



Passion for
SUSTAINABILITY

Thai Oil Public Company Limited
Sustainability Report 2016



**Passion for
Excellence**

by holistic
management



**Passion for
Partnership**

through mutual
understandings
and benefits



**Passion for
Planet**

by managing
efficiently



About This Report

Thai Oil Public Company Limited has published the corporate sustainability report for six consecutive years as part of its commitment to stakeholders on disclosing the company's material sustainability performance. The corporate sustainability report is a mean to build trust from stakeholders and to show transparency of Thaioil's economic, social and environmental performances. This report covers information during the period from 1st January 2016 to 31st December 2016.

Reporting Approach

The 2016 corporate sustainability report has been prepared in accordance with the Global Reporting Initiative (G4) Guideline, and Oil and Gas Sector Disclosure (OGSD). The report further presents Thaioil's progress in implementing the Ten Principles of The United Nations Global Compact: UNGC page 80-84.

In addition, Thaioil understands the importance of United Nations' Sustainable Development Goals (SDGs), and has conducted preliminary evaluation of Thaioil's performance in relation to SDGs, which are adapted for further development and strategy formulation, and will be presented in this report.

Reporting Scope (G4-17)

The scope of this report considered the relevant information of business, data comprehensiveness and performance of Thaioil's main businesses; namely, oil refinery, petrochemical, lube base oil, power generation, transportation and others. For occupational health, safety and environmental performance, the scope only covered Thai Oil Public Company Limited (TOP), Thai Lube Base Public Company Limited (TLB), Thaioil Power Company Limited (TP), Thai Paraxylene Company Limited (TPX), LABIX Company Limited, TOPSPP Company Limited, and Thaioil Energy Services Company Limited (TES), that covered approximately 97% of total revenues.

For additional information of the companies in Thaioil group, please refer to 2016 Annual Report or <https://investor-th.thaioilgroup.com/ar.html>



To download an electronic form of 2016 Corporate Sustainability Report, please visit https://www.thaioilgroup.com/home/media_ebook.aspx?id=273



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Thaioil Group aspires to grow for excellence with corporate governance, meanwhile taking stakeholders' concerns into improving, as well as integrating environmental management for a better future and sustainable society.

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Message from the CEO and President



The year 2016 marked another year of a volatile and challenging business environment for Thai Oil, as a consequence of OPEC production cuts, intense competition in the petroleum industry, rising domestic gasoline demand of more than 13%, and aging condition of our refinery facilities which have been in operations for more than 50 years. Nonetheless, Thail Oil believes that every crisis brings an opportunity to us for further improving and developing our business and organization for a better future.

Cognizant of our role to support the national energy security, Thai Oil is currently developing Clean Fuel Project (CFP), which is at the front-end engineering design (FEED) stage in order to increase our competitiveness. This project includes a new Crude Distillation Unit to expand our refinery capacity to 400,000 barrels per day, high conversion value added process and applies cost-saving technology to meet increasing market demand for cleaner fuel products, as well as improve and expand the infrastructure, such as product jetties, oil depots, electricity power plants, oil transport systems and crude oil reserve storage tanks, to support our expansion goal. Moreover, additional investment had been put in this project to accommodate production of fuels that meet EURO 5 standards which will contribute toward a reduction in sulfur for better living environment.

Moreover, the CFP presented Thai Oil with, more than ever, challenges and hurdles which we take it seriously. This includes acquiring necessary permissions and licenses, developing new safety standards and instructions for every step of the project to eliminate potential negative impacts on workers, surrounding communities, and the environment. Also including, human resource management both quantity and quality, by enhancing the capability and competency of our new employees through structured Individual Development Plan and effective knowledge transfers to ensure continuous excellent operations and to mitigate impacts from retirement of high skilled employees.

Moreover, to build a strong and sustainable business foundation according to the philosophy of Sufficiency Economy which we have adopted and to support the UN Global Compact Sustainable Development Goals, Thai Oil relentlessly pursues the operational excellence as exemplified by:



- Continuous effort to improve energy efficiency in production process which, in 2016, led to an energy saving of more than 470,000 gigajules per year or 26,000 tons of carbon dioxide equivalent.
- Commitment to collaboration with other sectors and organizations to create an opportunity to grow and succeed together. This includes collaboration with suppliers and contractors on supply chain risk management by organizing annual seminars with first tier suppliers on “Sustainable World and Sustainable Business with Good Governance in Procurement” to communicate, discuss, explore, and grow together.
- Build community engagement to raise the quality of life and create shared values with the communities as well as support a consortium of the government, private sector, and communities to push forward “Pracha Rat” (or “State of the People”) policies with the goal of creating sustainable growth for all. In 2016, Thaioil donated a building for Laem Chabang Hospital to increase the capacity and ensure adequate services of the Accident and Emergency department in the Laem Chabang area. Thaioil is also in a process of developing a methodology to quantify and measure values from sustainability target attainment.

Collaboration from employees and managers at every level combined with our commitment to sustainable development enable Thai Oil to remain a member of Dow Jones Sustainability Indices (DJSI) for the 4th consecutive year as well as receive the highest assessment score within the Energy Industry Group for the 3rd consecutive year. These awards and recognitions bring enormous pride to all Thai Oil's people.

Lastly, on behalf of Thaioil Group, I would like to thank all the support that enables Thaioil to operate and grow in a sustainable manner. I strongly believe that our collaborative and conscientious approach to run the business with consideration to and concern for the environment, economy and society will move Thai Oil steadily forward on the path of sustainable growth alongside our society.

Mr. Atikom Terbsiri
President and Chief Executive Officer
Thaioil Public Limited Company

Thai Oil Public Company Limited

The biggest refinery in Thailand and has been operating for more than 55 years.

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 %

Sale Revenues (Million Baht)

2016	274,739
2015	293,569
2014	390,090

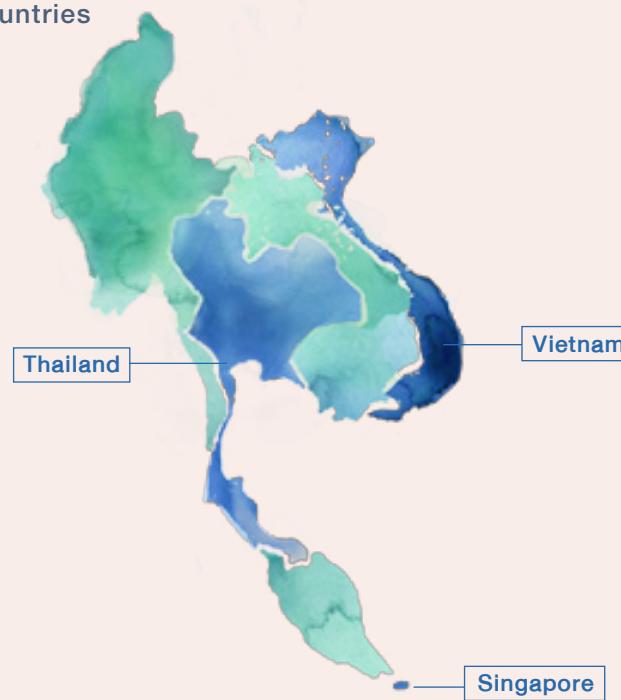
Net Profit / (Loss) (Million Baht)

2016	21,222
2015	12,181
2014	(4,140)

Number of Employees

1,434	Persons
Female	
Male	
378	
1,056	
368	
1,041	
349	
1,008	

Location of Operations in 3 Countries



Refinery Production in 2016



108 %

of nameplate capacity
at 275,000 BBL per day

298,000
BBL per day

Vision

We strive to be a leading fully integrated refining and petrochemical company in Asia Pacific

Mission

To be in top quartile on performance and return on investment

To create a high-performance organization that promotes teamwork, innovation and trust for sustainability

To emphasize good corporate governance and commit to corporate social responsibility

Corporate Values

positive

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



Thai Oil PCL is listed as a member of Dow Jones Sustainability Indices 2016 in oil & gas refining & marketing industry of the Emerging Market with the international recognition on sustainability performance in economic, social and environmental aspects for four consecutive years. Thai Oil has also maintained the Energy Industry Group Leader for three consecutive years.

In addition, RobecoSAM announced in Sustainability Yearbook 2017 that Thai Oil PCL achieved Gold Class level, the highest ranking of Oil & Gas Refining & Marketing companies worldwide.

Value Chain of Thai Oil

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.

CREATED ECONOMIC VALUE

Total Revenues
276,551 million Baht

DISTRIBUTED ECONOMIC VALUE

Employee Training and Development Expense
475 million Baht

Social Development and Contribution
87 million Baht

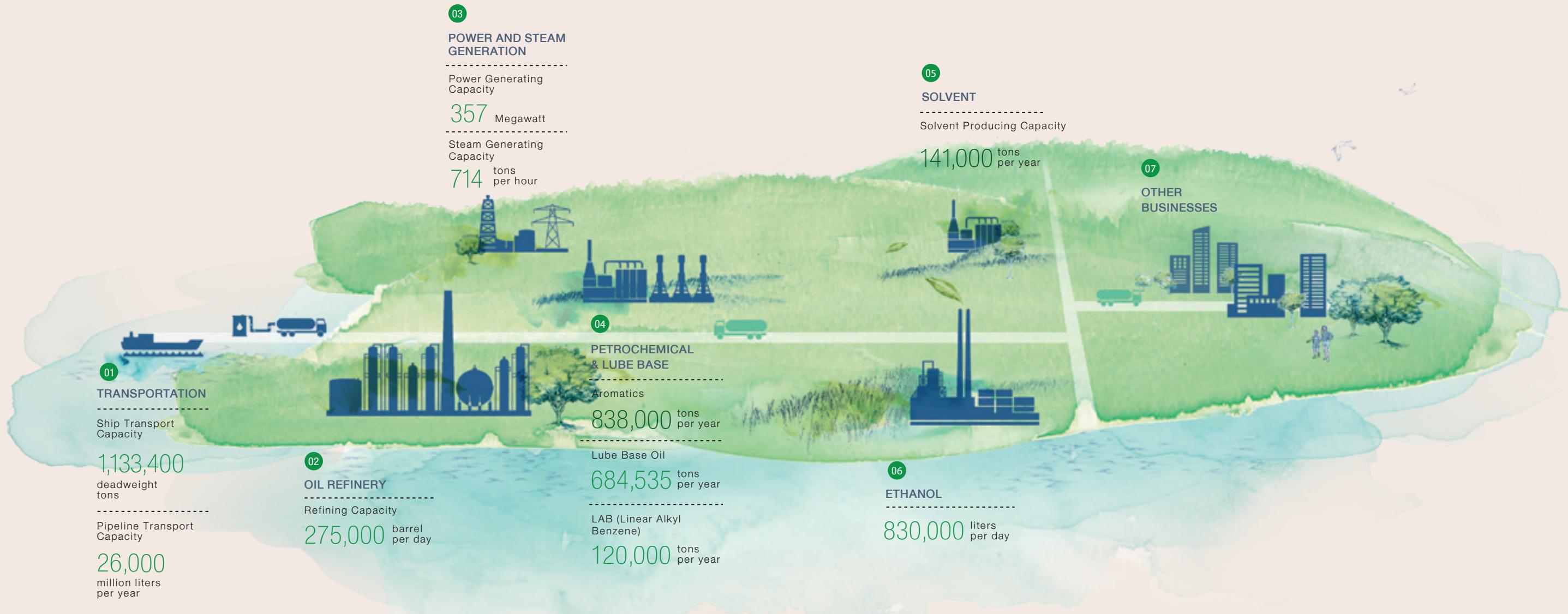
Investment on Energy Efficiency Improvement Projects
43 million Baht

09

VALUE CHAIN OF THAI OIL

THAI OIL PUBLIC COMPANY LIMITED

SUSTAINABILITY REPORT 2016



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.

02 OIL REFINERY

The oil refinery is our core business which has been operated for more than 55 years.

03 POWER AND STEAM GENERATION

Co-generation power plant of power and steam 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.

04 PETROCHEMICAL & LUBE BASE

This business utilizes the 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.

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.

06 ETHANOL

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

07 OTHER BUSINESSES

Thai Oil has a business in human resource management to supply workforce for companies within Thaioil Group. We also provide services in technology consultation.

Materiality Assessment and Stakeholders

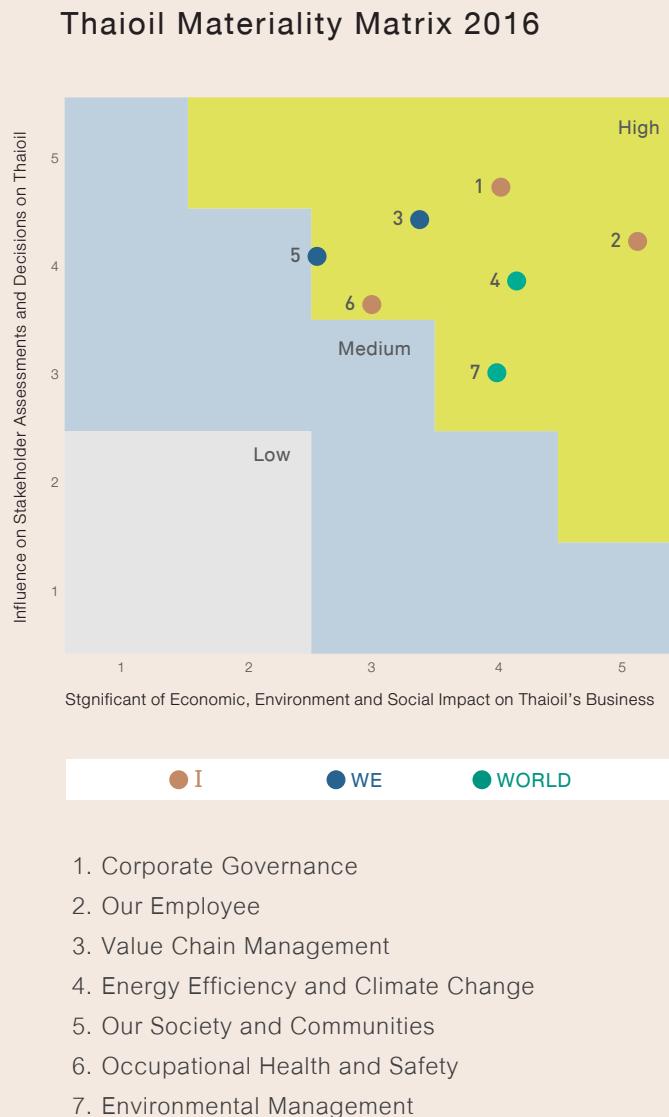


Stakeholder Engagement (G4-25)

Thaioil categorizes the stakeholders into six groups and has established functions specifically for each stakeholder. These functions' responsibilities are to engage and communicate with the stakeholders as well as receive feedbacks and concerns, which are taken into consideration during business decision-makings.

Stakeholder Engagement 2015-2016

Example of Engagement Method (G4-26)	Example of Stakeholder's Expectations (G4-27)	Response to Stakeholder's Expectations
<ul style="list-style-type: none"> • Annual General Meeting (AGM) • Annual report • Quarterly corporate performance announcement • Company site visit • Financial analysis meeting • Investment exhibition • Grievance mechanism (Whistle Blowing) • Forum • Frequently phone call 	<ul style="list-style-type: none"> • High and sustainable return on investment • Transparency and accountability • Potential growth for a business 	Additional information at Sustainability at Thaioil Group and Corporate Governance Chapter
<ul style="list-style-type: none"> • News letters • Annual customer satisfaction survey • Company site visit • Customer visit • Grievance mechanism (Whistle Blowing) 	<ul style="list-style-type: none"> • Product quality and efficient before and after sales services • On-time product delivery with status tracking system • Ability to response customers' demands • Green products 	Additional information at Value Chain Management and Climate Change and Energy Efficiency Chapter
<ul style="list-style-type: none"> • Meeting with suppliers and contractors • Frequently communications through electronic channels and phone call • Site visit based on suppliers relation management • Grievance mechanism (Whistle Blowing) 	<ul style="list-style-type: none"> • Fair and transparent procurement process • Attractive and suitable compensations with performance • Value added and sustainable corporation • Accurate payment period • Prevention of severe events leading to business continuity and community's impact 	Additional information at Value Chain Management and Corporate Governance Chapter
<ul style="list-style-type: none"> • Quarterly CEO meeting with employees • Monthly company journal • Annual employee satisfaction survey • Frequently internal electronic communication • Employee assessment during mid-year and year-end period • The exchange of ideas between supervisors and theirs employees • Annual knowledge sharing activities through representative from employees committee • Grievance mechanism (Whistle Blowing) 	<ul style="list-style-type: none"> • Compensation • Wage and benefit • Job security • Opportunities of career advancement • Occupational health and safety • Knowledge management • Happiness at work place • Disclosure of management performance 	Additional information at Our Employee and Occupational Health and Safety Chapter
<ul style="list-style-type: none"> • Frequently community relation activities • Monthly meeting with community leaders • Social and communities activities at Thaioil Refinery's vicinity 	<ul style="list-style-type: none"> • Community relations • Reduction of Thaioil's business impact to society and communities such as air quality resulting from Thaioil business expansion • Sponsorship of community activities • Development and troubleshooting for society and communities 	Additional information at Our Society and Communities and Environmental Management Chapter
<ul style="list-style-type: none"> • Submission of reports to government agencies every 3 months • Participation or support in activities and program relevant to Thaioil Group's business held by government agencies 	<ul style="list-style-type: none"> • Compliance with rules, laws and regulations • Anti-corruption • Prevention of communities' impacts such as air emission, waste water release to sea and traffic etc. • Law compliance 	Additional information at Corporate Governance and Environmental Management Chapter



Material Aspect to Thaioil Group	Corresponding Material GRI Aspects GRI (G4-19)	Impact Boundary (G4-20-21)			
		Within Thaioil Group	External Stakeholders	Related External Stakeholders	
Corporate Governance	Anti-corruption Governance Structure Code of Conduct	Governance Ethics and Integrity Anti-corruption	✓	✓	Shareholders, Creditors, Financial Institution, Supplier, Partner, Government, and Related Government Agencies
Our Employee	Capability Development Talent Attraction and Retention Knowledge Management Human Rights	Employment Training and Education Equal Remuneration for Women and Men Labor Practices Grievance Mechanism Human Right Assessment	✓		
Occupational Health and Safety	Personal Safety Process Safety Emergency & Crisis Management Occupational Health	Occupational Health and Safety Asset Integrity and Process Safety Emergency Preparedness	✓	✓	Supplier and Contractor
Our Society and Communities	Corporate Social Responsibility Community Engagement	Local Communities Grievance Mechanism for Impacts on Society	✓	✓	Community and Society
Value Chain Management	Supply Chain Management Product Supply Customer Relation Management	Supplier Environmental Assessment Supplier Assessment for Labor Practices Supplier Human Rights Assessment	✓	✓	Supplier, Contractor, and Customer
Environmental Management	Regulatory Compliance Air Emissions: NO_x , SO_x , VOC_s Waste Management Oil & Chemical Spill Prevention	Environmental Compliance Air Emission Effluents and Waste	✓	✓	Community, Society, Government, and Related Government Agencies
Energy Efficiency and Climate Change	Process Improvement Resource Efficiency Water Supply Management	Energy Emissions Economic Performance Water	✓	✓	Community, Society, Government, and Related Government Agencies, and Customers

Remarks

* In 2016, there was no restatement of previous year performance. (G4-22)

** In 2016, there was a change in the reporting scope which covered the environmental, safety and employee performance of Labix company limited and TOPSPP company limited. (G4-23)

Materiality Assessment on Sustainability of Thaioil Group in Accordance with GRI (G4-18, G4-32, G4-33, G4-34)

01

Identification / Review

For 2016 materiality assessment, Thaioil Group further reviewed the 2015 material issues by taking into account of Global Reporting Initiative, Dow Jones Sustainability Indices (DJSI), megatrends, United Nations' Sustainable Development Goals, readers' surveys, and stakeholders' expectations from internal channels.

02

Prioritization

Thaioil together with relevant functions reviewed the prioritized material issues from 2015 based on the evaluation of two dimensions: impacts and opportunities to Thaioil Group, and stakeholders' interests and concerns. These material issues are then evaluated on the scale of 1-5 point based on Thaioil operational risks and opportunities, and stakeholder interests. Content in this corporate sustainability report covered material issues classified at the medium and high levels.

03

Validation

Validation of material issues were processed by Sustainability Development function and relevant functions. The results then presented to a senior-level management meeting, chaired by CEO for endorsement and approval of material issues based on internal and external impact boundaries of the business. Independent assurers are also involved in verifying the materiality assessment process, stakeholder engagement, data processing, and accuracy in reporting against safety and environment performance indicators, as presented on page 78-79.

Integrated Risk Management

Thaioil Group manages risks, which are the fundamentals of corporate sustainability, under the risk management policy and the following 5 aspects of risk appetite framework: 1) performance; 2) compliance; 3) safety, occupational health and environment; 4) reputation; 5) fraud and corruption. Thaioil Group manages risks by linking to the strategic planning, investment and business planning processes, according to the short, medium and long term goals of the company. Then, internal and external critical risk factors are identified, measures and mitigation plans are established to ensure that all risks have been timely and appropriately responded, leading to creation of opportunities in business.

Risk management and its performance will be reported to the Risk Management Steering Committee (RMSC) and to the Risk Management Committee (RMC), which consists of executives and board of directors, respectively. Risks at corporate level are reported to the Audit Committee and Board of Directors. This is to ensure that all risks are managed by the defined measures.

Risk Management

Thaioil Group manages risks according to international standards, ISO 31000 and Committee of Sponsoring Organizations of the Treadway Commission (COSO). Risk information is stored in the corporate risk database in order to effectively analyze and monitor risk plans of each function at all levels under responsibility of the Risk Management Committee. In addition, Thaioil Group has developed the internal control process which is the collaboration between management and employees of all levels, to ensure that the defined methods or operations contributing to achievement of the organizational objectives. Furthermore, Thaioil Group has conducted the Control Self-Assessment (CSA) and the Functional Cross Check. In case of risk issues that have subsequent impacts, Thaioil Group has set up the Business Continuity Management Plan (BCP) covering all critical processes for effective enhancement of the Business Continuity Management according to international standards. A crisis scenario has been generated for the BCP Table Top Exercise which is regularly and continuously drilled together with the Emergency Exercise of the refinery.

Risk Culture

Thaioil Group aims to create an understanding and raise awareness of risk management as part of the corporate culture amongst all its employees, according to risk culture master plan through employee training to gain a better understanding of the organizational risk factors, risk management processes and risk management tools, to prepare for the potential impacts of business operations in short-, medium- and long-term.



To monitor corporate risks promptly, Thaioil Group has appointed the Risk Coordinator (RCO) from each division. The RCOs gain knowledge from training on the risk management and learn risk management practices from other leading companies, in order to gain experience and apply knowledge to their responsible area. In addition, the RCO also forward skills and knowledge to employees in their divisions so that their fellow employees can conduct risk analysis and assessment, and can appropriately determine the risk management measures.

In 2016, Thaioil Group has defined the Key Risk Indicator (KRI) covering all critical risks from organizational level down to executive level in each department and division level. The results of the KRIs are then quarterly presented to the Thaioil Group's RMSC to acknowledge of the changing trends of corporate risk and to prepare effective measures to mitigate risks. Consequently, the risk management process has been improved continuously and complied with international guidelines. In addition, Thaioil Group has implemented the Enterprise Risk Management Assessment conducted by external consultants, to constantly assess and further improve its risk management process. The overall assessment scores of 2016 are higher than those of the 2 past years. Furthermore, Thaioil Group has conducted the assessment of employee satisfaction on risk management, supporting both operational risks and business risks, through the Organization Health Index. Moreover, Thaioil Group has started defining the functional level KRI, which is expected to start the implementation in 2017.

Potential Risks to Thaioil Group's Sustainability

Due to global changing trends and directions, risks that may affect the refining and petrochemical business in the long term has increased constantly and with more intensity. Thaioil Group has realized and emphasized those situations; therefore, risk assessment and analysis of the impacts that may occur in different circumstances have been implemented and annually reported to the management and Risk Management Committee.

Climate Change Related Risk

Risk	Potential Impact	Mitigation Action
Climate change has become an increasingly important issue as presented in the 21 st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21) which was held in Paris. The COP 21 objective was to have a binding and universal agreement to reduce greenhouse gas emissions. Thailand has also signed an agreement to reduce greenhouse gas emissions by 20-25% within 2030, from business-as-usual projection. As a result, the rule and regulation related to the issue of greenhouse gas reduction will be in place within the next 3-5 years, leading to an enterprise risk due to the effect of changes in governmental policies, laws, rules and regulations.	Thaioil Group has assessed potential impacts to the organization, such as the more investment to improve production processes in order to reduced greenhouse gas emissions and the higher cost of operations and activities related to greenhouse gas reduction.	<p>Thaioil Group has planned and adapted for the situation by implementing the following action plans to directly and indirectly reduce greenhouse gas emissions:</p> <ul style="list-style-type: none"> Planning to invest into the construction of a new crude distillation unit with efficient production reducing greenhouse gas emissions, and planning to stop operations of the old crude distillation unit which is older than 50 years due to its low energy efficiency Reducing energy consumption based on the Solomon Energy Intensity Index: EII, expecting to reduce at least one point per year Implementing a life cycle inventory of greenhouse gas emissions in collaboration with the Petroleum Institute of Thailand. Participating in the cooperation project with Chulalongkorn University to evaluate the potential to reduce greenhouse gas emissions from the production process Encouraging employees to use public transports instead of private cars and use bicycles instead of cars within the production area Using virtue meetings instead of face-to-face meetings Preparing the Equator Principles (EP), related to the conceptual framework of social and environmental stewardship of large investment projects in 2017

Risk from Rapid Growth of Technology for Alternative Energy on Substitution to Fossil Fuel

Risk	Potential Impact	Mitigation Action
The rapid change of technologies nowadays impacts the manufacturing industry as well as lifestyle of society in energy industry. Today, the development and improvement of technology in alternative energy production process has substituted oil in various ways; for example, electric vehicle, fuel cell electric car. Moreover, new regulations by government encourage the use of alternative energy which influences the consumers' behavior with more options. The use of oil products has changed and the situation might occur rapidly such that the oil and gas industry could not adapt in time, which would affect the revenues and the growth of the business in long-term, it is considered as a corporate risk.	Thaioil Group has assessed potential impacts to the organization such as the substitution of alternative energy to fossil fuel in some products. For example, the decrease of gasoline demand leads to less profit.	<p>Thaioil Group has established the mitigation actions and adaptation as follows:</p> <ul style="list-style-type: none"> Improvement of production process with the investment on producing more diesel i.e. Clean Fuel Project Portfolio restructure to increase competitiveness for new investment such as specialty of products Increasing the ratio of investment that is not dependent on oil price factor. The target to increase the ratio in such investment is 20% by 2022 and 30% by 2030. Thaioil also has another target to develop new businesses to create sustainability in the long-term future for the Group

Sustainability at Thaioil Group



Commitment and Goal

The key to sustainable development of Thaioil Group is balanced growth in economic, social and environmental aspects with due consideration given to all stakeholders throughout the supply chain for the past, present and future. Thaioil, therefore, integrates sustainability management as part of our normal operation for every business unit, covering all companies in Thaioil Group.

Sustainability Context: Challenges and Opportunities

Challenges facing today's business stem from a myriad of factors, such as oil price volatility, intense competition within the same industry, consumer preference for environmentally friendly fuels and products, and advancement in efficiency-enhancing technologies. To prepare for these challenges, Thaioil plans to expand our refinery facilities to increase capacity from 275,000 barrels per day to approximately 400,000 barrels per day. This higher capacity will help us meet rising market demand for diesel oil in the future. Part of the plan is also to upgrade our infrastructure, including machines and equipment, with new efficiency-enhancing technologies to accommodate production of clean fuels that meets EURO 5 standards and to be energy efficient which will help reduce the environmental impacts.

Management and Performance

Sustainability Management within Thaioil Group

First announced in 2012, Thaioil's sustainable development policy has been implemented with a plan to expand the scope of implementation to cover all companies in Thaioil Group to ensure that their sustainability practices are consistent with the organization's policy and move forward in the same direction as guided by the "TOP way of conduct."

Thaioil's Sustainability Strategy

To integrate the goal of sustainable development into strategic actions, Thaioil incorporates stakeholders' as well as global perspectives on sustainability into our annual business strategy planning (Strategic Thinking Session – STS). The Board of Directors and senior executives can then use this information to formulate a sustainability strategy plan.

Key sustainability strategies for 2016 are:

OPERATIONAL EXCELLENCE	ENVIRONMENTAL/SOCIAL/GOVERNANCE RISK	SUSTAINABLE BUSINESS
Focus on developing and improving operational efficiency in economic, social and environmental aspects according to international best practices with an approval from all groups of stakeholders	Consider both opportunities and risks on the environment, society and governance including the effect on the supply chain when evaluating any investment to ensure transparency and fairness as well as impacts on both the company and the stakeholders, in the short, medium and long term.	Increase the organization's and employees' capability to build shared values with stakeholders to become a sustainable business
Develop a plan to deepen the organization's risk management culture by ensuring that employees have positive attitudes and applicable knowledge.	Foster a good corporate governance culture throughout the organization as well as educate suppliers and customers on corporate governance	
Have 28 projects to increase energy efficiency and reduce oil loss in production which can lower greenhouse gas emissions by 26,406 tons carbon dioxide equivalent per year	Obtain the Certificate of Carbon Footprint for Organization and the Low Emission Support Scheme from Thailand Greenhouse Gas Management Organization (Public Organization)	
Assess the risk of violating the basic human rights for our main activities per the Group's human rights policy.	Run Corporate Social Responsibility programs which benefit 983 households and 2 public places	

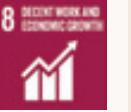
In 2017, Thaioil plans to review the sustainable development master plan to ensure that it is up-to-date with global developments and consistent with more comprehensive international best practices.

Moreover, in June 2016, the company set up the **Sustainable Development Committee** to ensure an integrated approach in sustainability management throughout the business operations. There also have The Sustainable Development function which is responsible for coordinating and reporting quarterly economic, social and environmental performance to the Sustainable Development Committee and then to the Corporate Governance Board.

Roles and Responsibilities



Sustainability Goals

Issues	Sustainability Goal	Current Practice	Plan to Achieve Sustainability Goal	Sustainable Development Goals (SDGs)	Issues	Sustainability Goal	Current Practice	Plan to Achieve Sustainability Goal	Sustainable Development Goals (SDGs)
Corporate Governance	Promote a good corporate governance culture throughout the organization.	Incorporate the corporate governance policy and the anti-corruption policy in the TOP Way of Conduct handbook to ensure good corporate governance within Thaioil Group, contributing towards sustainable growth.	Conducting a CG survey to assess employees' understanding on corporate governance and to gather feedback. Survey results can then be used to design projects that deepen and broaden corporate governance culture throughout the organization.		Occupational Health and Safety	To be an accident free organization in the top quartile of refinery businesses in the Asia Pacific region.	Incorporate a personal safety indicator (Total Recordable Case Frequency) into Corporate KPI and adopt production process safety indicator (Loss of Primary Containment Frequency) as a key risk indicator for the first year. Have a safety audit and performance review by executives on monthly basis.	Use the 5-year sustainability master plan as the operational framework to achieve objectives and goals. Have an assessment process and ensure that the annual operational plan is aligned with activities and risks, including both internal and external environment. Have a monthly performance review and the ISO 9001 Quality Management System review by executives.	
	Educate all employees on corporate governance.	Organize activities to promote learning and understanding about corporate governance such as CG Forum on "Business Ethics – Integration into Daily Practice" and share the knowledge with the company's suppliers by organizing events for suppliers such as the Supplier Summit.	Provide information and organize activities to educate employees on corporate governance principles that are up-to-date, relevant and applicable to the changing business landscape that meet global standards.			Elevate safety maturity to level 4 by 2018.	Implement the Thaioil Group Safety Culture Model which aligns with the 5-year sustainability master plan.	Build on the Safe-White-Green strategy to create safety consciousness and role model in workplace. Develop the QSHE Roll Out project to encourage employees be proactive and conscientious on safety, quality, environment and security at the operator level or the operating area level.	
	Promote employee readiness and well-being to become a high performing and healthy organization.	Promote employee readiness through the Recruitment Marketing project and Employee Branding project to build necessary skills for future leaders and to become one of the top organizations for which potential employees want to work with.	Have a cross-divisional career development plan to build multi-skilled employees and develop employees' qualifications to meet future business needs (Future People 4.0).						
Human Capital	Ensure employees' well-being as well as encourage participation and engagement with the company.	Develop an employee motivational project by providing diverse means and opportunities for employees to achieve their potential, such as alternative job positions, special assignments, and mentorship system.	Elevate the role of human resources from service provider to business partner with the goal of creating a comprehensive one-stop service for human resources to effectively meet the requirements of the organization.		Corporate Social Responsibility	Encourage communities in all remote regions of Thailand to become self-reliant according to the development approach called "Community Power" of His Majesty the Late King Bhumibol Adulyadej (Rama IX) by focusing on energy and promoting renewable energy.	Follow the Corporate Social Responsibility Policy, aimed to develop projects in collaboration with CSR partners, including public sectors, private sectors and universities who are social thought leader, to jointly develop renewable energy projects. In addition, Thaioil Group also encourages our employees to share experience and knowledge in engineering and energy in order to create a collaborative learning with the community.	Plan to develop sustainable community energy on the national level by focusing on 4 main issues: 1) appropriate selection of the project area based on physical conditions of the area and resources in the community; 2) exploring the real needs of the community; 3) building up energy management capacities of people in the community; 4) analyzing technologies for community energy generation suitable for the community.	
	Become a role model for fairness in the workplace.	Promote workplace fairness according to international human rights principles.	Extensively assess labor practices with the 7-step human rights due diligence process as well as operation according to mitigation measures of human rights violation within the company.						

Sustainability Goals

Issues	Sustainability Goal	Current Practice	Plan to Achieve Sustainability Goal	Sustainable Development Goals (SDGs)	Issues	Sustainability Goal	Current Practice	Plan to Achieve Sustainability Goal	Sustainable Development Goals (SDGs)
Community Responsibility	Create value in the community development in all dimensions of sustainability by giving priority to the developments that correspond to the real needs of stakeholders and further enhance the quality of life in the community.	Take close care of all 10 communities surrounding our refinery. The company is committed to provide complete and accurate information to the community in order to build up community's confidence in and trust to the organization as well as to achieve community acceptance of the operations of Thaioil Group.	Plan to develop and support new knowledge to the community with the purpose to make the community strong, self-reliant and able to adapt to social and economic changes.	   	Greenhouse Gas Emission	Utilize resources efficiently and reduce green house gas emissions throughout the product life cycle.	Completed the greenhouse gas account and the product life cycle database.	Analyze and present the carbon footprint data from the product life cycle database to be used as input for greenhouse gas emission reduction projects.	
Value Chain	Commit to value chain efficient management by conducting business in fair and transparent manner, promoting partnership and capability, and enhancing customer satisfaction on products and services.	Develop database system, integrating governance, environmental and social aspects into the procurement process, and evaluate the procurement of goods and services on a basis of environmentally friendly criteria.	Promote partnership and build collaboration and capability by implementing the sustainable partnership development program according to the 2016-2017 strategic plan which emphasizes risk management towards sustainable value chain.		Energy	Set the 2017 target for Energy Intensity Index (EII) of refinery facilities for 2016 at 80.7, better than the target of 81.7.	Achieved Energy Intensity Index (EII) of refinery facilities for 2016 at 80.7, better than the target of 81.7.	Plan to enhance the overall energy efficiency by continuously conducting relevant studies and projects.	
Environment Management	Support Thaioil business growth by taking into consideration the environmental impacts and stakeholder participation.	Follow the 5-year environmental master plan (2012-2016) which contains a number of projects, such as the 3Rs project on water management, enhancement of VOC (volatile organic compound) treatment project, and water flood management project etc.	Review and enhance the environmental master plan for 2017-2021 with the goal of protecting and mitigating environmental impacts from our operations under the principle of good governance to gain the support from every group of stakeholders.	  	Water Management	Optimize water usage and prevent water shortage risk which may affect the business and stakeholders.	Manage water according to the integrated water management strategy, business continuity plan, and 3Rs principle to prepare for raw water shortage risk.	Water management planning and improvement which includes collecting and analyzing water usage data to identify opportunities to increase water consumption efficiency per unit of production. Forecast water demand from Thaioil's business expansion plan relative to the forecast volume of current water sources to ensure production security and impact minimization for every group of stakeholders.	 

Passion for Excellence

Joining together through experience and determination of our employees under corporate governance and safety focus for our stable and sustainable growth.



Corporate Governance

New employees

100 %

attended an orientation that included training on corporate governance, business code of conduct, and anti-corruption.

An on-line, self-study curriculum on corporate governance

is **COMPLETED**

and available to all employees via the TOP Group e-learning system.

Corporate Governance Report of Thai Listed Companies (CGR)

awarded **“EXCELLENT”** or the highest recognition level for 8 consecutive years in 2016

by the Thai Institute of Directors (IOD). Moreover, Thaioil was in the top quartile of companies with more than Baht 10 billion of market capitalization.

Commitment and Goal

Thaioil has long committed to operate our business in accordance with good corporate governance principles founded upon honesty, transparency and fairness. We strive to give equal consideration to all stakeholders' interests and also fulfill our social and environmental responsibility. Continuous improvement in corporate governance is the key factor to achieve efficient and sustainable growth, to gain confidence and trust, and to benefit all stakeholders, society and the nation as a whole.

Challenges and Opportunities

As current economic and social conditions undergo rapid and significant changes, there is a need for the organization to uphold "good corporate governance" which serves as guiding principles for the management to be transparent, socially and environmentally responsible in order to gain public acceptance.

Therefore, the Securities and Exchange Commission (SEC), the Stock Exchange of Thailand (SET), and the ASEAN Capital Market Forum (ACMF) have issued guidelines on good corporate governance for registered companies in Thailand. These guidelines have been enhanced and improved continuously to adapt to changing conditions.

Thaioil attaches paramount importance to corporate governance and business code of conduct which are based on responsibility, transparency, and fairness. Rules, regulations and standards are adhered to while taking all stakeholders' interests into consideration. We keep abreast of the latest information to constantly improve and fine-tune our policies and guidelines to ensure completeness and comprehensiveness. We ensure

that our corporate governance and business code of conduct meet international standards and remain up-to-date.

In the midst of crisis and changes, there is an opportunity to grow and develop. Thaioil uses corporate governance principles as a foundation for setting up a systematic and efficient management approach in many areas, such as internal control, risk management, and whistle-blowing mechanism system. Committees have been set up to ensure that the day-to-day business operation complies with rules, regulations and any legal requirements. These practices make Thaioil more robust, particularly because problems and obstacles become more visible, allowing for a timely corrective action.

Management Approach and Performance

Corporate Governance Structure

For transparency and efficiency of Thaioil Group's operation, the Board of Directors (The Board) appointed 4 committees to oversee the operation within their scope of responsibility. These committees are Audit Committee, Nomination and Remuneration Committee, Corporate Governance Committee, and Risk Management Committee.

In 2016, the Board approved an amendment to the charters of the 4 committees by clearly defining the roles and scope of authority for each committee, ensuring a thorough oversight for all areas of operations. The Board also

publishes each committee's charter along with the list of names and titles of all committee members on Thaioil's website at www.thaioilgroup.com/home/corporate_governance.aspx

Any issues regarding corporate governance, social responsibility, and sustainability management will be handled and considered by the Corporate Governance Committee. Its performance is reported to the Board on an annual basis. However, any important and urgent issues shall be directly and immediately reported to the Board.



Code of Conduct and Anti-Corruption

Thaioil publishes the handbook on corporate governance, code of conduct and anti-corruption policy on Thaioil's website for the interested public to learn about business ethics and anti-corruption.

In 2016, Thaioil organized the CG Forum on the topic of "Business Ethics – Integration into Daily Practice." Mr. Danai Chanchaochai -- a thinker, writer, marketing manager, and advocate of the White Ocean Strategy -- was invited as a guest speaker. There were 64 employees attending this event. The goal was to facilitate an exchange and sharing of ideas, knowledge and experience on corporate governance, business code of conduct and other regulations. Moreover, the forum also reviewed and improved the whistle-blowing procedures for greater clarity and efficiency.

Furthermore, Thaioil's business code of conduct, anti-corruption policy and guidelines are parts of the important rules in the "Supplier Code of Conduct" handbook for suppliers and contractors. The goal is to build a mutual understanding between Thaioil and its suppliers to operate the business on the principle of sustainability covering all 3 aspects: environmental, social and governance. This principle is used as part of Thaioil's selection criteria for suppliers. Moreover, Thaioil has also written to suppliers and customers to communicate important corporate governance issues. For example, Thaioil has sent out letters requesting that neither gift nor hospitality event shall be given to managers and employees of Thaioil Group.

Additionally, Thaioil has maintained the relationship with various external organizations and networks; for example, being a member of United Nations Global Compact (UNG), Collective Action Coalition against Corruption (CAC) and Partnership against Corruption for Thailand (PACT Networking), and participating in their various activities. This allows Thaioil to share anti-corruption knowledge and experience with both domestic and international organizations.

Promoting Corporate Governance Awareness

Thaioil has been implementing programs to promote corporate governance awareness among directors, executives and employees. In 2016, Thaioil developed and rolled out the TOP Group e-learning system which offers self-study curriculums on corporate governance and safety, making the learning accessible and available to all employees. The corporate governance curriculum consists of 3 learning sessions on the topics of corporate governance, code of conduct and anti-corruption. Each learning session comprises a pre-assessment, learning materials (either in a webcast or e-book format), review questions in a form of games and a post-assessment. Employees can access this system via computers, smart phones, and tablets.



Thaioil, in cooperation with PTT Group, organized the 2016 PTT Group CG Day under the theme of "See through the Future" to promote transparency and to emphasize the importance of anti-corruption. Suppliers were also invited to join the event which featured talks by CEOs of the 6 companies in the PTT Group on the topic "Looking through the Lenses at the Future of Anti-corruption Practices within PTT Group"

Conflict of Interest Disclosure Electronic Reporting System

Thaioil has set up an electronic system for employees to disclose potential conflict of interest. This system serves as a channel for monitoring any conflicts of interest that may arise by reviewing electronic disclosure forms submitted by employees annually. In 2016, 80% of employees submitted the conflict of interest disclosure forms, of which 5 cases were identified as having potential conflict of interest. After review and investigation on these 5 cases, no conflict of interest is found with Thaioil.

Grievance Mechanism and Whistle-blowing Procedure

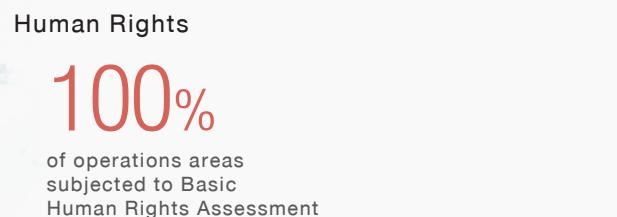
Various grievance mechanisms have been put in place by defining the scope of reporting, procedures, protection for whistle-blowers, and mechanisms for monitoring and enforcing compliance with the company's code of conduct. The Corporate Internal Systems Audit Department, an independent unit which directly reports to the Audit Committee, is responsible for reviewing circumstances and cases which may be construed as corruption. This year, Thaioil received three complaints. The first issue was settled because the complaint was made in an anonymous letter, which after investigating, turned out to be a personal conflict. The other two were under investigation process.

In 2016, Thaioil reviewed and made necessary changes to the existing grievance mechanisms and whistle-blowing procedures to enhance efficiency and completeness.

For protection mechanisms, whistle-blowers will receive adequate and fair protection. For example, whistle-blowers will not be subjected to threat, suspension, termination, change in job position or place of work, or any unfair treatments. Thaioil maintains strict confidentiality and will not disclose information supplied by a whistle-blower to any unrelated party unless required by law. If there is a breach of confidentiality or false reporting, the offender shall be subjected to disciplinary action, according to Thaioil's rules and/or prosecuted as deemed appropriate.

In 2016, there was no issue raised concerning an illegal act, no fine or non-monetary liability, and no corruption case. There was also a plan to raise employees' awareness and make the whistle-blowing procedures more widely known within the organization.

Our Employees



Commitment and Goal

Excellent human resource management is a crucial factor for business success in a challenging and competitive environment. Thaioil Group values our people and continuously enhances both employee capacity and capability to create a workforce with competitive advantage and versatility for future business expansion.



Challenges and Opportunities

Many external challenges push Thaioil Group to constantly develop our people's capability. For example, the current trend to automate manufacturing processes with digital technologies and internet, or the so-called Industrial Revolution 4.0, increases demand for workers with new and diverse skills. In addition, market competition for talented individuals, especially in the domestic labor market with highly diverse backgrounds on age, gender, race, and culture, leads to changes in required remuneration and benefits.

At the same time, Thaioil group also faces a crucial internal change and challenge which is a demand for experienced employees to support our business expansion and to replace retired skillful employees within the next 10 years.

Management Approach and Performance

Talent Attraction and Retention

Talent Attraction

Thaioil Group focuses on recruitment of capable and ethical individuals to fulfill our vision and mission by using the Recruitment Marketing strategy which applies marketing approaches to recruitment planning. There is a talent screening process which uses various activities to screen candidates prior to formal job opening. The strategy applies the 4P (Product, Price, Place and Promotion) marketing concept and adapts AIDA (Attention, Interest, Desire, and Action) monitoring and quality control tools to our human resource management practice. The company focuses on using technology and organizing fun activities to attract and foster candidate engagement. Furthermore, Thaioil Group conducted a survey among employees with less than 1-year tenure to identify material candidate value proposition. The survey results indicated that the target group gives priority to remuneration and benefits, career advancement, job responsibility and employee well-being within the company. This survey finding has been incorporated into our human resource operational plan.

Recruitment Marketing Project

Thaioil has organized a variety of activities to attract potential candidates:

- Organizing camps for chemical engineering students from universities throughout the country. These students were target candidates for Thaioil Group.
- Using technology to reach out new generations, such as 'Virtual Reality Technology (VRT)' to give job applicants virtual reality experiences about the company, public communication channel like Line App under the user name Thaioil Recruitment (id:@qpn8751f), and being active on Thaioil Recruitment Facebook.



The Recruitment Marketing project has increased qualified applications from 32 to 54 applications per job opening, or equivalently a 69 % increase, as well as resulted in 84% of candidates regarding Thaioil as a well-recognized company.

Qualified Candidate per 1 position

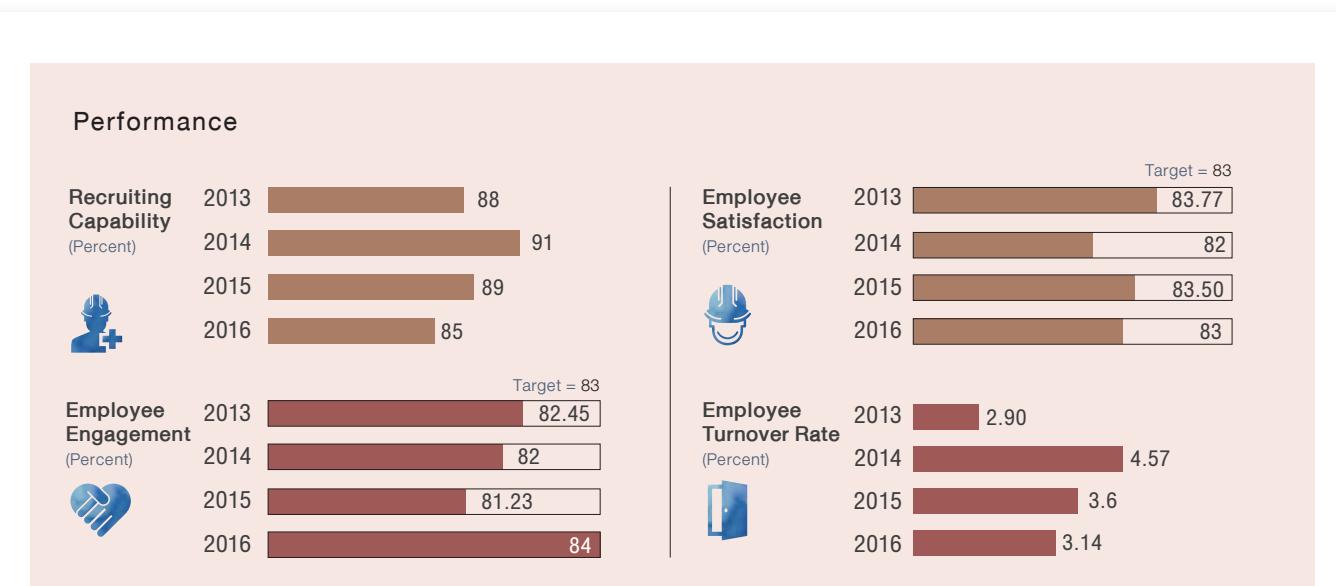
BEFOR
32

AFTER
54

Employee Retention

In 2016, Thaioil implemented the Talent Management project, which covered recruitment process, career management, capability development, and compensation management with an aim to retain talented employees for a long term. Compensation surveys and analyses have been conducted annually to ensure that Thaioil Group compensation is at the level comparable with other companies in the same industry.

The 2016 employee engagement score was at 84%, higher than the 83 percent target, while employee satisfaction score was at 83%. Thaioil Group conducted further analyses and communicated the survey results to every relevant function as well as worked on identifying ways to increase employee engagement. The company will continue to monitor progress on the plan to promote organizational health and to increase employee engagement in the following year.



Capacity Development

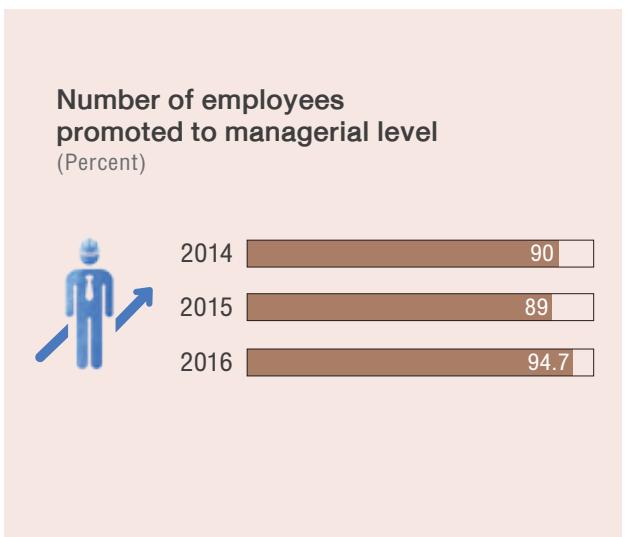
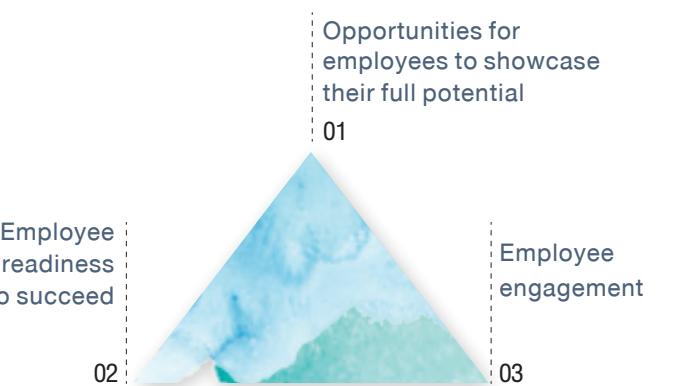
To ensure effectiveness of our human resource development process in building necessary skills, knowledge, and capability to achieve business goals, Thaioil Group uses performance indicators to measure and monitor progress throughout the process ranging from individual development planning, capacity development implementation, to performance appraisal. Human Capital Index (HCI) is still being used as the key indicator to assess employee readiness in 3 dimensions consisting of:

In 2016, Thaioil Group was able to achieve an 82.51% of the Human Capital Index which was better than the 79% of target. Moreover, internal promotion rate increased from 17.8% in 2015 to 19.3% in 2016.

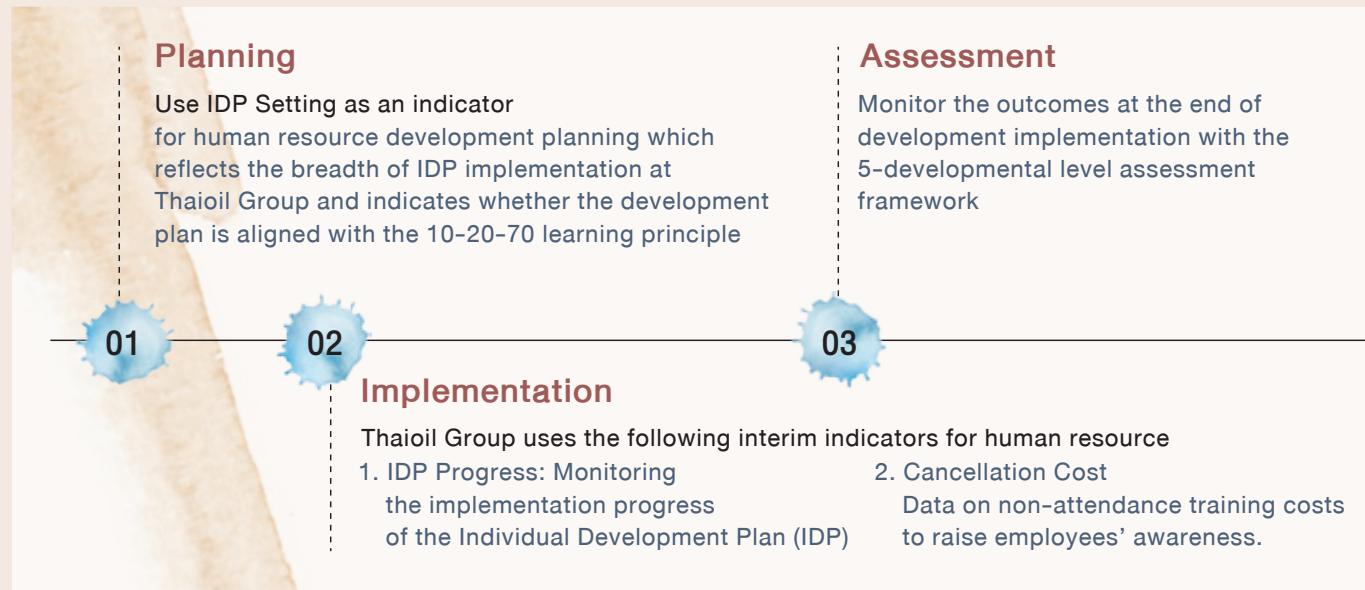


remark : A new methodology was used to compute the Human Capital Index during 2013-2016.

Thaioil Group also prepares a human resource development report every quarter. This report communicates the progress on employee capability development to relevant executives and managers to enhance effectively the interim implementation.



Thaioil Group's Human Resource Development Plan



Career Development

Thaioil Group is in the process of creating a comprehensive management system for employees in the specialist track which consists of career model, special professional developing and networking program as well as performance management. This system was launched in 2016 with specialist groups in the engineering function as the first cohort and will be phased into the technology and the production lines in 2017.

Leadership & Talent Development

Thaioil Group uses the 3-dimension talent development framework to train our people to become future leaders of our organization.



Furthermore, Thaioil Group has developed the 'GREAT Leader Model' program which is a leadership development program to prepare successors for management positions. This successor training program starts with an assessment to identify areas of development and provides continuous training until evaluation to ensure that successors are fully-trained and ready for their new positions.



Knowledge Management (KM)

Managing knowledge, experience and expertise of individual employees create important opportunities for the organization both in terms of competitiveness and business growth potential. Thaioil Group, therefore, puts an emphasis on capturing knowledge, including innovation, best practices, operational improvement, instrument usage, and other auxiliary knowledge to share within the organization and benefit the business.



In 2016, Thaioil continued the 'Thaioil Group Wisdom and Innovation Award' program from 2015. The program awards winners of the contest in six following categories of knowledge:

1. Work Lesson Learned
2. Knowledge Application
3. Best Practice
4. Innovation
5. Initiative Ideas
6. Best Contributor

There were 705 pieces of knowledge submitted for the contest. The combined benefits from the three categories which are Innovation, Best Practice, and Knowledge Application are estimated to be THB 968 million of generated income for Thaioil Group. The award ceremony for employees who create valuable knowledge for Thaioil Group was organized on July 11, 2016.

Furthermore, in 2016, Thaioil Group conducted a knowledge management assessment using PTT Group's KM Maturity Assessment tool in order to enhance efficiency of knowledge management and create business competitive advantage. The assessment outcome for 2016 was at 65% which was higher than the short-term target of 60%.



This assessment comprises 8 dimensions:

- Dimension 1 : Strategy**
Link between KM and functional strategic plan
- Dimension 2 : People and culture**
Organization's culture that affects KM
- Dimension 3 : Governance**
Link between KM and functional operation
- Dimension 4 : Content Management**
Accessibility and accuracy of the information
- Dimension 5 : Process**
Link between KM and business processes
- Dimension 6 : Quality**
Knowledge quality including standards used for quality evaluation
- Dimension 7 : Data Navigation**
Knowledge accessibility and assessment of searching functions
- Dimension 8 : Enabling Technologies**
Technological support for KM

Human Rights

Thaioil Group recognizes that human rights are basic rights and freedoms to which all people are entitled. In this case, "people" also covers to social communities as well as suppliers in the supply chain of Thaioil Group business. These people's rights extend to the rights to natural resources such as water, land, forests and forest products, fishing areas and unpolluted environment.

Thaioil Group, therefore, enacted the "Human Rights Policy in Operating Areas" which supports respects for human rights regardless of gender, race, religion, and skin color; and disapproves of abuses, child labor and forced labor. The policy supports employees' freedom to unionize and guarantees the negotiation outcomes. Thaioil Group has an organized union (Thai Refinery Workers Union) which had 525 members in 2016, accounting for 74.36% of Thaioil employees. Since the union's inception, there has not been any dispute. Moreover, Thaioil Group has a workers' committee which convenes every two months to manage any issues that have been raised and to communicate any changes of the organizational structure to employees.

Thaioil Group also respects the rights of employees, suppliers, stakeholders as well as every individual's inherent and inalienable rights with strict adherence to principles of international organizations for human rights which encompass United Nations Global Compact (UNG), United Nations Universal Declaration of Human Rights (UNUDHR) and United Nations Framework and Guiding Principles on Business and Human Rights (Ruggie Framework).

No
grievance related to
violation of human rights
in 2016

Hence, Thaioil Group announced the "Thaioil Group Business and Human Rights Policy for Stakeholder" which was effective as of May 26, 2016, with the following details.

"Under the Universal Declaration of Human Rights with due regard for human dignity, rights and freedom, and equality, Thaioil GROUP refrains from improper actions and strictly discouraging violation of human rights' principles by diligently examining any involvement in such violation, through these practices;

- 1) Thaioil GROUP strictly observes the Universal Declaration of Human Rights at domestic and international levels, including the constraints posed by labor laws in each country where it operates, by instituting workplaces that are safe, internationally hygienic, and narcotics-free. It treats all personnel equally regardless of homeland, gender, age, skin color, nationality, origin, religious belief, political view, disability, status, family background, or any other status unrelated to jobs. Also respecting individual rights and freedom, it safeguards individual information.
- 2) Thaioil GROUP must actively ensure that its business has no involvement with violation of human rights, and that it participates and adopts helpful guidelines to world society, including the principles of human rights adopted by the United Nations.
- 3) Thaioil GROUP must educate its personnel on human rights' principles for application as part of their operation and must not support business or activities, or both."

With these policy and guidelines applied to all production and service processes of Thaioil Group, we are confident that everyone will be treated with dignity and mutual respect. Thaioil Group recognizes the importance of 'valuing' and accepting different 'points of view' which results in employees' trust, dedication and engagement with the organization.

Occupational Health and Safety



Commitment and Goal

Safety is a critical element for business operations. Thaioil aims to be an accident-free organization for employees, contractors, and relevant stakeholders. Every Thaioil Group's operation activity must undergo a risk assessment by experts so that adequate and risk-appropriate control and prevention measures can be put in place. Moreover, a close supervision is also required to prevent losses or damages to people, assets, reputation, and environment

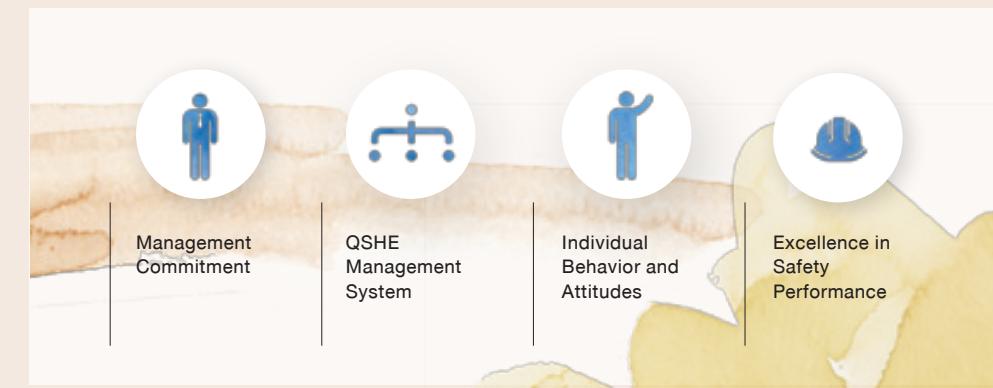
Challenges and Opportunities

2016 was a challenging year to achieve the safety goals because of business expansion construction activities, such as Labix Company Limited and TOP SPP Company Limited, which were completed and began operating in the first quarter of 2016. Moreover, there was also a construction project to expand product distributing stations – lorry loading, completed at the end of 2016, as well as a major turnaround of refinery facilities during the year. Nonetheless, each of the above construction activities was completed safely. The key factor of success lies in both employees' and contracts' cooperation and commitment to workplace safety as well as their readiness to face changes and challenges to create future growth for the organization.

Management Approach and Performance

Safety Culture

Thaioil believes in building a safety culture and, therefore, focuses on developing and elevating safety maturity through the Thaioil Safety Culture Model which encompasses four following elements:



Building a safety culture requires a systematic effort through a variety of activities to motivate and cultivate constant safety awareness among operators. In 2016, there were the following important activities:

- 01 Developed and improved the safety management system to be up-to-date and risk-appropriate
- 02 Communicated policies and performance on safety by the CEO via an internal communication forum called "CEO Update" on a quarterly basis
- 03 Operation site visit by the CEO and senior executives during a major turnaround of the refinery facility.
- 04 Weekly operation site visit by senior executives
- 05 Potential incident or near miss incident reporting system
- 06 Lessons-learned sharing of past accidents that occurred within and outside the organization

These activities emphasized safety role models, communications of important safety policies and activities, safety feedback and recommendations, and operator participation in safety activities.

Personal Safety

Thaioil continues to implement the Safe White Green strategy to instill safety consciousness and create a role model among operators. The company also builds on this strategy by initiating the "QSHE Roll Out" project with an emphasis on proactive strategies to create accessibility and consciousness on safety, quality, environment and security at the operator-level or the site-level. This project increases operators' participation in safety activities to improve their working environment.

SAFE Accident-free Workplace	WHITE Drug-free	GREEN No Environmental Impact (Complaints)
Invite 40 contractor companies to participate in safety management through the Contractor Safety Committee with an emphasis on safety policy communication, safety campaign planning, implementation, safety audit and performance review	Run a no-drug joint campaign with contractor companies and government agencies. Any person tested positive for the first time will be referred to enroll in the drug addiction treatment program with monthly progress monitoring. Only after addiction has been fully treated would the person be allowed to come back to work.	Implement the project to alleviate and prevent potential damages to the environment from business operations or activities of employees and contractors through "5 Sor" activities to promote environmental consciousness. Organize regular campaigns and assessment of operational activities and areas to ensure that every employee's or contractor's activity does not adversely affect the environment or the communities.
Accident rate per million hours worked at 0.53 achieving the target : < 0.80	Drug test result (Contractors) tested positive 0.25% achieving the target : < 0.50%	Complaints regarding environment 0 complaint achieving the target



QSHE Roll Out Project

In the second half of 2016, Thaioil built upon the Safe White Green program by initiating the QSHE Roll Out project based on the analyses of safety performance during the first half of the year. Both personal safety and process safety performance analyses showed that the main cause of accidents or process safety events were due to unsafe acts on the operators' part. Thaioil, therefore, adjusts our operational strategy to be more proactive by focusing on participation and conscious-building campaigns on safety, quality, environment, and security at the operation-area level with regular employee and contractor on-site visits.

Important Activities:

- Lessons-learned sharing of 25 past accidents both within and outside the organization
- QSHE Walk & Talk: 7 events during the refinery unit turnaround
- QSHE Awareness Promotion: 6 events
- HSE Committee site survey: 5 times
- Occupational Health Site Visit: 4 times
- Participation of 510 employees and 8,700 contractors

In addition to building consciousness among operators, Thaioil also has developed work procedure with checklists for 7 high-risk tasks, such as tasks involving heat and ignition, working in confined space, heavy-lifting tasks, working at height, equipment cleaning with high water pressure. These procedural additions also strengthen the work permit system and ensure compliance with operational safety standards.



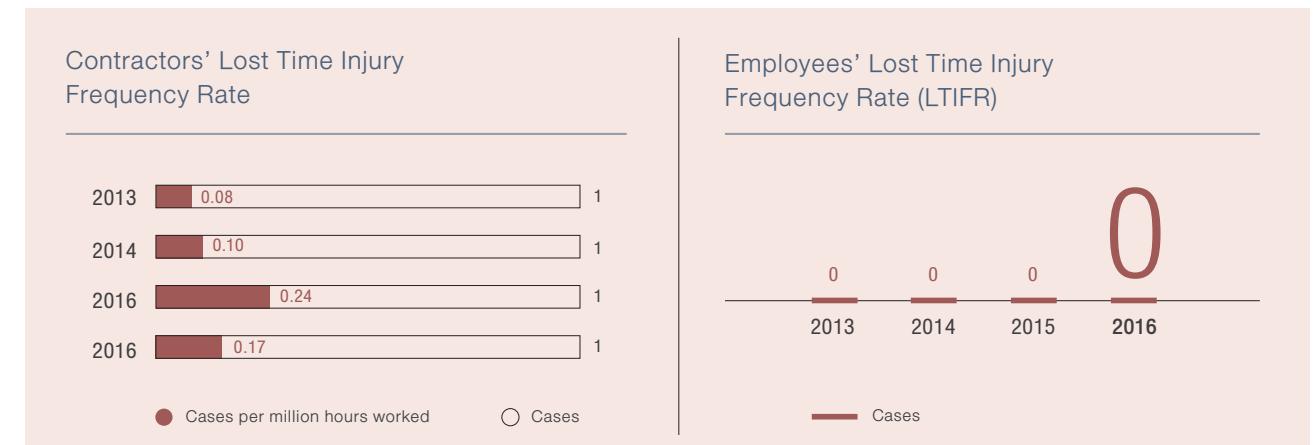
Near-Miss Reporting System

Effective prevention starts with an education on definition, importance, methodology, and goal of near-miss or potential incident reports (PIR) to create consciousness and awareness for preventing accidents or process safety events. The company's goal has successfully achieved in the past based on the number of near-miss and PIR reports written by employees and contractors which serves as an important indicator.

In 2016, a higher quality PIR was driven by running a campaign to promote report writing and organizing a monthly contest for best PIR. Winners for best PIR of the month are selected by the HSE Committee with contest results communicated to employees and contractors via the QSHE Newsletter.

Moreover, there was lessons-learned sharing during the APU daily meeting and the HSE Committee meeting for both employees and contractors. The lessons-learned was also shared regularly in contractors' meetings prior to the major turnaround.

Performance



Nonetheless, there was one case of lost time accidents that occurred to a contractor. The company already carried out an investigation to identify the cause and came up with correction and prevention measures to avoid future recurrence.

Process Safety

Production process safety is an important element for controlling and managing extreme hazards in the energy industry. In 2016, Thaioil came up with process safety procedure and process safety audit checklists to ensure that necessary hazard controls are in place. Employees and contractors have been informed of the operational procedure to prevent extreme hazards that may damage or cause a loss of lives and assets.

Performance



Furthermore, 2016 was the first year that the Group set a performance target for process safety. Our target was to have the total cases of Tier 1 and Tier 2 levels of Loss of Primary Containment Rate below 0.50 per million hours worked based on the API 754 standards (Process Safety Performance Indicator for the Refining and Petrochemical Industries.)

Thaioil has process safety data collection, investigation, correction and prevention measures, monitoring and audit, communication to employees and contractors, as well as lesson-learned sharing of past accidents among employees and contractors. Information on process safety incidents that had occurred in the oil and petroleum business has been summarized and presented to raise awareness and to facilitate learning about accident prevention. In 2016, there was one case of Tier 2 process safety incidents, resulting in the rate of process safety events being higher than the previous year but still within the target.

Preparing for Emergencies and Crises

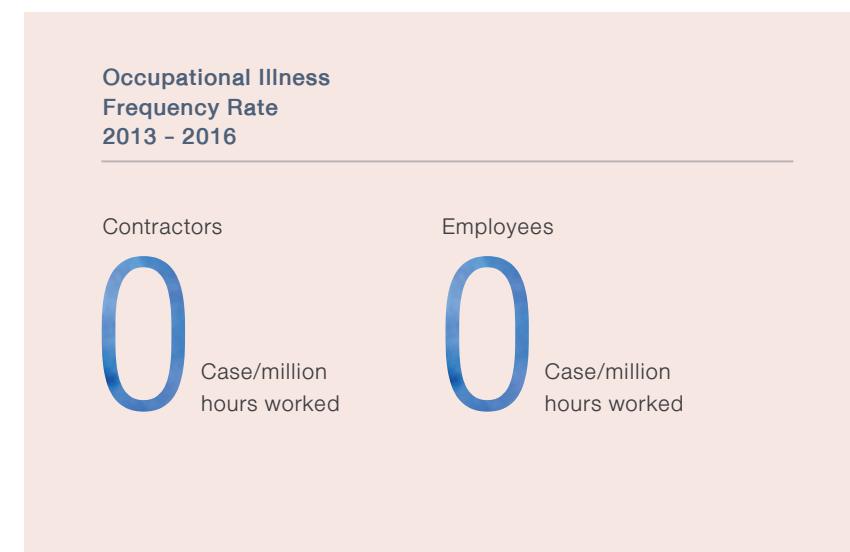
Thaioil has in place an emergency response plan with an assessment of severe risks, the adequacy and preparedness of our safety system and control measures to ensure a prompt and effective emergency response. In 2016, the Group had our emergency management and fire hazard prevention and control system assessed by external experts, Shell Global Solutions International (SGSI). Moreover, the Group has enhanced effectiveness of the fire hazard prevention and control system in the production process area by focusing on advance firefighting technique practices for the refinery firefighter team, fire control planning reviews, emergency action plan practices at various levels of the Group's Emergency Response Action team, and additional practices for the Business Continuity Plan.

Moreover, the Group carried out joint practices of emergency and crisis plans with government and private entities in the operation areas. These practices enhance our preparedness to handle and respond to potential emergencies and crises efficiently and effectively and alleviate the loss of lives and assets.

Occupational Health

Physical and emotional well-being of employees and contractors, including stakeholders, are important to us; therefore, the Group puts an emphasis on having a safe working environment. In 2016, the Group initiated a health-risk assessment program for Labix Company Limited and TOP SPP Company Limited. This health program was launched in the first quarter with the assessment coverage gradually expanding from chemical hazard exposure to physiological and ergonomic risks.

Performance



The Group also requires that employees who have taken sick leaves for work injuries, health issues or general illnesses pass a health examination before being allowed to return to work. In 2016, there were 4 employees and contractors who took the health examination for returning to work.

Moreover, the Group has reviewed the management system for hazardous chemicals usage, including refinery products or by-products as well as ensured that safety data sheets (SDS) in the database are up-to-date and consistent with DLPW and GHS standards. There have also been constant communications with relevant operators as well as usage control, and compliance audit.

Thaioil also offers health assessments for relevant chemical exposure risks and hearing tests to contractors with annual contracts to proactively raise our standard of care for contractors. Moreover, there are also health assessment checklists for operators who perform high-risk tasks as well as working condition assessments and occupational health audit during the major turnaround, the refinery expansion project, and normal operations to ensure a safe working condition and environment.

We

Passion for Partnership

We believe that the mutual development between Thaioil and all stakeholders will create synergistic power towards the stable and sustainable journey.



Our Society and Communities

Commitment and Goal

With our vision and mission to adhere to the corporate social and environmental responsibility, Thaioil Group recognizes the importance of all processes of clean and environmentally friendly energy generation throughout the past 55 years, and continues to maintain standards in the production process to achieve a sustainable development. In addition, the company also establishes various activities reflecting the corporate social responsibility of the organization, from business processes to community development which includes communities around the refinery and a whole society at the national level, by giving priority to the developments that correspond to the real needs of stakeholders and further enhance the well-being of the community and society, contributing to the sustainable self-reliance.

Benefits for stakeholders

983 households and **2** public places

Benefited from the energy development projects for society.

3,356 tons of CO₂ equivalent

Greenhouse gas emissions can be reduced thanks to the Biogas project at Mak Noi island, Phang-Nga province, and Mae Jo Hydro Power Plant Project in Chiangmai province.

56,967 people

Benefited from the Thaioil Group Health and Learning Center for Community.

Benefits for Thaioil Group

20,040 volunteer hours

of employees spent on CSR activities

97.98%

of satisfaction index of the surrounding communities to the operations of Thaioil Group*.

*Note: Method for calculating the index values of community satisfaction has been modified in 2016.

Challenges and Opportunities

The challenge of social development for maximum efficiency is to develop the capability of people in society to be self-sustaining. Thaioil Group, therefore, needs to work with a diverse group of associate partners to understand the characteristics of each community in depth through studying detailed information of community, analyzing social impacts and project value to business and society. In addition, Thaioil Group also establishes a community forum to communicate and build trust with the community and assesses risks before making investment-oriented social projects to ensure that the investments will give real benefits to society and community.

Meanwhile, Thaioil Group foresees an opportunity to apply our knowledge, experience and expertise in engineering and energy to enhance the ability to manage resources and improve the well-being of the community, on the basis of sufficiency. This is in line with the royal initiative on energy, which has been developed and disseminated to the Thai people by His Majesty the Late King Bhumibol Adulyadej (Rama IX) who was the revered "Father of Thailand's Energy Development". Therefore, Thaioil Group corresponds to the government policy in encouraging communities to take part in the production and use of renewable and alternative energy, contributing to the security of energy supply in Thailand.

Management Approach and Performance

Corporate Social and Environmental 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 TOP Group employees' participation while instill corporate social responsibility values and corporate culture.



Corporate Social Responsibility

Thaioil Group aims to encourage communities in all remote regions of Thailand to become self-reliant according to the development approach called "Energy Community" of His Majesty the Late King Bhumibol Adulyadej (Rama IX). This means that the community can transform or make use of the natural infrastructure and raw materials in their natural environment to generate renewable energy, such as wind power and hydropower, leading to energy self-sufficiency and sustainability, by focusing on the 4 main issues, as follows:

1. Appropriate selection of the project area based on physical conditions of the area and resources in the community can enable community to constantly produce energy and be self-reliant.
2. Exploring the real needs of community for project implementation is a factor that makes communities constantly produce and use renewable energy, and strives to learn energy management by their own.
3. Building up local people's capacities on energy management by creating working teams for energy community which is further developed to be lecturers of the community.
4. Choosing technologies for energy generation that suitable for the community, based on the principle of sustainable energy technology which includes:
 - Clean, environmentally friendly
 - Renewable, from other alternative energy sources
 - Reasonable, based on the concept of sufficiency economy
 - Effective, saving resources, labor and costs
 - Simple, communities can manage by their own

Thaioil Group focuses on promoting CSR activities by continuing to use the 3 aspects of framework as follows.

1. Knowledge Transfer to Local Communities

Transferring our knowledge, experience and expertise in engineering and energy to support social development, particularly in renewable energy development and efficient use of natural resources.

2. Collaborations

Collaborating with 52 partners at the national level, and with 44 partners in our operating areas, such as hospitals, universities, environmental energy institutions, and the United Nations for Development Project (UNDP) to initiate and develop the creative corporate social responsibility.



Example of Volunteer Activity with the Employees.

The volunteer activity, which employees of Thaioil Group eagerly attended, was the activity "Thaioil does good for the Father" organized during December 5-9, 2016 at Sanam Luang in Bangkok, to do community services dedicated to His Majesty the Late King Bhumibol Adulyadej and to commemorate his divine grace.



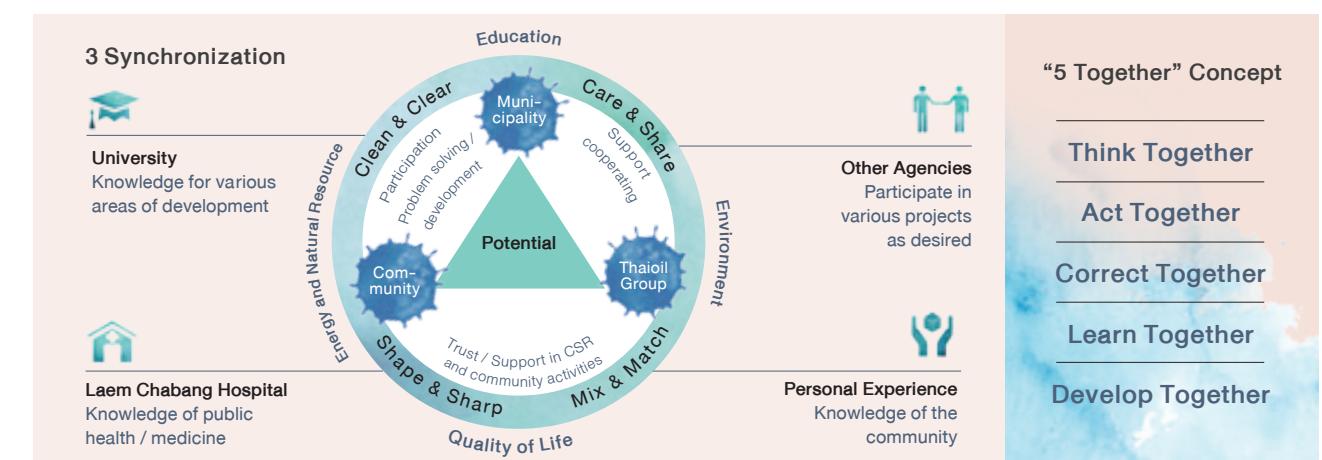
In addition to field volunteer activities, Thaioil Group also recognizes the benefits of sharing knowledge and experience. Therefore, a seminar on the topic of "simple life, why make it more difficult" has been organized and the guest speaker was Mr. Jon Jandai, also known as "Jon, Clay House, the Great Poor Man", who lives according to the concept of happy and self-sufficient life. This activity received positive feedbacks from the 150 attending employees, and helped to promote work-life balance through the story and experience of simple and happy living on the natural way of life, which can be applied to the employee's life and can be used to create a good conscience in social service.

3. Volunteerism of Employees

Raising awareness of doing good deeds for the society, according to the principles of good citizenship and the corporate values, called "POSITIVE". Consequently, Thaioil Group encourages our employees, which are the most important resource of the organization, to develop their working and management skills along with promoting their idea of contribution and participation in CSR activities. In addition, Thaioil Group also promotes the employees to initiate volunteer activities by themselves and propose to the volunteer activities fund of Thaioil Group. In 2016, employees of Thaioil Group participated in 19 volunteer activities for a total of 20,040 volunteer hours.

Community Engagement

Thaioil Group has carried out various activities together with 10 communities surrounding the refinery in Sriracha area, with the collaboration of Laem Chabang City Municipality, Laem Chabang Hospital and educational institutions, according to the Principle of Operation (3 Synchronizations) and the "5 Together" Conceptual Framework, with the purpose to encourage community involvement in the development of their own communities and self-reliance which leads to a strong community. The activities were divided into 4 aspects: 1) social aspect which includes support for religion, tradition and culture, 2) health aspect, 3) education aspect, and 4) environmental aspect, based on the holistic development.



Grievance and Whistle-Blowing

Thaioil Group has standard procedures for grievances relating to the occupational health, safety and environment from nearby communities with 30-minute response upon receipt of whistle-blowing. In 2016, Thaioil Group responded to all 19 issuing whistle-blowings according to the grievance management process in a systematic way. After assessments, it was found that none of these 19 whistle-blowings had an impact from the operation of Thaioil Group.

Community and Society Development Projects according to the CSR Framework

Thaioil Group has implemented community and society development projects according to the CSR framework covering the following 4 aspects: education, energy and natural resources, environmental conservation, and quality of life.



Education

Fishery group visiting project

Fishing is a traditional occupation of the Ao Udom community in Chon Buri province and is still the main occupation of many households in the area. However, decline of aquatic animal resources has affected the income of fishermen. Thaioil Group recognizes this problem and eagers to support fishermen in the long term by consulting with the fishermen to find appropriate solutions as follows.

1. Increasing aquatic animal resources in the sea. In 2016, crab and shrimp larvae were released several times into the sea, resulting in improved fishing for the locals.
2. On-site visits in other areas to observe and learn for further developing the Ao Udom community. In 2016, Thaioil Group has organized for the Ao Udom local fishermen a visit to 2 local fishery communities of Chao Samran Beach, Laem Phak Bia, Phetchaburi province and Pak Nam Pran, Pranburi district, Prachuap Khiri Khan province to observe the crab bank operations.

As result of these two solutions, the fishermen in the Ao Udom community have applied these approaches and have increased their income due to the abundance of aquatic animal resources and their modification to the fish farming.

Civil State Project on Basic Education and Leadership Development

Thaioil Group collaborated with PTT Group and 11 private companies to implement the civil state project for sustainable Thai education development. In cooperation with educational institution administrators, a development plan has been established and school development has been implemented according to the 10 strategic transformations, such as improving English skill and knowledge, cultivating morality and public mind for students, and developing and promoting young leaders.

In 2016, Thaioil Group has surveyed all 6 schools and the surrounding area, and has established school development plans together with school directors based on 10 project approaches.



Continuing Project

Youth Leadership Camp "Dare to think, Dare to lead, Doing good"



Result of Implementation

Four representatives of each community from 10 surrounding communities of Thaioil refinery, who have participated in the 12th Science Camp, were selected to receive training on leadership at the Thaioil Group's Community Health and Learning Center through knowledge based activities of Thaioil Group. In addition, this project also provided further knowledge on energy.

Capacity development project for the Village Health Volunteer (VHV) surrounding the operations of Thaioil Group



Capacity development project for the community leaders surrounding the operations of Thaioil Group



Thaioil Group has organized for the VHV group an on-site visit at the sufficiency economy learning center, Ban Saraphi community in Samut Songkhram province. The purpose is to educate the VHV group on healthy food consumption and innovative health care. The knowledges have been distributed and applied by some of the VHV group members to their communities, such as knowledge on making healthy salted eggs, organic mushroom cultivation in basket, etc.

Thaioil Group has organized an activity called "The Footstep of My Father", learning from the Thai Royal Projects, which includes visiting the Hua Hin Royal Rainmaking Center in Prachuap Khiri Khan province to observe the Royal Rainmaking Project and visiting Ban Nam-Sup Community, Phetchaburi Province to observe the philosophy of sufficiency economy which His Majesty the Late King Bhumibol Adulyadej (Rama IX) disseminated to the Thai people. Ban Nam-Sup is a small community above the dam and is a prototype of community development based on sufficiency economy to decrease its poverty.

Energy and Natural Resources

In 2016, Thaioil Group has received a certificate of participation in the Low Emission Supporting Scheme from Thailand Greenhouse Gas Management Organization (public organization) or TGO, under the concept of activity development to raise awareness for the reduction of greenhouse gas, and praising and recognizing a person for doing good deeds through technical analysis and evaluation. In addition, Thaioil Group has also built on the concept of sponsorship or donations from "donor" (business sector) to "receptor" (i.e. school, community) through the corporate social and environmental responsibility activities according to our intention to conduct business with responsibility to society, environment and community in our operation areas, with a focus on contribution to sustainable development.



Renewable Energy Development

"Mae Jo Hydro Power Plant Project at Ban Pao Sub-district, Mae Tang District, Chiang Mai Province"

This project is established by the collaboration of Thaioil Group, the Energy for Environment Foundation and the Department of Alternative Energy Development and Efficiency to construct a hydropower plant which generates electricity by hydropower from the Huai Mae Leaum according to the Royal Initiative of His Majesty the Late King Rama XI, with a capacity of 37 kW. This Mae Jo Hydro Power Plant is the first community energy project in Thailand which sells electricity to the Provincial Electricity Authority and is managed by the community enterprise. Based on assessment, electricity generated from Mae Jo Hydro Power Plant has reduced GHG emission by 56 tons of CO₂ equivalent per year.

Thaioil Group realizes to the value of natural resources in the country according to the intention of His Majesty the Late King Bhumibol Adulyadej (Rama IX), who contributed to the security of energy supply in Thailand, to use natural resources for the most benefit. With this in mind, Thaioil Group aims to continue social development based on the philosophy of sufficiency economy. The purpose is to encourage communities to manage their own resources, enhance social well-being and improve quality of life, and finally to be a self-sufficient community in sustainable energy.

Continuing Project

Biogas from Rubber Sheet Production and Household Wastes (Phase 3) at Mak Noi Island, Pang-Nga Province, with the collaboration of Thaksin University, Phatthalung Campus.



Result of Implementation

- The operation of biogas system has reduced GHG emissions by 3,300 tons of CO₂ equivalent per year.
- Organizing a volunteer activity through the Health Program of Douew Nam Dee community, with the topic of converting organic waste to household energy for cooking, at Mak Noi Island, Pang-Nga Province.
- Building a drinking water well with a filtration system using materials in the community, and installing 5 solar water pump systems.
- Providing the biogas system from waste to the Hoew Haeng, Nai Tood, and Pak Phaya communities, Nakhon Sri Thammarat province. In total 20 sets of the biogas systems have been developed by Thaioil Group.
- Developing 100 sets of gas absorber made from laterite and purchasing the portable gas analyser for determining components of biogas, particularly CH₄ and H₂S to support the research on gas absorber made from laterite.

Environmental Conservation

Cooperation Project on Cultivation and Restoration of Coral Reefs at Srichang Island, Chonburi Province

Thaioil Group has collaborated with the Department of Marine and Coastal Resources, the Aquatic Resources Research Institute, and the Faculty of Science, Chulalongkorn University on this project for 5 consecutive years. Project implementation has resulted in restoration of marine ecosystem around the Sichang island group, particularly coral reefs which have been recovered by more than 50%.



Besides the cultivation of coral reefs by researchers from Chulalongkorn University and the process during nursery phase done by the Department of Marine and Coastal Resources to make healthy coral larvae, Thaioil Group also focuses on raising awareness of natural resource conservation, particularly marine resources by involving the local youths who are a major force in maintaining coral reefs through the following activities:

- Establishing the junior marine protection group to raise the youth's awareness, particularly junior high school students on the Koh Si Chang, of the importance of marine conservation through various activities, such as training by a lecturer from the Department of Marine and Coastal Resources, scientific projects, field work, and fieldtrip.
- Organizing the event called "Gathering Sichang People for Coral Restoration" in order to educate and motivate the youth and communities to love and cherish their local, conserve ocean and nature, particularly coral reefs, to ensure sustainability, and develop the community to be a prototype on coral reef conservation and restoration.

Quality of life

Senior Screening Project: Assessment of Senior Members' Self-Reliance Capabilities



This is one of the Thaioil Group's Family and Community Assessment Project. The purpose is to develop capacity of senior community members to live with quality. Thaioil Group has collaborated with Laem Chabang hospital and Laem Chabang Municipality on assessing self-reliance capabilities of senior members from the 10 communities surrounding the refinery. The field survey has been done by the 3rd year volunteer students from Faculty of Pharmacy, Silpakorn university. Data of the seniors at or over 55 years old has been classified by the Barthel ADL Index to 3 groups, consisting of urbanite, homebody and home-bound, and has also included additional data regarding the use and storage of medicines. The survey results will then be used in planning and preparing to be the elderly with quality, and will be used in establishing the elderly care plan on health and social welfare fitting to the context of community.

In 2016, Thaioil Group has implemented the health screenings of eyes, depression, osteoarthritis, sleep problem, and fall condition, and has assisted the elderly with these problems and risks in various criteria by providing access to medical services for treatment and prevention. This leads to the development of project "Pha Ta Ya Phob Mohr" (taking grandparents to see the doctor) which is supported by the Village Health Volunteers (VHV). This project is considered as the beginning of an integrated care system for the elderly, starting from risk identification of elderly, health assessment, treatment process and home visits.

Continuing Project

Risk Assessment of Cardiovascular Disease Project in the 3rd Laem Chabang Health Exhibition, with the collaboration of Laem Chabang Municipality



Result of Implementation

- Screening the Apolipoprotein E gene to monitor the occurrence of cardiovascular disease in 200 non-controlled chronic patients.
- Screening Thalassemia in 253 people aged 15-35 years for family planning to reduce the chance of having a child with the disease or being a carrier of Thalassemia, by the Siriraj Hospital's Thalassemia Center.
- Assessing physical performance of 800 people and providing knowledge in changing consumer behavior to prevent abdominal obesity which leads to coronary heart disease and ischemic heart disease by the Thai People without Belly Network of the Royal College of Physicians of Thailand.

Creative Library and Entertaining Activity



Thaioil Group makes available the library at the Thaioil Group's Health and Learning Center in order to promote scientific knowledge, environmental knowledge, knowledge of English and general knowledge. In addition, Thaioil Group encouraged students from 24 institutions for internships during the semester break every year in order to bring knowledge from theory into practice in a real workplace, with an intention to promote learning coupled with making benefits to society through creation of learning outside classroom. In addition to encourage and support learning new things to the youth in the communities surrounding the refinery, Thaioil group also creates a great experience for them through games, experiments and learning materials which are easy to understand and the youth can further use and apply. Under the "Creative Library and Entertaining Activity" project, participants' age ranges from 5 to 15 years old.

Cultural Activity



Thaioil Group organizes cultural activities every year, such as evening prayer to settle mind, candle casting, offering candles to 10 temples, Thaioil Group's Kathin, to preserve and transmit traditional cultures in the area.

Value Chain Management

Supply Chain Management

99%

of the critical suppliers on electronic system of the Ariba network accepted and agreed to the Thaioil Group's supplier code of conduct

100%

of the new suppliers completed self-assessment on environmental, social and governance aspects

93%

surveyed critical suppliers recognizing to overall Thaioil's procurement.

Crude Supply Management

0.18 USD per barrel

of increased gross margin from sourcing a new type of crude oil for production.

Low Carbon Product

52%

share of low-carbon product sales relative to total fuel product sales (Baht)

Our Customers

91%

of customer satisfaction

Commitment and Goal

Thaioil Group has committed to develop economic, social and environmental sustainability throughout the value chain in accordance with the five-year strategic plan, which focuses on the risks, impacts and development plans that strengthen the procurement specialists and effectiveness of the system and process. Moreover, this strategic plan committed to conduct business in a fair and transparent manner, and to empower all stakeholders.

Challenges and Opportunities

In 2016, Thaioil Group has been studying a plan to expand oil refining capacities under the Clean Fuel Project to support energy security of the country. One of the challenges in expanding capacity is the potential for cooperation with suppliers and contractors in the area of crude oil supply, technology procurement and recruitment of skilled labors. Thaioil Group is well aware of the effective value chain management based on the Business Code of Conduct.

Management Approach and Performance

Cost Management

Thaioil Group has participated to the joint strategic procurement project with PTT Group under the management framework which is consistent with Thaioil's practices, including analysis of partner's data in the past year and defining joint procurement strategies to suit demand planning of each category of goods and services for utmost benefits. In addition, this project's management framework also covers on-time delivery with high quality, meeting the required standards and complying with the SSHE implementation and sustainable development. As a result, Thaioil improved the cost management by 17.6 % from this project with PTT Group, consisting of 18 projects.

Crude Oil Supply

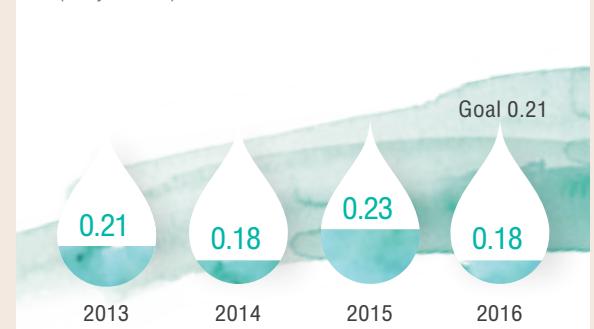
In 2016, crude oil faced a pressure due to oversupply in the market since Organization of Petroleum Exporting Countries (OPEC) increased the production from 1.4 million barrel per day to 33.9 million barrel per day as of November 2016. Especially, the fact that economic boycott on Iran is lessened, it resulted in increasing crude oil export up to 0.8 million barrels per day. In 2016, Thaioil Group was able to raise its gross margin by approximately 0.18 USD per barrel from souring a new type of crude oil.

Thaioil Group has defined the Ocean Loss Index as a performance indicator to monitor crude oil loss during marine transportation. In 2016, the value of Ocean Loss Index was better than the target thanks to the reduced loss of crude oil during the transfer from port into ships.

Performance

Ocean Loss Index

(% by volume)



Collaboration with Business Partners

To demonstrate the intention to promote sustainability throughout the value chain, Thaioil Group has implemented collaborative projects with external parties, companies and organizations. The key projects to reduce procurement costs were the Co-loading project, which is the collaboration with suppliers for a joint procurement of crude oil transportation, and the crude oil distribution to refinery plants through single buoy mooring. In 2016, Thaioil Group was able to reduce costs of 154 million Baht through those two activities.

Risk Management in Supply Chain

Thaioil Group has systematically managed the potential supplier risks as follows:

Supplier Selection	Approved Supplier list	Risk Assessment	Supplier Development Plan	Supplier Performance Evaluation
All new suppliers are screened by self-assessment on environmental, social, and governance (ESG) aspects through the e-Procurement system.	Thaioil Group has invited 614 existing suppliers in the approved list to conduct self-assessment on ESG aspects, achieving 100% of the target, and plans to increase the number of suppliers next year.	The results of risk analysis of self-assessments on ESG aspects in 2015 have been used to develop the environmental, social and governance risk verification program.	Surveyed supplier's interests through an annual seminar to collect information for the preparation of a supplier development plan.	Completed developing "Supplier Performance Management" module on the e-Procurement system, and ready for implementation in 2017.

Continuing from 2015, Thaioil Group has been integrating environmental, social and governance risk assessments into the supplier risk assessment. In 2016, Thaioil Group has total 289 new suppliers who have been screened, registered and completed ESG self-assessment prior to become Thaioil's suppliers.

Furthermore, Thaioil Group has assessed risks based on the results of self-assessment on ESG aspects in 2015. This has led to the study and development of "the Environmental, Social and Governance Risk Verification Program" which is extended from the CSR in Supply Chain Program conducted in 2013-2014 by integrating environmental, social and governance aspects which were identified in the Thaioil Group's Supplier Code of Conduct into the framework of verification program. Thaioil Group has classified target groups by prioritizing risks and impacts, and has designed the program in a variety of ways to correctly and effectively manage risks, for example, arranging training courses and workshops, providing specialist advice, being advisory of various programs, and joining partnerships to conduct environmentally friendly procurement. Thaioil Group has planned to start implementing the program with the suppliers in 2017 and has expected to finish the program 2-3 years afterwards, according to the strategic sustainability plans.

In 2016, Thaioil Group conducted the main supplier satisfaction survey, 23% of all main suppliers, on the procurement service for suppliers, price policy and procurement procedure, transparency, and critical supplier acknowledgement. The result of the survey showed 93% of collaboration satisfaction, achieving the 2016 target.

Promoting Transparency Throughout Supply Chain

In 2016, 99% of critical suppliers, who have been registered onto the supplier list on the e-Procurement of the Ariba network, have accepted and agreed to the 2014 Thaioil Group's supplier code of conduct.

Thaioil Group continuously promotes implementation of procurement according to the procurement policy, rules and conditions of Thaioil Group. In 2016, Thaioil Group has well cooperated in supporting all good governance activities such as the anti-corruption campaign, and inviting suppliers to participate the "PTT Group CG Day" event with PTT Group. Moreover, Thaioil Group has also created the vendor guide as a guideline for suppliers to be aware, understand and comply with the intention of transparency in the procurement of Thaioil Group. This guideline will be disclosed on the company's website at the beginning of 2017.

In addition, to encourage free competition and increase transparency, Thaioil group has implemented the auction method using new technology called "e-Auction". With this method, suppliers are able to offer dynamic pricing and see the process equally. Compared to last year, the selected projects for using e-Auction have increased by 2 times. As a result, this would help reducing costs as planned and targeted.

In terms of supplier capability building for long-term mutual growth, besides the development of the Environmental, Social and Governance Risk Verification Program which helps developing supplier's capabilities through specific risks, Thaioil Group has also organized supplier seminars for the second consecutive year under the topic "Global Sustainability, Our Sustainability, Good Governance in Procurement" in order to communicate, provide information and news, and inform important policies i.e. the procurement policy, anti-corruption policy, supply chain human rights policy, and Thaioil Group's Supplier Code of Conduct. In addition, Thaioil Group has surveyed the three areas of supplier's interest in good governance, sustainable development and the refinery strategy of Safe White Green. The survey results show that suppliers have focused on those three areas equally, serving as preliminary information for the supplier development program of Thaioil Group.

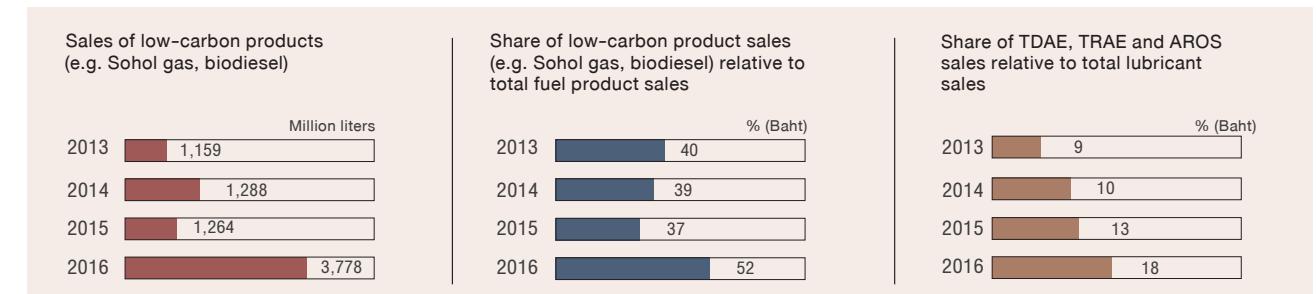


Environmentally Friendly Products and Services

To enable the business to grow sustainably together with society and environment, Thaioil Group continuously looks for business opportunities to grow and develop environmentally friendly products. In 2016, Thaioil Group had an intention to increase sales of low-carbon fuels, such as ethanol-gasoline or "Sohol gas" and biodiesel. At the same time, the Group is working on expanding the distribution channels of such fuel products with expected completion in 2017 by building more oil and tank distribution stations as well as Ethanol and B100 tanks for trucks to prepare for sustainable growth in the future.

Moreover, Thai Lube Base Public Company, a lubricant manufacturing company, has been manufacturing environmentally friendly products such as Treated Distillate Aromatic Extract (TDAE), Treated Residue Aromatic Extract (TRAE), and Aromatic Solvate (AROS), which are a rubber process oil products with low pollution as a result of the current EU regulations which limit the Poly Cyclic Aromatics (PCA) contamination level to be no more than 3%.

Performance



Customer Relations

Thaioil Group has constantly conducted customer relation activities. The main activities in 2016 were the following:



- Customer event, to thank and build strong relationships with customers
- Seminar on the topic of "Shifting Global Business Landscape"
- CSR activities ("Buad-Pa & Pluk-Pa", the reforestation to conserve water and forest)
- Customer on-site visit the refinery plants, providing a presentation on the production process and oil distribution by land and sea

Moreover, Thaioil Group emphasizes on potential and knowledge on energy by organizing the knowledge sharing activities for customers. The important activities of 2016 were the following:

- Weekly Customer Newsletters on oil trends (every Monday)
- Monthly and quarterly customer visit and market outlook (both domestic and international)
- Educating customers to enhance their understanding of the production process, manufacturing planning, product pickup and payment

Performance





World

Passion for Planet

Environment management
including resource optimization
are what we have been committing to
create for the more livable surroundings.

Environmental Management

Compliance on Environmental Laws and Regulations

100% compliance based on the environmental quality assessment

Environmental Management

2.7% of industrial landfill volume

0 case of non-compliance

0 case of significant spills from production and transfer processes

Commitment and Goal

Thaioil Group is committed to optimal management of resources and the environment which are fundamental factors for the society. Therefore, we aim to utilize resources efficiently and reduce environmental impacts by implementing projects and activities laid out in the 5-year environmental master plan with clear specification of targets and performance indicators in pursuit of Environmental Operational Excellence.

Challenges and Opportunities

In today's environment, there have been many changes to external factors that can affect our business, ranging from economic, social, environmental, technological, to even regulatory changes that have become stricter. In addition, Thaioil Group business also underwent an expansion in 2016 with an addition of two new establishments, LABIX Company Limited and TOP SPP Company Limited, which necessitates a wider scope of environmental management. All these changes present a challenge for Thaioil Group to be ready to face any social and environmental situation but are also a drive for our operational innovation which, so far, has materialized in the

form of the environmental master plan to respond to constant changes in the business environment. Spanning from optimizing resource utilization to developing a risk-based approach for management and operation, the master plan gives rise to a variety of projects, such as environmental impact mitigation for the atmosphere and water sources, monitoring and enforcement of compliance on new relevant laws from government agencies, and monitoring the globalization trend on the environmental dimension, as well as identifying opportunities to improve efficiency of resource utilization.

Management Approach and Performance

Environmental Impact Assessment

We want to ensure that any development project of Thaioil Group has been thoroughly considered on the basis of economic, social, and environmental aspects for both costs and benefits with adequate risk management to minimize the impacts on eco-systems and natural resources in a comprehensive manner. Therefore, every project operated by Thaioil Group is subject to an environmental impact assessment so that appropriate measures can be set up for environmental management and impact mitigation. Moreover, public participation in the assessment process has been organized at least twice per year in accordance with guidelines by the Office of Natural

Resources and Environmental Policy and Planning (ONEP). By disclosing information on our development projects and communicating our preventative and corrective environmental measures via public participation platforms, Thaioil Group has gained public trusts and confidence in our ability to appropriately, adequately, and effectively manage the environment, occupational health, and safety to minimize the impacts on the environment and surrounding communities. Specifically, in 2016, Thaioil Group prepared environmental impact assessment reports for two projects as a continuation from 2015 and organized one additional public participation forum.

Compliance on Environmental Laws and Regulations

In addition to conducting impact assessments for new future projects, Thaioil Group also regularly monitors and assesses compliance on relevant environmental laws and regulations to ensure that employees and related persons acknowledge and comply with these laws and regulations. In 2016, Thaioil Group also made changes to improve our monitoring and compliance assessment systems by organizing environmental laws and regulations into clear categories and setting up a compliance committee consisting of representatives from related work units to assess compliance on environmental laws and regulations in their areas of specialty. The new compliance committee ensures that our compliance assessment is more complete and accurate with the same standard throughout the organization. Because of this initiative, Thaioil Group incurred no fine or legal consequence from violating environmental laws and regulations last year.

Performance

Indicators	Unit	2013	2014	2015	2016
Environmental Violations	Case	0	0	0	0
Environmental Fines	Baht	0	0	0	0

Air Quality

Oxides of Sulphur and Oxides of Nitrogen (SO_x and NO_x)

To mitigate SO_x and NO_x emission impacts, Thaioil has followed the environmental master plan on air quality management by designing and adopting the Ultra-Low NO_x burner technology for efficient fuel combustion, using a higher proportion of fuel gas to fuel oil to control the amount of SO_x and NO_x emission, and installing the Continuous Emission Monitoring System. Moreover, air quality from flue gas stacks has been assessed annually with the recent assessment showing the volume of gas emissions better than the legal limits.

Performance



Note : Data 2016 expand scopes covering LABIX Company Limited and TOP SPP Company Limited

: Estimate from refinery throughput taken into only Thai Oil PCL. Labix Company Limited, operated since 2016, is the product development base on the existing business without any importing intake from outside.

Volatile Organic Compounds (VOCs)

Under the environmental master plan, Thaioil Group has implemented measures to reduce VOCs since 2012 to comply with international regulations and standards called 'Leak Detection and Repair (LDAR)' of United States Environmental Protection Agency (US EPA) and to constantly finetune our measurement approach to accommodate changes in production processes.

Furthermore, Thaioil Group employs the 'OPGAL camera screening' device to detect VOC gas leaks throughout the entire production process in conjunction with direct measurement device called 'Photo Ionization Detector (PID).' Thaioil Group continues to build on the Bio-filter project to reduce VOC volume from our production processes. Particularly, in 2016, the scope of the project was expanded to include wastewater treatment system and development of a spraying system to treat VOCs from the wastewater treatment system. Additionally, to improve VOC management, Thaioil Group also conducts a joint research project with academic institutions to study VOC evaporation and dispersion from storage tanks.

Performance



Industrial Waste Management

Waste

To attain the goal of zero waste to landfill by 2020, Thaioil Group works through the Waste Committee to drive policies and measures, and to monitor waste management from origination to the disposal process. This effort enables Thaioil Group to reduce methane gas emissions from landfill which, in turn, lowers greenhouse gas scope 3.

In 2016, the Group continued the 3Rs strategy implementation for waste management which focuses on Reduce, Reuse, and Recycle. Particularly, a pilot project by PTT Group has been launched to increase environmental and economic effectiveness of industrial waste management by focusing on creating value-added products from industrial waste and converting industrial electronic waste in landfill into reusable materials for other industries. In 2016, this project was able to reduce landfill volume for industrial electronic waste by more than 10,000 kilograms.

Moreover, Thaioil Group is in the process of developing an environmental database for waste management. This project has currently reached 80% completion and is expected to become operational in 2017.

Performance



Note : Data 2016 expand scopes covering LABIX Company Limited and TOP SPP Company Limited

Nonetheless, industrial waste had increased in 2016 but still remained within the landfill volume target of less than 5%. This increase was due to a wider scope of industrial waste management to include LABIX company and TOP SPP company, business growth, and major turnaround of Thai Lube Base Public Company and Thai Paraxylene Company.

Wastewater Management

Wastewater from Thaioil Group's production processes has been treated to a better quality than the legal requirement. The level of Chemical Oxygen Demand (COD) in wastewater is being monitored 24 hours a day with the observed level directly reported to the Department of Industrial Works.

In 2016, the Bio-filter project has been implemented to enhance efficiency in hydrocarbon treatment before releasing into the atmosphere. Microorganisms that are suitable for treatment conditions was found and selected which can lower hydrocarbon concentration by more than 70%. Convinced of the project's effectiveness, the company plans to apply bio-filters to the oily sludge decanter unit in 2017.

Oil and Chemical Spill Prevention

Oil and chemical spill prevention is of paramount importance for Thaioil Group's operation as evident by the fact that there has been no significant oil and chemical spill for more than 10 years or since 2005. Thaioil Group has an effective management approach for spill prevention by focusing on 3 following aspects.

1. Prevention

- 1.1 Continuous commitment to using only shipping vessels that meet safety standards according to the PTT Group Ship Vetting System by having captains of Thaioil Group and PTT Group review and cross-check ship's safety documents to ensure that each ship meets the safety standards for oil transport.
- 1.2 Routine maintenance of ports, buoys, and equipment used for oil transfer, such as oil pipelines, safety joints and ship ropes, with close supervision by the company's engineers.
- 1.3 Regularly conduct tanker safety audits based on random selection of both domestic and foreign ships at the company's ports. Any detected defects or problems will be notified to the ship captain and manager for further

correction and prevention under the monitoring of the Port Division. However, if a severe defect is found, a moratorium will be placed on the ship in question until the issues get resolved. Documents on the resolution must be submitted to the Port Division for approval before the moratorium can be lifted.

1.4 Reward recognition for tanker safety. Thaioil Group has a recognition program to promote safety and pollution-free work practices by selecting and rewarding the top 5 ships with the highest frequency at the company's port with no accident and a good audit record. This reward, given at the end of the year, provides additional encouragement for ship's crews at the company's ports to work with interest, attention, and enthusiasm.

2. Countermeasures

In 2016, the company created an additional plan to prevent and remove water pollution from chemical spills. This plan covers petroleum product transfer of every company in Thaioil Group, such as Thai Paraxylene Company and Labix Company. Employees who are part of the emergency plan also receive training to enhance their knowledge and understanding on emergency management. Specifically, in 2016, the company collaborated with the Naval Science Department to organize practice sessions to clean up water pollution from chemical spills. These practice sessions proved to be effective as participants have acquired useful knowledge and skills from the Navy.

3. Personnel Development

Thaioil Group places high importance on every aspect of personnel development including training our people to prevent and respond to oil and chemical spills. In 2016, Thaioil Group's personnel attended various courses and training as follows.

- 3.1 Ship handling course in France
- 3.2 Oil spill management workshop IMO 3 with the goal of continuous training for the management division
- 3.3 Training on chemical spill cleanup for employees at various levels who are part of the company's emergency plan
- 3.4 Practice the emergency plan in the event of oil or chemical spills in cooperation with external organizations, such as PTT Sriracha Oil Terminal and Esso (Thailand) Company, on December 22, 2016.

Thaioil Group has the following training plans for 2017.

1. Oil spill management workshop IMO 3 for people in the company's management who have not yet received this training
2. International training courses on marine chemical spill management
3. Emergency plan drills in the event of oil and chemical spills in cooperation with external organizations, such as PTT Sriracha Oil Terminal and Esso (Thailand) Company
4. Mutual aid agreement among oil companies in the Sriracha area, which are Thaioil, PTT, and Esso, on oil and petroleum product spill cleanup to enable a prompt and effective response in the case of a spill emergency to contain the spill and reduce the environmental impacts on coastlines, communities, and national tourist sites.

HIGHLIGHT OF PROJECTS IN 2016/ 2559

In 2016, Thaioil Group developed a system to record statuses on permits and report submissions to government agencies (Permit Dash Board) which serves as a central database for permit extension and report submission statuses. In addition to alerting responsible persons of upcoming deadlines for permit extension and report submission in advance, the system also provides an overview of permit statuses to enhance the flexibility for project planning and to serve as a report on Thaioil Group's operating status for the executives to monitor and prevent any potential risk for the business.

Climate Change and Energy Efficiency

Energy Efficiency and Oil Loss Reduction

Reduced energy consumption by

470,699 Gigajoules per year

or equivalent to

26,406 tons of CO₂ per year

as a result of 28 projects to increase energy efficiency and reduce oil loss in 2016

43 million Baht of investment in energy efficiency improvement and oil loss reduction projects in 2016

Low-Carbon Product

Reduced equivalent to

718,126 tons of CO₂

compared with emission from basic transportation fuels sold in 2016

Commitment and Goal

Climate change has become an increasingly important issue, both at the national level and the global level, and is the topic of interest for various groups of stakeholders. Thaioil Group recognizes our role and responsibility in optimizing greenhouse gas management to reduce and prevent environmental impacts. To adapt and prepare our business for climate change, there are projects to improve energy efficiency and water management effectiveness to alleviate potential water shortage risk from climate change. Moreover, the Group leverages technologies and R&D to create environmentally friendly products and clean energy for the future.

Challenges and Opportunities

In 2016, Thaioil Group established Labix Company Limited and TOP SPP Company Limited as well as implemented the initial engineering design phase of the Clean Fuel Project to expand refinery capacity. New production units have been designed to reuse fuel from the production process which helps lower dependency on external fuels and to use oil residue from production for electricity generation to reduce waste. More efficient production units and cutting edge technologies enable Thaioil to create products with lower greenhouse gas emission potential which are considered clean products and thus command higher market values

based on the current trend of market demand. Thaioil Group anticipates challenges and opportunities from energy consumption which is the main production input as evidence by our expansion project initiative. Specifically, the Group takes steps to control environmental impacts and improve energy efficiency under the government climate change management framework by designing and investing in technologies as well as making changes to the energy conservation master plan, the environmental management master plan, and the integrated water management strategy to align with the corporate strategy long-term plan.

Management Approach and Performance

Greenhouse Gas Emission Reduction

Projects to Study Greenhouse Gas Emission Reduction

Thaioil Group gives priority to participating in projects to study greenhouse gas emission reduction. In 2016, the Group was involved in three following projects:

1. Building a product life cycle database in collaboration with PTT Research & Technology Institute according to the environmental management master plan. In 2016, inventory analysis had been completed. The results of carbon footprint drawn from the database will be used in impact assessment analysis for planning greenhouse gas emission reduction throughout the product life cycle. This implementation plan aligns with PTT Group's Production Stewardship implementation plan. The impact assessment analysis are expected to be completed in 2017.
2. Developing a greenhouse gas emission account for Thailand to serve as the country-level database for the refinery industry in collaboration with Petroleum Institute of Thailand. Implementation of this project will be continued from 2016 with expected completion in 2017.
3. Participating in the pilot Carbon Footprint Organization assessment for industrial plants. Thaioil received a certificate for being a role model organization for greenhouse gas reduction and was registered as Carbon Footprint Organization with the Federation of Thai Industries and the Thailand Greenhouse Gas Management Organization (Public Organization) on September 19, 2016.



Energy Efficiency Improvement for reducing Direct Greenhouse Gas Emissions (Scope 1)

Energy, mainly from fuel combustion, is the major cost of oil refining business. It impacts on both the economic perspective of cost management and the environmental perspective. It is therefore important for Thaioil Group to manage energy efficiency as well as to set an energy target as part of the corporate key performance indicators.

Moreover, to support the organizational growth according to the refinery expansion plan in the Clean Fuel Project, Thaioil Group has estimated the trend of energy consumption within the next 2-3 years during the construction phase to ensure optimal resource management. Moreover, Thaioil Group also puts continuous effort into conducting research studies and projects on energy conservation.

In 2016, Thaioil Group operated 28 projects to increase energy efficiency and reduce oil loss resulting in 470,699 gigajoules per year of energy saving, equivalent to an emission reduction of Carbon Dioxide, a direct greenhouse gas (Scope 1), by 26,406 tons.

Important projects initiated in 2016 are as follows:

• Ocean Loss Reduction at Loading Port Project

Because crude oil is the main input cost for the refinery business, it is therefore important for Thaioil Group to manage and reduce oil losses at loading ports. By preparing a checklist for employees at loading ports to use during the crude oil transfer process, Thaioil has been able to reduce oil losses at loading ports from 0.17% to 0.11% of the total volume, which is equivalent to 60,255 barrel of crude oil per year or THB 84.3 million per year.

• Improvement of Furnace Efficiency Project

Production units operated by Thaioil Group employ more than 30 heating furnaces. This project lowers the amount of airflow into furnaces to reduce heat losses in the form of flue gas. From the survey of furnaces used by Thaioil Group, we found a significant efficiency improvement in 6 furnaces, resulting in an energy saving at 7.5 tons of fuels per day or estimated as cost saving at THB 26.2 million per year with no additional investment.

Performance



Note: The reported value of energy efficiency index includes only Thai Oil Public Company Limited and Thaioil Power Company Limited.

Note: Data 2016 expand scope covering LABIX Company Limited and TOP SPP Company Limited

: Estimate from refinery throughput taken into only Thai Oil PCL. Labix Company Limited, operated since 2016, is the product development base on the existing business without any importing intake from outside.

Volume of greenhouse gas emissions from production processes was higher in 2016 due to more energy usage from the Group's business expansion with two new companies, Labix Company Limited and TOP SPP Company Limited.

Reduction of Indirect Greenhouse Gas Emissions (Scope 2 and 3)

Thaioil Group does not have indirect greenhouse gas emissions (Scope 2) from consumption of purchased electricity and steam energy from external providers because all production units in Sriracha are not dependent on such external energy.

For a reduction of other indirect greenhouse gas emissions (Scope 3), Thaioil Group has an efficient management of oil shipping and waste processes to reduce indirect greenhouse gas emissions, such as limiting oil loss in shipping from production areas to refinery facilities. The Energy Management and Oil Loss Reduction working team is responsible for driving and monitoring the implementation which can be considered greenhouse gas emission reduction of material sources. Other reduction efforts include using pipeline systems to transport products to

eliminate the need for car and ship transport and reducing greenhouse gas emissions from waste landfills in accordance with the industrial waste management policy with the goal of zero waste landfill by 2020 which is under the supervision of the Industrial Waste Management Committee. There was also the "Combatting Global Warming" campaign initiative to build awareness and enthusiasm for resource conservation. This program encourages employees to use company cars instead of personal cars for commuting to work and for work-related travel, to opt for video conferences instead of in-person meetings which require travel, and to use bicycles to access production areas.

Low Carbon Products and Environmentally Friendly Products

In 2016, Thaioil Group encourages to increase sales of low-carbon products, such as ethanol-gasoline or "Sohol gas" and biodiesel as 3,778 million litres or 52% of total sales of all transportation fuels. Consequently, greenhouse gas was reduced to 718,126 tons of carbon dioxide equivalent.

Moreover, Thai Lube Base Public Company, a lubricant manufacturer, has started to manufacture an environment-

protecting product called Treated Distillate Aromatic Extract (TDAE) which is a rubber process oil product with low pollution since 2010 as a result of the current EU regulations which limit the Poly Cyclic Aromatics (PCA) contamination level to be no more than 3%. In 2016, 87,478 tons of TDAE was produced which approximate to 11% of total sales of lubricant.

Water Management

In 2016, Thailand faced a water shortage crisis which posed a critical risk for production processes in the industrial sector and necessitated careful water management with the right balance among all groups of stakeholders, both water providers and water users. Thaioil Group, therefore, follows an integrated water management strategy as formulated in the Business Continuity Plan by ensuring that all 6 desalination units are ready to be operated in the event of water shortage. Moreover, by shifting toward desalination in production processes, Thaioil Group was able to reduce portion of freshwater usage from natural water sources in 2016 by consumed more than 2 million cubic meter distilled from desalination units instead which represented a 37% share of total water use in production processes which better than last year for 4%.

Moreover, Thaioil Group continues to uphold the 3Rs principle for efficient water consumption to lower our dependency on raw water from natural sources through various projects, such as increasing the water circulation cycles in the cooling water circulation system with recycling, reducing the amount of discharge released into water bodies, replacing expired raw water pipes to reduce raw water leakage, running the Save Water Campaign to raise employee awareness and enthusiasm for saving and optimizing water resource, as well as enhancing water consumption efficiency in production processes by reducing steam loss from installation and maintenance of steam trapping devices.

Nonetheless, the net volume of raw water consumption in production process still etched higher in 2016 due to Thaioil Group's business expansion to include Labix Company Limited and TOP SPP Company Limited.

Performance

	Unit	2013	2014	2015	2016
Total water withdrawal	Million cubic meter	21.88	20.53	19.57	23.26
Water withdrawal per unit of production	Million cubic meter per ton of refinery raw materials	1.51	1.48	1.32	1.57

Performance Summary

I : PASSION FOR EXCELLENCE

Economic Performance		Unit	2013	2014	2015	2016
Economic Value Generated ⁽¹⁾						
Sale revenue	Million THB	414,575	390,090	293,569	274,739	
Economic Value Distributed ⁽¹⁾						
Operating cost ⁽²⁾	Million THB	397,556	394,170	273,819	247,261	
EBITDA	Million THB	22,337	2,651	25,492	32,675	
Net profit / [Loss]	Million THB	9,316	[4,140]	12,181	21,222	
Earnings / [Loss] per share	THB/ Share	4.57	[2.03]	5.97	10.40	
Total assets	Million THB	208,519	193,607	192,166	217,731	
Total liabilities	Million THB	94,981	87,844	97,009	106,134	
Return on equity	%	10.2	[4.7]	13.9	21.3	
Return on assets	%	4.5	[2.1]	6.3	10.4	
Market capitalization	Million THB	131,786	109,414	109,141	136,070	
Employee wages and benefits	Million THB	2,841	2,882	2,924	3,299	
Payment to providers of capital ⁽³⁾	Million THB	9,337	8,060	6,583	10,259	

Remarks:

1. Scope of reporting Economic performance is in alignment with Thaioil Annual Report 2016.
2. 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.
3. Payment to providers of capital includes dividend and interest.

Occupational Health and Safety Performance ^{(1), (2)}	Unit	2013	2014	2015 ⁽³⁾		2016	
				Male	Female	Male	Female
Total hour worked • employees	Hour	1,913,929	2,181,655	2,351,909		1,945,471	
				2,064,168	287,741	1,684,378	261,093
Total hour worked • contractors							
	Hour	12,928,206	10,283,128	5,192,527		5,629,968	
				4,215,943	976,584	4,677,579	952,389
Injuries ⁽⁴⁾							
Near miss ⁽⁶⁾ • employees and contractors	Case	1,722	3,670	3,237		3,697	
Absentee rate (AR) • employees	% of total day scheduled to be worked	1.09	0.76	0.50	2.25	0.75	2.26
Total recordable injuries case (TRIC) • employees	Case	0	1	1		1	0

Occupational Health and Safety Performance ^{(1), (2)}	Unit	2013	2014	2015 ⁽³⁾		2016	
				Male	Female	Male	Female
Total recordable injuries case (TRIC) • contractors	Case	5	4	3		3	
				3	0	3	0
Total recordable injuries rate (TRIR) • employees	Case / Million work hours	0.00	0.46	0.43		0.51	
				0.48	0.00	0.59	0.00
Total recordable injuries rate (TRIR) • contractors	Case / Million work hours	0.39	0.39	0.58		0.53	
				0.71	0.00	0.64	0.00
Lost workday case (LWC) • employees	Case	0	0	0		0	
				0	0	0	0
Lost workday case (LWC) • contractors	Case	1	1	1		1	
				1	0	1	0
Lost workday rate (LWR) • employees	Day / Million hours worked	0	0	0		0	
				0	0	0	0
Lost workday rate (LWR) • contractors	Day / Million hours worked	13.92	5.83	20.41		1.24	
				25.14	0.00	1.50	0
Lost time injury frequency rate (LTIFR) • employees	Case / Million work hours	0	0	0		0	
				0	0	0	0
Lost time injury frequency rate (LTIFR) • contractors	Case / Million work hours	0.08	0.10	0.19		0.18	
				0.24	0.00	0.21	0
Illnesses							
Occupational illness frequency rate (OIFR) • employees	Case / Million work hours	0	0	0		0	
				0	0	0	0
Occupational illness frequency rate (OIFR) • contractors	Case / Million work hours	0	0	0		0	
				0	0	0	0
Work-related Fatality							
Employees	Case	0	0	0		0	
				0	0	0	0
Contractors	Case	0	0	0		0	
				0	0	0	0
Process Safety ⁽⁵⁾							
Number of Tier 1 process safety events	Case	0	1	0		0	
Number of Tier 2 process safety events	Case	0	0	2		1	

Remarks:

NA: Not Available

1. Thaioil Group follows standard statistical reporting of PTT Group in accordance with Occupational Safety and Health Administration (OSHA)
2. Occupational safety and health reports are broken down to employees and contractors in order to illustrate social responsibility of Thaioil Group to operational contractors.
3. Data based on gender have been collected since 2015.
4. TRIC and TRIR data does not include accidents categorized at the first-aid level.
5. Thaioil Group reported process safety in accordance with API RP 754 standard.
6. Thaioil Group reports 'Potential Incident Report' together with 'Near Miss' (see also the content in Occupational Health and Safety chapter).

People	Unit	2013		2014		2015		2016 ⁽¹⁾	
						Male	Female	Male	Female
Employees									
Total number of Thaioil group's employees	Person	1,282		1,357		1,409		1,434	
		955	327	1,008	349	1,041	368	1,056	378
Number of employees by level									
• Executives ⁽³⁾	Person	7	0	5	0	8	1	12	2
• Management ⁽⁴⁾	Person	90	48	93	49	94	51	94	51
• Non-management	Person	858	279	910	300	939	316	950	325
Number of employees by age group⁽⁶⁾									
• Below 30 years old	Person	NA	NA	228	112	273	134	252	100
• 30-50 years old	Person	NA	NA	543	190	542	192	529	222
• Over 50 years old	Person	NA	NA	238	46	226	42	275	56
New employees hired									
Total number of new hire employees	Person	151		136		100		66	
		87	64	94	42	66	34	40	26
• Below 30 years old	Person	82	54	75	28	59	26	34	17
• 30-50 years old	Person	5	10	19	14	7	8	6	9
• Over 50 years old	Person	0	0	0	0	0	0	0	0
Total new hire rate	% of total employees	11.78		10.02		7.10		4.60	
		9.11	19.57	9.33	12.03	6.34	9.24	3.79	6.88
Employee turnover⁽⁵⁾									
Total turnover	Person	37		62		51		45	
		24	13	41	21	36	15	26	19
• Below 30 years old	Person	9	4	10	14	14	4	11	7
• 30-50 years old	Person	3	8	16	7	8	6	5	12
• Over 50 years old	Person	12	1	15	0	14	5	10	0
Turnover rate	% of total employee	2.89		4.57		3.62		3.14	
		2.51	3.98	4.07	6.02	3.46	4.08	2.46	5.03
Voluntary resignation	Person	24		48		33		34	
		11	13	27	21	22	11	15	19
Parental leave⁽⁸⁾									
• Employee taken parental leave	Person	25		22		20		16	
		19	6	18	4	14	6	12	4
• Employee returned to work after parental leave	Person	25		22		20		16	
		19	6	18	4	14	6	12	4
Average training hours⁽²⁾									
Total training hours	Hour	128,414		107,440		122,081		85,893	

People	Unit	2013		2014		2015		2016 ⁽¹⁾	
								Male	Female
Average training hours for all employees	Hour / Person / Year	92	118	80	78	90.6	75.5	57	68
• Average hours of training for executives ⁽³⁾	Hour / Person / Year	15	0	34	0	415	324	102	145
• Average hours of training for management ⁽⁴⁾	Hour / Person / Year	97	94	85	76	151	90	68	84
• Average hours of training for non-management	Hour / Person / Year	92	130	80	78	82	72	55	66
Individual Development Plan									
Employees who developed Individual Development Plan (IDP)	%	100		100		100		89	
Grievance									
Number of grievances about labor practices	Case	3		11		1		3	
• Resolved grievance	Case	3		11		1		2	
• Under investigation	Case	0		0		0		1	
Number of grievances about human rights ⁽⁷⁾	Case	NA		NA		0		0	
Union Labor									
Total employees covered by collective bargaining agreement ⁽⁸⁾	Person	627		590		552		525	

Remarks:

NA : not available

1. Data 2016 include employees those are secondments from outside the organization.

2. Data exclude paid educational leave provided by the organization.

3. Executives include CEO, president, executive vice president, and assistant executive vice president.

4. Management includes vice president, division manager, and section manager.

5. Turnover rate includes employees with voluntary resignation, normal retirement, dismissal, and death.

6. Data has been collected since 2014.

7. Data has been collected since 2015.

8. Scope of reporting includes only Thai Oil Public Company Limited.

WE : PASSION FOR PARTNERSHIP

Society and Community Development	Unit	2013	2014	2015	2016
Total investment for society and community development	Million THB	47	26 ⁽¹⁾	73	87

Remark

1. In 2014, expense decreased since all projects were under study phase.

Value Chain Managements	Unit	2013	2014	2015	2016
New suppliers that were screened using criteria for labors, safety and environment ⁽¹⁾	%	54.30	67.39	100	100
Customer satisfaction ⁽²⁾	%	89	93	100	91
Number of grievance about environment, human rights, labor practice and governance from suppliers and contractors	Case	0	0	0	0
Number of grievance about customer data leakage / loss	Case	0	0	0	0

Remarks

1. Only non-hydrocarbon suppliers that were assessed.

2. Scope included Thaioil, Thai Lube Base, Thai Paraxylene and Thaioil Marine

WORLD : PASSION FOR PLANET

Environment Performance	Unit	2013	2014	2015	2016
Refinery throughput ⁽¹⁾	Metric ton	14,455,228	13,905,501	14,870,915	14,781,364
Environmental investment	Million THB	473	2,243	23	195
Energy Management and Greenhouse Gas ^{(2), (3)}					
Total energy consumption ⁽²⁾	Million GJ	NA	18.11	17.62	27.39
Refinery energy intensity	GJ / Ton throughput	NA	1.30	1.19	1.85
Total fuel consumption ⁽²⁾	Million GJ	35.14	39.47	41.39	59.95
Refinery fuel consumption intensity	GJ / Ton throughput	2.43	2.81	2.78	4.06
• Natural gas	Million GJ	10.66	19.17	18.69	31.60
• Fuel oil	Million GJ	5.35	4.61	5.40	6.33
• Fuel gas	Million GJ	18.28	14.52	16.47	21.19
• Coke	Million GJ	0.83	0.84	0.82	0.82
• LPG	Million GJ	0.00	Less than 0.01	Less than 0.01	Less than 0.01
• Diesel	Million GJ	0.02	0.02	0.01	0.01
• 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	Mega Watt	NA	845,374	967,063	987,728
Electricity purchased	Mega Watt	212	0	0	0
Electricity sold ⁽⁴⁾	Mega Watt	0.00	294,363	294,526	1,171,414
Reductions in energy consumption	GJ	234,943	692,686	477,741	470,699
Total amount invested in renewable energy	Million THB	1,290	1,452	1,380	1,298
Direct Greenhouse Gas Emission (scope 1) ⁽³⁾	Million ton CO ₂ equivalent	2.54	2.42	2.54	3.65
Indirect Greenhouse Gas Emission (scope 2) ⁽³⁾	Million ton CO ₂ equivalent	Less than 0.01	0	0	0
Indirect Greenhouse Gas Emission (scope 3) ⁽³⁾					
• Suppliers : Industrial Landfill	Million ton CO ₂ equivalent	NA	NA	320	411
• Suppliers : Ocean Loss	Million ton CO ₂ equivalent	NA	NA	1,719	1,867
• Customers : Oil Products	Million ton CO ₂ equivalent	NA	NA	NA	20.4
• Other (for example, air transportation for employees)	Million ton CO ₂ equivalent	NA	NA	NA	498
Greenhouse gas intensity (scope 1 and 2)	Million ton CO ₂ equivalent	0.17	0.17	0.17	0.25
Greenhouse Emission Reduction (scope 1)	Ton CO ₂ equivalent / Ton throughput	14,500	73,000	26,827	26,406
Emission ^{(5), (6)}					
• Nitrogen oxide (NO _x) emission	Thousand Ton NOx	3.93	2.80	2.85	4.42
• Sulfur oxide (SO _x) emission	Thousand Ton SOx	5.41	4.77	5.13	7.21
• Volatile organic compound (VOC) emission	Thousand Ton VOCs	1.10	1.47	1.48	1.46
Water ⁽⁷⁾					
Total water withdrawal ⁽⁸⁾	Million M ³	21.88	20.53	19.57	23.26
• Industrial water supply (fresh water)	Million M ³	3.54	3.69	3.57	4.09
	Million M ³ / Ton throughput	0.25	0.27	0.24	0.28
• Seawater consumption ⁽⁸⁾	Million M ³	18.34	16.84	16.00	19.17

Environment Performance	Unit	2013	2014	2015	2016
Total water discharge volume ⁽⁸⁾	Million M ³	18.77	17.76	16.69	19.45
	M ³ per Ton Throughput	1.30	1.28	1.12	1.32
Biochemical Oxygen Demand (BOD)					
Chemical Oxygen Demand (COD)	Ton	121.08	192.86	137.65	129.66
Total oil and grease	Ton	3.75	3.93	2.25	2.91
Total suspended solids	Ton	33.36	28.58	24.00	22.10
Waste Disposal by Type					
Total hazardous waste disposal	Ton	5,554	6,708	4,648	5,922
• Landfills	Ton	31	56	21	24
• Recycle	Ton	4,967	2,225	1,661	884
• Recovery	Ton	0	3,491	2,764	4,685
• Others ⁽⁹⁾	Ton	557	936	202	329
Total non-hazardous waste disposal	Ton	1,449	1,933	254	354
• Landfills	Ton	715	117	119	161
• Recycle	Ton	87	1,130	78	95
• Recovery	Ton	34	448	46	47
• Others ⁽⁹⁾	Ton	613	238	11	51
Total non-routine waste disposal	Ton	NA	710	0	0
• Recovery (including energy recovery)	Ton	NA	517	0	0
• Landfills	Ton	NA	193	0	0
Oil and Chemical Spill ⁽¹⁰⁾					
• Significant oil and chemical spill-land	Case	0	0	0	0
• Significant oil and chemical spill-marine	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

Remarks

NA: not available

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 Group's laboratory.

3. Thaioil Group follows standard statistical reporting of PTT Group in accordance with WBCSD GHG Protocol. The greenhouse gases include CO₂, CH₄, and N₂O. Indirect GHGs emission scope 3 reported include the air travel of employees.

4. There was no steam sold to outside the organization.

5. Thaioil Group follows Health, Safety, and Environmental Performance Monitoring and Report developed by Shell International Practice Standard

6. Thaioil Group do not purchase ozone depleting substances including CFCs, HCFCs, halons, and methyl bromide.

7. Data exclude portable water consumption which has very small volume compared to water consumption in production process.

8. Both water withdrawal and discharge included the rejected water of desalination unit.

9. Other waste disposal covers incineration and external wastewater treatment services.

10. Oil and chemical spill greater than 1 Barrel is considered significant.

Awards and Recognitions



3
rd Year

Industry Leader and Gold Class 2016

RobecoSAM announced Thai Oil Public Company Limited to be the number one as the Oil & Gas Industry Leader in Sustainability 2016, and achieved Gold Class 2016 for three consecutive years.

By : RobecoSAM Yearbook 2016



APEA Awards

Mr. Atikom Terbsiri, the CEO and President of Thai Oil Public Company Limited received the Outstanding Category Award at the Asia Pacific Entrepreneurship Awards 2016 Thailand (APEA).

By : Asia Pacific Entrepreneurship Awards 2016 Thailand (APEA)

3
rd Year

Dow Jones Sustainability Indices 2016

Thai Oil Public Company Limited was announced to be the Energy Industry Group Leader for three consecutive years from Dow Jones Sustainability Indices 2016.

By : Dow Jones Sustainability Indices 2016



Certificate of ESG100 Company

Thai Oil Public Company Limited received the ESG 100 Certificate for two consecutive years as one of the top 100 listed companies, out of 621 listed companies in the Stock Exchange of Thailand, based on outstanding performance in Environment, Social and Governance (ESG).

By : Thaipat Institute



IAA Awards for Listed Companies 2015/2016: Best Investor Relation

Mr. Chatchai Siriwit, the Investor Relationship Manager of Thai Oil Public Company Limited received the IAA Award for Listed Companies 2015/2016 in the IR Excellence category

By : Investment Analysts Association.



Alpha Southeast Asia 2016

Thai Oil Public Company Limited received the first place in the regional stage for the Strongest Commitment to Sustainability Energy in Southeast Asia for five consecutive years.

In addition, Thai Oil also received the following three national awards:

- The Strongest Adherence to Corporate Governance for four consecutive years
- The Best Senior Management IR Support for the second years
- The Most Consistent Dividend Policy for the second years

By : Alpha Southeast Asia



Honorary Certificates as of GHG Reduction Model; Carbon Footprint for Organization (CFO) Certificate and the Low Emission Support Scheme (LESS) Certificate

Thai Oil Public Company Limited has been awarded the Carbon Footprint for Organization (CFO) Certificate and the Low Emission Support Scheme (LESS) Certificate during the appreciation ceremony 2016

By : Thailand Greenhouse Gas Management Organization (Public Organization) and the Ministry of Natural Resource and Environment.



CSR-DIW Continuous AWARD 2016

Thai Oil Public Company Limited received the CSR-DIW Continuous Award 2016 from the Project for Encourage of Industrial to Development Corporate Social Responsibility (CSR-DIW)

By : Department of Industrial Works.



Award for the Outstanding in Skill Development and Encouragement 2016

Thai Oil Public Company Limited received the Award for the Outstanding in Skill Development and Encouragement 2016 from the Ministry of Skill Development and Entrepreneurship. The ministry selected public companies from nation-wide, based on the success of employees' skills development and the encouragement of skills development according to the Labor Act.

By : The Ministry of Skill Development and Entrepreneurship



ASEAN Energy Awards 2016

Thai Oil Public Company Limited has been awarded the second place of ASEAN Energy Awards 2016 for Energy Management Awards (Large Industry Category) from the systematic and sustainable energy management of our plants.

By : ASEAN Energy



Sustainability Report Awards 2016, Excellence Level

Thai Oil Public Company Limited has been awarded the Sustainability Report Awards 2016, Excellence Level from the assessment of CSR Club, Thai Listed Companies Association together with the Stock Exchange of Thailand and Thaipat Institute.

By : CSR Club, Thai Listed Companies Association together with the Stock Exchange of Thailand and Thaipat Institute

LRQA Independent Assurance Statement

Relating to Thai Oil Public Company Limited's Environmental and Social Indicators within the Sustainability Report for the calendar year 2016

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 indicators within its Sustainability Report 2016 ("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 indicators within the Report have taken account of:
 - GRI G4's ¹ Sustainability Reporting Guidelines, and
 - GRI G4's Oil and Gas Sector Disclosures
- Evaluating the reliability of data and information for the selected environmental and social indicators listed below: ²:
 - Environmental: EN3, EN8, EN 15, EN 16, EN 21, EN 22, EN 23, EN 24
 - Social: LA6

Note: For safety performance data(LA6), it covered TOP's operation activities in Bangkok, Thailand.

Our assurance engagement excluded TOP's operations and activities outside 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 indicators as no errors or omissions were detected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

LRQA's approach

LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing TOP's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- Reviewing TOP's process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by TOP and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether TOP makes informed business decisions that may create opportunities that contribute towards sustainable development.

- Auditing TOP's data management systems to confirm that there were no significant errors, omissions or mis-statements in the Report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the Report.
- Interviewing TOP's management representative to understand and obtain data and information with respect of high level strategic management approach.

Observations

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

- Stakeholder inclusivity:
We are not aware of any key stakeholder groups that have been excluded from TOP's stakeholder engagement process. TOP has reaffirmed the importance to have a report on subsidiary companies whose material issues have impact on them. We believe the future report should address the progress on these subsidiary companies.
- Materiality:
We are not aware of any material issues concerning TOP's sustainability performance that have been excluded from the Report. TOP has processes in place for identifying and evaluating their material issues which are determined by a set of risk criteria. We have found that TOP has implemented a plan to identify the material aspects whose impact from all future projects as a part of sustainability development at decision making process, for example the Clean Fuel Project.
- Responsiveness:
TOP has processes and communication channels in place to respond to stakeholders, we believe that future reports should address more Sustainability Performance aligned with the high-level decision making processes, for example – positive and negative impact on the TOP operation for both of current and newly-established facilities for the stakeholder's concerns to be reported and form part of the sustainability performance.
- Reliability:
Centralised data management system on environment and safety performance are considered to be well established for the Report and this system has been implemented across the facilities, we believe the future report should apply for this centralised system for new facilities and projects to assure the reliable data.

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 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 1 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



Nit Tanasuthisiri,
LRQA Lead Verifier
On behalf of Lloyd's Register Quality Assurance
Lloyd's Register International (Thailand) Limited
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Dated: 21 February 2017

LRQA reference: BGK6046408

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¹ <https://www.globalreporting.org>

² GHG quantification is subject to inherent uncertainty.

GRI Content Index & UNGC Principles COP

GENERAL STANDARD DISCLOSURES			
General Standard Disclosures	Page or Website	Omission	External Assurance
Strategy and Analysis			
G4-1	4, 5		-
G4-2	4, 5, 14, 15		-
Organizational Profile			
G4-3	6		-
G4-4	6, 8, 9		-
G4-5	7		-
G4-6	6		-
G4-7	7		-
G4-8	8, 9		-
G4-9	6, 7, 8, 9, 69		-
G4-10	68, 70		-
G4-11	70		-
G4-12	8, 9		-
G4-13	5, 16, 36		-
G4-14	58		-
G4-15	7, 25		-
G4-16	7, 25		-
Identified Material Aspects and Boundaries			
G4-17	1, Annual Report (Corporate Information)		-
G4-18	12, 13		-
G4-19	12, 13		-
G4-20	1, 13		-
G4-21	13		-
G4-22	13		-
G4-23	1, 13		-
Stakeholder Engagement			
G4-24	10		-
G4-25	10		-
G4-26	10		-
G4-27	11		-
Report Profile			
G4-28	1		-
G4-29	1		-
G4-30	1		-
G4-31	1		-
G4-32	80 - 84		-
G4-33	78, 79		-

GENERAL STANDARD DISCLOSURES

General Standard Disclosures	Page or Website	Omission	External Assurance
Governance			
G4-34	17		-
G4-35	16, 17		-
G4-36	17		-
G4-37	17, 25, 66		-
G4-38	25		-
G4-39	17		-
G4-40	AR (Appointment of Directors), Corporate Governance Handbook page 52 -53		-
G4-41	27		-
G4-42	17		-
G4-43	Annual Report (Corporate Governance Report)		-
G4-44	Annual Report (Corporate Governance Report)		-
G4-45	12, 13		-
G4-46	14, 15		-
G4-47	14, 15		-
G4-48	12, 13		-
G4-49	14, 17		-
G4-50	27		-
G4-51	Annual Report (Corporate Governance Report)		-
G4-52	Annual Report (Corporate Governance Report)		-
G4-53	Annual Report (Corporate Governance Report)		-
G4-54	-	This indication is not applicable to Thaioil Group due to the country's cultural context.	-
G4-55	-	This indication is not applicable to Thaioil Group due to the country's cultural context.	-
Ethics and Integrity			
G4-56	7		-
G4-57	25, 27		-
G4-58	27		-

SPECIFIC STANDARD DISCLOSURES

Material Aspects	DMA and Indicators	Page or Website	Comments / Omissions	External Assurance
Category: Economic				
Economic Performance	G4-DMA	5, 7		
	G4-EC1 OGSD	68, 71		
	G4-EC2 OGSD	15, 64 - 67		
	G4-EC3	-	Thaioil Group does not make public the estimated value of liabilities related to the organization's benefit plan obligations.	
	G4-EC4	68		
Indirect Economic Impact	G4-DMA OGSD	5, 7, 44 - 51		
	G4-EC7 OGSD	44 - 51		
	G4-EC8 OGSD	44 - 51		

SPECIFIC STANDARD DISCLOSURES

Material Aspects	DMA and Indicators	Page or Website	Comments / Omissions	External Assurance
Category: Environmental				
Energy	G4-DMA OGSD	64 - 67		
	G4-EN1	72		
	G4-EN3	66, 72, 73	To avoid double counting, Thaioil Group dose not report energy consumption / sold of electricity, heating, cooling, and steam, since all wear self-generated from primary fuel. Only electricity was sold out to external.	✓
	G4-EN4	72, 73	Thaioil Group does not report energy consumption outside of the organization at this time.	
	G4-EN5 OGSD	72, 73		
	G4-EN6	66, 72, 73		
	G4-EN7	65		
Water	G4-DMA	67		
	G4-EN8 OGSD	73	The standards, methodologies, and assumptions used to calculate water withdrawal are not reported.	✓
	G4-EN9 OGSD	71		
	G4-EN10	67		
Air Emissions	G4-DMA	58 - 60, 64 - 66		
	G4-EN15 OGSD	72, 73		✓
	G4-EN16 OGSD	66, 72	Thaioil Group does not purchase electricity and steam from external providers as we cogeneration power plants supplying for all of our production units.	✓
	G4-EN17 OGSD	66, 72		
	G4-EN18 OGSD	72		
	G4-EN19 OGSD	72		
	G4-EN20	SR 2015 page 65		
	G4-EN21 OGSD	60, 72, 73		
Effluents and Waste	G4-DMA OGSD	61		
	G4-EN22	61, 73		✓
	G4-EN23 OGSD	61, 73		✓
	G4-EN24 OGSD	62, 63, 73		✓
	G4-EN25	-	Thaioil Group does not generate hazardous waste under the terms of Basel Convention at this time.	
	G4-EN26	-	There are no bodies of water that are significantly affected by Thaioil Group operations.	
	G4-OG5	-	Volume and disposal of formation or produced water is not applicable to non-exploration and production company	
	G4-OG7	-	Amount of drilling waste and strategies for treatment and disposal is not applicable to non-exploration and production company	
Compliance	G4-DMA	58 - 63		
	G4-EN29	58, 59, 73		
Overall	G4-DMA	64, 65		
	G4-EN31	64, 72		
Supplier Environmental Assessment	G4-DMA	52 - 55		
	G4-EN32	71		
	G4-EN33	52 - 55		
Environmental Grievance Mechanisms	G4-DMA	38, 61		
	G4-EN34	38, 58		

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Category: Social				
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	G4-LA1	69, 70		
	G4-LA2			
	G4-LA3	70		
	G4-DMA OGSD	36 - 41		
	G4-LA5			
	G4-LA6 OGSD	68, 69		✓
Occupational Health and Safety	G4-LA7	41		
	G4-LA8	-	Thaioil's formal agreements with trade union include all aspects of health and safety and in compliance with International Labour Organization.	
	G4-DMA	28 - 35		
	G4-LA9	70		
	G4-LA10	31, 32		
Training and Education	G4-LA11	70		
	G4-DMA	34 - 35		
Diversity and Equal Opportunity	G4-LA12	69 - 70		
	G4-DMA	53, 54		
Supplier Assessment for Labor Practices	G4-LA14	71		
	G4-LA15	53 - 54		
	G4-DMA	27, 47		
Labor Practice Grievance Mechanisms	G4-LA16	70		
Sub-category: Human Rights				
Assessment	G4-DMA	34, 35		
	G4-HR9	28		
	G4-DMA OGSD	52 - 54		
Supplier Human Rights Assessment	G4-HR10	71		
	G4-HR11	35, 53, 54, 71		
Sub-category: Society				
Local communities	G4-DMA OGSD	44 - 51		
	G4-SO1	44 - 51		
	G4-SO2 OGSD	6, 47 - 51		
	G4-DMA OGSD	24 - 27		
	G4-SO3	24, 25, 53, 54		
Anti-corruption	G4-SO4	24, 25		
	G4-SO5	27		
	G4-DMA	53, 54		
	G4-SO9	47, 71		
Supplier Assessment for Impacts on Society	G4-DMA	47		
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Grievance Mechanisms for Impacts on Society				

SPECIFIC STANDARD DISCLOSURES

Material Aspects	DMA and Indicators	Page or Website	Comments / Omissions	External Assurance
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Asset Integrity and Process Safety	G4-DMA <small>OGSD</small>	40		
	G4-OG13	69		
Sub-category: Product Responsibility				
Product and Service Labeling	G4-DMA <small>OGSD</small>	55		
	G4-PR5	55, 71		
Customer Privacy	G4-DMA <small>OGSD</small>	55		
	G4-PR8	71		

United Nations Global Compact Principles

Principles	Page
Human Rights	Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights
	Principle 2 Businesses should make sure that they are not complicit in human rights abuses
Labor	Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining
	Principle 4 The elimination of all forms of forced and compulsory labour
	Principle 5 The effective abolition of child labour
	Principle 6 The elimination of discrimination in respect of employment and occupation
Environment	Principle 7 Businesses should support a precautionary approach to environmental challenges
	Principle 8 Undertake initiatives to promote greater environmental responsibility
	Principle 9 Encourage the development and diffusion of environmentally friendly technologies
Anti-corruption	Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery



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