that cover labour issues, child labour, working conditions, and forced labour. This supplier assessment process is continuously implemented.



Number of suppliers acknowledged SCoC by type of suppliers



ESG Risk Assessment

Thaioil has identified the ESG Plus Verification system as a way to promote sustainable development practices within our business partners' activities. To that end, we have supported our key business partners in fully reporting and communicating how their practices align with our policies which are Procurement Policy; Business and Human Rights Policy for Stakeholder; Anti-Corruption Policy; Quality, Security, Occupational Health and Safety, and Environment (QSHE) Policy; Energy Management Policy; and Corporate Social Responsibility Policy. This, of course, adds on to the Supplier Code of Conduct and the CSR in Supply Chain standards. The process, namely "ESG Plus Verification Program", is separated into 3 phases: 1) Verification by Thaioil and Subsidiaries, 2) Third party assessment for high risk suppliers, and 3) Capacity building for business partners. The process began in 2017, and we have continued to lead this process. In 2018, there were 30 suppliers who passed the first phase of ESG Plus Verification, and we are still in the process of continuing to Phases 2 and 3.



Suppliers who passed the ESG Plus Verification



To manage risks in crude oil procurement, Thaioil has proceeded crude vendor assessment that each vendor has to register into our vendor list and comply with our requirements, which do not only touch on financial status but also other areas of non-financial performance. As a minimum requirement, vendors must provide evidence of their policies on managing environmental compliance, human rights, occupational health and safety, and good governance throughout their business activities. In 2018, Thaioil has developed e-Registration system for crude vendors, called "Counterparty Registration". Vendors' information will be maintained systematically in this system and can be audited all the time.

Aside from the above mentioned initial process of vendor assessment, Thaioil and Subsidiaries also examine the good governance information of crude oil suppliers through a media analysis (i.e. news, company website), including examination by other suppliers that the assessed suppliers continuously refer to.

In 2018, we found that none of the crude oil vendors registered in our vendor list created adverse environmental and social impacts.

Training for Procurement Employees

In 2018, Thaioil began an endeavor to increase the capacity of procurement employees through the PC Functional Competency organized by experienced procurement employees. This program provided training sessions of skills involved in procurement for 11 courses, such as courses in procurement strategies, sales data analysis, cost reduction and spending estimation, knowledge of regulations and requirements, Thaioil's own procurement policies and standards, cost analysis of ownership, and supplier relationship management. This initiative will be continued in 2019 as well.

Supplier Engagement

Suppliers are placed as our partners to enhance qualified deliverables and create satisfaction for internal partners. We have developed channels for supplier engagement and communication to ensure that they are able to voice their feedback and concerns and that Thaioil is able to accurately perceive supplier sentiments. For example, one such channel is our supplier perception survey that explores suppliers' perception of Thaioil's practices in procurement management, service, transparency, and fairness. All feedback received will be integrated in our decision-making process and activities.



All good governance activities are also continuously supported and promoted through campaigning and communication of Thaioil and Subsidiaries' procurement policies and other relevant business continuity policies in order to align with the Clean Fair Professional principles. Some examples of these initiatives include:



Inviting a total of **40** key suppliers to join the SME Executive Briefing with representatives of Thaioil and Subsidiaries,

Inviting a total of **5** key suppliers to join the PTT Group CG Day with PTT Group,



Communicating CSR in Supply Chain through our website, which covers our policies and requirements regarding the 7 main topics of social responsibility, namely,

- 1 corporate governance
- 2 human rights
- 3 labor practices
- 4 environment
- 5 fair operation practices
- 6 customers and consumers
- 7 community engagement and development



Communicating through relationship building activities to help suppliers be informed, understand, and comply with the spirit of transparency in Thaioil's procurement. One such example is the No Gift Policy.

Customer Relations

In 2018, Thaioil focused on our services in listening and responding to customers promptly and effectively, increasing convenience for customers in reporting issues and suggestions by improving the Voice of Customer (VOC) system. Customers are able to report problems and suggestions through the Thaioil website, and updates on the problem's solution are constantly communicated to them. The Voice of Customer system collects information in a database which can show historical files, view request status, summarize request type for the benefit of correct improvement and development of service in various areas.

- The Top Data Communication (TOP DCC) is a system that communicates information on trading between Thaioil and customers, which uses technology to facilitate data transmission as well as decreasing errors, time, and steps in a process, which have also won the Thailand ICT Excellence Awards 2018.

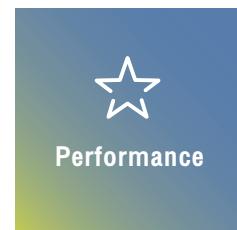


- The Voice of Customer (VOC) system has been improved to increase effectiveness in listening to customers' voice so as to respond within time.

Thaioil also values meeting clients regularly to listen to comments and exchange perspectives so as to improve and develop future operations, including:

- Meeting clients to build good relations and report on current market situation nationally and globally on a monthly and quarterly basis,
- Organizing customer visits to our refinery, as well as providing information to enhance understanding of production process and oil distribution by vehicle and by ship,
- Organizing activities to develop customer relationships by holding Sports Day, for example a football match,
- Participating in Bangkok Marathon Run activity with customers, and
- Holding leisure activities to help customers' drivers feel relaxed.

A survey of customer engagement shows that from various operations, customer engagement with Thaioil and Subsidiaries is at 96%, which is better than targeted.



The Clean Fuel Project (CFP) was able to begin operating

1 month earlier than planned due to the effectiveness of contractor selection process.



All important projects were completed according to plan and within planned budget.

The procurement strategy resulted in saving of costs and expenses from strategic planning, such as

Negotiation for the implementation of the Framework Agreement

30-50%

Collaboration with PTT Group

11-25%



non compliance
on procurement practices



A total of **30** suppliers passed the ESG Plus Verification process.



100% of procurement employees passed the procurement training, which also included ESG factors.



Training sessions for relevant managers were successfully organized.



♻️ Product Stewardship

🏡 Our Society and
Communities

👤 Human and Organization
Development

🖱️ Innovation Management

"To face the abrupt changes in today's world, Thaioil needs major transformations within the organization. We need to elevate our innovation and technological development to drive the organization forward through further business diversification with a focus on development of environmentally friendly products, and through strengthening "human capital" and "work processes" by digital technology. These are necessary actions to take to ensure that we are ready for changes and are able to adapt our investment strategy to find new business opportunities, ultimately bringing us to ensure future progress and sustainably create value for our communities and society."

—

Mr. Pongpun Amornvivat
Executive Vice President-Strategy, taking positions of
Executive Vice President - Innovation and Digitalization (Act.)
and Vice Presidency - Corporate Resources and Transformation-Management (Act.)
Thai Oil Public Company Limited



SUSTAINABLE VALUE CREATION

Sustainable Value Creation strategy focuses on using creativity and research and development (R&D) to innovate new initiatives for achieving long-term growth. This is realized firstly through developing the capabilities of the main driving force of our success – our employees. Through human capital development, Thaioil increases the capabilities of our employees to respond to changing contexts, and organizes knowledge management such that employees may innovate, research, and develop products that are environmentally friendly. Additionally, Thaioil also utilize technology and innovation, as well as collaborations within the organization and with surrounding communities, to create positive social and environmental impacts to all our stakeholders.



1,155%

Return on Human Capital Investment

5,162 million Baht

Values of applying organizational knowledge into business practice

484 million Baht

Benefits from commercialized R&D and Innovation

28%

Proportion of low carbon product sales per total finished oil products, equivalent to about 700K tons carbon dioxides reduced in the end consumption

97.27%

Community engagement

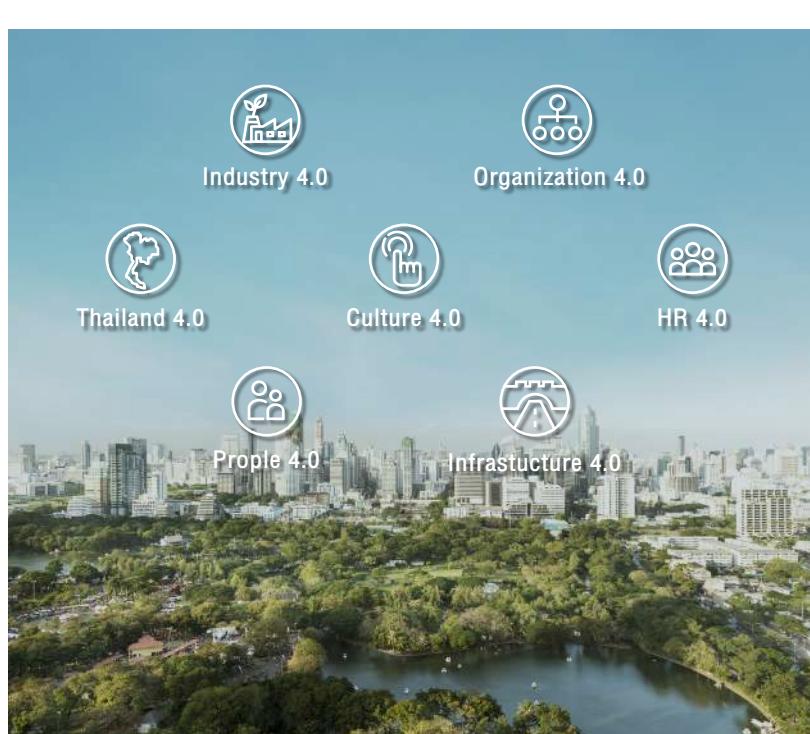
55,304 persons

Benefits from the use of Thaioi Group Community Health and Learning Center

Human and Organization Development

Challenges, Risks and Impacts

With transforming business trends that propel the economy, society, and environment into the 4.0 era, disruptive technology emerges as a risk that can create serious impacts to businesses. This pressures businesses to adapt by implementing new technology and innovation to create markets and value to their products and services. This includes growing their businesses digitally to become flexible in operations that can generate profits within a short time like Google, Facebook, or Tesla.



Economy DRIVEN by Innovation & Technology

Factors that are catalyzing change in people and organizational management to align with the digital transformation era include:

- Collaboration between human and machine in advanced analysis; and automation helps drive development in productivity and decision making
- The diverse talent market causes the creation of recruitment and employment strategies to attract personnel from the new generation
- Development of new generation personnel equipped with new skills to be prepared for future work includes increasing capacity (Upskill), adjusting to new abilities (Reskill), and changing the way of working for Millennials and Generation-Z
- Efficient and fast connections allow personnel to work whenever from wherever including developing products and services, creating innovation in shorter development periods (Learn Fast, Fail Fast), as well as creating a work environment that helps personnel communicate and collaborate with each other easier (4Cs experience: Connect, Collaborate, Communicate and Co-operate)

Commitment

Thaioil and Subsidiaries continue 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 (Our Motto: Refining Values)**” by defining strategies for personnel and organization ranging from planning personnel structure, designing organizational structure, recruitment, implementing initiatives that increase employee engagement, and human capital development. By improving processes and bringing in digital technologies, our employees will be able to produce work to meet our organizational goals.



Management Approach

Thaioil and Subsidiaries have developed 1-3-year plans in preparation to cope with upcoming human capital challenges. These plans include upgrading our comprehensive strategy to cover the planning process for strategic personnel, recruitment, development of personnel, creating and retaining personnel by

focusing on cultivating corporate culture and core competencies (TOP Core Competency) to support the vision, strategic plan, and develop Thaioil and Subsidiaries to become a high performance and healthy organization that can grow sustainably through the following operational plans

STRATEGY

People and Organization Development

ATTRACTION

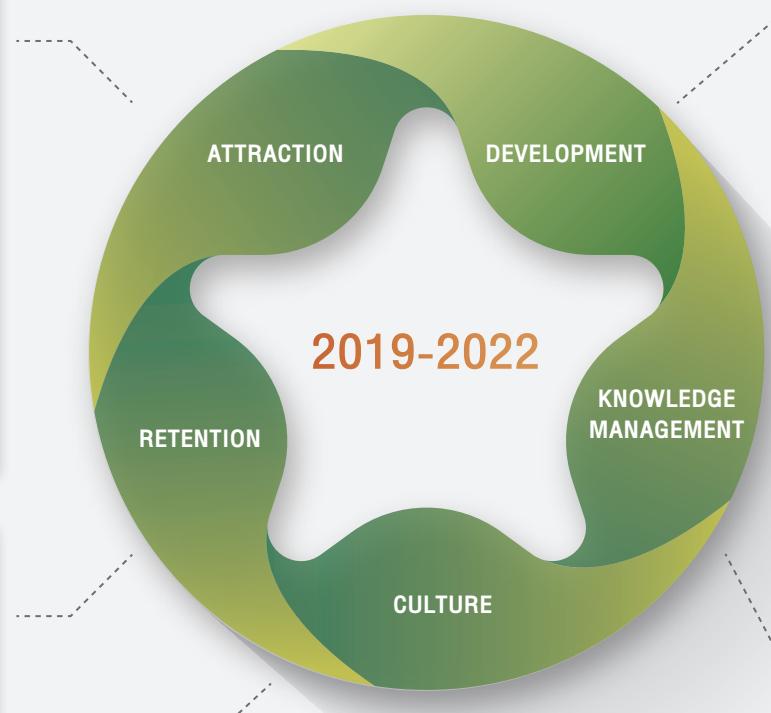
Execute a strategic workforce planning that supports our business direction and strategy, in which will allow us to maintain as a competitive workforce internationally. Thaioil have also developed the organizational structures to support digital projects, innovation, and investment in venture capital for future business expansion.

Furthermore, Thaioil has prepared to elevate our proactive recruitment strategy in order to obtain high-quality personnel to support future business expansion and to replace retiring personnel by applying digital technology in the recruitment process, and collaborating with educational institutions to share various technical knowledge in order to prepare students to enter the workforce.

RETENTION

Develop the Hire to Retire Digitalization Project, a human resource management technology system, to effectively support current and future businesses by using technology and digitalization in managing human resource through a system as a basis of development, such as:

- **Anytime Learning Project** to create opportunities for employees to access modern and diverse channels of learning.
- **Employee Portal project for employees to access personnel services online (Self-service at finger tips).**
- **Rhino Bot (Chatbot) project to cater to the new generation and provide them with easy access to information services and employee benefits through a mobile application.**
- **Well-being @ TOP project to enhance physical, mental, financial, and societal well-being and achieve a balance in their work-life through a mobile application.**



CULTURE

Create a corporate culture and work ethic for personnel of all levels, what we call Leader Drive Culture, in order to create a culture of digitalization and innovation with employees consisting of iTOP organizational values which serves as a strong foundation.

ACHIEVEMENT

DEVELOPMENT

Adjust human capital development strategy through creating integrated learning experiences for the duration of the personnel's employment period through the AGILE Learning Experience program by focusing on cultivating corporate culture, values, and core competencies (TOP Core Competency) to support the Thaioil vision and plans for business expansion in the digital age with various, modern development projects that support the learning needs of each age group and generation (Gen Z, Gen Y, Gen X, Baby Boom) such as:

- Learning about basic knowledge, core competencies, and organization values through online channels such as micro learning, AR learning, and e-learning.
- GREAT Leader Development Project to develop leadership and employee readiness for succession.
- Dynamic Career Management Project to develop core competencies of the organization and DANCE+ competencies to prepare for business expansion in the digital era.
- Mobility Development Project to develop employee capacities and readiness in commencing overseas operations.

KNOWLEDGE MANAGEMENT

Implement the Gen 2 Gen Knowledge Management Project to retain important knowledge within the organization, from generation to generation, by creating a knowledge architecture map that links with functional competency and by defining the knowledge that is important to the organization that need to be stored and passed on by professional expert with experience to new employees continuously.

2023-2030
Long-term
Strategy

Sustainability
Organization

Competitive
Leadership
on Digital

HR Best
in Class

The Best
Employer

High
Performance
& Healthy
Organization

Key Achievement

People
Readiness

HR System
Reliability

Cost
Efficiency

Ultimate Outcome

Skillful, Good,
Love the Company

ATTRACTION: Strategic Workforce Planning & Talent Attraction

Thaioil and Subsidiaries operate a framework on strategic workforce planning which aligns with our business direction and strategy with the goal of EBITDA per person being at the 75th percentile by 2023, as compared to international businesses in the same industry. Thaioil and Subsidiaries plan to increase productivity by 4.24% every year, so that we can continue to maintain our long-term competitiveness. Managing our organization under the strategic workforce framework will allow us to reduce costs relating to our workforce by approximately 400 million THB per year.

Moreover, Thaioil has restructured the organization by developing the 'Innovation and Digitalization' function to support the new vision, mission, and strategy for our transforming businesses. In search for future business opportunities, adapting the management and human resources structure will lead to operational and structural aspects aligning with current and future businesses. Increasing the capacity of professional services will increase the efficiency and effectiveness of business functions by separating strategic and operational tasks, as well as create better "partnership" interactions as shown in the picture below.



Additionally, Thaioil and Subsidiaries continue to focus on recruiting high-potential employees that are characterized as people with high potential who are skillful, good, and love the company by using the **4B strategy** (Build, Buy, Borrow, and Bring-in) as a baseline strategy in recruiting from a target group.

In 2018, however, Thaioil added a **DRIFT** strategy to attract the target group and instill confidence that Thaioil and Subsidiaries create sustainable growth while investing in developing high-quality employees that are happy with their work. The strategy is as follows:

Digital recruitment: aim for reforming recruitment technology by improving recruitment through social media. The use of QR codes for candidates to fill out and submit their application form in the pre-screening stage as well as interviewing applicants from around the world through Skype will allow Thaioil and Subsidiaries to attract expatriates to participate in our Mega Projects or the Clean Fuel Project (CFP). This will also attract millennials and increase recruitment efficiency

Robust Partnership: expand our network of external partners by MOUs with education institutions at the undergraduate and vocational level by using frameworks that include:

Providing knowledge aimed to develop academic knowledge and skills that can be applied to work towards students and faculty through lectures at institutions and visits at the refinery

Giving opportunities by accepting student internships that are project-based

Granting scholarships to outstanding students

And Thaioil also give opportunities for students to enter the selection process to become an employee.

International Sourcing: enhance proactive recruitment from the international labor market by recruiting experienced personnel from abroad, regardless of them being Thai or foreigner.

Fast Recruitment: implementing technology in recruitment processes will quicken the selection process

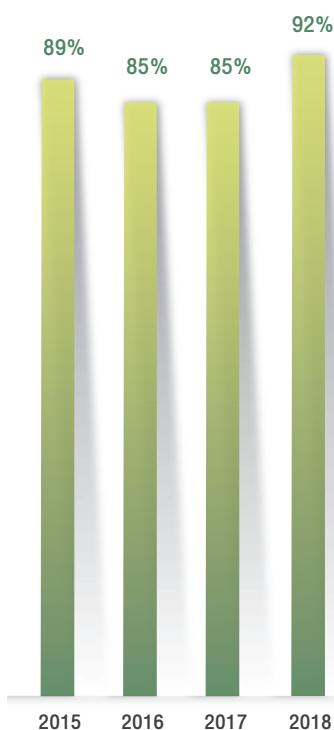
TES Employer Brand: create shared inside-out experience to be passed on by Thaioil Ambassadors and seniors to share their experiences of their work-life under Thaioil culture at the company and recruitment process on to external party or new coming employees.

The various activities according to our strategy will help in recruiting employees to support short-term and medium-term business plans as well as support employees retiring in the future.

Performance

Recruitment ability

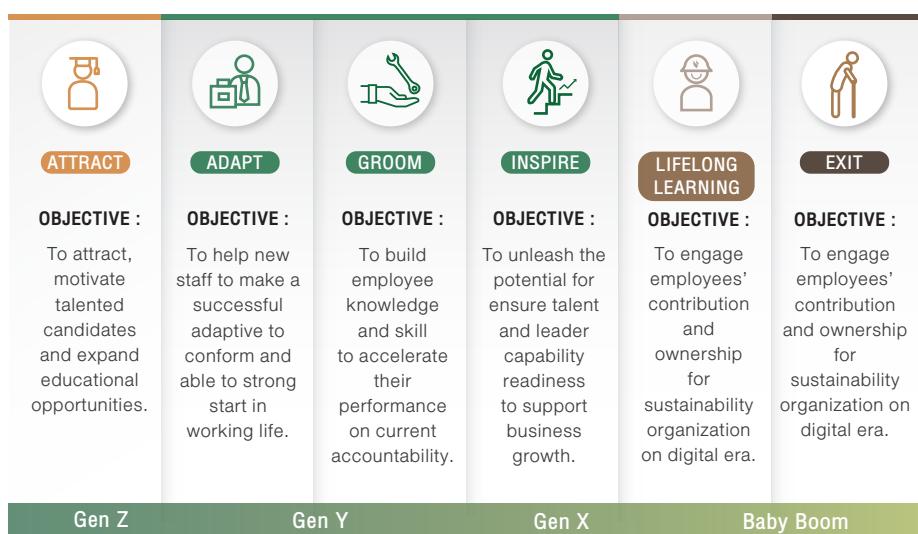
Unit: % of total numbers of open positions



DEVELOPMENT: Human Capital Development

Thaioil and Subsidiaries have established a framework in taking care and developing employees' potential through a development strategy called "AGILE" which will accelerate the development of the employee's knowledge, abilities, and awareness of changes in the digital era. This includes the ability to respond to changing business strategies. According to the "AGILE" development strategy, the development of employees' potential would start even before they join Thaioil and Subsidiaries and last until their retirement by focusing on enhancing their learning experience to focus on modern learning methods and models as shown in the picture.

AGILE Development Framework



Hire Empower human life through digitalization experience Retire

Generation Y & Z : Thaioil uses the ATTRACT & ADAPT strategy to support younger generations in attaining readiness to enter the workforce. This strategy touches on not only our new employees, but also others who may benefit from this resource. Thaioil essentially use digital channels to communicate ways in which this demographic can attain the necessary skills and capacities to best perform their work. Thaioil also include other helpful tips on adjusting oneself for participating in the workforce, as well as Thaioil values in order to ensure that these members of society can have a strong start in their career, especially if they choose to work with Thaioil and Subsidiaries. Furthermore, we use the GROOM strategy to develop employees' functional competencies, soft competencies, as well as mobility competencies. Thaioil believe this integration of different set of skills will enable our employees to accomplish their work assignment professionally.

Generation X : As a result of the global context and environments that they faced, this generation is often open-minded individuals who aspire towards self-development and seek opportunities to learn new things. The large majority of them have had some experience in the workforce, and may have already progressed towards senior positions. Thaioil and Subsidiaries use the INSPIRE strategy to develop employees who have talent and potential in being a leader and/or successor. This strategy allows us to contribute to our employees' career paths, such that they may grow in their positions. We also emphasize human capital development that is centered on LIFE-LONG LEARNING and a balance between different disciplines or ways of knowing. Through integrating knowledge and expertise from different dimensions in creating work, a balance between work and life may be achieved, and employees may gain a happier lifestyle with Thaioil and find a long-term career with Thaioil more attractive.

Baby Boomers : Baby boomers are determined in their work, and have accumulated valuable experiences that may be shared with younger generations. Thus, knowledge management is especially important in ensuring that this valuable knowledge is not lost. Our EXIT strategy then is focused on encouragement and appreciation that can inspire this group of employees with pride as well as a motivation to share their knowledge, in order to store knowledge and transfer to another generations to apply them.

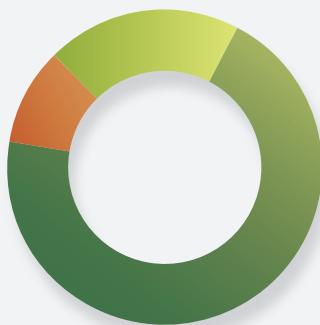
Examples of key training courses according to AGILE framework

Framework	List of key training courses
Adapt	1. Check in our future 2. Basic fire fighting
Groom	1. Performer development program (PDP1-6) 2. Great development : Leadership lab 3. Epara CVC (Corporate venture capital) workshop 4. Update accounting standard and tax 2018 5. RPA201 Solving refinery planning problem
Inspire	1.PTT leadership development program 1 2.Executive coach 3.Socialization development program 4.Leader as coach 5.Cross culture and host-country program
Lifelong Learning	1.Team building
Exit	1.Pre-retirement course (สุขภาพ สุขใจ ด้วยกีฬา) 2.How to lead healthy life above 50



Furthermore, Thaioil and Subsidiaries have come to value the 10 (Education): 20 (Exposure): 70 (Experience) principle for human capital development as follows:

With this principle, Thaioil and Subsidiaries have used an integrated human capital development approach that is focused on tangible outcomes. Some projects include:



10%

Education

Develop opportunities for education through organizing training sessions, workshops, and seminars where employees may learn new ways of thinking and theoretical underpinnings that can enrich their work.

20%

Exposure

Organize experiences where employees may gain exposure, such as networking events and site visits.

70%

Experience

Ensure that employees learn from their job experience through providing on-the-job training, rotation opportunities, and dynamic career track options.

The Linear Programming Model, or LP Model, Improvement Project has been continuously organized for employees. LP Model is a tool used in economic analysis, and can accurately reflect production processes. It is useful to increase efficiency in planning production processes, as well as procurement of crude oil and other raw materials.

A research study project on accounting regulations, tax planning, and liability management was organized to increase efficiency in financial management and tax planning for Thaioil and Subsidiaries. This led to the establishment of Thaioil Treasury Center company limited (TTC), as well as our ability to register international headquarters (IHQ) to reduce costs.

The Energy Intensity Index (EII) Project was used to identify ways to reduce costs and energy use, as well as manage the Financial Cost Saving Project, otherwise known as the Symphony Project, and the Orchestra Project for costs and expenses management.

In addition, Thaioil and Subsidiaries have engaged in human capital development initiatives that respond to our endeavor to find new business and investment opportunities. Some highlights are:

The Venture Capital Project, established the Corporate Venture Capital team and designed an investment process that is lean, transparent, and accountable. This supported Thaioil and Subsidiaries in investing in the Applied Science and Engineering fund, which is also one of our business strategies.

The Research & Development Project allowed Thaioil and Subsidiaries to gain new commercial innovation products. These include the K-2 Device, a device that can open and close valves so that workers may operate with more convenience and safety, and the Cyclopentane, which is a hydrocarbon that can be used in producing plate heat exchangers. The Cyclopentane 80 is a new upgrade from an existing product line to further satisfy customer demand.

In developing leadership skills and soft competencies, Thaioil and Subsidiaries organized development programs, including:

Executive Coaching to empower executives and motivate them in working efficiently, and

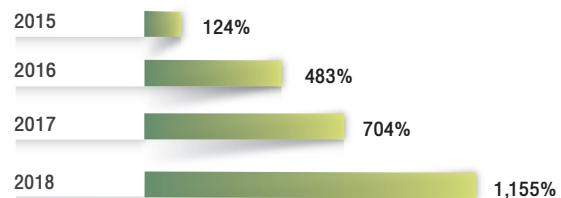
Leadership Lab for middle management employees to build their capacities in creating strong teams and caring for employees, as well as their ability to identify employee strengths and apply these points to the organization's and team's advantage.



Thaioil and Subsidiaries also open up opportunities for employees to develop their capacities through our Anywhere Anytime Any Content initiative. Here, we offer online courses from SkillLane and organize micro-learning content, make use of artificial reality (AR) in these human capital development initiatives, such that our people may receive the most recent knowledge and be aware of forefront global trends.

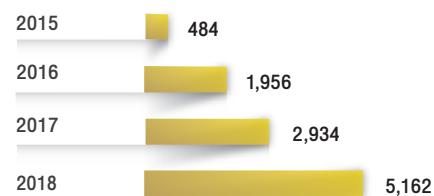
From our use of the 10 : 20 : 70 integrated development principle, where we emphasize the practical application of lessons learnt, Thaioil and Subsidiaries were able to increase business value and return on employee development investment, and create benefits that have also been applied to business growth, by a total of 5,162 million THB. This is an increase of 76% from our 2017 performance. Results are as follow:

Return on Employee Development Investment



Business benefits from applied knowledge

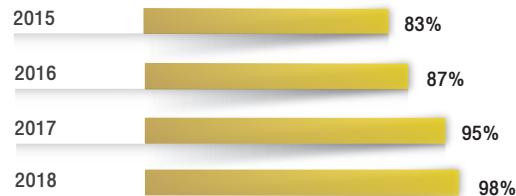
(Unit: Million THB)



Employees who have completed IDP (IDP progress)



Employees with planned career paths



Remark

Between 2014-2018, Thaioil and Subsidiaries were in a phase of restructuring the organizational structure such that it aligns with business expansion strategy. The IDP Progress plan was reviewed and updated for the present accordingly.

Reduced recruitment costs = **5.8** million THB

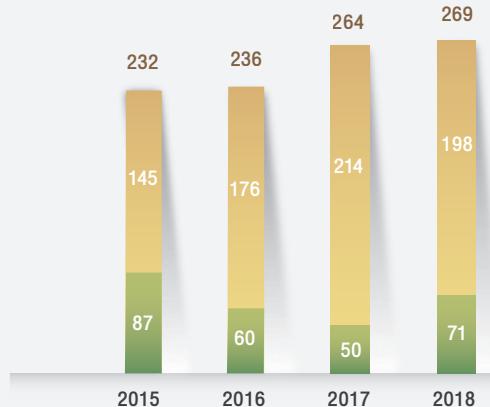
Employee training statistic by type

Total training sessions for employees in 2018 were 597 courses.

**Hours of employee training, broken down by type of training**

Unit: hours per FTE

- Training (10)
- Coaching and On-the-Job training (20-70)
- Development hour / head

**KNOWLEDGE MANAGEMENT**

The Readiness of Critical Knowledge through G2G: according to current data, employee retirement is expected to increase over the following 10 years. At the same time, there will be new incoming employees. This means there may be a gap in knowledge transfer. Thus, during 2017-2018, Thaioil and Subsidiaries have started accumulating critical knowledge of our employees and developed a knowledge architecture map for each function. This is done to identify critical and necessary knowledge that falls in the category of functional competencies. Additionally, this mapping exercise will also make efforts to develop employee capacities more easily organized and more integrated with existing systems. Our knowledge architecture maps also come with information on where the knowledge is stored. For example, the KM Portal Thaioil Intranet Share Folder

is one such location. At the same time, this knowledge is stored in various forms such as online documents, videos, interviews, and summaries. All employees can easily access this information for their own learning and understanding.

In 2018, Thaioil and Subsidiaries have commenced initiatives to increase the percentage of readiness of critical knowledge, or explicit knowledge from 65% to 72.08%, and have developed plans in 2019 to continue this journey in order to embed knowledge management into day-to-day business activities through the KM Ranger Project. We will first start with a gap analysis of knowledge management performance of each function, then proceed to closing the identified gaps. This is so that KM is not isolated but rather a part of work.

Performance

Over 360 knowledge was created in the Wisdom System.



The ability to adopt best practices with excellent knowledge is an important corporate KPI that will drive employees to developing towards best practice, or applying other best practice approaches into their own activities. This will ultimately increase our competitive capabilities. In 2018, we have 150 submitted practices for “best practice” classification, of which 59 submitted practices have been categorized as best practices. Examples include Crude Vessel Optimization, Transformation of Price Risk Management Operations, High Contamination Crude Purchasing Strategy, Deep Bed Filter Installation at HCU-2, TAM Anywhere, and TOP Group The Best Labor Practice Process (BLP).



Benefits from Wisdom & Innovation Project through developing best practices and applied practices accumulated in 2018 value over 3,380 million Baht.

RETENTION & CULTURE:

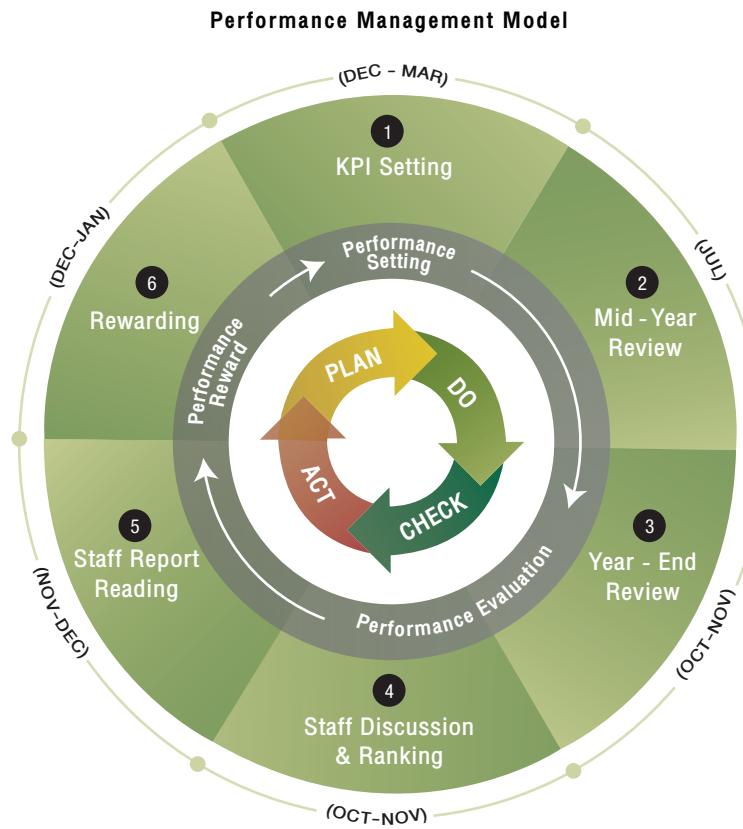
Talent Retention & Engagement

One factor in employee retention is having a clear assessment and evaluation of employee performance as well as communication for mutual understanding. Because of this, Thaioil and Subsidiaries designed a tool in evaluating the performance of employees in these 6 steps outlined below:

1. KPI Setting Thaioil and Subsidiaries will determine indicators and goals at the corporate level which will reach employees through a Waterfall or Top Down method. Employees can determine additional indicators and goals that align with the ones decided at the corporate level through a Bottom up method. Supervisors and employees can agree on goals to work towards together in order to create participation and togetherness.

2 Mid-Year Review Thaioil and Subsidiaries provide an opportunity for employees to review goals and indicators in the middle of the year, and support supervisors in coaching and giving employees feedback on their performance. If there are any factors that would prevent employees from meeting their goals, their supervisors may suggest a review of the plan, including indicators and goals.

3. Year-End Review Thaioil and Subsidiaries give importance to reviewing employee performance by providing advice and feedback in order to ensure employees' progress towards a better performance. This includes reviewing achieved goals to act as a basis in setting the following year's goals. Additionally, employees

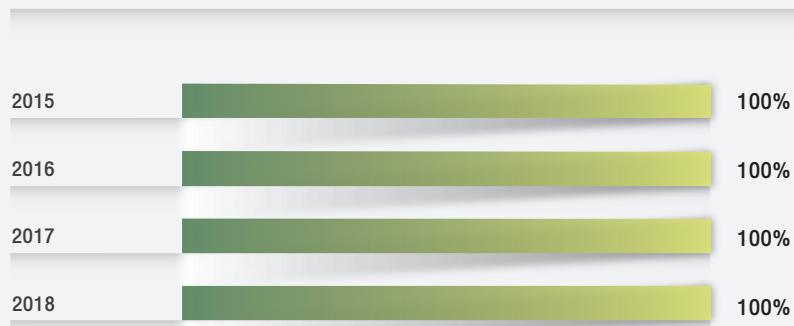


are given an opportunity to evaluate their own performance with their supervisors according to the goals both parties have discussed.

4. Staff Discussion & Ranking Thaioil and Subsidiaries require a transparent performance evaluation process that is fair towards their employees by allowing employees to evaluate their own performance and supervisors presenting the content at the department meeting. The CEO will be the president and the Vice President will be a judge in the department meeting where performance will be based on tangible results and will be evidence based.

5. Staff Report Reading The supervisors will discuss employees' performance with them in regards to achievements and suggestions for creative improvement as well as guidelines on how to continue developing themselves in the following year.

6. Rewarding According to the performance of the organization, and with the approval of the human resources committee, Thaioil and Subsidiaries will raise wages for employees which will act as an incentive for better performance and to propel employees towards career advancement.

Percentage of employees who were evaluated

More importantly, Thaioil and Subsidiaries promote employee engagement from the beginning (i.e. new employees) to the end (retiring employees). Due to the diverse generations that we engage with, each project and program is looked over by specific groups of people, such as:

Creation of a workplace environment for younger generations to meet, chat, and engage in informal discussions, as well as modern co-working spaces where employees can participate in cross-function work, these spaces also have digital technologies that may be used for communication and presentation, such as virtual boards and real-time technologies. This also helps with reducing constraints in having employees travel from Sriracha to Bangkok.

Organization of new facilities in the Sriracha Refinery area, which are planned to be completed in 2023. Over the past year, we have constructed a new facility and commenced moving part of the employees. The Engineering Building Center (EBC) which will span 22 Rai has been completed. Meanwhile, the Thaioil Laboratory is still in construction and is expected to be completed in the first quarter of 2019.

Talent retention: To retain talented employees for a long period of time, we have introduced additional benefits on top of the welfare and benefits that we provide in line with other industry leaders. We have organized the Long Service Emblem Ceremony to demonstrate appreciation and inspire employees who have completed 10, 15, 20, and 40 years of work in Thaioil. Through this ceremony, employees receive gifts of appreciation from executives.

Furthermore, Thaioil and Subsidiaries have promoted other employee benefits that may create value for employees outside of their work lives. These include financial benefits and health and wellness benefits, as outlined here:

**Financial Initiatives:**

Thaioil and Subsidiaries have established the Savings Cooperative Ltd. And Consumers' Cooperative Ltd. to contribute to the economic and social well-being of our employees. These cooperatives create benefits for members through mutually running business activities. A committee that will manage the activities of Thaioil Savings Cooperative Ltd. has also been established to lead the activities of the Cooperative such that our goals are accomplished.

**Health and Wellness Initiatives:**

Thaioil and Subsidiaries have renovated and expanded the Thaioil Club, which is an area where members can relax, exercise, participate in meetings, celebrate, as well as organize special events for each other and/or family members. Besides the Thaioil Club, we also have introduced other initiatives including:

Thaioil Health Management Program was designed to increase health balance for employees through financial planning and physical, mental, and social activities that are fitting for each age group.

Happy Retirement Project was designed to help employees prepare for retirement for 2 years in advance such that they may attain quality and happy retirement lives.



Fundamental Health Care Program offers annual health checks, influenza vaccination, and weekend health activities.

The Special Health Care Program organizes doctor visits to Thaioil to address chronic diseases such as blood pressure, diabetes, and obesity through BMI Control.

The Mental Care Program includes employee visits and the happy clinic.

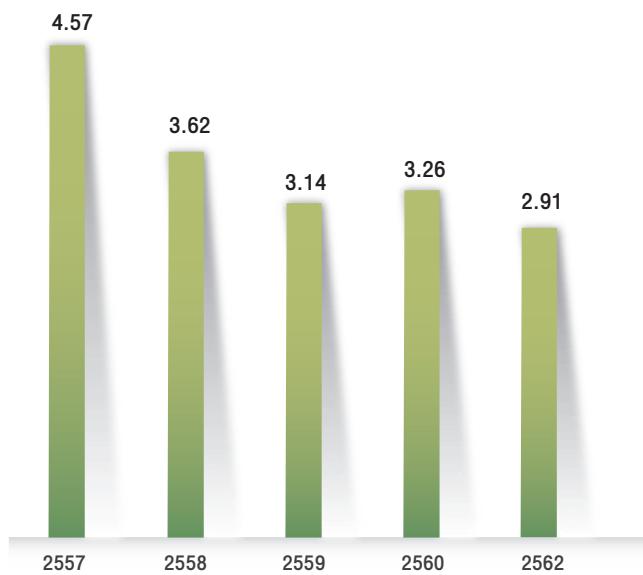
The Social Program includes the organization of activities for employees from various functions and sites to meet. These range from happy hour events to special events and CSR events, where employees are encouraged to devote themselves towards contributing to social good.

For A Good Life Activities include traditional activities that promote culture and heritage conservation. Some of these are Thai traditions and holidays such as activities for mental strength and meditation activities where employees can participate in Vipassana Meditation together.

Thaioil and Subsidiaries continue to foster and strengthen our corporate culture. In fact, one of our human and organizational strategies is to promote and drive this corporate culture. In 2018, Thaioil and Subsidiaries focused on fostering a strong sense of consciousness and promoting transparent behavior that is fair and free of corruption. Our Akane Program allowed our employees to nominate employees who have capacities in leadership, honesty, and integrity. This resulted in some employees being identified as role models, and created an awareness and appreciation of being gifted, awarded, and appreciated. This helps establish a set of desirable behavior that employees can look up to and follow with. Furthermore, Thaioil reviewed a set of behavior related to innovation and digitalization to develop our corporate culture to meet with our future business mission, vision, and strategy.

Performance

Employee Turnover Rate



Remark

Turnover Rate includes death, retirement, dismissal, and resignation



Innovation Management

Challenges, Risks and Impact

The 2018 was the year of transformations for Thaioil and Subsidiaries. The 2030 vision is developed and set with the focus not only on creating competitive advantage through our core business, such as the expansion project i.e. Clean Fuel Project: CFP, and the strategy to advance business by digital transformation, but also on developing new businesses to respond to and/or empower human life, which have a tendency to change according to the new wave of economic, social, and environmental trends.

In search of new business opportunities under this vision, Thaioil has necessarily transformed our strategy, tools, structures, processes, and human competencies and capability. Innovation is one of the key factors to drive a step change for transforming business development into a way that aligns with upcoming trends such as Corporate Venture Capital (CVC), startups, and accelerators.

Management Approach

Strengthening and enhancing competitiveness of core business

The Pilot Plant of Residue Hydrocracker Unit (RHCU) Project

The CFP's main objective is to improve efficiency of refining capacity while increasing finished product value. Thaioil thus designed the new refinery unit by selecting advanced technology with potential to refine heavy crude oil, which is a cheaper raw material compared to light distillates commonly used in production today. By this, the costs of raw material sourcing is expected to reduce to 4-5 USD per barrel.

However, as heavy crude oil is complex to manage and refine, it becomes the challenge that confronted us throughout our feasibility studies and the investment decision-making process. Since the characteristics of the crude oil will impact not only on product quality but may also present a risk of unforeseen potential impacts on equipment lifetime, all crude oil used in our refining processes are thus required to pass technical assessments from relevant specialist matching with the specification on technology before use. Thus, the process of testing new crude oil before processing is the most important procedure.

Although there are various plants that provide this crude oil testing service, the supply of these services still does not adequately meet the high demand. Thus, the investment in our own pilot plant for crude oil research will enable us to effectively conduct tests and research. The use of this pilot plant is expected to provide 260 million THB (8.27 million USD) worth of returns on investment per year.

Our Commitment

Thaioil and Subsidiaries enhanced the management of innovation and technology by setting up, in 2018, the 'innovation and digital' organization structure to focusing on transforming business into digital era, in order to increase business's competitiveness. With an intention to enhance core refining business into the economies of scale, the new refinery unit under the CFP project is designed to be able to add value to products by converting fuel oil to high quality products that meets Euro 5 standards, which have lower sulfur content and be environmental-friendly, in line with the government policy. This results in the needs of feasibility studies and scientific research on best available technology, as well as the proof-of-concept study on how digitalization can come to increase efficiency of production performance.

Apart from the core business, Thaioil seek for the new business opportunities to strengthen our long-term competitive capabilities by prioritizing the development and commercialization of innovation projects that provide tangible value to our business. This is through an integrated use of tools and processes, including those that promote creativity and Design Thinking process, research and development, intellectual property application of technology and digital devices, and new type of business investment such as CVC for the propose of commercial benefits. Thaioil and Subsidiaries have set a target to increase the portion of profits generated from technology and innovation businesses to 5% of total profits by 2030.

Odyssey: Digital Transformation Project

In 2018, Thaioil and Subsidiaries focused on digital transformation within the organization by establishing the Digitization Task Force (called 'Odyssey') as a specialized unit to strategize the end-to-end process of digitization for transforming all Thaioil's business activities within 2019-2021, and to conduct the Proof of Concept: PoC such that Thaioil will lead to increased business competitiveness and production capacity.



Performance

In 2018, the following projects have passed the proof of concept as pilot projects for the Odyssey Project:



WIRELESS PLANT

To connect all equipment in the refinery through the wireless network, utilizing digital technology and Internet of Things (IoT) to link functions of all equipment for better efficiency, such as the gas detector at lorry project, block culvert flooding monitoring project, and wireless instrument infrastructure test project.



CFP DIGITAL CENTER (CDC)

To apply technologies – namely radio frequency identification (RFID) and face recognition – in order to monitor and assess employees in the refinery for efficiency, safety, and accuracy in operations. Examples include tracking solution for turnaround and face recognition for employee identification.



FINANCE TRANSFORM

To apply automation process technology to improve work processes and replace manual work, and increase effectiveness in responding to customers' needs and henceforth customer satisfaction. Examples include the intercompany auto sale order/delivery order and the auto interface tank-meter, which both gave employees more time to use in data analysis and development planning.



DIGITAL WORKPLACE

To apply chatbot technology to upgrade the quality and efficiency of responding to employees. Rhinos BOT is used to enhance employee's access to and understanding of human resource regulations, welfare and benefits, and support employees to get access to such information at anytime and anywhere.

New Business Investments Through Corporate Venture Capital (CVC)

To respond to our new vision and current trends of abrupt changes, Thaioil has established a unit to seek out investment opportunities in new businesses, in the form of Corporate Venture Capital (CVC). Thaioil has established investment processes, organizational structure, investment portfolio, Growth and Investment Committee, and agreed on types of targeted technology to be invested as follows:

- Manufacturing technology
- Technology for green and human life
- Technology on hydrocarbon disruption

Performance



In 2018,
Thaioil approved
1 venture
capital fund
regarding applied science
and engineering.

Innovation Culture Fostering

Thaioil and Subsidiaries continue to focus on building innovative culture in our organization, in order to develop employees' capacities and create an environment that encourages and promotes development of innovation as well as platform of innovative product development. Most importantly, Thaioil aimed at tangible benefits from commercialization of its innovations by setting the target of incomes gained from the commercialization of innovation projects as one of the corporate's KPI.

Tools to Promote an Innovative Organizational Culture: The 3E+E Approach, as Outlined Below:





Performance

Thaioil has gathered innovative ideas and projects exhibited at the Wisdom and Innovation Award event, where innovators came to discuss and exchange ideas, and further developed their innovative projects. In 2018, various recognition awards were granted. For example, awards for those with outstanding creativity, awards for ones who enhance knowledge, innovation awards for those that were applied and generated value.



Benefits from commercialized projects in 2018

Total **484** million THB



Benefits of

38 innovation projects

from the Wisdom and Innovation Award 2018

1,198 million THB



Number of innovators who participated at the Wisdom and Innovation Award 2018

120 innovators

Number of Patent registered 2 patents

PROject DOcument Control System (PRODOC)



A document management system for project management with a unique edge in that it allows different contributors to work on the same document at the same time. Contributors may edit and add information on the document, and PRODOC will assimilate all information into one document.

Terminal Automation Management (TAM) System



A high-efficiency terminal management system that includes functions to check purchase orders from anywhere, arrange queues of oil loading for maximum accuracy, and track transport vehicles. The linked modules of the TAM System can minimize time spent at loading terminals from more than 2 hours to 45 minutes.

Number of commercialized projects 2 projects

Cyclopentane 80 (CP80)



A collaboration project to produce the CP80, which acts as a blowing agent in the production of rigid polyurethane (PU). The CP80 is comparable to the CP95, but costs lower and, if produced locally, can replace imports. Additionally, CP80 may be used as a replacement of CFCs (chlorofluorocarbons) and HCFC (hydrochlorofluorocarbon), which are main contributors to the greenhouse effect.

K-2 Device



An equipment that assists in the opening and closing of gear system valves, and may be used to reduce time in opening and closing big valves.

Innovation Culture in 3E+E Model



EXPOSE

Sustainable Energy Technology Asia 2018 (SETA 2018)

21 – 23 March 2018,
Bangkok International Trade and Exhibition Centre (BITEC)



Conference Confirmation: Project Management Conference 2018

24-25 May 2018
Kameo Grand Rayong Hotel



PTT Group Process Design and Simulation Seminar 2018

31 May 2018,
Holiday Inn Pattaya



PTT WE CAN

1 June – 20 July 2018
PTT HQ



PRISM Lab to commercial: MOV & K1 by TOP

2 August 2018
CCR Building, PTT Tank, Rayong



Digital Thailand Big Bang 2018

19-23 September 2018
Challenger Hall 2, Impact
Muang Thong Thani



EDUCATE

Together We Share: Innovation Series #1/2018: "Thaioil and Sriracha Innovation District (SID): Thaioil's Role in SID as an Energy Leader

5 April 2018
Thaioil Refinery



Together We Share #3/2018 "We Did Machine Learning Together" Innovation Series

10 August 2018
Thaioil Refinery



National Engineering 2018

1-3 November 2018,
IMPACT Forum Hall 9



PTT Group Innovation Awards 2018

8 November 2018, PTT PCL Head Office,
Main Meeting room, 2nd Floor, Bldg. 3



Future Energy Asia 2018

12-14 December 2018
Bangkok International Trade
and Exhibition Centre (BITEC)



Field visit at PTTLNG Company Limited

13 November 2018
Thaioil Refinery



ITICHE2018 & TICHE2018

8-9 November 2018
A-One The Royal Cruise Hotel Pattaya



EXECUTE

Commercialization: Cyclopentane 80

9 November 2018
Thaioil HQ



Commercialization: K2-device

25 December 2018,
PTT Tank



EVALUATE

Thaioil Group Wisdom and Innovation Award 2017

11 July 2018,
Thaioil Refinery



Product Stewardship

Challenges, Risks and Impacts

To promote sustainable growth and environmentally friendly businesses, Thaioil and Subsidiaries continuously seek for opportunities to grow our business and develop our products to become more environmentally friendly, by aiming to extend our main business towards environmentally friendly products. Especially in petrochemical business, Thaioil has identified trends in trade expansion and technology advancement that together have made consumers more concerned of health, safety, and environmental impacts. Thus, TOP Solvent Company Limited has established policies to ensure the quality and safety of our production, procurement and distribution practices, especially with regards to any potential impacts on the products. TOP Solvent prioritizes customers' satisfaction with the purchased products and services, as well as the end consumers who use the products and services.

Commitment

Thaioil focused on increasing the sale revenue of low-carbon fuels, including gasohol and biodiesel. Moreover, Thaioil and Subsidiaries have recognized a business opportunity within the growth of energy demand in Thailand, we have expanded our production capacity through the Clean Fuel Project. We expect that when the CFP is operated in 2023, Thaioil will be able to produce Euro 5 diesel fuels (which have low sulfur content at 10 ppm) and convert fuel oils from our production process to the kind of fuels that are more environmentally friendly.

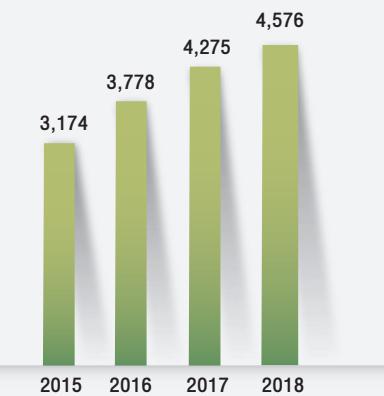
As mentioned above, Thaioil is committed to safe and environmentally friendly production and distribution practices in our petrochemicals business. The development of products, services and new innovations to increase value of the products and services are for the purpose of responding to customer needs and demands. While we manage all production processes to minimize risks and impacts on the environment, Thaioil also actively communicates to our customers to support them in making informed decisions and using our products properly and safely. We ensure that we do not withhold any necessary information and that the information we provide are free of distortion. We also take feedback and recommendations from customers as inputs for further product improvements to improve products and services that may best fit to the needs of different groups of customers.



Performance

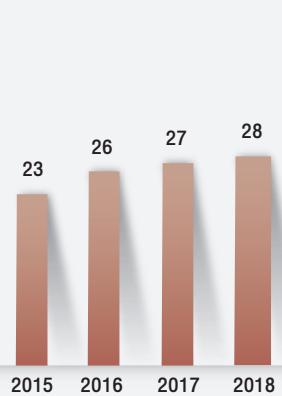
Sales of low-carbon products (Gasohol and Biodiesel)

Unit: Million Liter



Share of low-carbon product sales (e.g. gasohol, biodiesel) out of total fuel oil product sales

Unit: % (Baht)



Share of environmentally friendly product (TDAE, TRAE and AROS) sales out of total lubricant sales

Unit: % (Baht)



Management Approach

Our refinery distributes gasohol and biodiesel in accordance with government policy, with the share of 28% from all fuel sales in 2018. Additionally, in the same year, Thaioil also started distributing B20 biodiesel for trucks and public buses in order to contribute to the reduction of air pollution and environmental problems that have stemmed from incomplete combustion. For the continuous growth in domestic fuel demand. The project to improve and expand truck loading terminals and increase storage capacities of storage tanks for fuels, ethanol, and B100 have been implemented since 2017. These improvements are to enhance our competitiveness and meet the increasing demands of customers.

Thaioil is still aware of safety in product delivery. In 2018, we have developed facilities at the truck loading terminals for truck drivers through renovating the accommodations and building a new

cafeteria for the drivers. The objective is to ensure that truck drivers are fully rested, such that risks of accidents during fuel deliveries may be reduced. Moreover, Thaioil has a plan to expand the jetty areas to accommodate more vessels. We aim to build two additional loading points. As a result, more vessels can get access to the loading point, and the jetty can better accommodate large oil vessels. These improvements are to ensure that Thaioil's facilities are ready to facilitate our clients, while maintaining their satisfaction in our services in the future.

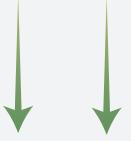
TOP Solvent Company Limited has set a management approach that covers product development, monitoring and tracking, and education that would most benefit our customers. The approach is outlined below:

- Develop high safety products through the elimination of hazardous substances, such as

carcinogens including benzene and naphthalene.

- Develop products to replace substance that have significant impacts on environment, such as expandable polystyrene
- Procure and develop bio-products that are compostable and have minimum impacts on environment.
- Monitor and conduct tests of heavy metal contaminants which are hazardous in accordance with international standards such as ROSH and SVHC.
- Adopt and issue the Product Safety Document, in accordance with the Globally Harmonized System.
- Manage transport of dangerous goods in accordance with the UN Recommendation on the Transport of Dangerous Goods (UNRTDG).
- Promote customers' awareness and understanding of product usages, storages, and product care for their safety.

Environmental friendly and safety product by petrochemical business (TOP Solvent)

<p>CFC HCFC</p> 	<p>Cyclopentane 80, developed by collaboration project in Thaioil Group through research and development. This substance can replace and reduce the use of CFCs (Chlorofluorocarbons) and HCFC (Hydrochlorofluorocarbon), which are both GHG emissions, in the production of heat absorbing foam. This substance can contribute to reducing risks of global warming.</p>	 <p>Procurement and distribution of the solvent with no carcinogens, used in production of glue, synthetic rubber, and surfactant.</p>	 <p>Procurement and distribution of other products used in food production industry, biodegradable detergent, and surfactant which received national innovation award.</p>
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Our Society and Communities

Challenges, Risks and Impacts

Thaioil, as one of the main businesses operating in the Sriracha area of Chonburi Province, consider our duty to operate with a sense of responsibility towards how our business decisions and activities create societal impacts and affect surrounding communities and environments. With this intention, we run our business with transparency and ethical values that promote sustainable development and coexistence with our stakeholders, complying with all regulatory requirements and aligning with international standards. To create an integrated organization-wide, we develop corporate social responsibility programs that can effectively solve society's most pressing problems by considering various options and simulation scenarios of issues regarding the environment, public health, education, and quality of life uplifting, for both the communities surrounding our operational areas and communities in remote areas around the country such that they can get ready for any economic, social, and cultural changes that will result from future industrial expansion.

Commitment

Thaioil aspires to be a leading fully integrated refining and petrochemical company that also responsibly operates with regard to social and environmental impacts. Our vision is to do good business while also creating value and contributing to the attainment of a good quality of life for surrounding communities and communities in other remote areas.

Thaioil attain the trust and acceptance

of our neighboring communities through centering our work on creating shared value, developing social development programs, systematically assessing and evaluating our performance to continuously mitigate our impact and improve upon our work for the maximum benefit of our stakeholders, and fostering participation with all related parties for a sustainable partnership.

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*Thaioil has set a 2019 target to achieve
community
engagement
level of more*

97%

*than or at least the same level as 2018,
through implementing projects such as
the "Thaioil Job Training Community
Center" as part of the social enterprise
programs.*



Management Approach

The Board of Directors of Thaioil have sets policies and framework to guide our corporate social responsibility work, and also continuously monitors our performance. As well, the Company set up the specific dedicated functions to taking care of community development and social responsibility, which are responsible for setting corporate social responsibility strategy, developing long-term plans, engaging with communities surrounding the operational areas and selected remote areas, reporting performance to the Board of Corporate Governance every quarter, and communicating to all employees and workers for awareness and proper actions.

Corporate Social Responsibility Strategy

1. Select community development projects with a focus on dimensions that are aligned with Thaioil's business direction.
2. Focus community development projects on four priorities to support communities towards achieving self-reliance and sustainability: education, energy and natural resource, environmental conservation, and quality of life.
3. Create networks and collaborate with PTT Group, research institutes, and other organizations that have expertise in community development and are accepted by society.
4. Promote the participation of important stakeholders, such as community members, government agencies, customers, suppliers, and employees.

Corporate Social Responsibility Policy

1. 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.
2. 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
3. Implement corporate social responsibility projects by focusing on community's participation in collaboration with local organizations in the public sectors.
4. Promote Thaioil Group employees' participation while instill corporate social responsibility values and corporate culture

Community Inclusiveness

Thaioil carried out various activities together with communities surrounding the refinery in Sriracha area, with the "3 Synchronization Model" and the "5 Together" Conceptual Framework in order to encourage engagement in community development and promote self-reliance so that community could be strengthened. The activities were divided into four aspects: 1) social aspect which includes support for religion, tradition and culture, 2) health aspect, 3) education aspect, and 4) environmental aspect, based on holistic development principle. In 2018, Thaioil increased frequency of the 3 synchronization meeting for full team (all chairpersons of ten communities) into every 2 months. The purpose of the meetings were to communicate and discuss the progress of our expansion projects and to invite the representatives of each community to visit the areas where relevant to them.



Value Creation framework for Society and Communities Development

Priorities	Education (SDG target 4.3) 	Environmental Conservation (SDG target 13.1) (SDG target 13.3) 	Energy and Natural Resource (SDG target 7.2) 	Quality of Life (SDG target 3.8) (SDG target 8.3)  
Approach	Support initiatives, collaborate with schools, and grant scholarships	Manage operational processes and reduce greenhouse gas emissions	Develop alternative energy sources and promote energy efficiency	Support access to employment and promote public health for local communities
Value Created to Society	<ul style="list-style-type: none"> Increased access to education Increased quality of education Increased number of students from disciplines that contribute to national development 	<ul style="list-style-type: none"> Reductions in greenhouse gas emissions Increase in environmental conservation initiatives 	<ul style="list-style-type: none"> Increased access to clean energy Increased knowledge and expertise on energy 	<ul style="list-style-type: none"> Increased quality level of local public health Increased employable skills Increased household incomes
Value Created to ThaiOil	<ul style="list-style-type: none"> Social license to operate Developed human capital with business knowledge and expertise 	<ul style="list-style-type: none"> Social license to operate Reduced complaints related to environmental impacts 	<ul style="list-style-type: none"> Social license to operate Increased number of employee volunteers with expertise in energy development Increased employee experience 	<ul style="list-style-type: none"> Social license to operate Reduced complaints related to health impacts Increased community engagement Increased capable human resource to the nation

2019 Project Implementation Plan by Project Type

Type	Priority	Status	Objective
CSR Projects Around the Refinery			
Construction of Thaioil Building for Laem Chabang Hospital in Sriracha, Chonburi	Quality of Life	Hospital will operate in August 2019	To promote public health and quality of life of residents in Sriracha.
CONNEXT ED Project to develop leadership skills (part of the Pracharath Project with PTT Group)			
Job Training Community Center at the Thaioil Health and Learning Center	Quality of Life	Feasibility study	To provide job training for community members and Sriracha residents at the Health and Learning Center in purpose to increase employment opportunity
Crab Bank Community Fishery Center and Marketplace	Environmental Conservation	MoU completed, to commence in 2019	To systematically manage coastal resources without compromising the natural ecosystem through creating a crab hatchery and conservation area where crabs may reside before being released into the wild, and to promote sustainable fishing practices
Solar Panels for Koh Sichang Hospital	Energy and Natural Resources	Feasibility study	To use alternative energy sources instead of diesel generators, which often come with blackouts
Baan Khao Yhai Community Forest at Bo Thong with the Forestry Department and the Thailand Greenhouse Gas Management Organization (TGO)	Environmental Conservation	MoU completed, to commence in 2019	To grow a 1,283 rai (2 sq.km.)-forest to reduce greenhouse gas emissions, to create a fire prevention path, and to share information on environmental conservation with communities
National Development			
Alternative Energy Developments at Baan Jo Leu Nua, Mae Hong Son	Energy and Natural Resources	Feasibility study	To promote the use of alternative energy sources through "community water turbines" and "innovation of solar energy for chili drying"
Alternative Energy and Philosophy of Sufficiency Economy (PSE) Education Center at the Baan Huay Tong Border Patrol Police School at Nopphitam, Nakhon Si Thammarat	Energy and Natural Resources	Feasibility study	To promote the use of alternative energy sources through the "Solar: The Light of Education" project
Huay Pong San Pik Hydro-electricity Project at Baan Nong Hoi in Paang Ma Pha	Energy and Natural Resources	Feasibility study	To partner with the Department of Alternative Energy Development and Efficiency (DEDE) of the Ministry of Energy of Thailand to promote the use of alternative energy sources

Type	Priority	Status	Objective
Co-development project with PTT Group			
Café Amazon for Chance at Laem Chabang Hospital in Sriracha, Chonburi	Quality of Life	To commence in April 2020	To create job opportunities and provide barista skill training for those with hearing disabilities and the disadvantaged in Sriracha
“OUR Khung Bang Kachao” Green Space Development Project	Environmental Conservation	Participation in the working group on water resource development and erosion	To strike a balance between conservation and development, reduce risk of natural disasters, and increase water resource security and sustainability
Thaioil SE Shop (connected to the Job Training Community Center at the Health and Learning Center) Social Enterprise Phase 2	Quality of Life	Feasibility study	To support community product development in terms of branding, marketing, and packaging with communities from Laem Chabang and surrounding areas
Promoting Employee Voluntary Culture			
CSR Projects with New Employees	Quality of Life	Continued in 2019	To foster a corporate culture of volunteerism while also applying expertise from new employees to contribute to communities
Run and Have Fun for the Children: Collecting kilometers ran and/or walked to trade for athletic wear donations for children	Quality of Life	Continued in 2019	To foster a corporate culture of volunteerism and promote public health
TOP Way of Conduct CSR for Thaioil affiliates	Quality of Life	Continued in 2019	To foster a corporate culture of volunteerism and advance the CSR practices



Highlights 2018 of Surrounding Community Development Programs

1. Thaioil Group Dental Clinic for Schools

Background: Cavities and other teeth issues create impacts on health and quality of life for all from every age level, especially children ages 6-12 years who are still physically and socially developing. Additionally, this is the age group where all 28 adult teeth mature.

Activity: Organize “Dental Health Campaign” for primary school students (grades 1-6) in 8 schools around the refinery

Objectives: To increase dental health for students

Performance:

- Thaioil has organized free dental health inspections, cavity filling, tooth extraction, pit and fissure sealants, fluoride treatment, and scaling and root planning, as well as promoted tooth decay prevention at partnered schools since 2010. Results show that this program has resulted in better dental health for students.
- The average rate of gingivitis for youth in the 10 Laem Chabang communities who received dental health services was at 17.11% (Figure 1), which is better than the national rate at 66.3% (Table 3).
- The decayed, missing, and filled teeth (DMFT) index for students across 8 schools was 0.92 (Figure 2), which is huge better than the national rate of 1.4 (Table 3).

Figure 1: Percent of Gingivitis*



Figure 2: The Decayed, Missing, and Filled Teeth (DMFT) Index*



* Dental health performance surveyed from 12-year-old sixth graders (Academic year 1/2018) from the 8 participating schools in ten communities in Laem Chabang district.

Table 3 : The 8th National Dental Health Survey in 2017 (Country average rate of 12-year-old students)

Cavities and teeth decay

Frequency of cavities

52%

Average cavity found

1.4 teeth/person

Good teeth

66.7%

Without cavity

48%

Gums

Gingivitis

66.3%

Necessity of cavity remedy

Pit and fissure sealants

19.9%

One-sided cavity filling

24%

Dental care behavior

Never brush teeth after lunch

55.3%

Brush teeth before bedtime

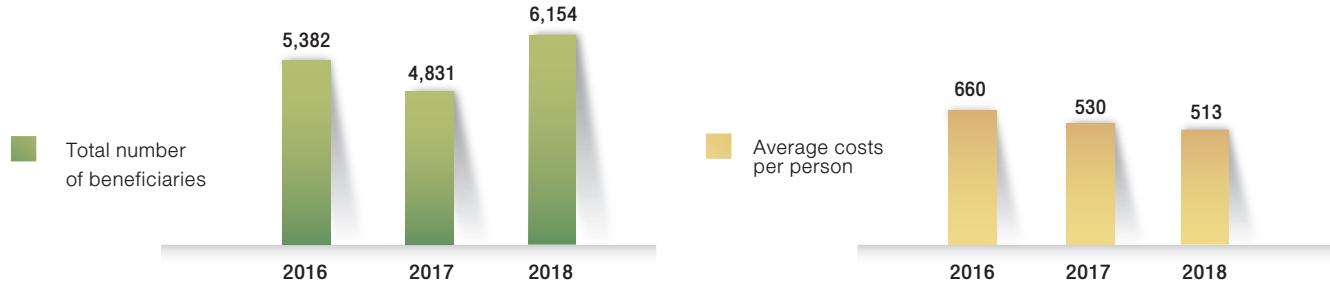
38.6%

Drink sugar-sweetened beverage 1-3 days per week

57.4%

Eat snacks every day

32.6%

Thaioil Group Dental Clinic Statistics**2. Light for a Better Life Project**

Background: The Light for a Better Life Project is a project under the CONNEXT ED Leadership for Sustainable Education Project, which is also part of the Pracharath Project. Here, Thaioil has brought the engineering expertise and experience of our employees to support community development.

Objectives:

- To prevent electrical fires.
- To reduce the risks of students and school staff getting electric shocks.
- To increase energy conservation through equipment replacement.
- To provide basic guidance on maintenance and use of electrical systems.

Performance: Employees from the electrical engineering functions of Thaioil and our suppliers volunteered in the inspection, maintenance, and repair of electrical systems in participating schools. They also replaced faulty and unsafe electrical equipment, set up power system protection equipment and the electric shock protection system, and repaired the lighting systems within walking paths and classrooms. Additionally, our volunteers also promoted energy conservation through the use of LED lamps. By 2019, this project will be implemented across a total of 10 schools, as stated follows.

Year	School	Number of Beneficiaries	
		Students	Teachers/ Staff
2017	Baan Nong Song Hong School (Chon Buri Province)	173	14
2017	Wat Don Sai School (Chachoengsao Province)	135	11
2018	Wat Prasat Sopon School (Chachoengsao Province)	101	7
2018	Baan Nong Ka School (Chon Buri Province)	174	15
2018	Baan Nong Kayad School (Chon Buri Province)	272	16
2018	Wat Sanam Chan School (Chachoengsao Province)	217	9
2018	Wat Laem Chabang School (Chon Buri Province)	313	21
2018	Wat Mhai Nern Payorm School (Chon Buri Province)	612	38
2019	Wat Manorom School (Chon Buri Province)	1,232	63
2019	Baan Sak Yai Jeen School (Chon Buri Province)	614	26

Highlights 2018 from CSR Projects That Promote Volunteerism in Employees

1 Run and Have Fun for the Children

Background: This is a recurring initiative that has been organized since 2015. Our employees walk, run, or exercise to collect kilometers that will be exchanged for clothes, shoes, and socks that will be donated to schools in Chonburi.

Objectives: To promote employee health and to organize an employee volunteer activity where Thaioil staff can collectively work to develop schools and fundraise for student lunches.

Performance: In 2018, we organized an activity in Baan Klong Ko School in Kaset Suwan, Bo Thong, Chonburi. Our employee volunteers applied their engineering expertise to contribute to school development through designing and creating a lawn mower. Through this lawn mower, the school will be able to keep the soccer fields well maintained and reduce the risk of students getting snake bites while on the field.

School	2015	2016	2017	2018
	Baan Nern Tong Sriracha	Baan Klong Yang Bo Thong	Baan Kong Pradoo Koh Chan	Baan Klong Ko Bo Thong
Teachers	7	5	9	7
Students	80	70	93	108
Runners	60	62	174	306
Kilometers ran	4,316	4,485	13,824	29,407
Employee volunteers	60	65	100	100

2 CSR Projects with Our New Employees

Background : This initiative was organized to help promote volunteerism for new Thaioil employees.

Objectives : To apply employee expertise, especially in engineering, in community development.

Performance : About 65 new employees in 2018 came together with their expertise in engineering, and created a water bicycle

from used bicycles and old materials within the refinery. This water bicycle will be given to students and children to use in their sufficiency economy gardens. Thaioil also provided metal baskets to Maap Prachan School at Baang Lamoong, Chonburi, with the hopes that this will make it easier for students to correctly sort wastes.

3 Communicating the Corporate Social Responsibility Policy through the TOP Ways of Conduct

Background : Thaioil developed the TOP Ways of Conduct to establish important policies and standardize our management approach across Thaioil and Subsidiaries. The CSR Policy is one of the policies that will be communicated to all subsidiaries for the standardization of CSR practices.

Objectives : To create a corporate culture of volunteerism and advance social work through using performance indicators, including:

- Determination and revision of corporate social responsibility policy and strategy
- Planned CSR projects and activities for the year, and their alignment with Thaioil's core business plan
- Strategy for communicating social performance
- Volunteerism culture and ability to systematically volunteer
- Networks with stakeholders and collaborations in community development projects
- Representation in the Social Working Committee

Performance

2017



27 July 2017
Mangrove Forest Planting and RC Rallying

Location: HTMS Prasae Memorial, Klaeng, Rayong

Description: This activity increased green space around the Industrial Estate that Thaioil operates in, and promoted environmental conservation awareness. It was run following the standards of the Ministry of Industry.



7 December 2017
CSR Colored Signs to Improve Scenery in Parking Lots: Year 3

Location: Sai Jai Thai Foundation Under Royal Patronage

Employee Volunteers: 180 volunteers

Description: The initiative made merit for Her Royal Highness Princess Maha Chakri Sirindhorn, who is also the chair of the Sai Jai Thai Foundation. Thaioil also took charge of preparations to welcome the Princess for her visit in December.



26 November 2017
TS CSR Developing Quality of Life for Primary School Students: Year 1

Location: Baan Kao Amnuay Sook School, Phanat Nikhom, Chonburi

Employee Volunteers: 40 volunteers

Description: Thaioil contributed to the improvement of students' quality of life through creating a clean space for brushing teeth, an area for the community farm for sufficiency economy and a storage room for farming equipment. We also organized a coloring activity with the theme "Following Our Father's Footsteps" and improved playground facilities.

28-29 March 2018
Channel 9 and Bangkok Post Visit

Location: SAKC / HTMS Prasae Memorial

Employee Volunteers: 30 volunteers

Description: Planted trees in the mangrove forest



26 July 2018
Mangrove Forest Planting and Driving Big Tree Tourism Culture with the Prasae Community

Location: HTMS Prasae Memorial, Klaeng District, Rayong Province

Description : Thaioil increased green space in 2018, did coastal cleaning, and participated in the cultural event promoting big tree tourism in Thailand: "Our Arbors: National Heritage Under the Shadow of the King" at the twin takien trees at Wat Takian Ngam Temple.

15 September 2018
International Coastal Conservation Day (ICC Day)

Location: Hat Pla, Baan Chang, Rayong

Employee Volunteers : 50 employees

Description : Employee volunteers participated in coastal cleaning.



29 September 2018
Forest Tree Planting for the King and Releasing Crabs Into the Wild

Location: Chulachomklao Fort, Phra Samut Chedi, Samut Prakarn

Employee Volunteers: 80 volunteers

Description: Through this activity, Thaioil fostered good relationships with the Navy while supporting conservation efforts and increasing crab population in the wild.



14 December 2018
Scenery Improvement (road surface marking and petanque court renovation) Through Creative Painting

Location: Sai Jai Thai Foundation Under Royal Patronage

Employee Volunteers: 175 employees

Description: Thaioil employees volunteered to make scenario improvements in preparation for Her Royal Highness Princess Maha Chakri Sirindhorn's visit, and promoted active sports and overall health for veterans and Foundation staff.



26 November 2018
TS CSR Developing Quality of Life for Primary School Students: Year 2

Location: Chulachomklao Fort, Phra Samut Chedi, Samut Prakarn

Employee Volunteers: 56 volunteers

Description: Thaioil promoted employee volunteerism and developed sanitation in the school, and increased students' quality of life through improving the infrastructure of the primary school students' building, leading efforts in a "big cleaning" activity, improved the area for brushing teeth, and working on some scenery improvements.



2018

Highlights 2018 of Social Enterprise Projects



Cafe Amazon for Chance at Laem Chabang Hospital Branch

Background : Thaioil joined other PTT Group businesses – namely PTT, PTTEP, PTTGC, IRPC, GPSC, and PTTOR – to establish the Sarn Palung Social Enterprise Co., Ltd (SPSE). SPSE was registered on September 8th 2017 with a registered capital of 10 million THB. The purpose of SPSE is to run non-profit social enterprises that solve social and environmental issues, including the issue of local employment in areas of operations. As one of the founding members, Thaioil's investment makes up 15% of the total investment. We are also tasked with the important duty of supporting SPSE in recruiting and/or developing social enterprises to ultimately reach SPSE's social enterprise target.

Objectives : To create a space specifically for social enterprises to rent and do their business, and to increase employment and income, and provide a source of inspiration for disadvantaged groups and the disabled in the area.

Business Alignment : Thaioil supported the establishment of Cafe Amazon for Chance through making donations through Sarn Palung Social Enterprise Co., Ltd. We also participated in the development and execution of this Project, which is the main pilot social enterprise of PTT Group in the Thaioil Haven for Community area at Laem Chabang Hospital.

Objectives :

- To support the Pracharath Project for Society (E6), strengthen communities, and increase incomes and quality of life by establishing a fund to improve quality of life for the disabled.
- To create a learning center where the disadvantaged – i.e. the disabled, orphans, economically disadvantaged students, teenage mothers – can access job training.
- To create secure jobs that can increase incomes for project beneficiaries and support them in attaining self-reliance and independence from families and welfare fund
- To develop human capital and create at least 3 capable baristas per year
- To expand the business and create other branches in other areas in Chonburi in order to further support employment for the disadvantaged and the disabled
- To increase incomes for communities who supply bakery products or other locally-made products in Amazon Cafe

Performance : The store is undergoing construction and we are currently in the process of selecting employees who have hearing disabilities. We plan to start operating in April 2019.

Thaioil's CSR Approach to Supporting Laem Chabang Hospital:

In line with the Ministry of Public Health's policy for amenities and facilities that support patients and their visitors in hospitals, Thaioil created green spaces for relaxing for the Hospital's patients and public visitors around the Cafe Amazon for Chance.

Community Engagement in the Operating Areas and Grievance Mechanisms

Thaioil and Subsidiaries have established procedures to respond to reported occupational health and safety and environmental incidents from surrounding communities. Complaints are processed through our grievance procedure for environmental impacts, with committed to providing a response to the complainant within 30 minutes of receiving the complaint. In 2018, Thaioil received a total of 19 issues, and responded to all of them through systematically following the grievance procedure. However, from investigation, it is founded that all issues did not result from Thaioil's operations. By any means, Thaioil proactively advanced our grievance mechanism by appointing the Company-established Community Committee as a center of first-line issues and complaint receiving channel with the intention to respond to any issues in a timely and transparent approach. This brought in the result of 2018 community engagement score at 97.27%, which indicates that our efforts to engage community members have succeeded in strengthening communities and helping them achieve self-reliance.

Performance Summary

Economic Performance		Unit	2015	2016	2017	2018
Economic Value Generated ⁽¹⁾						
Sales revenue	Million THB	293,569	274,739	337,388	389,344	
Economic Value Distributed ⁽¹⁾						
Operating cost ⁽²⁾	Million THB	273,819	247,261	305,386	373,128	
EBITDA	Million THB	25,492	32,675	36,925	20,239	
Net profit/ [Loss]	Million THB	12,181	21,222	24,856	10,149	
Earnings / [Loss] per share	THB/share	5.97	10.40	12.18	4.97	
Total assets	Million THB	192,166	217,731	228,108	268,613	
Total liabilities	Million THB	97,009	111,597	127,148	126,472	
Return on equity	%	13.9	21.3	21.7	8.3	
Return on assets	%	6.5	10.5	11.4	4.2	
Market capitalization	Million THB	109,141	136,070	171,832	177,238	
Employee wages and benefits	Million THB	2,924	3,299	3,468	3,580	

Remarks

- Scope of reporting Economic Performance is in alignment with Financial Statement in Thaioil's Annual Report 2018
- Operating costs are the expenses which are related to the operation of a business, or to the operation of a device, component, and piece of equipment or facility or location.

Contributions to Organizations and External Associations	Type of Organization	Unit	2015	2016	2017	2018
Oil Industry Environmental Safety Group Association (IESG)	Trade Association	THB	1,302,000	1,477,000	1,740,000	1,799,000
Oil Spill Response Limited (OSRL)	Trade Association	THB	2,398,375	2,370,574	1,973,293	2,187,097
PTIT Petroleum Institute of Thailand	Tax-Exempt Organizations	THB	642,828	684,201	710,993	758,660
Thailand Environmental Institute	Trade Association	THB	250,000	250,000	250,000	250,000
The Federation of Thai Industries (FTI)	Trade Association	THB	42,800	121,980	209,760	132,680
Inspectioneering	Tax-Exempt Organizations	THB	37,740	18,870	37,740	37,740
International Council of Large Electric System (CIGRE)	Trade Association	THB	19,598	18,743	20,348	0
The Association of Private Power Producers (APPP)	Trade Association	THB	42,800	82,033	85,600	0
Board of Trade of Thailand	Trade Association	THB	10,700	10,700	10,700	10,700
The Thai Chamber of Commerce	Trade Association	THB	24,610	24,610	24,610	24,610

Remarks

- Contributions from Thaioil and Subsidiaries are calculated to be 97% of the total sale revenue

Occupational Health and Safety Performance ^{(1), (2)}	Unit	2015		2016		2017		2018	
		Male	Female	Male	Female	Male	Female	Male	Female
Total hour worked	Hour	2,351,909		1,945,471		2,214,031		2,072,882	
• employees		2,064,168	287,741	1,684,378	261,093	1,822,245	391,786	1,844,465	228,417
Total hour worked	Hour	5,192,527		5,629,968		3,772,751		5,753,718	
• contractors		976,584	4,677,579	952,389	3,043,649	729,102	4,707,147	1,052,571	
Work Related Injuries⁽³⁾									
Fatality as a result of work-related injury	Case	0		0		0		0	
• employees	Case / Million work hours	0		0		0		0	
Fatality as a result of work-related injury	Case	0		0		0		0	
• contractors	Case / Million work hours	0		0		0		0	
Total recordable work-related injury rate (TRIR)	Case	1		1		0		0	
• employees		1	0	1	0	0	0	0	0
Case / Million work hours	0.43		0.51		0		0		
	• contractors	0.48	0	0.59	0	0	0	0	0
Total recordable work-related injury rate (TRIR)	Case	3		3		1		2	
• contractors		3	0	3	0	1	0	2	0
Case / Million work hours	0.58		0.53		0.27		0.35		
	• employees	0.71	0	0.64	0	0.33	0	0.43	0
Lost-time injury frequency rate (LTIFR)	Case	0		0		0		0	
• employees		0	0	0	0	0	0	0	0
Case / Million work hours	0		0		0		0		
	• contractors	0	0	0	0	0	0	0	0
Lost-time injury frequency rate (LTIFR)	Case	1		1		1		0	
• contractors		1	0	1	0	1	0	0	0
Case / Million work hours	0.19		0.18		0.27		0		
	• employees	0.24	0	0.21	0	0.33	0	0	0
Near miss ⁽⁴⁾	Case	3,237		3,697		3,138		3,393	
Work Related Illness									
Fatality due to work-related illness	Case	0		0		0		0	
• employees									
Fatality due to work-related illness	Case	0		0		0		0	
• contractors									
Occupational illness frequency rate (OIFR)	Case / Million work hours	0		0		0		0	
• employees									
Occupational illness frequency rate (OIFR)	Case / Million work hours	0		0		0		0	
• contractors									
Process Safety⁽⁵⁾									
Number of Process safety events – tier 1	Case	0		0		3		2	
	Case / Million work hours	0		0		0.5		0.26	
Number of Process safety events – tier 2	Case	2		1		1		1	
	Case / Million work hours	0.27		0.13		0.17		0.13	

Remarks

1. Thaioil and Subsidiaries follow standard statistical reporting of PTT Group in accordance with Occupational Safety and Health Administration (OSHA).
2. Occupational health and safety 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 the additional content in Occupational Health and Safety chapter)
5. Thaioil and Subsidiaries reported process safety in accordance with API RP 754 standard.

People Performance	Unit	2015		2016		2017		2018									
		Male	Female	Male	Female	Male	Female	Male	Female								
GRI 405-1 Employees⁽¹⁾																	
Total number of employees	Person	1,409		1,437		1,447		1,480									
		1,041	368	1,056	381	1,059	388	1,088	392								
Number of employees by level																	
Permanent Contract																	
• Executives ⁽³⁾	Person	8	1	12	2	8	1	11	2								
• Management ⁽⁴⁾	Person	94	51	94	51	91	50	94	55								
• Non-Management	Person	939	316	950	325	958	334	983	335								
Temporary Contract ⁽⁷⁾																	
• Executives ⁽³⁾	Person	N/A	N/A	0	1	2	1	1	1								
• Management ⁽⁴⁾	Person	N/A	N/A	0	1	0	1	0	1								
• Non-Management	Person	N/A	N/A	0	1	0	1	0	1								
Number of employees by age group⁽¹⁾																	
• Below 30 years old	Person	273	134	252	100	246	93	292	100								
• 30- 50 years old	Person	542	192	529	222	522	238	516	239								
• Over 50 years old	Person	226	42	275	56	291	57	280	53								
Number of employees by area of work																	
Permanent Contract																	
• Depot	Person	N/A	N/A	2	1	2	1	2	0								
• Bangkok	Person	N/A	N/A	46	128	49	131	49	135								
• Sriracha (Refinery)	Person	N/A	N/A	1,008	249	1,006	253	1,036	254								
Temporary Contract ⁽⁷⁾																	
• Depot	Person	N/A	N/A	N/A	N/A	0	0	0	0								
• Bangkok	Person	N/A	N/A	N/A	N/A	0	3	0	3								
• Sriracha (Refinery)	Person	N/A	N/A	N/A	N/A	2	0	1	0								
Number of employees by religion																	
• Buddhist	Person	N/A		1,401		1,415		1,449									
• Christian	Person	N/A		20		19		18									
• Islam	Person	N/A		31		12		12									
• Atheist	Person	N/A		0		1		1									
ATTRACTION																	
GRI 401-1 New employees hired⁽¹⁾																	
Total number of new employees hired	Person	100		66		55		70									
		66	34	40	26	32	23	53	17								
• Below 30 years old	Person	59	26	34	17	27	17	51	12								
• 30- 50 years old	Person	7	8	6	9	5	6	2	4								
• Over 50 years old	Person	0	0	0	0	0	0	0	0								
Total new hire rate	% of total employees	7.10		4.60		3.80		4.73									
		6.34	9.24	3.79	6.88	3.02	5.93	4.87	4.34								
Ability to recruit employees	% of the total number of position available for recruitment	89		85		85		92									
RETENTION																	
GRI 401-1 Employee turnover^{(1), (5)}																	
Total turnover	Person	51		45		47		43									
		36	15	26	19	33	14	27	16								

People Performance	Unit	2015		2016		2017		2018									
		Male	Female	Male	Female	Male	Female	Male	Female								
• Below 30 years old	Person	14	4	11	7	9	4	8	7								
• 30- 50 years old	Person	8	6	5	12	3	5	7	5								
• Over 50 years old	Person	14	5	10	0	21	5	12	4								
Turnover rate	% of total employees	3.62		3.14		3.25		2.91									
		3.46	4.08	2.46	5.03	3.12	3.61	2.48	4.08								
Voluntary resignation rate	% of total employees	2.34		2.37		1.60		1.76									
DJSI Employee engagement⁽⁸⁾																	
Employee engagement score	%	81		84		89		57									
Employee satisfaction score	%	84		83		92		75									
GRI 401-3 Parental leave																	
• Employee taken parental leave	Person	20		16		40		35									
		14	6	12	4	24	16	20	15								
• Employee returned to work after parental leave	Person	20		16		40		35									
		14	6	12	4	24	16	20	15								
• Rate of employee return to work and stay after using the parental leave	% of employees taken parental leave	100%		100%		100%		100%									
		100%	100%	100%	100%	100%	100%	100%	100%								
DEVELOPMENT																	
GRI 404-1 Average training hours^{(1), (2)}																	
Total training hours	Hours	122,081		85,893		71,644		105,032									
		94,307	27,774	60,019	25,874	52,340	19,304	81,804	23,228								
Average training hours for all employees	Hour/Person/Year	90.6	75.5	57	68	49	50	75	60								
• Average hours of training for executives ⁽³⁾	Hour/Person/Year	415	324	102	145	42	269	110	27								
• Average hours of training for management ⁽⁴⁾	Hour/Person/Year	151	90	68	84	46	71	74	84								
• Average hours of training for non-management employees	Hour/Person/Year	82	72	55	66	50	45	75	56								
Human Capital Development Performance																	
Employees who developed Individual Development Plan (IDP)	%	100		89		97		100									
IDP Progress	%	70		82		85		99									
Employees who have a Career Path	%	83		87		95		98									
Rate of internal promotion ⁽⁵⁾	%	17.81		19.28		20.18		15.36									
Development expense	Million THB	391		405		417		447									
	THB/person	277,175		282,427		288,182		302,640									
Values from applied knowledge into business practice (KM)	Million THB	484		1,956		2,934		5,162									
Return on employee development	%	124		483		704		1,155									
RIGHTS																	
Employee Grievance																	
Number of grievances about corruption	Case	0		0		0		0									
• Resolved grievance	Case	0		0		0		0									
• Under investigation	Case	0		0		0		0									
Number of grievances about labor practices	Case	1		3		0		1									
• Resolved grievance	Case	1		2		1		1									
• Under investigation	Case	0		1		0		0									

People Performance	Unit	2015		2016		2017		2018	
		Male	Female	Male	Female	Male	Female	Male	Female
GRI 102-41 Labor Union									
Employees supervised under labor union ⁽⁶⁾	%	79		76		74		72	

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, senior executive vice president, and executive vice president.
4. Management includes vice president, department manager, and section manager.
5. Turnover rate includes employees with voluntary resignation, employees with normal retirement, employees who have asked to be resigned, layoffs 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 2018, there has been a change in the method used to assess and calculate the employee engagement and satisfaction score to the organizations. A more challenging method has been adopted to help improve employee's engagement to the organization in the future. This caused the results for this year to be lower than the previous.
9. Due to the past 5 years (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 2016 and 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.

Society and Community Development	Unit	2015	2016	2017	2018
Number of beneficiaries who used Thaioil Group Health and Learning Center in Sriracha	Person	56,245	56,967	51,649	55,304
Community Engagement Score	%	98.20	97.98	93.50 ⁽¹⁾	97.27
Number of employee volunteer hours	Hour	5,344	7,168	17,672 ⁽²⁾	8,376

Remarks

1. From 2017 onwards, the Community satisfaction score has been changed to Community engagement score to the organization.
2. Employee volunteer hours were higher in 2016 as it was during the royal funeral ceremony of His Majesty King Bhumibol Adulyadej.

Value Chain Management	Unit	2015	2016	2017	2018
GRI 308-1 and GRI 414-1 Suppliers					
New suppliers that were screened using the criteria for social and environmental aspects	%	100	100	100	100
GRI 414-8 Customers					
Number of grievance about customer data leakages/loss	Case	0	0	0	0
Customer engagement ⁽¹⁾	%	100	91	96 ⁽²⁾	96

Remarks

1. Scope included Thaioil, Thai Lube Base, Thai Paraxylene and Thaioil Marine.
2. From 2017 onwards, the Customer satisfaction score has been changed to Customer engagement score.

Environmental Performance	Unit	2015	2016	2017	2018
Refinery throughput ⁽¹⁾	Metric ton	14,870,915	13,905,501	15,121,269	15,132,708
Investment regarding energy conservation	Million THB	23	43	26	0
Energy Management and Greenhouse Gas^{(2), (4), (12)}					
Total energy consumption ⁽²⁾	Million GJ	17.62	27.39	29.41	31.60
Refinery energy intensity	GJ/ ton throughput	1.19	1.85	1.95	2.09
Total fuel consumption ⁽²⁾	Million GJ	41.39	59.95	57.33	58.89

Environmental Performance	Unit	2015	2016	2017	2018
Refinery fuel consumption intensity	GJ/ ton throughput	2.78	4.06	3.79	3.89
• Natural gas	Million GJ	18.69	31.60	35.11	37.28
• Fuel oil	Million GJ	5.40	6.33	2.53	3.19
• Fuel gas	Million GJ	16.47	21.19	18.72	17.48
• Coke	Million GJ	0.82	0.82	0.97	0.92
• LPG	Million GJ	less than 0.01	less than 0.01	less than 0.01	less than 0.01
• Diesel	Million GJ	0.01	0.01	less than 0.01	0.015
• Gasoline	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	967,063	987,728	1,026,841	1,053,508
Electricity purchased from external supplier	Megawatt Hour	0	0	0	0
Electricity sold ⁽⁴⁾	Megawatt Hour	294,526	1,171,414	1,583,839	1,580,035
Reductions in energy consumption	GJ	477,741	470,699	383,009	562,075
Total amount invested in renewable energy	Million THB	1,380	1,298	1,212	1,381
Direct Greenhouse Gas Emissions (Scope 1) ⁽³⁾	Million ton CO2 equivalents	2.54	3.65	3.40	3.49
Indirect Greenhouse Gas Emissions (Scope 2) ⁽³⁾	Million ton CO2 equivalents	0	0	0	0
Greenhouse gas intensity (Scopes 1 and 2)	Tons/ throughput	0.17	0.25	0.22	0.23
Greenhouse gas emission reduction (Scope 1) ⁽³⁾	Tons	26,827	26,406	21,487	32,151
Air Emissions ^{(5), (6), (12)}					
Nitrogen oxide (NOx) emission	Thousand Tons NOx	2.85	4.42	4.44	4.50
Sulfur oxide (SOx) emission	Thousand Tons SOx	5.13	7.21	3.49	4.14
Volatile organic compound (VOC) emission	Thousand Ton	1.47	1.46	1.42	1.43
Waste Disposal by Type					
Total hazardous waste disposal	Ton	4,648	5,922	4,276	7,369
• Landfills	Ton	21	24	18	47
• Recycle	Ton	1,661	884	1,031	1,425
• Recovery	Ton	2,785	4,685	3,134	5,754
• Others ⁽⁷⁾	Ton	181	329	92	143
Total non-hazardous waste disposal	Ton	254	354	241	306
• Landfills	Ton	119	161	100	182
• Recycle	Ton	78	95	82	57
• Recovery	Ton	46	47	39	67
• Other ⁽⁷⁾	Ton	11	51	20	0
Total non-routine waste disposal ⁽¹³⁾	Ton	0	0	0	5,338
• Recovery (including energy recovery)	Ton	0	0	0	5,338
• Landfills	Ton	0	0	0	0
Oil and Chemical Spills					
Significant oil and chemical spill-land	Case	0	0	0	0
Significant oil and chemical spill-marine ⁽⁸⁾	Case	0	0	0	0
Legal Compliance					
Fines for non-compliance with environmental laws	Million THB	0	0	0	0
Number of violations of legal obligations/regulations	Case	0	0	0	0

Environmental Performance	Unit	Water				Water withdrawal from areas with water stress
		2015	2016	2017	2018	
Water⁽⁹⁾						
Water withdrawal by source						
	Total Seawater ⁽¹⁰⁾	Million m ³	16.0	19.17	18.23	17.96
	• Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0	0
	• Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	16.0	19.17	18.23	17.96
	Total water withdrawal from other sources	Million m ³	3.57	4.09	4.63	4.98
	• Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	3.57	4.09	4.63	4.98
	• Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0	0
	Total third-party water withdrawal by withdrawal source	Million m ³				4.98
		Million m ³	Million m ³			0
		Million m ³	Million m ³			0
		Million m ³	Million m ³			0
Total Water Consumption	From all water sources	Million m ³	19.57	23.26	22.86	22.94
Water discharge by destination	Discharged into the sea	Million m ³	16.69	19.45	18.73	18.60
Total water discharge ⁽¹⁰⁾	All discharge destinations	Million m ³	16.69	19.45	18.73	18.60
Water discharge by level of treatment	Freshwater (≤1,000 mg/L Total Dissolved Solids)	Million m ³	0	0	0	0
	Other water (>1,000 mg/L Total Dissolved Solids)	Million m ³	16.69	19.45	18.73	0
Water consumption	Total water consumption	Million m ³	2.88	3.81	4.13	4.34

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 CO₂, CH₄, and N₂O.
4. There was no steam sold to outside the organization.
5. Thaioil and Subsidiaries follow Health, Safety, and Environmental Performance Monitoring and Report developed by Shell International Practice Standard.
6. Thaioil and Subsidiaries do not purchased ozone depleting substances including CFCs, HCFCs, halons, and methyl bromide.
7. Other waste disposal covers incineration and external wastewater treatment services.
8. Oil and chemical spill at sea greater than 1 Barrel is considered significant.
9. Data exclude portable water consumption which has very small volume compared to water consumption in production process.
10. Both water withdrawal and discharge include the rejected seawater of desalination unit.
11. Referring to Aqueduct Water Risk Atlas according to GRI Standard's requirement
12. The refining capacity of Thaioil in 2018 was more efficient than the previous year as the result of the efficiency of equipment maintenance compared to aged lifetime, including higher numbers of planned shutdown and the increase in ratio of fuel oil, resulting in the increase in all environmental parameters.
13. Non-routine wastes in 2018 were from ground preparation for the expansion project.





LRQA Independent Assurance Statement

Relating to Thai Oil Public Company Limited's Environmental and Social Disclosures within the Sustainability Report for the calendar year 2018

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 Sustainability Report 2018 ("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: ¹:
 - Environmental: GRI disclosure 302-1, 303-3 , 303-4 , 305-1, 305-2, 305-7, 306-2, 306-3
 - Social: GRI disclosure 403-9 a 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, Thailand.

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 misstatements in the Report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the Report.

¹ GHG quantification is subject to inherent uncertainty.



- Interviewing TOP's management representative to understand and obtain data and information associated with high level strategic management approach.

Observations

Further observations and findings, made during the assurance engagement, are:

- Stakeholder inclusivity:**
The stakeholder engagement process provides TOP with a valuable learning tool; routinely input from stakeholders has contributed to the strategic management. However, we believe that the stakeholder engagement process should also capture the needs and expectations of other vulnerable groups, such as migrant workers.
- Materiality:**
We are not aware of any material issues to be excluded from the Report. TOP has maintained its process of identifying and determining material issues, which takes into account local and global issues, and uses this information to make informed business decisions that improve TOP's sustainability performance. For example: local issues relating to the mega project expansion include:
 - disruption associated with the construction phase which is being addressed through a number of management processes, and
 - compliance with more stringent environmental regulation which is being addressed through the introduction of 'state of art technology' to replace current but aging refining processes that enables TOP to reduce their impact on issues such as water shortage and production of cleaner fuels
- Responsiveness:**
TOP has demonstrated their commitment towards improving sustainability performance by putting in place policies and strategic management approaches that address the impacts associated with the material issues. For example:
 - Energy efficiency projects to address climate change challenges, and
 - Health assessments to improve the well-being of subcontractors.
- Reliability:**
TOP has an established internal verification system which ensures the data reliability and accuracy across the Group.

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 2019

Nit Tanasuthisari,
LRQA Lead Verifier

On behalf of Lloyd's Register Quality Assurance
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Awards and Recognitions

01

Gold Class level of RobecoSAM
Sustainability Award 2018 for
the 5th consecutive year



02

Member of Dow Jones Sustainability
Indices (DJSI) 2018 for the 6th
consecutive year



03

The 2018 Energy Sector Executive
of the Year Award was awarded to
our CEO
by the Foundation for Thai Society and
the Local Development Institute.



04

The 2018 Thailand ICT Excellence
Award for Business Enabler Projects
was awarded for our TOP Data
Communication Center (TOP DCC)
Project – a system that automatically
sends and receives sales-related data to
and from our business partners. The TOP
DCC Project is also a pilot project to work
towards commercial excellence, received
by the Thailand Management Association.



05

The Governance, Environment, and Safety Award was awarded to Sak Chaisidhi Company Limited

with a “White Flag-Green Star” distinction in 2017 and “White Flag-Gold Star” distinction for the 6th consecutive year by the Industrial Estate Authority of Thailand.



06

The 2018 Asset Triple A Asia Infrastructure Awards

for the Power Deal of the Year was awarded to Thaioil Public Company Limited and TOP SPP Company Limited by The Asset magazine, with Thaioil Public Company Limited also receiving the Power Deal of the Year-Highly Commended Thailand Award.



07

The Best Public Company of the Year 2018 from the Resource Group

was awarded in the Money & Banking Awards 2018 event.



08

The 2018 CSR-DIW Continuous Award for the 11th consecutive year

for the Light for a Better Life project, an initiative under the Pracharath Project to develop basic education and build the leadership capacities for Department of Industrial Works officials.



09

On the 27th of August 2018, Thaioil Public Company Limited held an Extraordinary General Meeting for shareholders regarding the Clean Fuel Project (CFP), and received approval from shareholders to invest in CFP.



10

Certificate received for participation in the Low Emission Support Scheme (LESS)

through the submission of 4 energy conservation and energy efficiency projects in the “2017 100 Hearts To Reduce Global Warming” initiative organized by the Thailand Greenhouse Gas Management Organization (Public Organization).



11

The regional-level 2018 Strongest Commitment to Sustainable Energy in Southeast Asia Award was awarded for the 7th consecutive year, with the Best Senior Management IR Support Award and Best Strategic Corporate Social Responsibility Award also awarded in the national level, by the Alpha Southeast Asia magazine



12

The Sustainability Awards of Honor was awarded for the 2nd consecutive year from the 2018 SET Sustainability Awards, and Thaioil was also listed as a sustainable investment in the Thailand Sustainability Investment (THSI) list by the Stock Exchange of Thailand.



13

The 2018 Best Company Performance Awards

for listed companies with market capitalization of over THB 100 billion, the Outstanding CEO Award, and the Outstanding Investor Relations Award from the 2018 SET Awards organized by the Stock Exchange of Thailand.



14

The 2018 Best Energy Corporate Governance Thailand Award was awarded by the British magazine Capital Finance International or cfi.co.



15

The Leadership Excellence Award and the Sustainable Development / CSR Excellence Award or the 2nd consecutive year from the Thailand Corporate Excellence Awards 2018 event organized by the Thailand Management Association with Sasin Graduate Institute of Business Administration of Chulalongkorn University.



16

The 2018 Excellence Sustainability Report Award

was awarded by the CSR Club of the Thai Listed Companies Association, in collaboration with the Securities and Exchange Commission of Thailand and the Thaipat Institute.



17

A full 100 points awarded for the evaluation of the quality of organized annual general meeting for shareholders (AGM Checklist) in 2018

by the Thai Investors Association.



18

The ESG 100 Certificate awarded for the 4th consecutive year

by the Thaipat Institute.



19

Ranked “Excellence” in the Corporate Governance Report of Thai Listed Company 2018 for the 10th consecutive year

by the Thai Institute of Directors.



20

The TOP 50 ASEAN PLCs (TOP 11-30) Award was awarded by the ASEAN CG Scorecard project for the 2nd consecutive year.



GRI Content Index

UNG C PRINCIPLES COP

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TOPIC SPECIFIC DISCLOSURES

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Fight Against Corruption	GRI 103: Management Approach	103-1	20		
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		103-2	41, 48-49		
		103-3	43, 48		
	GRI 303: Water and Effluents 2018	303-1	41		
		303-2	41		
		303-3	43, 97	The standard, methodologies and consumptions used to calculate water withdrawal are not reported.	yes

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		103-2	46-50		
		103-3	46-50		
	GRI 302: Energy	302-1	94-95	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
		302-3 _{OGSD}	94		
		302-4	95		
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		303-4	48, 97		yes
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		305-3	43, 96		
		305-4	96		
		305-5	96		
		305-7	49-50, 96		yes
		306-2	96		yes
		306-3	38-39		yes
		308-1	55-56		
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UNGCR PRINCIPLES COP

United Nations Global Compact Principles		
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	Principle 2 : Businesses should make sure that they are not complicit in human rights abuses	26-31
Labor	Principle 3 : Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining	31, 93-94
	Principle 4 : The elimination of all forms of forced and compulsory labour	31
	Principle 5 : The effective abolition of child labour	31
	Principle 6 : The elimination of discrimination in respect of employment and occupation	31
Environment	Principle 7 : Businesses should support a precautionary approach to environmental challenges	32-39
	Principle 8 : Undertake initiatives to promote greater environmental responsibility	46-50
	Principle 9 : Encourage the development and diffusion of environmentally friendly technologies	72-79
Anti-corruption	Principle 10 : Businesses should work against corruption in all its forms, including extortion and bribery	20-25

SDGs Progress

Thaioil assesses the social and environmental impacts of our main business activities in our assessment of sustainable material issues. We prioritize the issues based on both negative and positive impacts, and define targets that are in alignment with the United Nations' Sustainable Development Goals. Thaioil's assessment, monitoring, and reporting process has been developed in reference to GRI's and UNGC's "Integrating the SDGs into Corporate Reporting: A Practical Guide".

Thaioil's Commitment



2018 Progress

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2018	More Information
SDG 3: Good Health and Well-being 	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 in public health service accessibility of communities in Laem Chabang district, Chonburi Province, and other remote communities.	<p>Thaioil Group's Health and Learning Center</p> <ul style="list-style-type: none"> 55,304 persons benefited from the use of the Health and Learning Center 6,154 persons benefited from participating in Thaioil's Dental Clinic Project <p>The construction of Thaioil emergency building for Laem Chabang Hospital was completed and will be operated in 2019</p>	Our Society and Communities: page 80-89
SDG 7: Affordable and Clean Energy 	7.3 Double the global rate of improvement in energy efficiency.	To be ranked as the top quartile of Energy Intensity Index (EII) among global oil and gas industry by 2023.	Refinery Energy Intensity Index at 82.5	Operational Eco-Efficiency: page 47
SDG 8: Decent Work and Economic Growth 	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 first 10% of oil and gas industry by 2022.	TRIR at 0.26 cases per million workhours for all workers, better than the target of less than or equal to 0.50 cases per million workhours	QSHE Management: page 33-37
		To maintain zero of Process Safety Events: Loss of Primary Containment (LOPC) Tier 1	LOPC Tier 1: 2 events	
		To implement the human rights due diligence process for 100% of Thaioil operations and to assess human rights risks for all critical suppliers.	<p>100% of employee trained about human rights</p> <p>100% of Thaioil operations subject to human rights risk assessment</p> <p>100% of new suppliers responded to ESG self-survey</p> <p>30 critical suppliers participated ESG Plus Verification Program for ESG risk assessment at site level.</p>	Human Rights: page 26-31

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2018	More Information
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. 	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 innovation culture and enhance the business opportunity in area of innovations.	<p>Established 'Innovation and Digital' organization structure to focus on research and development, innovation and technology</p> <p>2 patents filling</p> <p>2 R&D projects commercialized</p> <p>484 million THB in cost savings and revenues generated from commercialized R&D and innovation</p> <p>Innovation ideas initiated in Wisdom & Innovation Award event can be applied into 38 improvement projects, value at around 1,198 million THB</p> <p>120 innovators enrooted in Wisdom & Innovation Award</p>	Innovation Management: page 72-77
SDG 11: Sustainable Cities and Communities 	11.1 Ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums.	To enhance communities' quality of life through promoting basic infrastructure and knowledge on energy and engineering to ultimately create self-resilience.	<p>6 schools and 3 organizations benefited from projects for remote communities</p> <p>Project Light for a Better Life under CONNEXT ED to provide knowledge on electricity system and energy conservation for 10 schools in Chonburi and Chachoengsao provinces</p> <p>Provided expertise in engineering, and created a water bicycle for schools in Baang Lamoong, Chonburi</p> <p>Support employment of people with hearing disabilities in Café Amazon for Chance project</p>	Our Society and Communities: page 80-89
	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 community and conduct a proper public participation for all significant capital projects.	<p>100% of significant capital projects passed public participation of concerned stakeholders</p> <p>Clean Fuel Project was approved.</p>	QSH Management : page 37-39

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2018	More Information
SDG 12: Responsible consumption and production 	12.2 Achieve the sustainable management and efficient use of natural resources 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 of environmental incidents.	4.34 million cubic meter of total water consumption 4,140 tons of SOx emission 4,497 tons of NOx emission 1,427 tons of VOCs emission 229 ton of waste to landfill, equal to 1.76% of total waste generation Zero significant spill of oil and chemical	Operational Eco-Efficiency: page 48-50 QSHE Management : page 37-39 Value Chain Management : page 53
SDG 13: Climate Action 	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.	To promote green procurement practice in the organization and enhance environmental, social and governance (ESG) practice with suppliers.	Announced Supplier Code of Conduct: SCOC since 2015 and continued in 2018 100% of new suppliers acknowledged SCOC and responded to ESG self-survey Not any crude suppliers in approved list present environmental and social impacts Considered environmental impact along life cycle in the green procurement practice, pilot with catalyst.	Value Chain Management : page 53-57
SDG 13: Climate Action 	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	To reduce GHG emission from business as usual by 4% by 2022	0.23 tons carbon dioxide equivalent per ton throughput	Climate Change Risk: page 40-43

UN Sustainable Development Goals	UN Sustainable Development Goal Targets	Corresponding Thaioil Targets	Progress in 2018	More Information
SDG 16: Peace, Justice, and Strong Institutions 	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.	Maintained zero corruption and fraud incidents. 100% of new employees trained about code of conduct and anti-corruption. 100% of employees reported conflict of interest.	Fight Against Corruption : page 20-25
			Established 'compliance unit for procurement' function for transparency and auditability. Utilized digital system for both suppliers and customers for transparency and fair treatment.	Value Chain Management : page 53-57



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Survey of Reader's Opinion

Responses collected from the 2018 Sustainability Report Survey of Reader's Opinion will be used to improve and develop the next annual sustainability report.





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