



Corporate Sustainability Report 2018
PTT Public Company Limited

BALANCE AND
SUSTAINABILITY



TABLE OF CONTENTS

- 01** About This Report
- 02** CEO Statement
- 04** **Organization Overview**
 - PTT Business
 - Strategic Challenges and Opportunities
 - Stakeholder Engagement
 - Materiality
- 12** **Value Creation for Sustainability**
 - PTT Strategy and Contribution to SDGs
 - Value Creation Model
- 18** **Governance**
 - Corporate Governance
 - Risk and Opportunity Management
 - Fair Operating Practices
- 24** **Economic**
 - Business Growth
 - Capital Project Management
 - Supply Chain Management
 - Product Stewardship
- 36** **Social**
 - Human Resource Management
 - Human Rights
 - Corporate Citizenship
 - Safety
 - Security and Crisis Management
- 56** **Environment**
 - Environmental Management
- 65** **PTT Performance**
 - Economic
 - Social
 - People
 - Safety
 - Environment
- 78** Awards and Recognition
- 80** GRI, UN SDGs, IR, UNGC and TCFD Content Index
- 87** Assurance Statement
- 89** Reader Feedback Survey



About this Report



PTT Public Company Limited has published the company's 11th annual sustainability report to communicate its performance on the sustainability management of economic, social, and environmental aspects to all stakeholder groups. The report covers the period from 1st January to 31st December of each year. The key contents and other aspects of performance disclosed in this 2018 report have been prepared in consideration of the following international guidelines:

GRI

The **Global Reporting Initiative (GRI)** Sustainability Reporting Standards 2016 and the Oil and Gas Sector Disclosures (OGSD) in accordance with the GRI Standards: Core option

IIRC

The Integrated Reporting <IR> Framework of the **International Integrated Reporting Council (IIRC)**

UNGC

Communication on Progress on the 10 Principles of the **United Nations Global Compact (UNGC)** Advanced Level

TCFD

Climate change performance reporting according to the **Recommendation of the Task Force on Climate-related Financial Disclosures (TCFD)**

SDGs

Progress reporting on the United Nations **Sustainable Development Goals (SDGs)**

On 1st July 2018, PTT restructured its business by transferring the Oil Business Unit, along with relevant company shares, to PTT Oil and Retail Business Public Company Limited. The scope of this report therefore differs from previous years' reports, and covers PTT-operated businesses which consist of the Natural Gas Business, International Trading Business, Technology and Engineering Business, and Oil Business (between 1st January to 30th June 2018 for Oil Business only). It also includes the following PTT Group Flagship companies: PTT Exploration and Production Public Company Limited (PTTEP), PTT Global Chemical Public Company Limited (GC), Thaioil Public Company Limited (TOP), IRPC Public Company Limited (IRPC), Global Power Synergy Public Company Limited (GPSC), and PTT Oil and Retail Business Public Company Limited (PTTOR) (between 1st July to 31st December 2018 for PTTOR only), or as specified in each chapter. The key contents of this report have been reviewed and approved by the PTT Group Sustainability Alignment Committee (SAC). As part of its report verification process, PTT has engaged an independent assurer for the 8th consecutive year to verify the economic, social, and environmental performance data reported herein and to ensure its completeness, accuracy, transparency, and credibility.

Readers may click or scan the QR codes presented in the sustainability report for further information on each topic and visit www.pttplc.com for more information on PTT's performance. QR Code link: www.pttplc.com



Message from the President and CEO



“An organization of pride, emphasizing transparency, towards sustainability”

As of 2018, PTT has achieved its 40th year of operations. It was PTT's vision to become a leading internationally recognized Thai company, and its mission to fairly care for all stakeholder groups, cascade through generations, which provides PTT the strength to continuously march forward in its operation, to promptly adapt itself to different challenges: environmental, social and economy. However, to ensure secure business growth, PTT's immunity must be further strengthened. PTT must become “an organization of pride, emphasizing transparency, towards sustainability,” unwaveringly adhere to good governance in its operations. PTT will facilitate progress towards the 20 year-plan National Strategy, maintaining alignment with the United Nations' Sustainable Development Goals. This is for the benefits of the organization and all social sectors, ranging from community, society, to the nation.

Once PTT implemented the Three Lines of Mechanisms approach for risk management, in 2018, PTT also founded Corporate Governance and Regulatory Affairs Function. This integrates governance principles, internal risk management and controls, as well as ensuring for operation's compliance, enabling PTT towards work process in accordance to international standards. To ensure that corporate governance management is effective, transparency and traceable, Corporate Governance Function is responsible in acknowledging and follow up on any incidents. The function is also responsible in ensuring that employees are ethical and of good moral state during work.

Furthermore, PTT continues to prioritize human capital development, to build technical knowledge on science, technology and innovation. This will ensure sustainability and self-sufficiency, based on environmentally friendly products and consumption. PTT's support and encouragement help facilitate innovation from both employees and PTT Innovation Institute. In this year alone, there are over 500 submissions, with 38 new products. PTT is also collaborating with the National Science and Technology Development Agency (NSTDA) to develop the Eastern Economic Corridor of Innovation (EECi) at Wang Chan Valley, Wang Chan District, Rayong Province. There will be an enriched inno-ecosystem, serving as Thailand's advanced research and innovation development center. Results can be further utilize and contribute to driving the country forward in line with Thailand 4.0 Policy. PTT is the one responsible in laying down fundamental infrastructure and develop areas commercial. The latter is a smart city on an area of 3,455 Rai. This includes founding of Kamnoetvidya Science Academy and Vidyasirimedhi Institute of Science and Technology to promote education, as well as scientific and technology-oriented researches. The first class of graduates comprise 71 students, with 13 recent Master graduates. There has also been collaborative research efforts with industrial sectors for practical application.

While the business landscape and technology rapidly changed, PTT continue to maintain its goal of creating the nation's energy security. PTT aims to enhance competitive advantage, from short-, medium- to long-term for sustainable growth. Digital technology is noted and adopted to enhance effectiveness of current operations. There is also an expansion of natural gas pipeline, and liquid natural gas depots, targeting at 10 projects within the next 5 years. The projects are in place due to anticipation of increasing demand for clean energy from large-scale electricity generations and industries. It also enables exploration for novel businesses that can become the New S-Curve. By 2030, it is targeted that revenue from new businesses will contribute to 10% of revenue proportion.

In cognizance of the determination to address climate change and reduce the country's greenhouse gas emission, PTT's Board of Directors has approved for PTT Group Clean & Green Strategy to integrate climate change strategy with business strategy. The initial target for PTT Group's greenhouse gas emission is to reduce the emission by 20% against business as usual. Within 2030, there will be a control measure on intensity of greenhouse gas emission. Considerations have also been made on increasing proportion of revenue from low carbon products, as well as on adopting carbon

credit criteria for investment decisions. Furthermore, analyses of climate change-related risks and opportunities have also been identified and integrated into corporate-level risk management. The first 3 risks with business impacts, which require further mitigation efforts, comprise, policy and regulations, natural disasters, and consumers' changing behaviors – from reduced reliance of fossil-based energy.

Notably, in December, PTT and Private Sector Network, comprising 15 companies, have co-launched the Global Compact Network Thailand, successfully. This follows the founders' first move for the establishment since 2015. It aims to promote business operations respectful of human rights and labor rights, to conserve the environment and to take actions against corruption, in accordance to the 10 Principles of the United Nations Global Compact (UNGC). The Network also collaboratively raised awareness and understanding of sustainable business for corporate members, therefore reduced risks and fostered credibility of Thai businesses at an international level.

Due to the Executives' and employees' commitment and readiness towards change for corporate sustainability, PTT is able to maintain its position as a member of the Dow Jones Sustainability Indices (DJSI) for the 7th consecutive year. PTT receives the highest score and is therefore recognized as Industry Leader of the Oil & Gas Upstream & Integrated Sector (OGX) for the 2nd consecutive year. I would like to take this opportunity to express my gratitude to all stakeholders who have supported us. I am confident that, together, we will be able to create great many things. Together, we will bring PTT forward, securely and sustainably.

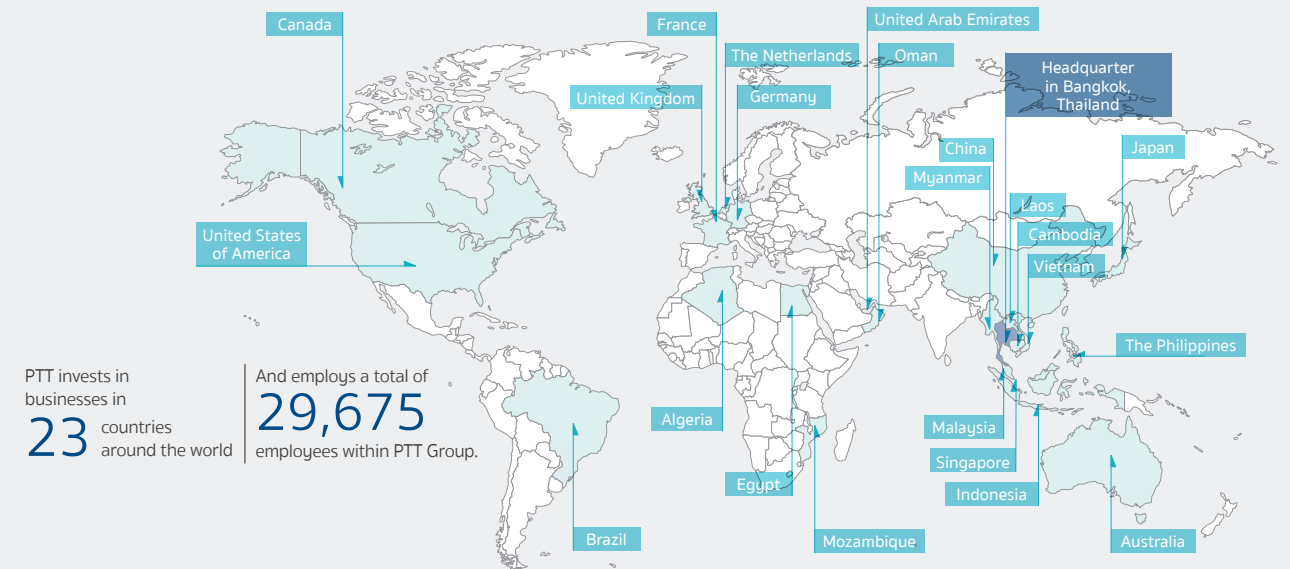


Chansin Treenuchagron
President and Chief Executive Officer

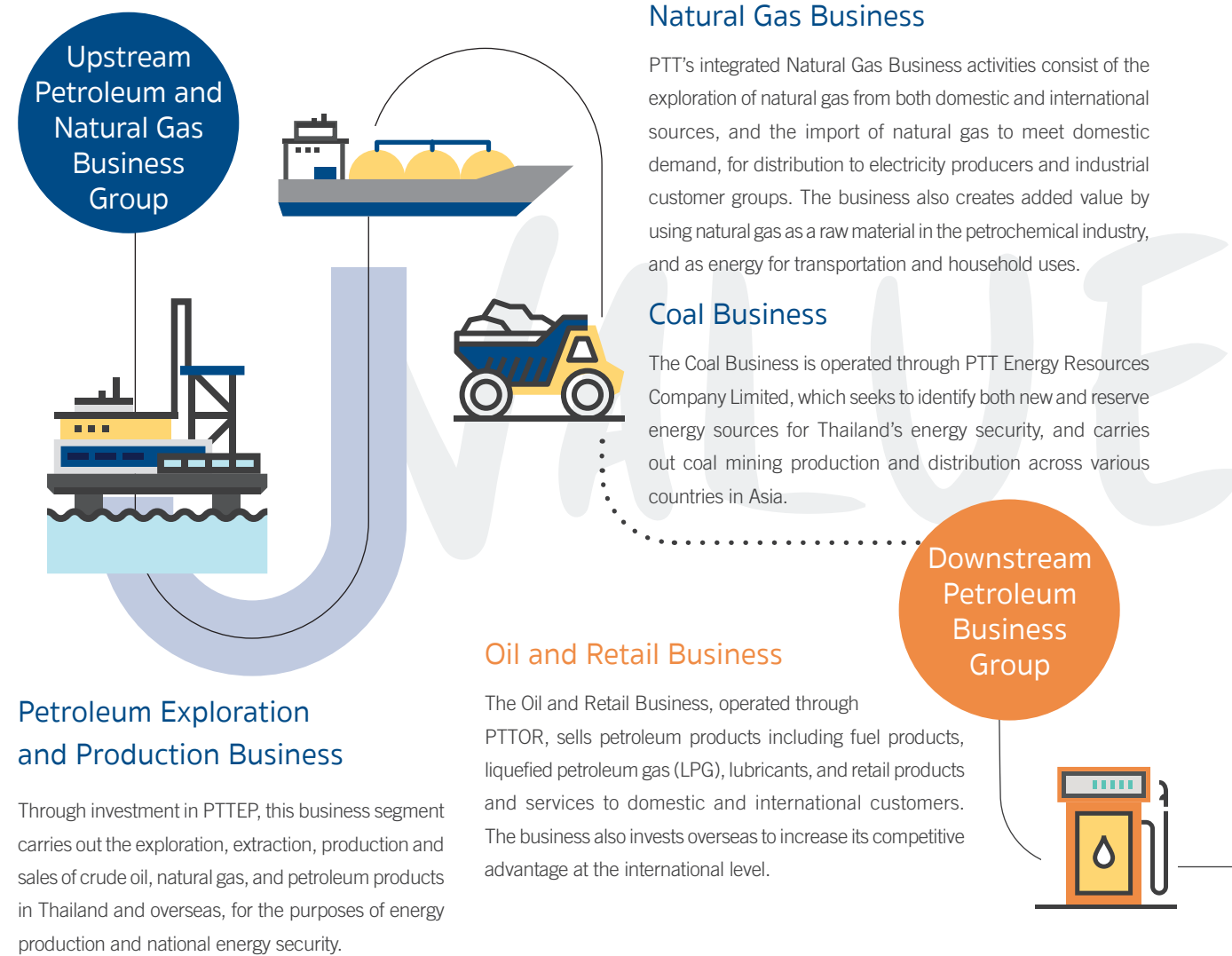
Organization Overview

PTT Business

PTT Public Company Limited, or PTT, is a national energy company and state enterprise of Thailand which operates under the oversight of the Ministry of Energy, with the Ministry of Finance as a major shareholder. PTT has been listed on the Stock Exchange of Thailand since 2001, and carries out integrated energy and petrochemical business activities from upstream to downstream with the goal of building energy security for Thailand. This is achieved through PTT-operated businesses, which consist of the Natural Gas Business, International Trading Business and Technology and Engineering Business; and through PTT affiliates and subsidiaries comprising the Petroleum Exploration and Production Business, Infrastructure Business, Coal Business, Petrochemical and Refining Business, and Oil and Retail Business. PTT's headquarter is located in Bangkok, Thailand.



PTT Group's Value Chain



Petrochemical and Refining Business

This segment is operated through 4 PTT Group businesses: PTT Global Chemical Public Company Limited (GC), Thaioil Public Company Limited (TOP), IRPC Public Company Limited (IRPC), and PTT Tank Terminal Company Limited. Activities cover crude oil refining, production of fuel oil and petrochemical products (upstream, midstream and downstream). It also supports and focuses on the production of green products to reduce environmental impacts, and promotes sustainable business practices.

International Trading Business

The International Trading Business focuses on the procurement of crude oil, petroleum products, liquefied petroleum gas (LPG), and various petroleum and petrochemical products. This also includes the procurement of oil ships for international transport to create commercial value for PTT's products, build national energy security, and expand opportunities for business throughout all regions of the world.

Technology and Engineering Business

This segment focuses on engineering and PTT's large infrastructure projects; real estate management, and the research and development of products and innovations to build strength in technology and expand new business opportunities for PTT in support of its domestic and international growth.

Technology and Engineering Business Group



Infrastructure Business

Through Global Power Synergy Public Company Limited (GPSC), this segment operates electricity and utilities businesses consisting of independent power companies and public utility companies, namely electricity, steam, and demineralized water, for industrial customers. Through Energy Complex Company Limited, it oversees office space management services, physical resources management, and supports the development of integrated real estate businesses for PTT Group. In addition, PTT Energy Solutions Company Limited provides technical consulting services on engineering, and PTT Digital Solutions Company Limited provides services on information technology and communications.

Strategic Challenges and Opportunities

Global Trends and Changes

In the present-day world, innovation that creates markets, added value to products, and disruptive technology results in exponential and continuous growth. This drives manufacturers and service providers with novel solutions to fulfill the consumer's requirement of ease and reduced prices. The drive for research and development of new technology along with rapid commercialization imposes challenging situations for businesses; who utilize traditional technology, and are unable to adapt to the changing technology. Additionally, consumers are more considerate of the environment, leading to conservation trends becoming a driving force for businesses to change. In the energy industry, customers' demand for clean energy is apparent, yielding numerous disruptive technology to emerge. The development of electric vehicles and the rapid reduction of cost in manufacturing solar cells enable commercial viability and profitability.

The aforementioned factors have caused increased volatility concerning energy. Various other factors also make impacts to supply and demand, such as Shale Oil technology, which transforms the United States from the world's largest importer of oil into an oil exporter. This includes economic sanctions and oil embargos on Iran and Venezuela, and trade wars between the United States and China. These caused market volatility when oil prices were recovering, and a significant decrease in oil prices towards the end of the year.

Thailand's situation challenges PTT's strategic planning and risk valuation, driving the establishment of Pride and Treasure of Thailand Strategy or PTT. This stems from government's policy for Thailand 4.0, focusing on innovation as a driving tool for future economy; the government's energy market liberation policies, to the soon-to-expire natural gas concessions, and the building of public trust. Aside from focuses on building business success and consolidating PTT as an invaluable national treasure, Pride and Treasure of Thailand Strategy also takes care of communities, society, and the environment; this includes fairly creating values for all stakeholder. PTT continues steadfastly in the mission to become an everlasting Pride and Treasure of Thailand.

Business Risks

Price Risk Management

The decrease in crude oil prices towards the end of 2015 from increased supply, caused by OPEC's maintained production and the increased production of Shale Oil and Shale Gas in the United States, has led to price volatility.

PTT have devised risk management plans to reduce cost, increase financial discipline, and increase production resulting in PTT's continuous increase in business profit. In 2018, PTT continues to face various challenges, including increased global demand for oil from emerging markets and developing countries, such as China and India; and tightening of global supply from OPEC and Non-OPEC's continuously decreased production.

Geopolitical issues, an important factor effecting production levels and crude oil price volatility, has resulted in PTT's increase in production by applying technology and digitalization to improve performance effectiveness. These actions resulted in increased production-based revenues in 2018 compared to 2017.



Emerging Risks and New Opportunities

The Enterprise Risk Management Committee (ERMC) have analyzed the effectiveness of risk management and new business opportunities, along with impacts towards the business operation of PTT. In 2018, the issue of cyber security from 2017 remains a significant risk for PTT's business operations. It was revealed that human resource management poses the risks and new opportunities in 2018. As for EV vehicles, which was one of the emerging risks from 2017, PTT has integrated the matter into business plan and management for a clearer and more tangible approach. As a result, this issue is no longer an emerging risk for 2018.



Cyber Security

In 2018, cyber security remains an emerging risk and opportunity for PTT, continuing from last year. The utilization of digital processes increases process effectiveness and grant new business opportunities. However, trends illustrate an increase occurrence and variation of cyber threats and cyber security, causing unexpected impacts. This includes critical information thefts from PTT and customers, computer virus attacks, ransoms, and penetration to the organization's important infrastructure control systems. PTT stays cognizant of the impacts these threats have towards business continuity, corporate trust, and reputation. Consequently, PTT applies ISO/IEC 27001 on operational framework in Information Security Management System to improve cyber security and enhance safety approach's effectiveness. Cybersecurity is a corporate-level risk, requiring continuous and up-closed system monitoring and risk assessment on information system's gaps. Primary activities include surveillance audit, vulnerability assessment of information systems' gaps. There are also preventive tools installed, in conjunction with the use of artificial intelligent for threat monitoring and assessment. In parallel, PTT also trains employees to ensure accurate understanding. There is also business continuity management approach available to address any threatening cases on PTT information system.

Employee Adaptability towards Changes in Digital Systems

Digital systems play an increasingly large role in the business operation of PTT, impacting business direction with great significance, as well as enabling expansion to new businesses. There may be a lapse between employee digital capability to support PTT's strategy and directions, making it difficult to meet demand. This, therefore, causes delays in operations and opportunity loss in technological adoption. The latter could have enhance operation's effectiveness, and capability to innovate for new businesses – addressing the ever-changing future. PTT is cognizant towards the stated changes and importance in preparation for risk controls. Operations were conducted at multi-level, from accentuating digital technology-based corporate drive to be one of the organization's values. Organization Transformation Strategy is set to support organizational operations, introduced under 3 initiatives namely: enhancing people's capability to adapt, corporate culture; enhancing process improvement for maximum effectiveness and efficiency, including improvement of corporate management tools; and ensuring integration of systems to facilitate ease and prompt access to corporate data. This allows for analysis for further development and improved efficiency of business operations, making possible the creation of New S-Curve business opportunities for PTT.

Stakeholder Engagement

PTT's mission toward its stakeholders encloses 6 groups, which are the country, communities and society, customers, shareholders, partners, and employees. The mission encompasses more than merely producing results and generating profit. As a national energy company, the company must maintain balance between responding to stakeholders and taking into account the benefits of the people and the nation. Therefore, engaging with diverse groups of stakeholders assists PTT in understanding and prioritizing sustainability issues related to its business operations. Furthermore, it aids in effectively responding to sustainability challenges and opportunities that may potentially affect all stakeholder groups.

Stakeholder Management

Effective stakeholder management enables the organization to achieve its mission and goals to be a driving mechanism of the country, and a proud organization which focuses on transparency toward sustainability. Thus, PTT operates to manage stakeholder expectations and respond to key expectations, as follows:

- Evaluating the impact of all plans/projects to all 6 stakeholder groups and preparing a management plan to reduce negative impact and protect stakeholders' benefits. These actions include the extension of positive results, execution of the plan, and quarterly progress reporting to the Enterprise Risk Management Committee (ERMC). Moreover, the PTT Board of Directors has been assigned to supervise and monitor stakeholder management, and provide recommendations that are consistent with PTT's business strategy.
- Assessing the needs, expectations, and concerns of all 6 stakeholder groups by collecting and analyzing the Voice of the Stakeholder from various channels, such as the Call Center. Other means of collecting information include research studies, engagements, and organizing activities or meetings with stakeholders. The result of these efforts forms a management approach for relevant departments to implement accordingly.

PTT measures the results of stakeholder management based on the stakeholder engagement scores that are evaluated on an annual basis. In 2018, the score was 84 points, which slightly decreased due to external factors that influenced the opinions of the stakeholders. The factors include negative issues from the news and misunderstandings on PTT's operations as well as the continued rise in prices for crude oil and natural gas. The result was a call to boycott PTT service stations for raising oil prices, which corresponded to the world market price. Since PTT implemented its stakeholder management as mentioned above, the company was able to reduce the degree of loss to the stakeholder engagement score. PTT plans to improve and thus increase the level of engagement by focusing on communication to create a correct understanding of energy and the operations of the company. PTT wishes to convey the method with which the company conducts business and cares for society and the environment in order to continuously create value for its stakeholders, as it has in the past.



Country

Stakeholder Engagement Channel

- Monthly meetings to report progress on implementation in line with energy policies
- Delivery of reports or information related to energy business operations every 1-2 months
- Quarterly site visits of PTT's operational areas
- Monthly collaboration with private organizations (the Thai Chamber of Commerce, the Federation of Thai Industries, and the Pracharat Committee)

Interest of Stakeholders

- Full disclosure of information in a quick and punctual manner
- Creating energy security

Key Performance

- Sufficient energy supply to meet the domestic demand at a reasonable, fair, and affordable price
- Infrastructure development
- Good corporate management
- Expansion of service stations into remote areas including secondary roads to increase the people's access to energy

Customers



Stakeholder Engagement Channel

- Annual customer satisfaction surveys in both B2B and B2C groups
- Ordering & Customer Relations Center – ORC (PTT Call Center 1365)
- Post-sales services

Interest of Stakeholders

- Quality of products and services
- Appropriate product and service prices

Key Performance

- Research and development of products and services to meet customer needs in terms of quality, innovation, and products & services that are environmentally-friendly



Communities and Society

Stakeholder Engagement Channel

- Participation with communities through meetings, consultations, seminars, and monthly focal group meetings
- Collaboration with communities and society through institutions and foundations such as the PTT Reforestation Institute, the Green Globe Institute, and the Sustainable Energy Foundation
- On-the-ground engagement by public relations employees and functions responsible for community/social projects on a weekly basis

Interest of Stakeholders

- Economic support and career building
- Educational support
- Conservation of natural resources and the environment

Key Performance

- Establishment of Social Enterprise (SE) projects to support the community's economy and careers for the disabled
- Community relations activities through social projects such as the Clean Energy for Community Project, and the Water, Forest and Bang Kachao Conservation Project

Stakeholder Engagement Channel

- Annual Supplier Relationship Management Seminar
- Annual surveys of supplier's satisfaction in PTT's procurement process and on doing business with PTT

Interest of Stakeholders

- A procurement process that is convenient, fast, accurate, transparent, fair, and non-discriminatory

Key Performance

- Trainings on developing sustainability operations for stakeholders in the supply chain, including
 - PTT Group's Procurement officers
 - PTT Group's Key partners
 - Employees of other departments related to the management of suppliers/contractors



Partners

Stakeholder Engagement Channel

- The President and Chief Executive Officer communicates directly with executives and employees through various channels, such as emails, Townhall meetings, and social media (PTT Workplace)
- Monthly Labor Relations Committee meetings
- Annual employee engagement surveys
- Annual two-way performance assessments

Interest of Stakeholders

- Employee engagement to the organization
- Career management for career advancement
- Promotion of learning and employee development

Key Performance

- Adding training courses on the employee competency development to handle various challenges
- Developing a plan to improve the level of engagement in the organization by focusing on every group of employees
- Organizing activities to promote and build capacity for digital technology



Shareholders

Stakeholder Engagement Channel

- Annual General Meeting for shareholders
- Quarterly Analyst Meetings
- Quarterly information disclosure to the Stock Exchange of Thailand (SET)
- Quarterly activities and meetings with individual investors and the SET (Opportunity Day)
- Quarterly "Happiness" magazine for PTT bondholders including "PTT Bizway" newsletters for general shareholders

Interest of Stakeholders

- Creating good returns
- Business development for sustainability and future changes
- Research and development of clean and environmentally-friendly energy
- Operating PTT business in a responsible manner for society, communities, and the environment

Key Performance

- Good corporate management and continuous performance
- Appropriate payment of dividends to shareholders



Employees



Materiality Assessment Process

The materiality assessment process is based on the GRI Sustainability Report Standard 2016 and the Integrated Reporting Framework of the IIRC. This allows PTT to manage stakeholders' expectations in a balanced manner as well as various issues that may have impact upon the organization's value creation, and efficiently report performance in line with the interests of stakeholders.

Materiality Assessment Process

1 Identification of Material Issues for the Organization and Stakeholders

PTT gathers relevant material issues by evaluating internal and external factors including: strategic business direction, the context of risks and opportunities that may impact business operations, value creation for stakeholders, global trends and direction on sustainability, relevant standards and requirements, the government's strategic plans, and the needs and expectations of PTT's stakeholder groups. The material issues from the previous year were also reviewed and the scope of importance to stakeholders of each material issue was defined.

2 Prioritization

Responsible functions prioritize the various material issues by considering their level of impact on PTT's operations and value creation potential, which cover financial performance, business processes and operations, corporate reputation, impacts on customers, suppliers, and employees; and the level of impact on the organization's stakeholders as well as the issues' significance for stakeholder value creation.

3 Validation

The PTT Group Sustainability Alignment Committee (SAC) assumes the responsibilities for reviewing, evaluating, and validating the results of the materiality assessment, and provides their approval for information disclosure.

Materiality Assessment Matrix



Revisions to Material Issues

In 2018, innovation and technology became important components of PTT's business operations and value creation. Stakeholders likewise demonstrated more interest in these issues. For this reason, the company added Innovation into the Research and Development material issue, and changed the name of the issue to Research & Development and Innovation.

Materiality Assessment Results

The results of the 2018 materiality assessment revealed that the 3 highest priority issues were: Sustainable Governance, Climate Change, and Research & Development and Innovation. This was a result of a clearer evaluation of the global trends and direction on sustainability – on the issues of integrated sustainability management, considerations on importance of climate change, and PTT's role in contributing to greenhouse gas emissions reduction efforts at both the national and international levels. The issues also include research and development of technology and innovation for digital application in the company's operations, and the promotion of clean technology to support the future transformation of energy businesses. Meanwhile, the top 2017 material issues, Human Capital Development, and Talent Attraction and Retention, have been well managed by responsible functions, and thus their significance has reduced accordingly. For more information on the company's performance under each material issue, please refer to their relevant chapters.

For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Materiality Assessment" sub-heading.

| | | |
|---|--|---|
| <h3>1 Sustainable Governance</h3> <p>Implementing business strategies and managing risks for business continuity and in pursuit of sustainability Page 18</p> | <h3>2 Stakeholder Dialogues</h3> <p>Processes of engaging with stakeholders and gathering their feedback and opinions Page 8</p> | <h3>3 Fair Operating Practices</h3> <p>Good corporate governance, board responsibility, transparency, and anti-corruption Page 21</p> |
| <h3>4 Capital Project Management</h3> <p>Assessing the social and environmental impacts of capital projects and engaging with communities throughout a project's life cycle Page 26</p> | <h3>5 Supply Chain Management</h3> <p>Engaging with suppliers to enhance their capabilities, improve performance, and to identify new business opportunities Page 28</p> | <h3>6 Research & Development and Innovation</h3> <p>Research and development of technology, and promoting process, product, and service innovations that factor in customers' needs and health, safety, and environmental impacts Page 30</p> |
| <h3>7 Product Stewardship</h3> <p>Impacts of PTT's products and services on customers and customer relationship management Page 33</p> | <h3>8 Human Capital Development</h3> <p>Individual employee development and employee capacity-building through means such as training and knowledge management Page 36</p> | <h3>9 Talent Attraction and Retention</h3> <p>Building employee engagement, fostering an organizational culture, and providing opportunities for career advancement, work-life balance, and fair compensation Page 40</p> |
| <h3>10 Human Rights</h3> <p>Management of human rights risks across the supply chain Page 41</p> | <h3>11 Corporate Citizenship</h3> <p>Engaging with communities to enhance their livelihoods; developing the nation's human resources, and conserving natural resources and the environment Page 42</p> | <h3>12 Safety</h3> <p>Ensuring safety at all PTT operations, good occupational health and a safe work environment, process safety, and safety in ground transportation and logistics Page 50</p> |
| <h3>13 Security and Crisis Management</h3> <p>Incident prevention and crisis suppression to ensure business continuity Page 54</p> | <h3>14 Climate Change</h3> <p>Energy management and greenhouse gas emissions reduction Page 57</p> | <h3>15 Integrated Water Management</h3> <p>Managing water use together with local communities to prevent water shortages Page 60</p> |
| <h3>16 Air Pollution</h3> <p>Control of air pollutants including nitrogen oxides, sulfur oxides, and volatile organic compounds (VOCs) Page 62</p> | <h3>17 Effluents and Waste</h3> <p>Effluents and waste management Page 61</p> | <h3>18 Biodiversity</h3> <p>Managing impacts on biodiversity in areas surrounding PTT's operations and new projects Page 64</p> |

Internal Impact



External Impact



Value Creation for Sustainability

PTT Strategy

Global trends and challenges have driven PTT, as a core organization in national energy sustainability, to create business opportunities and growth in response to our stakeholders. Accordingly, we determined to develop corporate strategy that navigates us through the challenges and bring us long-term stability. In 2018, PTT remained adamant in implementing its Pride and Treasure of Thailand (PTT) Strategy by placing great significance on sustainability management in 3 aspects (3P) equally. The 3 aspects are conducting business in parallel to taking care of the community and the society (People); conserving natural resources and environment (Planet); and being a strong foundation for sustainable growth of the country's economy and society (Prosperity). In addition to creating business success for PTT, the strategy also drives PTT to take part in fostering the community, society, and environment, while ensuring the needs of all stakeholder groups are met. In strategy implementation, we also adhere to the good governance and ethical corporate management principles in order to be a sustainable organization the Thais can take pride of. Consequently, we developed "CHANGE for Future of Thailand 4.0" Policy enabling flexibility for our employees to adjust their ways of working to comply with current and future situations and challenges.



PTT will be one of the nation's driving mechanisms, an organization of pride, transparency, and sustainability.

Contribution to the UN's Sustainable Development Goals



PTT considered the UN's Sustainable Development Goals (SDGs) in addition to the global trends, challenges, and national strategies. PTT's Board of Directors approved integrating the SDGs into PTT's business development strategies. In 2018, 7 goals that were particularly concentrated on included Goals 7, 8, 12, 13, 14, 15, and 16. The related SDGs targets are as the followings.



Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Targets

- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
- 7.3 By 2030, double the global rate of improvement in energy efficiency



Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Targets

- 8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 percent gross domestic product growth per annum in the least developed countries
- 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
- 8.8 Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment



Goal 12: Ensure sustainable consumption and production patterns

Targets

- 12.2 Achieve sustainable management and efficient use of natural resources
- 12.4 Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle
- 12.5 Substantially reduce waste generation through prevention, reduction, recycling, and reuse
- 12.6 Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle
- 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities



Goal 13: Take urgent action to combat climate change and its impacts

Targets

- 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- 13.2 Integrate climate change measures into national policies, strategies and planning
- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning



Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Targets

- 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
- 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
- 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels



Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Targets

- 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally
- 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species



Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Targets

- 16.5 Substantially reduce corruption and bribery in all their forms
- 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels
- 16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

Details on these issues can be found in their relevant chapters.



Credits to the Global Goals for the SDG target logo, downloaded from <https://www.globalgoals.org/resources>

Corporate Strategy Performance

PRIDE

Creating PRIDE with participation



Promoting energy security and adding economic value to the country

- Signed a collaboration agreement in energy with Electricity Generating Authority of Thailand (EGAT). This collaboration was considered a milestone of the two Thai state-owned enterprises, both under the supervision of Ministry of Energy whose core missions involve overseeing the country's energy security. It was the beginning of energy business and innovation collaborations as Team Thailand for Energy Business for the country's economic growth and the people's well-being improvement.
- Signed a contract on Liquefied Natural Gas (LNG) sales with Big Gas Technology Co., Ltd. It was the first time PTT signed a sales contract with a private supplier. The supplier distributes LNG to industrial factories located off the route of natural gas pipes. The distribution offers the factories an access to LNG, clean energy used as an alternative of liquefied petroleum gas (LPG) and bunker oil. LNG helps reduce the factories' energy cost for 3 – 5%.
- Opened 56 Compact Model service stations or small PTT service stations located on secondary roads connecting the town center with districts. The number of Compact Model service stations opened this year was higher than the original target set.



Conducting business with transparency and good governance

- Appointed a Senior Executive Vice President overseeing Corporate Governance and Regulatory Affairs and in charge for developing policy and direction of the organization. We also established the Good Governance and Corporate Ethics Department overseeing and supporting good governance practices. The department also acts as the contact center for grievances, tips, following-up with incidences reported, and protecting those who come forward with grievances and treating them with fairness.
- Certified as a member of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) for the 2nd consecutive round.
- Evaluated as an organization with an excellent performance in the Integrity and Transparency Assessment by the Office of the National Anti-Corruption Commission for the 5th consecutive year.



Promoting shared value creation for society and demonstrating environmental responsibility

- Promoted service stations as a platform to sell agricultural products such as rice, pineapples, garlics, and rubbers for farmers without charge to provide more distribution channels.
- Collaborated with the State Railway of Thailand in testing biodiesel B10 fuel, used in train engine for the route of Baan Laem – Mae Klong in support of the government's policy of increasing the ration of biodiesel from 7% (B7) to 10% (B10). This was in order to reduce 36,000 liters of palm oil in the market, improve engine combustion, and decrease greenhouse gas emission.
- Became the first distributor in Thailand who started selling PTT UltraForce Diesel, Euro 5 Standard certified premium diesel fuel with less than 10 ppm level of sulfur.
- Opened 4 branches of Café Amazon for Chance through Sarn Palung Social Enterprise Company Limited. The project employed 12 staff who had hearing disability and purchased 128.2 tonnes of coffee beans from hilltribes for the cafés in 2018, higher than previously set goal.

TREASURE

Pride and Treasure of Thailand



Building organization's strength to become a top quartile performer

- Developed Commodity Trading and Risk Management (CTRM) to improve the information and technology systems in preparation for business expansions in sales volume, transportation of products, and complication from price risk management and future new products trades.
- Collaborated with Kasikorn Bank as the first oil company in Thailand to develop PTT e-Wallet to provide a convenient and quick channel of payment for customers in response to the government's National e-Payment within the Thailand 4.0 Policy.
- Improved work efficiency of every business unit to continuously increase productivity and reduce cost, generating PTT Group 46,530 million profits before interests and taxes.



Expanding growth and managing investments for all business groups

- Transferred assets and liabilities of oil business units as well as shares of related companies to PTT Oil and Retail Business Public Company Limited
- Acquired shares of IRPC Public Company Limited from Government Savings Bank, increasing shares ration in IRPC to 48.05%. This was an increase in investment proportion in petrochemical and refinery business with a promising growth capacity.
- Collaborated with the National Science and Technology Development Agency (NSTDA) to plan, develop, and manage Wang Chan Valley in Rayong Province as an efficient base of the Eastern Economic Corridor of Innovation (EECi) in order to support science, technology, and innovation competitiveness capacity of the country.
- Signed an agreement on technology and innovation collaborations with 9 banks – Bangkok Bank, Krungthai Bank, Bank of Ayudhya, Kasikorn Bank, TMB Bank, Siam Commercial Bank (SCB), Thanachart Bank, United Overseas Bank (UOB), and Government Savings Bank to collectively drive financial innovation development and improve financial systems.
- Signed a collaboration agreement with the State Railway of Thailand to develop Smart City and rail transportation systems consisting of researching and creating a development plan of Phahonyothin area surrounding Bang Sue Station with environmental-minded energy management for sustainable development.



Preparing the organization for exponential growth through the search for new business opportunities

- Signed a collaboration agreement with the Krungthep Thanakom Company Limited for the development of energy and digital technology innovations to generate adding values throughout the chain of business operations and services. The collaboration employed digital and technology as a foundation to provide services and to develop to "Bangkok, Smart City"
- Signed a collaboration agreement with Etran (Thailand) Company Limited for technical supports in the development of model electric motorcycles which was also exhibited at the Motor Expo 2018. The collaboration was to add on to the environmentally friendly electric vehicle innovation.
- Signed a collaboration agreement with the National Innovation Agency (Public Organization) (NIA) to improve innovation capacity and to further develop and commercialize PTT's research and findings.
- Invested corporate venture capital in 5 energy and technology funds in the United States and 2 start-ups in Thailand.



Value Creation

Input



Financial Capital

- 28,562,996,250 shares of issued and additional paid-in capital
- 1,995,722 million baht revenue from products and services in 2017
- 345,395 million baht from EBITDA (Earnings Before Interest/ Tax/ Depreciation)



Social and Relationship Capital

- Relationship between PTT and our stakeholders
- Brands and reputation
- Investment in social development 1,558.51 million baht
- Cooperation with stakeholders



Manufacturing Capital

- Production and research facilities
- Infrastructure such as natural gas pipelines and petroleum terminals



Human Capital

- 3,715 PTT employees
- Skills and experiences of our people, suppliers, and partners
- 73.68 hours of average training time of employees and managers
- Motivation for improving processes, goods and services
- Determination to promote health, occupational health, and well-being of the employees



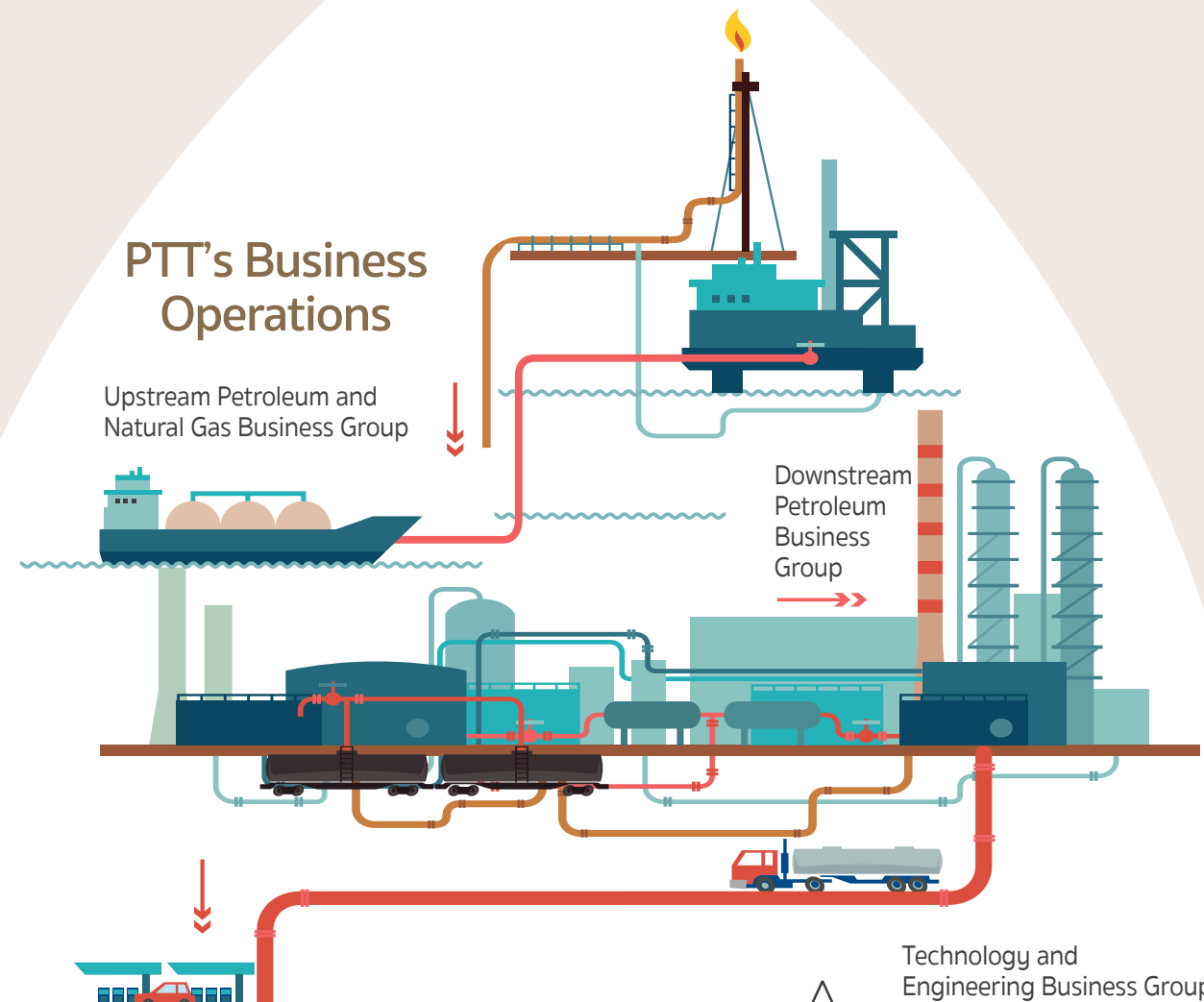
Intellectual Capital

- Knowledge – based assets
- Licensed technology
- Innovations and other initiatives



Natural Capital

- Renewable and non-renewable natural resources
- Environmental investments – 384 million baht



Product and Service

- Natural gas
- Natural gas pipelines
- Petrochemical
- Aviation fuel
- Marine fuel
- Industrial fuel
- Petroleum – based lubricants
- LPG

Value Creation



Conducting business in parallel to taking care of the community and the society
(People)

- Human capital return on investments of 246 times
- Employee engagement score of 71%
- Employee turnover rates: Male employees 2.17; Female employees 2.12
- Employee succession rate - 100%
- Community engagement in operational areas – 100%
- Stakeholders engagement score of 84
- No community conflicts



Conserving natural resources and environment
(Planet)

- Direct greenhouse gas emission (Scope 1) 29.24 million tonnes of CO₂ equivalent
- Direct greenhouse gas emission (Scope 2) 1.44 million tonnes of CO₂ equivalent
- Volume of water recycled and reused 8.81 million cubic meters
- 160,000 hectares of reforestation project to honor His Majesty the King Bhumibol Adulyadej to offset 2.18 million tonnes of CO₂ emissions per year and contributed 280 million baht per year in value.



Being a strong foundation for sustainable growth of the country's economy and society
(Prosperity)

- Revenue from products and services 2,336,155 million baht
- 351,397 million baht from EBITDA
- Net Debt / EBITDA ratio - 0.31
- Basic earnings per share - 4.15 baht
- Income taxes payment 53,647 million baht
- 6 gas separation plants with production capacity of 2,820 million cubic feet/day
- Natural gas pipelines of approximately 4,772 km in length
- 1,845 service stations*
- 14 electronic vehicle service stations
- 38 new products, with 3 products in the patent registration process
- Direct and indirect revenue of 1,316 million baht from research and development

* Domestic service stations from PTT and PTTOR as of December 2018

Corporate Governance

Corporate Governance for Sustainable Value Creation



Good GOVERNANCE



Board Responsibility

The PTT Board of Directors has formulated a strategy on the principles of good governance and sustainable growth and encouraged employees to exhibit a working culture characterized by “talent, ethics, and responsibility,” to ensure that the company is able to adapt appropriately to challenges in all contexts – from within and outside of the organization. The Board places emphasis on ethical business practices and the straightforward disclosure of information; is accepting of audits in all processes, and is steadfast in its determination to transform PTT into a sustainable organization as Thailand’s national energy company. Such approaches will ensure that the company can build confidence among investors, financial institutions, business partners, and furthermore, create added value and balanced benefits for all stakeholders.

The Board of Directors has established and assigned the Corporate Governance Committee, which consists of 3 independent directors, to oversee PTT’s governance in a way that aligns with good governance principles, work related to sustainability management and anti-corruption, and to report its performance to the Board, where performance indicators relating to good governance and sustainability management constitute a part of the Board’s annual targets. In 2018, key actions by PTT’s Board of Directors included the following:

Organizational Restructuring

The PTT Board of Directors issued a resolution to restructure the organization, which called for the establishment of the Technology and Engineering Business Group to support PTT Group’s innovation development, and to foster collaborations with various organizations including the public and private sectors and suppliers to research, study, and develop technologies that can respond to and create value for stakeholders. In addition, the Board created the role of the Senior Executive Vice President, Corporate Governance and Regulatory Affairs, to undertake the responsibility of enacting policies and determining direction on corporate governance; to manage corporate reputation, and to strengthen PTT Group as a model organization for best practices, one that would be ready to exchange experiences both inside and outside of the organization and to be accepted as such by external agencies.

Moreover, the Board added responsibilities to the Risk Management Committee to ensure that their oversight extended to stakeholder management, and revised the role of the Corporate Governance Management Committee (CGMC) to cover good governance and compliance, operational risk management, internal controls, compliance with rules, laws and regulations, and to act as the company’s center for Anti-Corruption in State Enterprises. In light of this, the Committee’s name has been changed to the Governance, Risk and Compliance Management Committee (GRCMC).

Revision of the Corporate Governance, Ethical Standards and Code of Business Ethics Handbook (CG Handbook)

The Corporate Governance Committee deemed it suitable to revise key content in the Corporate Governance, Ethical Standards and Code of Business Ethics Handbook (CG Handbook) concerning the restriction on the number of director positions that PTT directors can hold in state-owned enterprises and/or as a juristic person, to ensure that this aligned with the criteria of the Corporate Governance Report of Thai Listed Companies (CGR). This measure will further increase the efficiency and transparency of corporate governance for the company.

For a detailed summary of performance by the PTT Board of Directors and the Corporate Governance Committee, please refer to PTT’s 2018 Annual Report or www.pttplc.com and refer to the “Sustainability” heading and “Corporate Governance and Responsibility” sub-heading.



Risk and Opportunity Management

In recognizing the constantly changing nature of internal and external risk factors, PTT has put in place a systematic risk management approach that allows it to appropriately adapt and react to any situations that might occur; mitigate damages ensuring from risks, and create business opportunities from such changes. Such an approach enables the company to consider value creation for stakeholders in a balanced manner, over both the short- and long-terms. PTT adheres to internationally-recognized frameworks and risk management processes including COSO Enterprise Risk Management and ISO 31000, and also strives for continuous improvements in order to build business resilience. The company has implemented a clear policy and risk governance structure, which consists of the Enterprise Risk Management Committee, Audit Committee, the Corporate Plan and Risk Management Committee as well as relevant company functions, to collectively push for efficient risk management across the entire organization. Furthermore, PTT has measures for identifying and selecting key risk factors as part of its yearly planning process, factors which cover environmental, social, and governance (ESG) dimensions, and align with PTT’s strategic direction and sustainability management context. This involves evaluating the likelihood of risk occurrence and its potential impact on stakeholders, in order to determine its significance, before it is included as part of the Corporate Risk Profile and is assigned to risk owners to manage within acceptable levels. Finally, risk monitoring and reviews of risk factors are regularly undertaken.

In addition, PTT has integrated risk management principles into various internal processes within the organization in order to build awareness of uncertainty in business, and to promote risk management as integral to business conduct in order to prepare for and respond to any situations that may occur in the future. As for risk management approaches that focus on critical process interruptions and Black Swan events (low risk, high impact), PTT has implemented a Business Continuity Management Plan (BCM) which aligns with the international ISO 22301:2012 standard, as well as with other relevant business continuity management systems and standards. The results of risk management and business continuity management are periodically reported to the Enterprise Risk Management Committee, and such approaches are also deployed within PTT Group through the PTT Way of Conduct.

Risk Governance

PTT strongly believes that efficient risk management is crucial to the organization's sustainability. As a national energy company that must confront innumerable challenges, laying down a strategy and carefully managing risks is thus vital to business operations. Given this, the PTT Board of Directors has assigned the Enterprise Risk Management Committee the responsibility of overseeing and managing the company's risks within appropriate levels. They must do so in compliance with the principles of good governance, and ensure that PTT's risk management is efficient in reaching set targets, is able to reduce the impacts stemming from an uncertain business environment, and builds confidence for shareholders who can be certain that PTT's risk management system responds to all dimensions of risks.



In 2018, PTT organized a research study trip to Denmark, Norway, and the United Kingdom for the Board of Directors and the Enterprise Risk Management Committee to visit energy businesses and study new technologies. The objective was to provide the Board with new perspectives for doing business; to learn from foreign start-ups, consult with public organizations responsible for alternative energy businesses, and to meet with foreign energy companies. It also involved a visit to PTT International Trading London Ltd (PTTT LDN), where the Board of Directors provided advice to them on risk management in international trading transactions to support their mission of creating energy security for the country.

Promoting an Organizational Risk Culture

PTT promotes the creation of a risk management culture across the organization, where it falls upon the company's management and employees to conduct themselves according to PTT's Risk Management Policy, Risk Management Framework, and Risk Management Process. They are also required to regularly report on risk management performance; to revise and improve risk management effectiveness using various indicators, and assign risk management indicators for PTT Group's management. The company also requires that risk management is included in the enterprise planning process and in investment considerations. Furthermore, PTT has added the issue of risk management into the organization's SPIRIT values in order to promote learning and distribute knowledge on risk management to PTT's Board of Directors and employees. For the Board, this is achieved through risk management training courses in collaboration with the Thai Institute of Directors; for employees, it involves organizing risk management training courses and sharing information on risk management through the PTT Enterprise Risk Management Manual and the Knowledge Management (KM) community, which is the central mechanism for deploying risk management approaches, among other measures.



For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Risk and Crisis Management" sub-heading.

Fair Operating Practices



Embedding an Ethical Business Culture

PTT employs the principles of good corporate governance as the key to building and maintaining trust in the organization. This is not merely because PTT highly values integrity and ethics, but also because such principles help to manage the organization efficiently and transparently, ensures accountability, and creates value in a balanced way for all groups of stakeholders. The Corporate Governance Committee is therefore focused on integrating good governance principles into all work processes and applying it for constant development, as this will enhance practices in line with international levels. Such efforts are led by top management, who have a vision for creating an understanding of ethics and conduct themselves as positive role models for employees, striking a balance between governance and overseeing efficiency in operations. This further includes building strength from within, as staff are encouraged to be both professional and ethical individuals. Additionally, the company has designated channels to accurately disclose information to stakeholders and to provide advice in case of any issues of concern. There is also a proper channel for receiving grievances and whistleblowing related to corruption, which is equipped with serious measures for managing them. All of PTT's employees are required to closely study the CG Handbook and strictly adhere to its requirements as part of their work discipline.

In embedding an organizational culture based on integrity and ethics, PTT aims to foster an atmosphere and an environment that is unaccepting of corruption in any form. The focus is on building robust awareness about corruption at all levels – from the Board level to management and employees. This is achieved

through training courses on good governance and anti-corruption, which are offered at all new employee orientations, and regular employee trainings on ethics and the code of conduct to refresh their understanding. The CG Camp was also held for the 5th consecutive year to offer employees the opportunity to learn intensively about CG principles and apply it in their work, so that they can communicate such matters to their colleagues later on. In addition, PTT has developed the CG E-Learning System as a portal for employees to independently study corporate governance principles and the code of conduct, no matter where they are. This is achieved through various virtual event simulations which help to raise their awareness and helps them to apply their learnings appropriately to real-world conditions. The company also added 3 chapters into the CG E-Learning System – featuring content on the prevention of money laundering, creditor practices, and the Anti-corruption policy – to make sure that the System reflects the 4th revision of the CG Handbook, and is open for employees to test their CG knowledge and understanding throughout the year. To date, a total of 3,377 participants have used the CG E-Learning System for learning and tests, or the equivalent of 90.9% of all employees.

Furthermore, PTT has extracted key content from the CG Handbook to develop into engaging communications materials for distribution through all available channels, for instance, question and answer games, the CG Intranet, CG Tips, and CG Comics – helping employees to update their understanding correctly. In 2018, PTT added an employee communications channel, the 'CG Channel' page, into the 'PTT Workplace' portal, and included ethics and adherence to the business code of conduct as one part of the employee 'Core Competency' requirements, which are used in employee career advancement evaluations and annual performance reviews.



To encourage employees to adhere to ethical principles as required by the organization's values, the I-Integrity & Ethics Working Team organized the PTT Integrity Forum 2018 event for the 2nd consecutive year, where approximately 200 employees were in attendance. The concept behind the event was to transform PTT into a transparent organization upon the foundation of a governance, risk and compliance (GRC) system. The company's directors and top management together communicated their vision for building an organizational culture based on GRC, and called for management practices that aligned with the 'Three Lines of Defense' concept. A lecture titled, "Integrity to Sustainability," and a workshop seminar, "Transforming into a Top Sustainable Performing Organization with GRC," were held during the event. Ultimately, this Forum is a means for the company to create mutual understanding for employees and deploy that understanding to PTT Group companies, in order to strengthen PTT Group from within, and expand that knowledge outwards.



"Creating a culture of good governance, risk management and internal controls, and ensuring compliance in business practices (GRC), has been something that PTT has always prioritized in our business conduct. In 2018, the PTT Board of Directors approved the establishment of a Corporate Governance and Regulatory Affairs function to assume the responsibility of integrating the GRC system and elevating standards of work. This is an important step in building trust and transparency for the organization. Furthermore, PTT encourages all of our employees to instill a DNA of honesty, integrity, and ethics into their work. As can be seen in the company's SPIRIT Values under I-Integrity & Ethics, this must start from within."

Mr. Chansin Treenuchagron
President and Chief Executive Officer
PTT Public Company Limited
Speaking at the PTT Integrity
Forum 2018 on 25th September 2018



Anti-Corruption and Transparency

In view of the current situation in which innovation and technology have now assumed a crucial role in improving the efficiency of PTT's operations, the company has encouraged the use of communications technology for information search and storage. This will improve the efficiency of information access – making it faster, more convenient, and readily available for any need. It will also be an important measure for creating transparency, accountability, and avoiding conflicts of interest within the organization. Several systems were therefore created inside the company's intranet to allow all PTT management and employees to demonstrate their transparency, as is required by the latest CG Handbook. These systems included one for advance reporting on the trading of PTT Group company assets in order to prevent insider trading, and a system to report gifts, assets, or other benefits received by employees, as stipulated by the company's No Gift Policy. Employees are able to report instances in which they had to accept gifts or assets and were unable to return them, and these will then be collected by the company to be given as donations to various charity organizations.

In 2018, following the resolution by the PTT Board of Directors to approve the restructuring of work on corporate governance and regulatory affairs, the company set up the Corporate Governance and Ethics Promotion Function. This Function is to serve as the central entity for receiving incident reports and whistleblowing reports; monitoring incidents, protecting and fairly treating those who had reported the grievance or assisted in providing information relating to incidents of corruption; reporting results of the investigation, issuing punishments to the relevant management function or committee, and finally, reporting the results to all parties involved. In 2018, PTT received 6 grievance reports through the whistleblowing channel which were related to general management, procurement, and operations. Following due processes of investigation, the company found that these 6 issues were not causes of corruption. However, it was discovered that these incidents involved wrongful conduct by employees and were considered breaches of the code of conduct. Such cases resulted from carelessness, deliberate hiding of the truth, violations of PTT's rules, regulations or orders, and purposefully stalling PTT's operations thereby causing damages to the company. On all of these issues, PTT has completed the appropriate processes for their resolution.



In 2018, **100%**
of PTT employees filed their
conflicts of interest disclosures.
No significant conflicts of
interest were found.

Given that, in 2017, PTT organized a training on anti-corruption management systems for the company’s management staff at the functional level and above, in 2018 the company organized the same training course for management and employees at all levels, held over 2 sessions. The trainings were attended by approximately 200 participants. Aside from providing knowledge to internal staff and relevant individuals, PTT also shared knowledge on various relevant areas to external agencies and the general public as part of the effort to create a network for transparency, and to enhance capabilities for preventing and suppressing corruption in Thailand. These included:



Promoting good corporate governance for the State Railway of Thailand (SRT) through the State Enterprise Management Support Project (Mentoring Project), in which PTT was assigned by the State Enterprise Policy Office (SEPO) to oversee, support, promote, share experiences and elevate the organizational management levels of other state enterprises.



Encouraging PTT suppliers and sales representatives to declare their commitment to be a part of Thailand’s Private Sector Collective Action Coalition Against Corruption (CAC) through seminars and meetings on various issues. PTT also invited its suppliers to attend the SME Executive Briefing event organized by Thailand’s Private Sector Collective Action Coalition Against Corruption to explain the details for their involvement in the CAC Small and Medium-sized Enterprises (SME) Certification Program, which aims to support SME businesses with the relevant tools to develop their own guidelines and internal measures for protecting against the giving and receiving of bribes, similar to those available for large organizations. In 2018, PTT communicated to its suppliers about anti-corruption measures at the annual Supplier Relationship Management seminar, which was attended by approximately 200 suppliers.



PTT highly prioritizes the integration of work and the development of an anti-corruption network together with public and private agencies, in order to work towards the elimination of corruption in a tangible way. This is accomplished through various types of activities, such as becoming a member of a network to organize the National Moral Assembly event; participating in the National Anti-Corruption Day organized by the Anti-Corruption Organization of Thailand, and the development of PTT’s Master Plan and Action Plan on Moral Promotion for the National Moral Promotion Committee under the Department of Religious Affairs, Ministry of Culture, among others.



Drafting the 4-Year Action Plan on Preventing Corruption in State Enterprises (2018-2021), according to the MOU signed between the Office of the National Anti-Corruption Commission (NACC), the State Enterprise Policy Office, and state enterprises.

“For management, being a ‘role model’ is a very important responsibility. Management have to strictly adhere to principles of ethics and codes of conduct; they have to uphold what is right, and create the inspiration for employees to follow. They must also encourage these practices in all work processes. If an environment conducive to such conduct is created, it will help to build a strong organizational culture in the future.”

Mr. Kris Imsang

Senior Executive Vice President, Corporate Governance and Regulatory Affairs
 PTT Public Company Limited
 Speaking at the PTT Integrity Forum 2018 on 25th September 2018



For more information please visit www.pttplc.com and refer to the “Sustainability” heading and “Fair Operating Practices” sub-heading.

Economic



Business Growth



To increase competitiveness in accordance with corporate vision and mission, PTT Group have devised strategies to focus on productivity improvement, the introduction of technology, innovation and digitization to add work value for most effective results. This effort has established PTT as provider of energy security for over 40 years, while sustaining national economic growth. In 2018, the generated economic value was 2,145,287 million baht. PTT Group has continuously strived to achieve business growth with stability and sustainability, through investment in key capital projects.

Creating Strength for the Present

PTT has improved the organization structure to confront significant challenges, allow resilience and capability in work processes in accordance to corporate strategy to create balanced and sustainable value for stakeholders. On July 1st, 2018, PTT has transferred its oil and retail business to PTTOR, enabling it to become PTT Group's Flagship Company. This is in alignment with the government strategy for oil market liberation and create alternative quality service for the public. In terms of investments in the petrochemical and refining business, PTT have acquired shares in IRPC from the Government Savings Bank. As a result, PTT now owns a total of 48.05%, an investment with potential and secure growth in the future.

Since 2016, natural gas production has decreased and new concessions have become uncertain. PTT have negotiated with producers to increase the guaranteed duration of natural gas supply and monitored progress to enable contingency plans. The initiation of the LNG Receiving Terminal extension project for an additional 1.5 million tonnes capacity is an extension of the port and LNG Receiving Terminal construction completed in September 2018, befitting the aim to provide reliable and secure energy for the nation. This allows for increased capacity to 11.5 million tonnes/year from the previous 10 million tonnes/year. The system is currently undergoing tests. Additionally, there has been progress in the LNG Receiving Terminal project in Ban Nong Faep Sub-district, Rayong Province, with a capacity of 7.5 million tonnes/year, scheduled to operate in 2022.

Economic value distributed



Operating costs
2,023,002
Million Baht



Employee wages and benefits
9,953 Million Baht



Dividend payments for annual performance
57,126 Million Baht



Income taxes payment
53,647 Million Baht



Social investment
1,558.51 Million Baht

The International Trading Business Unit have strategies in place to source crude oil from the United States. This is in collaboration with a national oil company in Southeast Asia. The initiative ensures crude oil reserves that meet national demand while focusing on creating new business opportunities by readily increase the amount of LNG products and green commodities. Both of which have lower greenhouse gas emission than oil and coal. The aim is to increase the amount sold to 1 million tonnes/year by 2025.

Future Business Growth

In an era with fossil fuel limitations by quantity, accessibility and higher production cost, energy business requires adaptation and changes in strategic direction to confront challenges in the near future. The importance of resilience to confront disruptive technology and future consumer behavioral changes has led PTT to invest in long-term new S-Curve businesses or businesses with exponential growth in accordance to the Design Now Strategy. The organizational structure reform to create a reporting line under the Senior Executive Vice President for Innovation and Digital within the technology and engineering business. This enables the development of PTT Group's innovation and technology into new valued added businesses. This initiative creates stable and sustainable value for stakeholders.

PTT's investment in the new S-Curve business is a long-term growth investment in 4 potential business groups namely:



NEW S-CURVE

Innovation and technology required to develop new PTT Group S-Curve businesses inherently aligns with the government's Thailand 4.0 Model on creating Existing S-Curve and New S-Curve.

PTT Group in conjunction with the National Science and Technology Development Agency (NSTDA) have developed Wang Chan Valley, Rayong Province, to become the research and developmental hub for innovation and technology. This facilitates network building between national and international entrepreneurs, enhancing new businesses under within the Eastern Economic Corridor of Innovation (EECI).

Investment in PTT's new S-Curve boundary is secured from various channels, including internal processes and external factors. This comprises selected technology and innovation research results from PTT Innovation Institute, which passed the process of PTT Idea to Commercialization Gate (I2C Gate). Others include Vidyasirimedhi Institute of Science and Technology (VISTEC) or joint research and studies with leading national and international institutions. Furthermore, governmental policies also perceives opportunities for merger and acquisition, joint ventures, or Corporate Venture Capital involving Express Solution or Expresso. The Expresso team, comprising new staff who have received PTT scholarship to study abroad, is responsible for the analysis, monitoring, research and investment in startup businesses with innovation and technology to develop new businesses.

Upon discovering business opportunities, a decision making processes and review is to be held by the investment committee to ensure that investment in new businesses will truly create added value to stakeholders and provide sustainable growth to PTT Group.

Capital Project Management



It is both a challenge and an opportunity for PTT to ensure energy security, meeting the increasing national demand for energy, from electricity generation, industrial, and transportation sectors. In the past year, the Energy Planning and Policy Office (EPPO) has approved PTT to proceed with the natural gas pipeline network as part of the natural gas infrastructure plan. Aiming to create energy security and economic values for national economy, PTT has a set of processes involved for its project management: planning, devising strategy, developing its employees' skills and capability, as well as a fair and proactive stakeholder management. Moreover, PTT also seeks opportunities to create a network of cooperation with other groups such as the business sector, the academic sector, educational institutes, the public sector and the civil society. This is to ensure an exchange of information and an active participation of various stakeholders, benefiting the public and business operations.

PTT is committed to minimize social and environmental impact of its projects in every stage: pre-operation, during-operation, and post-operation. It is committed to engage with stakeholders anticipating impacts from the project, to conduct environmental impact analysis report, and to manage grievance. On addressing grievances of potentially affected party, stakeholders and community members can express their concerns to the Project Coordination Center or to PTT's Call Center (1365). All grievances will be fully investigated. Findings will be used to develop further impact prevention measures.

A committee composed of province and district representatives of governmental and local community leaders has also been formed. The committee analyzes the cause, work to mitigate and prevent environmental impact following the prevention measures. It has the authority to govern, monitor prevention measures, and resolve issues relating to project operations or impacts. Concerns are discussed in accordance to the step laid out by grievance mechanisms. The representatives also work together to evaluate the completion of the project against project operations excellence goals, for maximum benefits to PTT and the country. A strong coexistence of the community and the environment is a foundation of a stable and sustainable business growth.

Capital Projects in 2018

Onshore Gas Transmission Pipeline Nakhon Ratchasima (Phase 2)

passes through 5 sub-districts and 4 districts* in 1 province. The total distance is 33 kilometres. The construction has been completed according to plan. Currently, the gas distribution system is under tests. It is expected to deliver gas to customers by the scheduled date. PTT encouraged community engagement throughout the construction period. It also closely followed prevention methods and environmental safety practices, resulting in positive acceptance from people in the areas and the communities.



Onshore Gas Transmission Pipeline No. 5

passes through 104 sub-districts and 29 districts* in 8 provinces: Rayong, Chonburi, Chachoengsao, Prachinburi, Bangkok, Pathum Thani, Ayutthaya, and Nonthaburi. The total distance is 415 kilometres. Currently, the project is under the process of construction. The expected due date is 2021. During the construction, the project has held stakeholder meetings.



Onshore Gas Transmission Pipeline No.6 Ratchaburi Gas Controlling Station - Wang Noi (RA#6)

includes areas in 34 sub-districts, 8 districts* in 4 provinces: Nonthaburi, Nakhon Pathom, Ratchaburi, and Kanchanaburi. Currently the project is under construction with an expected due date in 2020. The project hosted stakeholder meetings during the construction period.



Remark:

* There has been a change in the natural gas piping routes, affecting the number of districts estimated in 2017.

Capital Project Management Results

| Action Plan | 2018 | | 2019 |
|---|-------------------------|--------|--------|
| | Results | Target | Target |
| Environmental impact controls, monitoring and assessment to ensure compliance to environmental measures | | | |
| Project acknowledgement and acceptance | Project acknowledgement | | |
| | | | |
| Stakeholder participation | Project acceptance | | |
| | | | |
| Number of community grievances and resettlements | | | |

PTT has created reports assessing environmental impact for the Office of Natural Resources and Environmental Policy and Planning (ONEP) and the Department of Energy Business (DOEB). PTT also has created more reports for relevant organizations throughout the project execution periods. Stakeholders and those who are interested to know more may request such reports from ONEP and DOEB.

For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Project Management" sub-heading.



Supply Chain Management



PTT employs comprehensive risk management mechanisms throughout the supply chain and processes to collaborate with various parties to ensure that the organization could handle normal business operations and could assume constant preparedness for emergency and crisis situations. PTT Group companies develop and plan for joint strategies on resource utilization to ensure supply security and business continuity. This is essential to mitigating risks and delivering long-term revenue for PTT.

Sustainable Supplier Management

PTT's sustainable supply chain management is directed by PTT Group Sustainable Sourcing and Supplier Management Policy. The company also implements the PTT Supplier Sustainable Code of Conduct (SSCoC) that aligns with relevant rules and regulations. The SSCoC covers a variety of topics namely, business ethics, social responsibility, occupational health and safety, and environmental management. PTT encourages its suppliers to comply with the requirements to ensure sustainability in the supply chain.

100% of new suppliers screened using the Environment, Social and Governance (ESG) assessment criteria.



100% of PTT suppliers with the purchasing order value of over 2 million baht, and/or suppliers whose work affects safety and the environment as well as suppliers who wish to register with PTT, signed acknowledge on and complied with the PTT Suppliers Sustainable Code of Conduct.



To efficiently manage suppliers, PTT assesses risks based on economic, social, and environmental performance in the supply chain as well as a spend analysis. Suppliers are categorized into 3 levels namely,





Critical suppliers must also undergo a sustainability assessment. PTT develops an annual plan for the Sustainable Performance Assessment of critical suppliers. In 2018, PTT worked with external partners to assess the sustainability performance of 11 critical suppliers, accounting for 100% of the number of suppliers planned for the year. The result of the assessment showed no non-compliance with the requirements, regulations, or the Supplier Code of Conduct.


With the aim to encourage good practices and promote its policies regarding transparency and anti-corruption among its suppliers, PTT engaged 26 companies through the annual Supplier Relationship Management (SRM) seminars and workshops to build suppliers' capacity in sustainability. These seminars and workshops allow PTT and its suppliers to jointly improve economic, social, and environmental management by developing technology and knowledge, and taking into account customer demand, thus enabling suppliers to grow together with PTT.


In addition to the work with its suppliers, PTT also enhances capabilities of procurement staff within PTT and its group companies, as well as of employees in other functions who are involved in supplier/contractor management. This helps to promote the proper understanding of procurement processes of the organization, strengthen their expertise in specific areas, and prevent any conduct that runs counter to its requirements.

Creating Shared Value with Suppliers

 In collaboration with its suppliers, PTT organized a workshop on new product development to meet customer demand for bunker oil in alignment with the changing requirements of the International Maritime Organization (IMO). Coming into effect in 2020, the new requirements would raise the standards for bunker oil used as marine fuel. This workshop thus helped to prepare PTT and its suppliers for more efficiency in overall sourcing to constantly meet market demand in the future.

 Together with a GC refinery which is the supplier within PTT Group, PTT launched the PTT-GC Logistics Improvement Project to increase the logistics capability as part of the project to improve the JET A-1 refueling service by truck at GC. The fuel has now been directly transported to U-Tapao Airport via truck instead of transporting via pipeline from the refinery to Lam Luk Ka Oil Terminal. This resulted in the ability to transport more fuel, thus meeting the customer demand while reducing cost by 79% or approximately 21 million baht annually.

 PTT continued the PTT Group Marine Excellence Project with the aim to enhance transparency and fairness toward stakeholders through vessel quality check, procurement of vessel services, and other logistics activities relating to PTT Group's ports. The Project helps to promote the Thai merchant marine and increase efficiency of the Group's procurement.

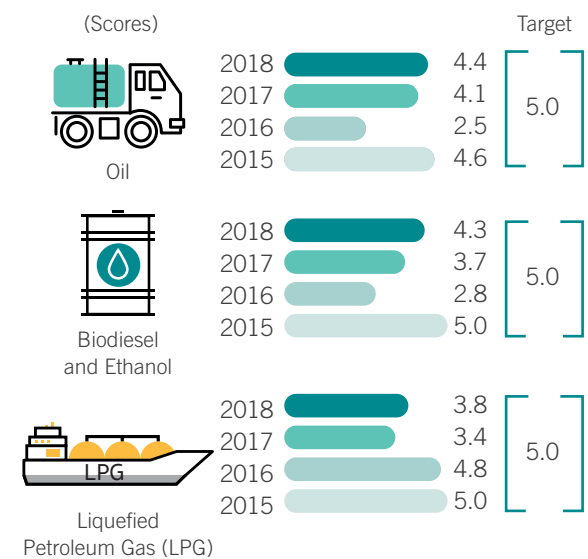
 PTT enhanced supplier capabilities based on the Green Industry criteria so that they meet international supplier standards, thus helping PTT to advance sustainability in its supply chain.



For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Supply Chain Management" sub-heading.

Energy Supply Security

PTT regularly assesses security in energy supply by evaluating the proportion of each product received from refineries against its monthly Supply and Logistics Optimization Plan by supplier. Sourcing of biodiesel and ethanol is determined based on the adequacy of the quantity sourced and the company's long-term strategic plan to meet demand. On the other hand, the security of LPG supply is assessed by whether the sourcing can respond to the changing government policy.



Remarks:

- The energy sourcing security score for liquefied petroleum gas (LPG) was below target due to fluctuation in demand as a result of the changing government policy on trade liberalization since February 2018.
- The 2018 energy sourcing security scores for oil, and biodiesel and ethanol were calculated from the performance during January – June 2018 as the procurement of biodiesel and ethanol had been transferred to PTTOR since 1st July 2018.

Support for the Promotion of the B20 Diesel Consumption Project

PTT supports the sourcing of B100 diesel to be utilized in the Promotion of the B20 Diesel Consumption Project for public transport for the Bangkok Mass Transit Authority (BMTA) and the Transport Co., Ltd. (BorKorSor) in response to the Ministry of Energy's policy on promoting palm oil usage to help oil palm farmers. Concurrently, this also results in the reduction of air pollution and helps to prepare for oil price fluctuation which would have an impact on the cost of living. In 2018, PTT produced and sold a total of 125,000 liters of B20 diesel to BMTA and BorKorSor.

Product Stewardship



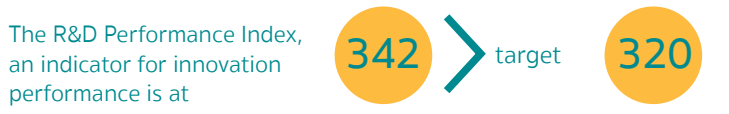
PTT's strategy emphasizes the identification of growth-enabling business opportunities with fair value-creation to stakeholders. The promotion of innovation and research & development are crucial factors facilitating the achievement of the aforementioned strategy.

Innovation for Sustainability

For PTT, research and development of innovations refers to new product development, or product and process improvement. Improvement may refer to increased productivity, reduced cost, or any other non-financial results. PTT's research projects can be categorized as follows: long-term projects, focusing on technological development and preparation for emerging changes; product development, addressing short-term business needs; technical-support, providing solutions for processes, testing service, or technical advisory related to PTT Group's various businesses (e.g., research and development of fuels, lubricants, polymers, petrochemical products, automobiles, the environment, as well as prolongation of natural gas pipelines). Notably, PTT has earmarked a research and development budget of no less than 3% of its net profits per year, which is in alignment with the country's Research and Development Promotion Policy. PTT Innovation Institute, founded over 20 years ago, is an active part in driving this performance.

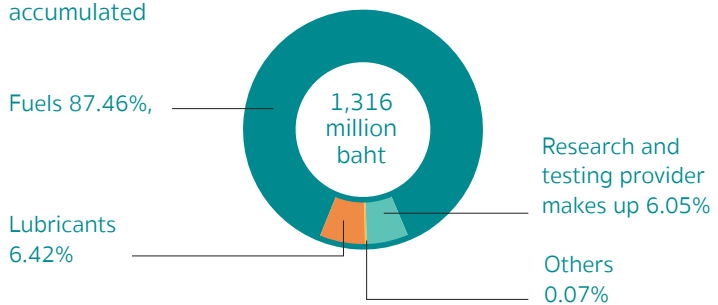
Corporate Innovation Support

Promoting an innovative corporate culture has always been an integral part of PTT's core value SPIRIT, which is in line with the government's Thailand 4.0 Policy to develop business opportunities for the country. With cognizant to the Policy, the Board and the Management have set policies, strategies and business directions accentuating innovation development, as well as encourage for all employees to adopt a work culture that is creative, open, and welcoming of changes.



and is a progress compares to last year. This was calculated based on values generated from researches, against expenses for researches and development.

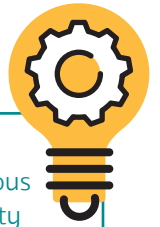
Direct and indirect revenues from research and development accumulated



Governance and Support to Employees' Innovation

Since 2012, the President and Chief Executive Officer have stipulated a policy for appointment of Innovation Network for Innovative Corporate Culture. They provide support and drive to enable innovation development, tangibly and sustainably across all areas in PTT. Apart from PTT Innovation Institute's performance, PTT has set an innovation framework to ensure innovation sustainability in the corporate. There is an innovation roadmap for short-term, medium-term, and long-term; and KPIs for each phase. They are connected and contributive to PTT Group's key strategy and directions. Additionally, there is annual PTT Innovation Awards, a contest for notably successful concepts and implementable innovation. This results in continuous affirmation of creative and innovative atmosphere in PTT.

In 2018, PTT has made further modifications in the organizational structure. Technology and Engineering Business was founded to support, drive and govern policies and standards in technology and engineering. The emphasis is placed on development of new business, extrapolated via adoption of digital and technology.



Through continuous foster of creativity and innovation in PTT, the number of employees' submission to PTT Innovation Awards, since its founding in 2011, accumulates to a total of 2,393 submissions.

In 2018 alone, there were **563** submissions



Development and Support for Adoption of Clean Energy

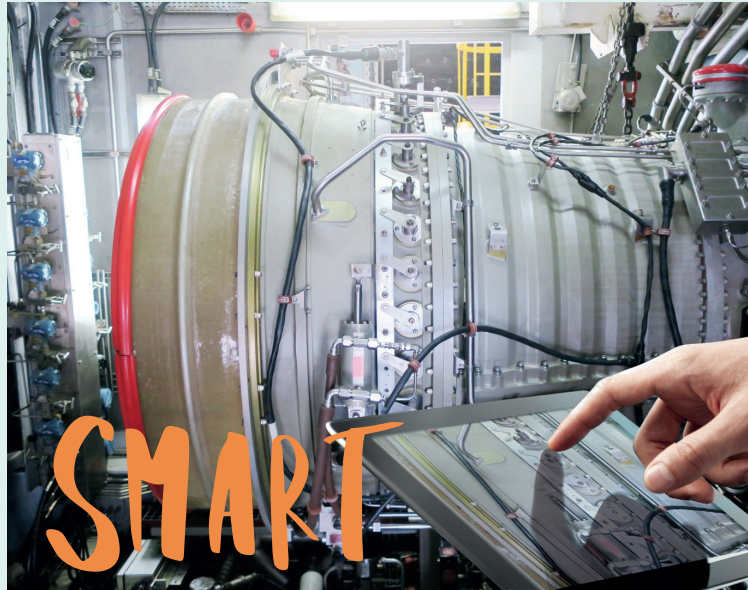
Electric Vehicle Charging Stations

Corresponding to its aim of developing clean energy for all, PTT has accordingly developed its EV-Chargers with AC Normal Charge. These can be installed against walls in residential areas or parking buildings, using a 1-phase power supply of 220 Volts, with 3.5-7 kW capacity. The stations accommodate Plug-in Hybrid Electric Vehicle (PHEV) and Battery Electric Vehicle (BEV) in compliance to IEC 61851 Standards. They are fully equipped with safety system against current leakage and overloads. Two models have been distributed, Eco model and Smart model. For the Smart model, the credits for EV charging can be set, and data of usage collected through the networks. Results can be illustrated via application. It is suitable for energy management to ensure maximum efficiency. In terms of EV Charging Stations, at the end of December 2018, PTTOR had installed a total of 14 stations. These comprise both those with DC Quick Charge (50 kW) and AC Normal Charge (3.5-22 kW). The effort is made to facilitate transition towards electric vehicles in the long-run, in conjunction with the continuous development of the service stations. This ensures enhancement of customers' convenience and trusts concerning PTT services.



Digital Technology for Innovation and Development

In 2018, there was a notable innovation from employees, which utilizes digital system as an enhancement tool for performance process' effectiveness as follows.



SMART WORK

Monitoring of Natural Gas Pipeline using Internet of Things (IoT)

The Upstream Petroleum and Gas Business Group, in conjunction with the Technology and Engineering Business, are collaborating with Advanced Info Service Plc. to develop a signal transmission system to monitor cathodic protection (CP)'s function online. It is a protective system against erosion of gas pipeline, which enables for real-time monitoring without requiring any personnel to monitor along the pipelines. The previous operating system has the following limitations, comprise the variety of measuring tools and methodology, monitoring personnel's expertise and experience, as well as duration taken for the monitoring. This innovation has an intelligent system serving as a medium for measurement of CP values with all brands of measuring tools. Instruction can be provided on mobile phones or office's computers. Aside from reducing the work



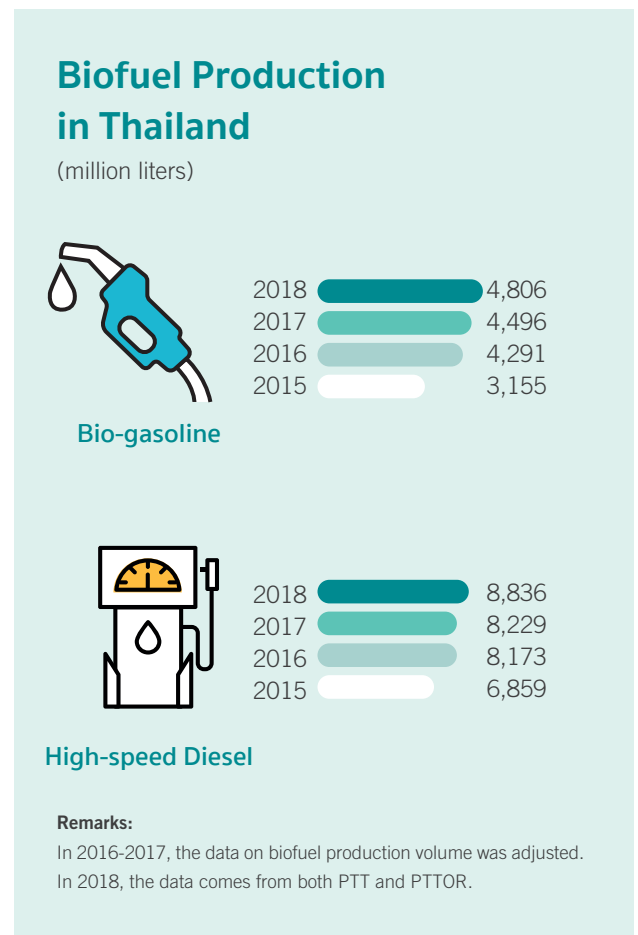
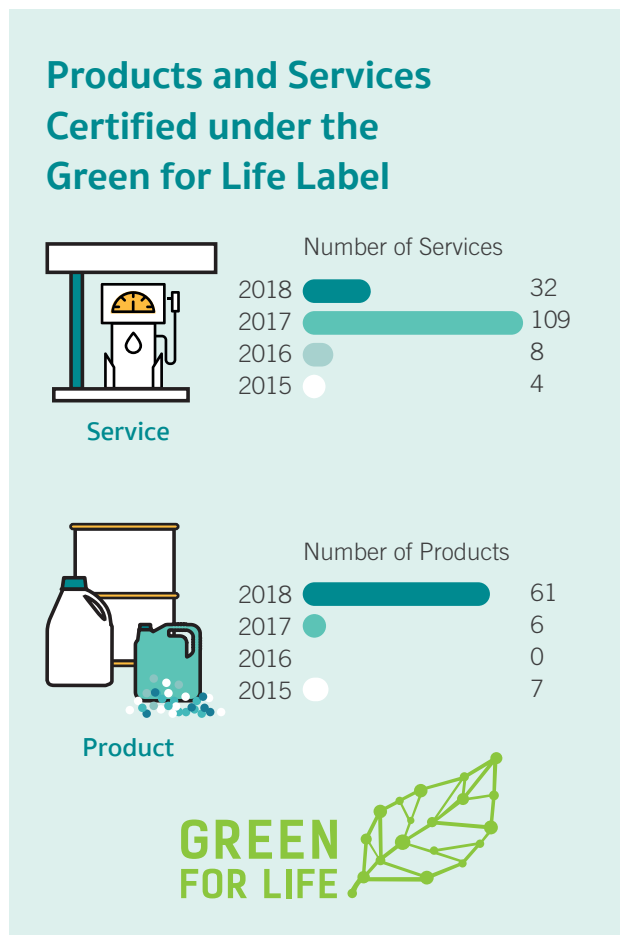
hours by over 8,000 hours, an equivalence of 12 million baht per year, and increasing accuracy in monitoring, it also diminishes operational risks from on-site monitoring. Furthermore, results from successful innovation can be extrapolated for further application with other asset maintenance tasks, such as those of natural gas pipelines, oil pipeline, oil depots, and water transmission pipelines.

Digital Machine for Damage and Malfunction Forecasts

The Gas Separation Plant has adopted the preventive maintenance system for monitoring, calculating and forecasting any malfunctions. The machine's recorded data in the database is used to forecast potential malfunctions and raise warnings to relevant personnel in advance. This ensures timely prevention and actions to address any malfunctions, therefore reducing cost and time loss from process disruption beyond those anticipated by plans. This enhances customers' trust in the operations of the Gas Separation Plant, as well as employees' competency in applying digital technology.

Green Products and Services

PTT is proud to be a part of green product and service development, having continuously facilitate the growth of green product and service market in Thailand. PTT utilizes its self-certified Green for Life label, created in accordance with ISO 14021:2016, for evaluation and assessment of green products and services within PTT Group. This, therefore, ensures that PTT is promoting and bolstering green innovation in line for commercial development, along with providing greater opportunities for improvement, development and communication to further elevate the public awareness regarding PTT Group's green products.



Product Life Cycle Assessment

PTT studies and assess environmental impacts throughout a product's life cycle, and certified for Carbon Footprint for Products. This enables consumers to be aware of each product's greenhouse gas emission prior to their purchase decision. It also provides incentives for entrepreneurs to modify their production technology to become more environmentally friendly. Presently, there are 7 PTT products in the registry, which are Ethane, Propane, Liquefied Petroleum Gas (LPG), Natural Gasoline (NGL), Pentane, Sales Gas from the Rayong Gas Separation Plant, and Carbon Dioxide from Industry Use.



Customer Relationship Management

PTT manages customer relationship at business unit-level, covering demands and expectation survey, product and service development to address needs and enhancing satisfaction, as well as building product and service loyalty. Customer relationship management also comprises integration of customer-centric process with other relevant processes in a systematic manner. There is a clear timeline for process implementation and improvement, such as setting and reviewing learning channels on customers and markets, analysis of market information system, effective process for customer relationship building. These will ensure that the customer's needs and expectations are addressed.

Furthermore, all business units employ systematic approach for customer relationship building, with the approach being in alignment. This includes acknowledging customers' feedback through various feedback channels, such as 1365 hotline, and annual satisfaction survey. Such approach provides useful information for analysis, facilitating product and service development. Additionally, there are systematic and regular customer visits, customer seminars, and creating an effective customer database via information system. This thoroughly addresses business needs and fosters customer relationships, furthering PTT as a company prioritizing customers' business needs in an era of digital economy. Nowadays, there are more digital mechanisms available for communications and feedback from customers. PTT uses both websites and online media to promote customers' access on information about key products and services.

Customer Satisfaction Survey

(%)

Oil



| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 97.0 | 95 |
| 2017 | 97.0 | |
| 2016 | 95.0 | |

Natural Gas



Natural Gas

| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 90.6 | 93 |
| 2017 | 92.0 | |
| 2016 | 89.0 | |



Electricity and Wholesale

| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 87.8 | 91 |
| 2017 | 90.7 | |
| 2016 | 89.1 | |



Industry

| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 91.2 | 93 |
| 2017 | 92.2 | |
| 2016 | 89.5 | |



Petroleum and Petrochemical Products

| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 94.4 | 93 |
| 2017 | 93.8 | |
| 2016 | 92.1 | |



NGV

| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 87.4 | 91 |
| 2017 | 91.0 | |
| 2016 | 88.7 | |

International Trading

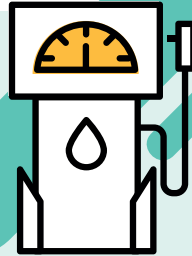


| | Satisfaction level | Target |
|------|--------------------|--------|
| 2018 | 91.0 | 89 |
| 2017 | 88.3 | |
| 2016 | 85.0 | |

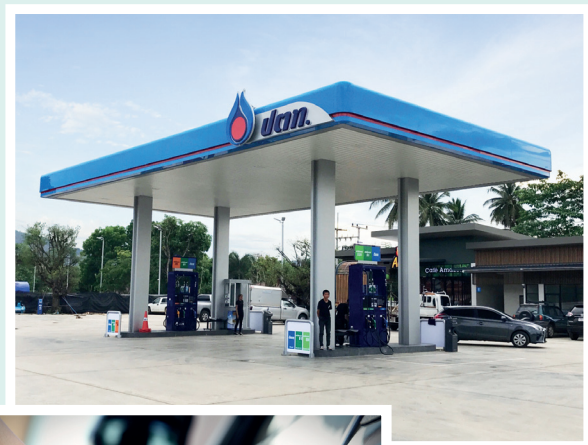
Based on results from the annual customer satisfaction survey, customers from the Oil Business Group overall demonstrated higher satisfaction scores that exceeded the target. This was due to greater PTT's efforts to resolve issues, to care and support customers, particularly at PTT Service Station, providing quality service according to standards, while swiftly addressing any issues. Conjointly, each regional sales department manager also provides good guidance and aid to customers.

For the Natural Gas Business Group, the overall satisfaction score did not meet the target, due to the target set being especially challenging. For the past year, there has been a need for technical troubleshooting of an especially complexed issue, requiring cross-function collaboration; in conjunction with increasing price for natural gas, reflecting the true cost. These impact the score slightly, causing a decrease compared to 2017. However, PTT aims to closely work and attend to customers, particularly to ensure effective energy usage. This includes, adding more activities to enhance relationships, and to strengthen knowledge on natural gas for all relevant personnel.

The International Trading Business Group saw an increased satisfaction score, due to inter-department collaboration and problem analysis to improve internal process. This also helps set clear performance indicators, ensuring performance that is more effective. In 2018, PTT did not encounter any incidents of non-compliance with rules, regulations and laws relating to occupational health and safety, product labelling, data privacy of customers or product marketing.



PTT Compact Model



COMPACT

In 2018, PTT launched 56 Compact Model Service Stations (PTT Compact Model) situated on secondary roads connecting a province and a district. This exceeds the target of 50 stations. The stations proves greater access to energy and standardized service to citizens across all areas. Medium and small-scale entrepreneurs are given the opportunities to become the service station's owners. Employees are local hires, therefore increasing investment opportunity to locals.



For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Product Stewardship" sub-heading

Social

Human Resource Management



PTT recognizes the importance of systematic human resources management and the equal treatment of its employees. Thus, PTT has prepared and developed the full potential of its management and employees at all levels so that they represent the company values of integrity, intellect, professionalism and a willingness to learn. PTT also encourages its employees to develop loyalty and strong relationships to the organization. This is to create a joint force to protect and drive PTT toward sustainability according to the company's values, and respond fairly to all stakeholder groups.



Human Capital Development

Employee Capacity Building

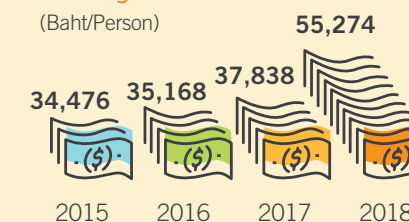
Career management is a process of developing employees to reach their full potential and capabilities. It also allows them to proceed in the career path that are crucial to PTT's business direction to enhance the organization's competitiveness. PTT conducts and reviews the success profiles and career advancement plans of each position. The success profiles are used to map out the desired professional experiences needed for employees to perform in higher positions, providing them with clear directions and motivating them to develop themselves. In 2018, the managers along with the employees reviewed their success profiles, accounting for 84%, 62% of whom were male and 38% were female. The Individual Development Plans were also completed which follow the 10/20/70 principle: 10% through classroom trainings, 20% through coaching from managers or mentors, and 70% through applying skills and knowledge to employees' own responsible tasks or exchanging knowledge with colleagues.

Supporting the Learning Process

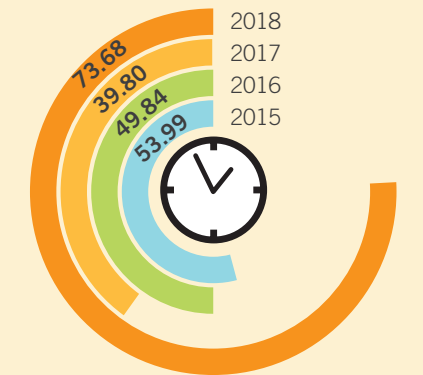
To comply with the Thailand 4.0 national policy in driving the economy forward through innovation and technology, PTT has prepared to adapt its working approach to accounting for the digital changes in work-related technology and tools, as well as employees' lifestyles. Hence, PTT has added technological savvy as an indicator of employee performance assessment. This addition will drive the efforts to enhance technological capability for the employees to be able to manage and apply digital tools and technology for maximum benefits, as part of PTT's human capital development policy to become a digital leader sustainably.

The PTT Leadership and Learning Institute (PLLI) has thus adjusted its training curricula, activities and tools to be up-to-date, by focusing on experimenting and hands-on learning, in addition to knowledge exchange across all levels. Digital tools are also used to facilitate continuous learning outside of classroom, such as E-Learning courses in organizational knowledge and other electives. Currently, the PLLI offers 8 E-Learning courses, 39% of which have been accessed by learners. This E-Learning method helps employees save time as they can choose to study anywhere and anytime most convenient to them. Another benefit is to save training costs of approximately 600,000 baht per year. Moreover, a simulation game has also been introduced to help learners learn through hands-on activities, in addition to theoretical learning, such as business simulation in the Management Development Program and Advanced Management Program.

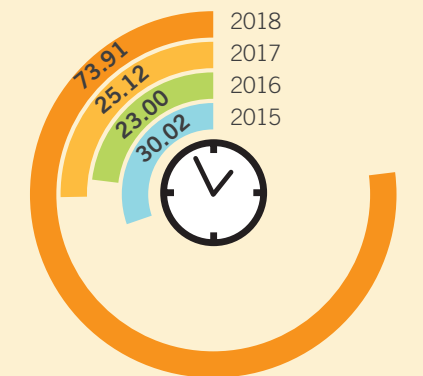
Training Cost (Baht/Person)



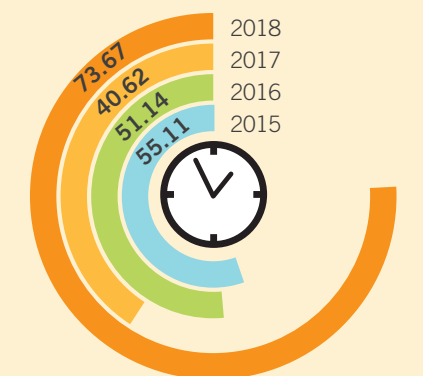
Average Hours of Training of Managers and Employees



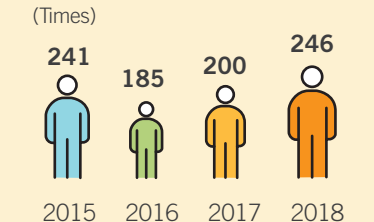
Average Hours of Training of Managers



Average Hours of Training of Employees



Human Capital Return on Investment (Times)



As for the executive succession program, PTT has categorized the management from the Leadership Pool into 3 groups which are Senior Executive Vice President, Executive Vice President, and Vice President. The categorization is based on the analysis of the organization's needs for the next 5 years. This program has an overarching aim to prepare the managers before they take on important positions, through the selection of employees with high potential, completion of the Individual Development Plans, and identification of target positions for transition. The program has achieved the succession rate of 100%, exceeding the set goal of 95%. Meanwhile, plans are rolled out for employees who will be retiring in the next 5 to 10 years such as course offerings in healthy living, exercises and nutrition, financial and investment management, for quality retirement. PTT retirees will continue to receive post-retirement benefits, such as participation in elderly club activities, and free first aid treatments at PTT clinics.



PTT TECH Savvy Agent 2018

As the first of its kind in Thailand, the PTT TECH Savvy Agent Program is an in-company reality show pilot program, aiming to promote and enhance digital skills through competition of concepts related to working in the digital age. It seeks to build awareness for employees about PTT's available digital tools and media, while grooming tech-savvy employees as the organization's role models. Lessons learned from this Program will be later used to develop activities for the general employees. There are 3 awards, including:

“Developing” Agent

The development of concepts related to digital tool and technology usage for maximum benefits

“This program gives employees an opportunity to present their ideas without being restricted to their own department. This is great because young-generation employees have diverse ideas. They just lack a stage to share these ideas.”



Mr. Pratchaya Laipaiboon,
Analyst
Winner of the Developing
Agent Award

“Sharing” Agent

The development of skills in digital knowledge sharing to colleagues

“I am very glad to see a program like this happening at PTT because it is fresh, fun, and new for the young generation. It would be even better if these ideas are applied in the real work environments. Some ideas that the employees presented are very interesting and have high potential”



Mr. Win Mayuraritphibal,
Engineer in the ExpressSo Project
Winner of the Sharing Agent Award

“Applying” Agent

The development of skills in applying concepts, strategies, digital tools, or technologies in their own work

“The program is an interesting way to learn. It is much more effective than the traditional learning styles. The idea brainstorming and presentation like this make it easier and faster to further develop the concept.”



Mr. Jaruchai Sutjarittam,
Analyst
Winner of the Applying Agent Award

The recipients of these 3 awards will win the Digital Technology Ambassador title whose mission is to promote PTT's innovative ideas and innovations to the public. In addition, they will also act as mentors to the new-generation employees who will participate in the competition in the future. In 2019, PTT plans to continue this Program and host a group competition under the cooperation of PTT Group.

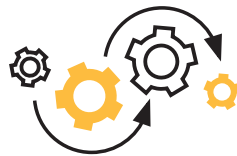
Knowledge Management

PTT has combined the following information points for the organization’s knowledge management, and strategy development and goal setting of knowledge storage, sharing, application, monitoring, and evaluation: the organizational vision, strategic performance, stakeholder needs and expectations, and external and internal factor reviews. Relevant knowledge is managed through the 3 mechanisms which are People, Process, and Technology, as follows:



People

Build employee behaviors of sharing knowledge, foster a learning culture, and continuously develop employees. Past initiatives include building the Community of Practice to search for best practices in each area, the search and selection of excellent value-added projects for PTT Group and stakeholders through competitions, Knowledge Sharing activities, and visits to leading companies in knowledge management to apply their practices to the company.



Process

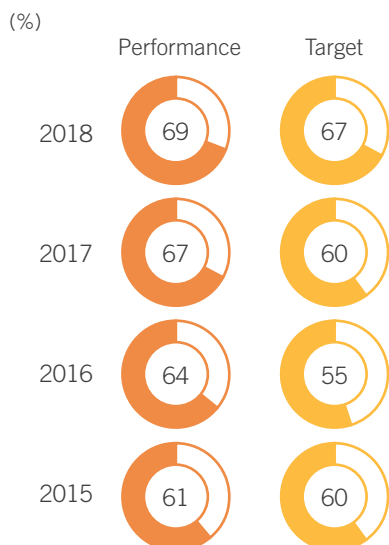
Improve the knowledge management process in order to establish a standard for a systematic process of sharing, storing, applying, and developing knowledge. In 2018, PTT acquired 10% more knowledge. Since 2015, a new tool called PTT Group KM Maturity Assessment is used to assess the standards of the PTT Group’s knowledge management. This assessment tool is comparable to those of the leading organizations.



Technology

Promote the use of information technology in storing and searching information, and as a space for the employees to exchange knowledge. This can help improve the effectiveness, convenience and speed of knowledge accessibility. For example, knowledge exchange through the BRIGHT portal (PTT Group KM Portal) has been operated since 2010, and the portal has continuously been improved. In addition, the PTT Workplace has also been implemented to stimulate employees to form groups and provide comments through an internal social network since 2017.

Knowledge Management Framework Score

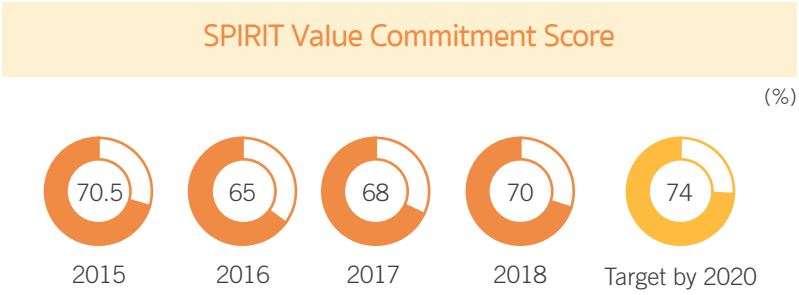


Employee Engagement

Company Values

PTT Group considers the SPIRIT values as a foundation for instilling in and binding every company employee to foster cohesion within the company and inspire integrity, intelligence, and responsibility within PTT Group, in the larger society, communities, and the country.

In addition, due to the fact that digital technology has disrupted ways of conducting businesses and unavoidably alters operations of any organization, PTT's employees must be able to adapt to the fast-moving global trends by adopting the SPIRIT values to develop new digital concepts and behaviors. They should have an open mind, embrace new knowledge, and utilize digital technology in their workplace in order to increase efficiency, create jobs, and drive technology and innovation, emerging the SPIRIT+D values.



Employee Engagement

PTT recognizes the importance of employee engagement and satisfaction. It is a key for employees to feel engaged with the organization, and at the same time, for the company retain valuable talents. Therefore, PTT conducts engagement and satisfaction surveys every year, the results of which will be analyzed to provide insights that enable PTT to understand the diverse needs and expectations of different employee groups. This understanding is integral to improving the effectiveness of the employee engagement and satisfaction process. In 2018, PTT reviewed the PTT Engagement Model and adjusted the evaluation factors to be in line with both international standards and the context of PTT. The Model is used as to conduct surveys, analyze results, create action plans to enhance the employee engagement and satisfaction, and improve the effectiveness of human resource management processes.

The recent employee engagement and satisfaction survey was participated by 93% of the employees. The company engagement score increased by 1% from 2017 to 71%, which marks the second year of an upward trend. Meanwhile, the engagement score of employees globally and in the Asia Pacific region also increased by 1% from 2017 to 69%. In 2018, PTT conducted a workshop to develop PTT overall employee engagement guidelines to enhance engagement levels of employees from different lines of work. The workshop was joined by the management and employees from different lines of work to jointly discuss key areas affecting the employee engagement and satisfaction score. All such efforts will help create improvement plans to better respond to employee expectations.



For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Sustainable Human Resource Management" sub-heading.



Human Rights



In accordance to its commitment to conduct business with respect for human rights, PTT has developed and applied the PTT Group Human Rights Management System. The system is in compliance with national and international human rights practices such as the National Action Plan on Business and Human Rights, the National Human Rights Plan No. 4, and the United Nations Guiding Principles on Business and Human Rights. PTT also has announced policies to ensure that business operations are in compliance with the laws and organizational regulations whilst respecting human dignity, human rights, freedom, and equality of individuals who are under the protection of Thai and international laws. To reiterate the importance of human rights compliance in every area of PTT business operation, PTT has directed all of its employees to be cognizant of ethical human rights practice as specified in the Corporate Governance, Ethical Standards and Code of Business Ethics Handbook. PTT also has integrated human right practice into its supply chain management where it requires all suppliers to sign to acknowledge and comply with the PTT Supplier Sustainable Code of Conduct (SSCoC) which encompasses human rights principles such as freedom of labor, freedom to form unions, child labor prevention, equal treatment, fair practice in compensation, setting work hours and firing, and a respectful and humane treatment of foreign and migrant labor. Moreover, PTT has set up channels to respond to and address human rights-related grievances and also promotes labor relations in order to increase awareness and commitment in human rights management in its business operations.

PTT Group Human Rights Risk Assessment

PTT Group annual human rights risk assessment covers the identification of potentially affected stakeholder groups, the issues and impacts to each group, and potential impacts at a national, business, operational and an individual level. To ensure the efficacy of the human rights risk assessment, PTT has classified the following groups as vulnerable groups: women, ethnic minority members, foreign laborers, LGBTQI, underprivileged and handicapped individuals, and children. Moreover, PTT has established a practice where it reviews risks of human rights violations in conjunction with relevant organizations annually or as frequent as needed. Instances where such reviews are needed include significant changes in business operations, a new business development, or a divisional-/project-level change. A review may also take place if there is an occurrence of a potential violation of human rights issue. PTT risk assessment process also tracks and monitors PTT group's human rights operation and reports any at-risk human rights issues to relevant levels of management in order to keep them informed and devise necessary resolution plans. As for tackling issues at risk of human rights violations, necessary control measures and action plans will be created, and results will be reported to the PTT Group Sustainability Alignment Committee to ensure the effectiveness and appropriateness of control measures.

PTT's 2018 annual human rights risk assessment covered the Group's activities and operations in 117 locations and 29 countries globally (or 8% of the total assessed locations.) The assessment revealed that 9 areas have a possibility to be at risk of human rights violations and are at a level which requires continuous monitoring. Such areas are in 4 countries which are Thailand, Cambodia, Laos and the Philippines. The plausible risks are: forced labor, occupational safety, community health and safety, and human rights management in the supply chain. Since then, each area has accordingly devised a risk mitigation and management plan for its supply chain. The plan passes on the expectations and commitment to conducting business operation whilst respecting labor rights to suppliers in the supply chain. The PTT Group Sustainability Alignment Committee receives quarterly progress updates regarding the plan.

Furthermore, PTT's employees receive 1 hour/person/year on average of training and knowledge sharing on human rights issues. As part of the PTT Group Sustainability Management course, the training was attended by 78% of all employees. In addition, no human rights grievances were filed in 2018.



Corporate Citizenship

In terms of social development, PTT is committed to addressing stakeholders' expectations and needs. This includes communities surrounding PTT's operational areas, as well as other communities in PTT's social project networks all over Thailand. PTT utilizes the organization's knowledge and expertise to promote community's well-being and capacities for sustainable self-development. PTT focuses particularly on enhancing participations in PTT businesses, with priority given to promoting underprivileged groups or groups with low income. PTT also established the group-wide strategy on corporate citizenship and philanthropy focusing on 2 dimensions: People and Planet. 'People' focuses on human resource development through creating better educational opportunities and access to standardized education, promoting a learning culture and increasing the quality of life for communities; whereas, 'Planet' concentrates on preserving and restoring the environment and natural resources. The strategy has been executed in parallel with PTT's efforts to build awareness and cooperation with various sectors, in line with PTT's business direction that emphasizes inclusive stakeholder engagements. In 2018, PTT allocated a total of 1,558.51 million baht on social development, with 16.77% of the budget allocated for commercial initiatives, 46.68% for community investments, and 36.55% for charitable donations. Additionally in 2018, the total hours of employees participating in social activities during their working hours were 15,055 hours.

Community Engagement

To create community engagement at the development of social development projects, PTT ensures that communities have participated and voiced their recommendations during project planning, in accordance to the context and needs of the target communities. Moreover, communities are involved in social development project evaluations, to ensure that all concerns and recommendations are integrated for further improvements of the projects. These have been done in various modalities, such as establishing joint committee with representatives from the communities, organizing public hearings, and assessing the project effectiveness against the objectives and expectations of the communities. Nonetheless, PTT is committed to elevate the performance of community relations functions to ensure that participating communities in PTT's social project have sustainably improved their well-beings and living conditions.

Community Consultations

37

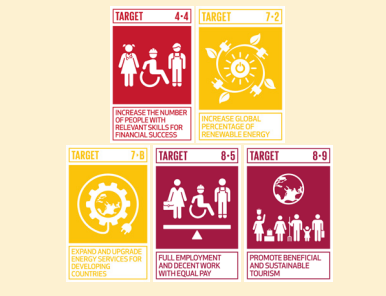
operations, equivalent to 100% of the total operations.

3

development projects, equivalent to 100% of the total development projects.

Social Development Projects

Projects on human resource development, community and social development (People)



Vidyasirimedhi Institute of Science and Technology (VISTEC) and Kamneotvidya Science Academy (KVIS)

PTT promotes human resource development through supporting the education in the field of science and technology in line with international standard. This is to create personnel for science, technology and innovation in order to support the nation's development in the future. In 2018, the first cohort, 71 students, graduated from KVIS. Another three cohorts, 216 students are studying. As for VISTEC, there are 170 students studying postgraduate and doctorate levels. This is divided into 4 faculties as follows, Faculty of Material science and Material Engineering, Faculty of Chemical Engineering, Faculty of Science and Biomolecular Engineering and Faculty of Science and Information Technology. In 2017, the first cohort of 13 master's students graduated and received a diploma from HRH Princess Maha Chakri Sirindhorn on 22nd August 2018.

VISTEC and PTT joined the "University-Industry Research Collaboration" to develop research into a commercial product. In 2018, an outstanding research project, funded by the Energy Policy and Planning Office, focused on the development of high-performance lithium-ion battery. The research produced a highly efficient lithium-ion battery with a capacity of more than 2,200 mAh/cell, to be used in small vehicles such as tuktuks (three-wheeled vehicle). VISTEC has developed further on this initiative and construct a pilot lithium-ion battery factory in the Institute, and expected that the research can be commercialized for E-TukTuks.



Petro Camp to Champ Petro

For 13 consecutive years, Petro Camp to Champ Petro project continues to supporting selected youths from across Thailand to join the youth camp, participating in activities and workshops on science, petroleum science and environment. In addition, PTT collaborated with the Faculty of Engineering, King Mongkut's University of Technology Thonburi to grant scholarships to selected outstanding students who participated in the Camp, to study at the Faculty of Chemical Engineering and Environmental Engineering. PTT supports all 4 years of higher level education. In 2018, there were 57 students from 13 schools participated in the Camp, with 8 students granted scholarships. Since the project's inception, 63 students have been awarded scholarships, of which 27 students already graduated. Whereby a number of graduate students continued their postgraduate studies in Energy Science and Engineering, while the other grantees have worked as quality engineers in both public and private sectors. In the future, the project will expand to cover 2 more programs of study, including of Electrical Engineering and Mechanical and Energy Engineering.



Pracharath School Project

PTT Group supports educational developments in line with the Government's Policy. In 2018, PTT Group expanded the project to support 82 Pracharath Schools. The project focuses on developing knowledge, skills, and technical teaching skills on STEM (Science Technology English & Mathematics) courses, leadership skills and ethics. The project also promotes students' entrepreneurial skills through quality of life development project, and develops infrastructure for target schools through the Power of Learning Foundation.



Clean Energy for Community Project

PTT utilized the company's expertise on engineering and energy to enhance community's quality of life and promote access to sustainable clean energy. Taking significant attention to the context of each locale, the project aims to develop solutions to address energy challenges in the communities, generate incomes, and reduce household expenditure on energy consumption. The project aims to achieve these objectives through community participation in the process of project design and planning and trainings to develop communities' capacity to maintain and sustainably manage the established clean energy infrastructure in their locals. Today, the project has developed various types of clean energy as follows:

Water Distribution using Hydraulic Ram Pump Project

PTT initially developed the hydraulic ram pump in 2013 at Khanun Klee Village, Tha Khanun Sub-district, Thong Pha Phum District in Kanchanaburi Province. Khanun Klee Village is a village along the East (Thai-Myanmar) natural gas pipeline. The hydraulic ram pump was developed to help solve issues regarding water shortages due to the increase in community's water consumption. Working together, terrains were explored and the designs of the hydraulic ram pump which does not require the use of electricity or fuel was developed. With the issue being solved, the project was expanded and implemented into 17 other areas across the nation. This project results in numerous communities and institutions can get access to clean water of more than 225,661.25 cubic meter per year for domestic consumption, agriculture uses and forest fire prevention. Nonetheless, PTT has continuously developed the hydraulic ram pump, whereby in 2018, the new pump design can pump water up to areas located at the height of 350 meters and to areas as far as 2,300 meters away. PTT plans to expand this project to areas facing water stress in parallel to increasing the efficiency and creating an added value for the PTT Hydraulic Ram Pump.



Community Biogas System from Pig Farming Project

PTT promotes the knowledge of communities by propagating information about carbon credits through the Thailand Voluntary Emissions and Reduction Program (T-VER). The project contributes to increasing income for the communities. In 2017-2018, PTT expanded projects in 3 existing sites: Tha Manao Sub-district in Lopburi Province, Kham Khaen Sub-district in Khon Kaen Province and San Sai Sub-district in Chiang Mai Province.



671 households benefiting from the project



Reduce cost and generate income at $\approx 3,745,786$ baht per year



Greenhouse gas emissions reduced by 5,013 tonnes of CO₂ equivalent per year



Since 2016, PTT has successfully developed the Floating PV and solved water management issues for 11 communities.



500 households benefiting from the project



135,000 units of electricity generated per year



Households can save up to 885,000 baht per year from the reduced electricity expenditures

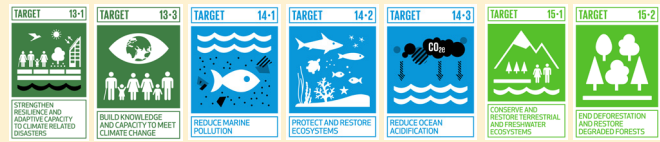


Greenhouse gas emissions reduced by 78.58 tonnes of CO₂ equivalent per year

Floating Solar Photovoltaic Panels (Floating PV)

PTT recognizes the opportunities for communities to access clean energy such as solar energy. In collaboration with the Chaipattana Foundation and partners, PTT conducted research and developed the use of floating solar photovoltaic panels in Rama IX reservoir under the Royal Initiative since 2016. The research aimed to develop a Floating PV model which was appropriate to use in Thai society. The solar energy was used in supporting water management for household consumptions and agriculture, as well as to reduce investment costs and increasing the efficiency of agriculture irrigation. In 2018, the project expanded to 8 locations including Ban Muat Ae, Nong Tum Sub-district, Mueang District in Khon Kaen Province, Den Chai Sub-district, Den Chai District in Phrae Province, Ban Lai Kha Nang, Phan Sao Sub-district, Bang Rakam District in Phitsanulok Province, surrounding area of the Biodiesel Plant in Petchaburi Province, Bhumirak Nature Conservation Center, Hin Tang Sub-district, Mueang District in Nakhon Nayok Province, Ban Khon Kwang, Dong Khilek Sub-district, Mueng District in Prachinburi Province, Ban San Talung, Tha Manao Sub-district, Chai Badan District in Lopburi Province and Ban Tha Kasem, Kham Khaen Sub-district, Mancha Khiri District in Khon Kaen Province.

Projects on Natural Resources and Environmental Conservation (Planet)



PTT Reforestation Institute

PTT Reforestation Institute continues its mission to maintain 160,000 hectares of forest planted to commemorate the 50th anniversary of His Majesty the King Bhumibol Adulyadej's ascension to the throne. The project has been done in collaboration with communities and network of partners across Thailand. Moreover, PTT sets the strategic target of reforesting 739 hectares in 2018. Combining with other reforested areas, currently PTT has the total reforested areas at 186,342 hectares under our care. To assess the performances of this project from 1994 to 2016, PTT collaborated with the Faculty of Forestry, Kasetsart University to conduct an assessment study, which found that the total 178,429 hectares reforested under this initiative has absorbed averagely 2.18 million tonnes of CO₂ per year. The value of benefit created by the reforestation exceeds 280 million baht per year. To continue these success, PTT aims to expand our network to cover households and take the initiative of income generating forests to be developed as a community enterprise. In addition to reforestation and forest conservation, PTT developed learning centers for the public to disseminate awareness and knowledge reforestation and forest restoration, including:



PTT Green in the City Learning Center

This is a center for knowledge sharing on reforestation and conservation, and a public recreational space near the heart of Bangkok. Situated on Sukhapibhan 2 Road, Prawet District, Bangkok, this 1.92-hectare learning center consists of 75% forested areas and 10% of water body. The rest of the areas is occupied by the green building, which was design in harmonious with the environment, and the 2016 awardee of the LEED (Leadership in Energy and Environmental Design) Platinum Certification, green buildings designed to fit harmoniously with the environment, and certified the LEED design to be in harmony with the environment. The PTT Green in the City hosts monthly exhibitions and learning activities on forest conservation and environment for average of 24,000 visitors per year.



Supporting the Natural Resource and Environmental Conservation Network

PTT promotes and supports natural resource and environmental conservation in various areas across Thailand, either through directly supports, or in collaboration with independent institutes in the areas. The aim of the supports is to strengthen the awareness of community-level environmental conservation on the significance of sustainable natural resource conservation in their areas. The supports include:

Green Globe Institute

The Green Globe Committee is responsible for determining the institute's direction, knowledge development and selecting awardees to be recognized as natural resource conservation champions. PTT has taken parts in driving and supporting the Institute for over 20 years. Today, Green Globe Institute has expanded its network to community level, and covers individuals and youths in 6 regions in Thailand, in order to conserve the forest of over 340,800 hectares across the country.

The Vetiver Network

Initiated from planting vetiver to prevent landslides, PTT further developed the project in collaboration with the Chaipattana Foundation, Office of the Royal Development Projects, and the Department of Land Development. Since 2006, the Network have organized competition among the projects on developing vetivers and promotion of vetiver planting in accordance to the Royal Development Project. In order to promote and support individuals who have continuously made use of vetivers. The 2 main categories of the Award are for the promotion and expansion of vetiver plantation, and vetiver products development. In addition, PTT encourages knowledge management and capacity buildings on sustainable and self-reliance management for the Thailand Vetiver Network. The initiative has evolved to the Network members sharing knowledge on soil and water conservation, and vetiver based product development. Today, the network has more than 10,000 members who can generate the total income of 3.3 million baht per year.



Wang Chan Forest Learning Center

The Center is located at Pa Yup Nai Sub-district, Wang Chan District in Rayong Province. With an area of 56 hectares, Wang Chan Forest Learning Center exhibits various types of forestation, and provide public spaces for leisure activities. The water management system and conservation of local plant species have benefitted in maintaining environmental fertility and biodiversity in the area. The learning center is also a pilot area for reforestation project which participates in the T-VER project, "Forest" category. In 2018, the learning center has been officially registered 763 tonnes of carbon dioxide reduction under the T-VER project, by Thailand Greenhouse Gas Management Organization (TGO). The learning center also received an Award of Excellence for the category "Wildlife, Biodiversity, Habitat Enhancement or Creation" by the International Federation of Landscape Architects (IFLA), for its landscape planning which focuses on balancing ecosystem and optimizing area uses, whilst minimizing environmental impacts. The learning center has received 45,000 visitors per year on average.

Sirinart Rajini Ecosystem Center for Mangrove Forestation

PTT transformed the 62-hectare abandoned shrimp farm in Prachuap Khiri Khan Province to a national and regional learning center for mangrove ecosystem. The center is a model of sustainable forest management in collaboration with communities and public sectors. In 2018, the center received over 50,000 visitors, and Sirinart Rajini Ecosystem also became part of the Natural Resource and Environment Protection Volunteers in Pak Nam Pran Sub-district, Pranburi District in Prachuap Khiri Khan Province. The network includes the Ban Klong Kao Mangrove Forest Conservation Group and Pak Nam Pran Fishery Farmer Group who join forces to improve the local environment. The groups implemented the River Pran Conservation project to conduct monthly activities including water quality assessment and trash clean-ups from Kaeng Krachan Dam to the mouth of the river, and organized coastal cleanup activities nearby the mouth of the Pran River every Friday. The network was awarded an outstanding provincial network, outstanding regional network level, and was ranked the third best conservation network in Thailand by the Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment.



Sarn Palung Social Enterprise

PTT Group, including PTTEP, GC, TOP, IRPC, GPSC and PTTOR co-established Sarn Palung Social Enterprise Company Ltd. (PTTSE) to optimize their collaborations in resolving financial, social and environmental challenges. Through the mechanism of business operations, social enterprise can generate incomes for sustainable self-reliance and growth. In 2018, social enterprises which have commercially operated under this initiatives include:

For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Corporate Citizenship" sub-heading.



Café Amazon for Chance

With the main objective to create opportunities for people with hearing disabilities to become baristas, the project provides barista training courses at the Amazon Inspiring Campus (AICA) under PTTOR's Café Amazon business unit. The trained hearing disabled baristas will also be interning at the Café Amazon for Chance, Office of the President at Mahidol University, Salaya Campus. The 12 employees with hearing disabilities have increased their income by 50% after joining the project. The project proves to achieve its goal in promoting employment of people with disabilities, creating incomes, and building career confidences for people with hearing disability, as well as promoting their abilities to support themselves and their families in the future.

- In 2018, Café Amazon for Chance opened 4 branches including:
- Office of the President at Mahidol University, Salaya Campus;
 - Faculty of Environment and Resource Studies at Mahidol University, Salaya Campus;
 - Art Gallery at Ban Chao Phraya Branch; and
 - Sky Lane Branch at Suvarnabhumi Airport.

"I would like to thank PTT and Café Amazon for giving me this opportunity to become a barista. It is an amazing opportunity because I am working in a positive environment with amazing people. From working with my colleagues, we can communicate and train together. These opportunities make me confident, happy and very proud of myself."



Miss Rattanaporn Sawanglok

An employee with hearing disability at Café Amazon for Chance, Office of the President at Mahidol University, Salaya Campus.

Community Coffee Sourcing

This project aims to ensure that coffee farmers have channels to sell coffee seeds at a fair price, to promote stable income and better living conditions among coffee farmers, as well as to promote and support farmers in farming and producing coffee seeds in an environmentally sustainable way. PTT does not only purchase coffee beans from the farmers, we also support capacity building in various areas including designing new approach to improve coffee seeds processing to meet the standards of Café Amazon, increase the management efficiency of planting and processing coffee, develop wastewater management system for coffee processing and support the plantation of other perennial plants aside from coffee. In 2017, the first 2 communities, Pang Khon Coffee Enterprise and Aka Pang Khon Coffee Community Enterprise located at Huai Chomphu Sub-district, Mueang District in Chiang Rai Province was initiated. In 2018, the project expanded to 8 additional communities in Chiang Rai Province which includes Ban Huai Yuak Pa So, Ban Huai Mak, Ban Sam Sung and Ban Ato which are located in Mae Salong Sub-district in Mae Fa Luang District and Doi Pang Khon Coffee Enterprise, Pang Khon Coffee Farm Enterprise and 2 communities in Ban Phalang which are located in Huai Chomphu Sub-district. After joining the project, each member experienced 10% increase of income, and a part of the revenue generated was collected as funds to expand the initiatives to develop skills and improve livelihoods of Thai coffee farmers.



Water, Forest and Khung Bang Kachao Conservation Project



Khung Bang Kachao is an important green area which is facing changing environment, which was influenced by internally and externally factors and affected by various stakeholders. Sustainable development of the area requires collaboration with various sectors, and PTT continues to take part in driving collaboration among relevant organizations. In 2018, PTT co-established OUR Khung Bang Kachao Project in collaboration with 34 organizations from public sector, private sector, civil society, academic institutions and communities. The 5-year plan has set the goal to increase sustainable and environmentally friendly economic and social growth by 20%, through utilization of knowledge, expertise, and technology and innovation contributed by participating organizations. The collaborations aim to optimize efficiency of development in the area, and to integrate all resources to address the challenges. The Committee is led by Chaipattana Foundation, with the sub-committee consisting of 1) Khung Bang Kachao Development Committee for Sustainable Development 2) Subcommittee for Supervision of Khung Bang Kachao Development to Sustainability 3) Subcommittee for Supervision of Khung Bang Kachao Development to Sustainability (Legal

Department) 4) Khung Bang Kachao Development Area Working Group to Sustainability, which consists of 7 taskforces. These taskforces include Green Area, Water Management, Waste Management, Career Promotion, Tourist, Youth, Education and Culture Development, and Administration and Communication. PTT was appointed as the lead of the Green Area Taskforce, and Administration and Communication Taskforce. The Committee has set the target to conserve 960 hectares of green space within 5 years, develop identity of each pilot green spaces in different sub-districts in Bang Kachao as a value added to these eco-tourism destinations, and increase areas of land used for organic farming in sub-districts to 50% of the total arable land. For the first phase, the area of 64 hectares of the Royal Forest Department was allocated for organic farming. This operation is collaborated with the 6 sub-districts in Bang Kachao Green Area Conservation Network. In 2018, 15 associate organizations joined to support the development of green spaces, and allocated a total of 49 hectares for the initiative.

Safety



Recognizing that every employee as well as suppliers and contractors who work with PTT have the rights to work in a safe and secure working environment essential for having the good quality of life, PTT continues to uphold its systematic management of security, safety, occupational health, and environment. It allows the organization to strengthen its business operations, mitigate risks and impacts, reduce cost, and create added value to the organization and its stakeholders.

PTT also emphasizes its compliance with the laws, regulations, as well as with international standards. The company reviews the efficiency and effectiveness of its occupational health and safety management on an annual basis to encourage continuous improvements by assessing external factors including Sustainable Development Goals, statistics, performance and causes of accidents of other leading companies within the same industry, policies and targets at the national and international level, together with internal factors including its past performance, cause of accidents, employee health check-up results and risks, workplace environmental monitoring results, and complaints.

Occupational Health and Safety

Safety Culture

In addition to the identification and assessment of risks at each operational site according to the SSHE Management Standard, PTT also commits to nurturing safety culture by being injury and illness free, zero-accident, and a place of work from which everyone can return home safely. Such an aim is driven by PTT Life Saving Rules which serve as the basis for all conducts as well as by PTT Security, Safety, Occupational Health, and Environment Policy which covers the rights and responsibilities of employees in relation to occupational health and safety including Stop Work Authority and Rights to Refuse Unsafe Work Assignment. Each operational site implements these rules to manage risks relating to its operation. In 2018, PTT promoted the prevention of accidents in the office workplace by engaging employees in conducting safety inspection at PTT headquarter office, allowing them to suggest ideas to mitigate risks to employee safety, organizing video clip contest to promote awareness on accidents that could occur in the office workplace, and launching a campaign to stop using mobile phone while walking to reduce risks of slip, trip, and fall which are the most common accidents in the office workplace. As a result, there was only one case of accident in the office workplace in 2018.



Walk Don't Chat Project

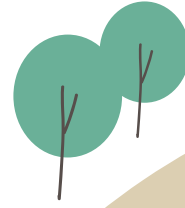
Responding to an increasing number of accidents in the office workplace, PTT launched the Walk Don't Chat Project encouraging employees to stop using any communication device while walking and, if necessary, only use the device when standing on the sidewalk. This enabled PTT to be a good example to the society in changing towards good safety behavior. Activities under this project include campaigning to raise awareness and using equipment to remind employees in the areas with high traffic especially where accidents previously occurred. The project received good feedback as employees stopped using communication device while walking.



Occupational Health

PTT uses the score of Health Performance Indicators (HPI) from its self-assessment on occupational health management following the International Association of Oil & Gas Producers (IOGP) and International Petroleum Industry Environmental Conservation Association (IPIECA) to continuously improve its management of occupational health. In 2018, PTT's HPI score was 3.28, increasing by 8% from 2017 which was higher than the target that was set at 6%. The HPIs comprised the management of the following eight aspects:

1. Health Risk Assessment and Planning
2. Industrial Hygiene and Control of Workplace Exposures
3. Medical Emergency Management
4. Management of Ill Health in the Workplace
5. Fitness to Work Assessment and Health Surveillance
6. Health Impact Assessment
7. Health Reporting and Record Management
8. Public Health Interface and Promotion of Good Health



Health Promotion Program

In 2018, a series of health promotion programs has been implemented to promote health consciousness among employees. In particular, PTT encouraged employees to lose weight to maintain body mass index (BMI) at the appropriate level by organizing PTT Sport Day on every last Wednesday of the month and hosting the Live for Fun & Run for Firm event on every quarter. PTT also launched the PTT Calories Burn Programs 2018 (BMI Challenge). Participated by 289 PTT Group employees, the program resulted in 24% improvement in BMI. In addition to these, PTT participated in the charity running event for cancer patients (Stronger than Cancer). The event encouraged employees to walk, run, cycle and accumulate distances while PTT matched the monetary donation from the Piggy Bank Project according the accumulated distances. As a result, PTT successfully donated 121,999 baht to Thai Cancer Society. For the second consecutive year, PTT also organized PTT Group Run for Siriraj which is the charity running event to raise fund for the construction of Nawamintrabopit 84 Years building at Siriraj Hospital. PTT Group was able to raise more than 4 million baht in total.



Process Safety

In 2018, the number of process safety incidents for PTT Group decreased for both Tier 1 and Tier 2. This was a result of the Group's ongoing commitment to developing Process Safety Management Strengthening Toolkits to prevent human barriers from the CEO to operators. The aim was to promote leadership and awareness of process safety by developing performance indicators which are monitored every trimester. In addition, PTT also works to increase the efficiency of its process safety management by planning to conduct the study on the implementation of tools to evaluate and monitor the effectiveness of process safety prevention and mitigation barriers. The study would be conducted during 2019-2021. In 2019, PTT still aims to achieve its target of zero Tier 1 process safety incidents. Additionally, the new target on Tier 2 process safety incidents would also be set for the first time, at no more than the number of incidents in 2018, which were 6 incidents.

PTT Group Process Safety Incidents¹

(Number of incidents)

2015 2016 2017 2018



Remark:

¹ PTT Group's Tier 1 Process Safety Incidents are reported according to the requirements of the American Petroleum Institute (API) Recommended Practice 754.

² One Tier 1 Process Safety Incident was reported at PTT involving an event when contractor's excavator shoveling into the 4-inch natural gas pipeline causing damage and natural gas leakage without causing any injury.

³ No Tier 2 Process Safety Incidents were reported at PTT.

For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and the "Security, Safety, and Occupational Health" sub-heading.



Transport and Logistics Safety

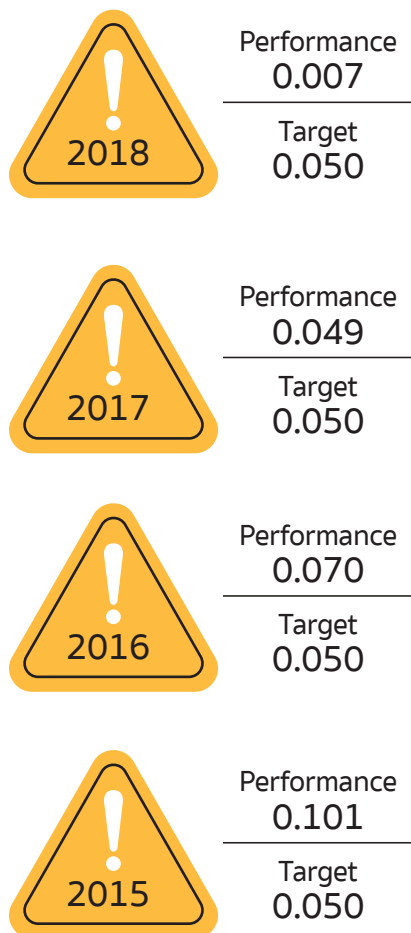
PTT continues to push forth its zero major accident logistics target to reduce impacts on the organizations, the society, and the environment from accidents occurring during the transport of products. Major logistics accidents at PTT are determined from factors such as the number of lost days from injury, volume of spills, number of fatalities, impacts to communities, and impacts to corporate reputation. In 2012, PTT formed the Logistic Zero Accident Steering Committee and enacted the policy requiring all transport contractors to strictly adhere to the PTT Group Road Safety Management Guideline. Furthermore, the company established the target that major accidents should occur less than 0.050 times per 1 million km, and that there should be zero lost time accidents. Due to its continuous efforts which has improved over time, the number of major land transport accidents has gradually decreased. PTT thus revised its target that major accidents should occur less than 0.040 times per 1 million km and has been committed to achieving its long-term target for zero accident by 2023.

PTT worked with logistics providers to improve driver competencies through regular trainings on defensive driving. In 2018, the company awarded the PTT Group Logistics Zero Accident and Eco-Driving Award 2018 to outstanding transport providers, which also comprised of the 'Zero Accident' Program and 'Fuel Saving Program.' These programs encouraged transport providers to operate according to PTT Group's requirements for the safe transport of products, and reduced logistics fuel usage by up to 1.84 million liters per year – the

equivalent of 46 million baht in savings per year and a reduction of greenhouse gas emissions by 4,985 tonnes per year. However, there were 2 major land transport accidents in 2018. PTT has undertaken inspections of the underlying causes of these accidents and found that the first case was due to negligence and speeding inappropriate with the route, thus causing one fatality. Responding to this, PTT set a requirement for speeding on the route with high risk and installed audio signal device for inappropriate speed. The second case was owing to defective transport device causing leakage of crude oil onto the road. In response, PTT implemented measures to further inspect related device and trained drivers on emergency response. In addition, the company also used these cases as lessons for drivers and monitored the performance of its transport providers to ensure that they strictly adhered to the agreed requirements for service.

Number Land Transport Accidents in PTT Group

(per 1,000,000 km)



In 2017-2018, PTT participated in the government-initiated Pracharat Project and was the leader of Pracharat for society's road safety working team working with the government, private sector, and other networks to reduce road accidents through a variety of programs e.g. training program for safe motorcycle ride to obtain motorcycle license (Good Rider Program) under the Pracharat Road Safety campaign, EEC Zero Accident Project, Model District Project, and Organizational Measures for Road Safety Project. These programs led PTT to earn Building a Good Society Award presented by General Anantaporn Kanjanarat, Minister of Social Development and Human Security as the leader of the Pracharat Social Working Group. The award was presented to private or civil society organizations that had outstanding work on social development and stood exemplary for future cooperation.



For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and the "Logistics Zero Accident" sub-heading.

Security and Crisis Management

The current world is constantly changing economically, socially, and environmentally. Such constancy may lead to unpredictable crises such as natural disasters, terrorism, and various forms of threat. As crisis poses impact on life, assets, and relevant business processes, PTT therefore prioritizes its protective measures, preparation, rehearsals. The company promotes awareness and responsibility of stability, safety, occupational health, and the environment. PTT also recognizes the importance of business continuity management to foster national energy security, build trust, and protect the benefits of all stakeholder groups.

Security and Safety

To decrease damage from threats internal and external of the company, PTT has initiated protective measures for individual and asset security. This is through security strategies and the security management system of PTT Group. In order to align with international human rights practices, PTT evaluates important security risk levels and formulate risk management measures against threats. This includes ensuring the effectiveness of risk and crisis management.

Furthermore, there exists promotions and raising awareness of a secure and safe work environment by evaluating risks to determine protective measures for possible threats. Implementation includes installing CCTV cameras in all operational areas of PTT according to the government's security policy. This includes warning signs indicating security levels. In addition, PTT also collaborates with internal and external organizations, the community, and the society to receive relevant news and information for protecting employees, assets, business operations, image and reputation from threats. Governance, monitoring and evaluation of performances to decrease the rate of security breaches internal to PTT are also carried out.

In 2018, PTT prepares for threatening situations by providing trainings on the Incident Command System (ICS) as a role play situation training exercise for employees working in security. They will also participate in the crisis management exercise 2018 (CMEX 18). Furthermore, PTT holds the "Security Crisis Management Challenge & Solution Seminar 2018" for relevant individuals from PTT Group, governmental agencies, Network of State-Owned Security Operations (SECs), and private sectors. Private sectors include the Air Support Division, Department of Disaster Prevention and Mitigation, National Intelligence Agency, Electric Generating Authority of Thailand, etc. The seminar will assist relevant parties as mentioned in learning and sharing opinions on the management of security crisis and various disasters. As stated in the procurement contract, PTT requires the security contractor provider to hold trainings on necessary skills for the operation, including Practical trainings of the "Methodology for Suppressing Security Incidents of Security Officers" and other trainings that are crucial to appropriate human rights practice. As a result, the security guards working for PTT is 100% trained.



CRISIS MANAGEMENT



Crisis Management

PTT believes that immunization and provision of crisis management tools will allow for stakeholders' trust and create sustainable competitiveness. Given this, PTT has developed the PTT Group emergency and crisis management plan for evaluation, prediction, improvement of control plan, and prevention of risks and threats. The plan also includes setting strategies, planning, and preparing appropriate resources for monitoring and handling of any crises that may occur. Ability of business operations will continuously be protected. If events affecting business continuity should arise, PTT has adapted a Business Continuity Management System according to the international standard ISO 22301:2012. This serves as a guideline for business continuity management during crisis. It is managed by the Crisis and Business Continuity Management Center to allow PTT's business operations to return to its normal state effectively and promptly.

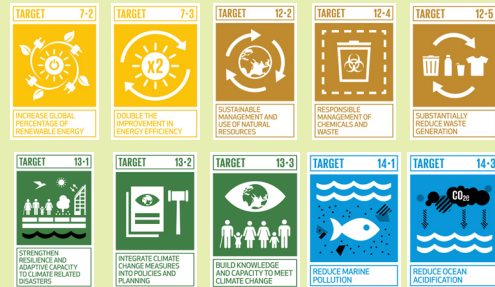
"PTT has been stably developing its Business Continuity Management System and been the first in Thailand to receive a company-wide certification of the ISO 22301 standard. Such achievement reflects the determination and ability to maintain national energy security and to protect significant benefits of stakeholders."



Mr. Thirakul Boonyong
Senior Manager and Head of Business Continuity Management System in accordance to ISO 22301, Management System Certification Institute (MASC)



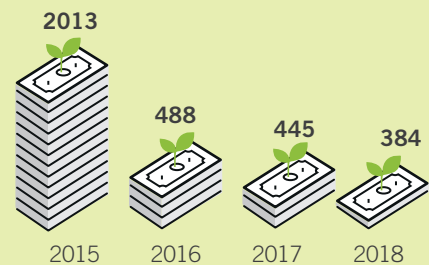
Environment



Environmental Management

Environmental Management Accounting

PTT incorporated Environmental Management Accounting (EMA) to manage and develop the system for collecting data on environmental expenses, revenue, and investments according to the international standard “Environmental Management Accounting Procedures and Principles, the United Nations”. Data is collected, consolidated and reported through the system since 2018, in conjunction with integration of Business Intelligence (BI), a specialized technology developed for such action and analyzing using a multidimensional models. Such that information regarding environmental expenses, revenue and investment is analyzed for further decision making, investment planning and environmental management. Nonetheless, the system is currently being developed for implementation in other PTT Group companies, aiming to reflect an even clearer vision of PTT Group’s all round environmental investment.



Environmental Investments (million baht)

Remarks:

- In 2018, environmental expense decreased compares to 2017. This was due to the decoupling of PTTOR since July 2018.
- In 2015, large scale investments were made. This included investments to increase energy efficiency by heat recovery at the Gas Separation Plant in Rayong Province. This accounts for 80% of the increase in expenditure.

Climate Change and Energy Management

Controlling greenhouse gas emissions is an issue highly prioritized by the government as Thailand participated and voiced their intent at the Conference of the Parties (COP21) in Paris, France. The International Agreement also known as the Intended Nationally Determined Contributions (INDCs) states to reduce emissions by 20-25% within 2030 and the Nationally Appropriate Mitigation Actions (NAMAs) by approximately 7-20% when compared to the business as usual emission rate in 2020.

Hence, to contribute to this commitment, in 2018, PTT Group established a climate change strategy called “PTT Group Clean & Green Strategy” which aligns with PTT Group’s business strategy. Nonetheless, the strategy has been approved by PTT’s committee and senior management to ensure all of PTT Group is moving in the same direction. Climate change policy and strategy has been reviewed annually, with the details provided below.

| | | |
|--|--|--|
| <ul style="list-style-type: none"> • Reduce greenhouse gas emissions from operations such as improving energy efficiency, reduce flare and leakages of methane, etc. • Adopt the concept of circular economy into operations such as using materials which result in highest values and identifying reusing/recycling opportunities <p>Targets</p> <ul style="list-style-type: none"> • Reduce PTT Group’s greenhouse gas emissions by 20% when compared to business as usual level by 2030 • Control the concentration of emissions released into the atmosphere by business units and flagships | <ul style="list-style-type: none"> • Increase the proportion of renewable energy and natural gas • Develop environmentally friendly products and services • Adopt the concept of carbon pricing when considering to invest <p>Targets</p> <ul style="list-style-type: none"> • Increase the PTT Group’s revenue from low carbon products in 2023. • Evaluate and implement carbon pricing when considering to invest in 2020 | <ul style="list-style-type: none"> • Establish a strategy for investment relating to Clean & Green Strategy • Develop and invest in electricity or other related business • Adopt the circular economy concept into PTT Group’s value chain |
|--|--|--|

The progress of climate change implementation will be monitored and reported to PTT’s Board of Director and the executive management, as well as to the PTT Group Management Committee quarterly.

Risk and Opportunity Assessment for Climate Change

Climate change-related risks and opportunities are key issues for energy business which is directly related to fossil fuels. Therefore, PTT Group has integrated risk and opportunity assessment for climate change into the enterprise risk management by considering the risk factors from the energy transition caused by climate change such as policy & regulation, market & technology, reputation, natural disasters, etc. In addition, PTT also considers possible opportunities such as more cost-effective energy efficiency technology, higher investment returns in renewable energy, access to markets with cleaner and more environmentally-friendly energy and products, access to environmental funding locally and internationally, etc.

Appropriate actions to reduce physical risks from climate change is to prepare to prevent and cope with the possible effects through the Business Continuity Management (BCM) which covers various crises from natural and anthropogenic situations. Each business group is responsible for monitoring the progress of the BCM plans.

The top 3 prioritized risks and opportunities caused by climate change are as follows.

1. Policy and regulation related to the government's mechanism such as target of greenhouse gas emission, emission allocation for each facility, cap and trade, etc.
2. Natural disasters from extreme climate, including storm and drought.
3. Consumer's behavioral change from reducing the use of energy derived from fossil fuel toward more environmentally-friendly alternative energy and renewable energy.

Identification Process and Risk Assessment for Climate Change in PTT Group consist of



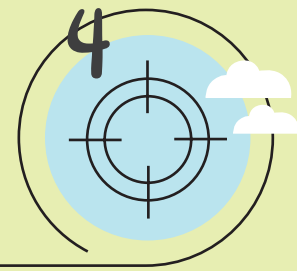
1 Prepare a greenhouse gas emission inventory at the facility and asset level for PTT Group based on the PTT Way of Conduct; collect data and calculate, using the Greenhouse Gas Calculation Tool, the amount of emission in compliance to the PTT Group Greenhouse Gas Accounting and Reporting Standard.

2 Monitor the situation related to climate change at the global and local levels that affects the organization's sustainability, such as laws, rules and regulations, mechanism to control greenhouse gas emissions, relevant guidelines and standards, situation tracking that covers attending the meeting, participating in public hearing to give opinions on the actions of government agencies, public organizations and others.



3 Identify corporate risks and opportunities from appropriate methods, covering laws & regulations, physical change from climate change, etc.

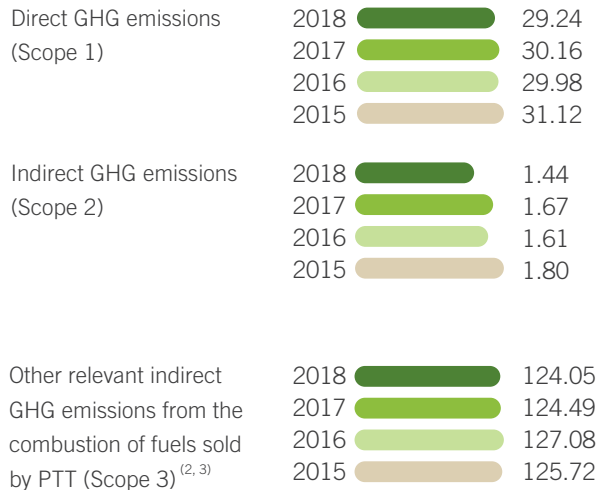
4 Develop strategies for high risk and opportunity covering 2 aspects: actions to control, reduce and absorb greenhouse gas emissions in the atmosphere and adaptation for sustainable business.



5 Follow up and report the performance against the action plan and the KPIs to PTT's Board of Director, PTT Management Committee, PTT Group Management Committee, and senior executives on a quarterly basis.

PTT Group Direct and Indirect Greenhouse Gas Emissions¹

(million tonnes of CO₂ equivalents)



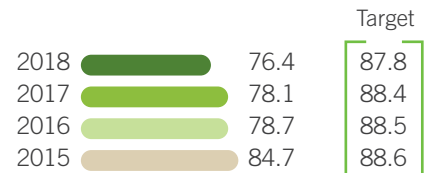
Remarks:

- 1 The scope of data covers companies in Thailand in which PTT holds direct shares more than 20% and hold indirect shares for 100%.
- 2 Scope 3 emissions cover the combustion of PTT fuel products (gasoline, diesel, jet fuel, fuel oil, liquefied petroleum gas and kerosene). PTT has set the target to control indirect GHG emissions (Scope 3) based on the amount of PTT's direct and indirect GHG emissions (Scope 1, 2 and 3) per unit of PTT products sold as defined by the State Enterprise Performance Appraisal (SEPA).
- 3 The scope of data for Scope 3 covers PTT, PTTRM (January – June 2018) and PTTOR (July – December 2018).

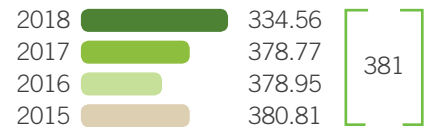
Greenhouse Gas Intensity

(kilogram CO₂ per barrel of oil equivalents)

Direct and indirect GHG emissions from PTT activities (Scope 1 and 2)



Direct and indirect GHG emissions from PTT activities and the combustion of PTT's fuel products sold (Scope 1, 2 and 3)

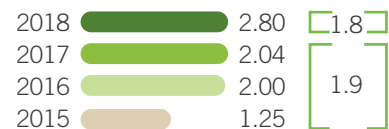


Remark:

The scope of data covers companies in Thailand under PTT's operational control in which PTT holds direct shares more than 20% and holds indirect shares for 100%.

Energy Intensity Reduction from Energy Management Project

(% per year compared to business as usual)



Remark:

The scope of data covers PTT's Rayong Gas Separation Plant, PTTEP, GC, TOP and IRPC.

The 2018 performance for greenhouse gas management is as follows.


- Greenhouse gas emission reduction in PTT's business, such as energy efficiency management, methane management, carbon capture and storage, carbon offset projects through various mechanisms, use of renewable energy in operations, carbon pricing, etc.
- Development of environmentally-friendly products to strengthen climate resilience portfolio such as expansion of PTT's environmentally-friendly products, greenhouse gas emission reduction in operations, use of products for greenhouse gas reduction purposes, etc.
- Continuous direct and indirect greenhouse gas emission reduction projects in operational areas, including energy efficiency project in compliance to the ISO 50001, control and reduction of methane leakage in collaboration with the Oil and Gas Methane Partnership (OGMP), Thailand Voluntary Emission Reduction Program (T-VER), carbon capture and storage projects, use of renewable energy in operations, etc.
- Participation in climate change network such as raising awareness about climate change to internal and external stakeholders, participating in the Working Group on climate change of the Ministry of Energy, as well as committing to and building collaboration with local and international agencies.


For more information, please visit www.pttplc.com and refer to the "Sustainability" heading and "Climate Change Management" sub-heading





Water Management


PTT Group's major production is based in Rayong and Chonburi Provinces, which are undergoing the expansion of the industrial sector from the development of the Eastern Economic Corridor (EEC), resulting in increased demand of water consumption. Currently, the amount of water used varies according to the climate each year. In addition, the regulation on water use control and effluent standards are becoming more stringent. PTT Group therefore places importance on risk management and reduces the impact on water resources and the environment according to international standards to meet the needs and to make the most out of the natural resource withdrawn. The PTT Water Management Team has a role in determining water management strategies, establishing long-term plans for PTT Group, following up, analyzing, evaluating and reporting the situation of the eastern region. In order to manage and reduce dependence on the use of water from public water sources, the Team also coordinates with external agencies and internal units to meet the goals. The following activities are carried out continuously.


- 

• Prepare a strategic plan for water management in accordance with PTT Group's climate management strategy and risk management
- 

• Assess risks and water impacts on PTT Group's operations, including physical risks (volume and quality), legal risk, and corporate reputation risks by using tools and international assessment standards such as Aqueduct, WBCSD Global Water Tool, CERES Aqua Gauge, and Water Footprint Assessment. In addition, they also analyze and prepare a risk management plan to reduce the water impact of each company that is potentially affected by the raw water reduction measures in 2018. The portion of water reduction by the measure varies from 10%, 30% to 50% which may cause a huge impact on the production of the plant and may lead to temporary production shutdown.
- 

• Set goals, evaluate and monitor the efficiency of the organization's water use, targeting on water consumption intensity in 2030 compared to the base year 2013. For the production sector and office buildings, PTT targets to reduce 12.6% and 10% of water intensity, respectively.
- 

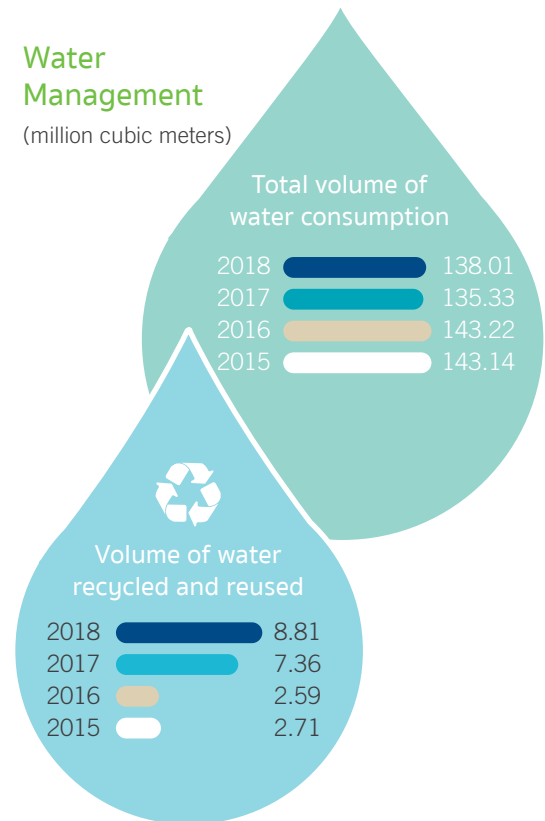
• Monitor the situation and assess water risks at the watershed level, together with the Water War Room working group in the East, which consists of relevant government agencies, Eastern Water Resources Development and Management Public Company Limited (East Water), and representatives from other private sectors.
- 

• Manage water according to the 2Rs Principle (Reserve and Re-visualize) by monitoring the progress of the water resources development project of the relevant agencies, integrating cooperation to create stability and sustainability of the overall water management in the eastern region. PTT has the target not less than 240 million cubic meters by the end of 2018 for water storage in PTT's operating areas, Rayong Province, covering Dok Krai reservoir, Nong Pla Lai Reservoir, and Khlong Yai Reservoir. It also monitors and promotes the efficiency of the water resource development projects in the EEC area to have the potential to support water demand expecting to increase to 1,000 million cubic meters/year by 2036.
- 

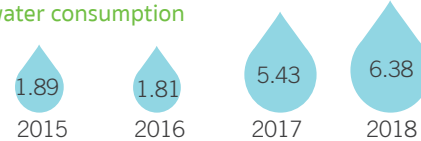
• Support the 3Rs Principle (Reduce, Reuse, Recycle) and evaluate the likelihood of desalinating seawater to reduce dependency on public water resources.

Water Management

(million cubic meters)

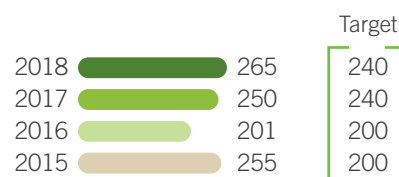


Percentage of volume of water recycled and reused from the total volume of water consumption



Water Storage Capacity for PTT's Operational Areas in Rayong Province

(million cubic meter)



Remark:

The scope of data covers 3 main reservoirs in Rayong Province: Dok Krai, Nong Pla Lai, and Khlong Yai.



For more information, please visit www.pttplc.com and refer to "Sustainability" heading and "Water Management" sub-heading

Waste Management

PTT aims to reduce the amount of industrial waste brought to landfill by reusing and extending the life cycle based on the Circular Economy Principle. Consequently, PTT manages to reuse the contaminated containers and insulation by 195 tonnes/year. In addition, PTT Group Waste Management Sharing is held among 12 PTT Group companies in Rayong and Chonburi Provinces in order to analyze disposal methods, create a database of waste management, and come up with a change of management method. For instance, precious metals are extracted with catalysts to produce ceramic color powder, creating value according to the Circular Economy Principle. Contents from knowledge sharing can be used as a guideline for each PTT Group company to achieve the goal of reducing the amount of industrial waste to landfill to zero by 2020.



PTT Touch Green Society Project: A Resource-efficient Society

PTT encourages our employees to reduce the single use plastic through the “S-U-P (Single Use Plastic) Free day” in and around PTT’s office building. “Grab & Go Stations” are provided as service points for employees and office building users to borrow cloth bags that come from donations instead of excessively using plastic bags of one-time use.

In addition, PTT has developed the “SSHE Token (Touch Green: Campaign for Sorting and Exchanging Recycled Waste to Reduce Global Warming)” which is the first copyrighted blockchain system for reducing the amount of greenhouse gases from waste sorting. The project follows the principle of “NOTHING IS WASTED” to make waste sorting from the source and bringing back waste for other uses a closely related matter to employees, contractors, and users of offices in 6 areas: PTT Head Office Building, Phra Khanong Office, PTT Innovation Institute, Chonburi Operation Center, Rayong Gas Separation Plant, and Khao Bo Ya Gas Terminal. Waste sorting includes plastic bottles, cups, milk cartons, and aluminum cans. PTT has collaborated with relevant agencies to reuse the waste into various objects such as seedling pots at the Sirinart Rajini Ecosystem Center for Mangrove Forestation, Green Board for artificial legs and for sell to support environmental costs in operational areas. The SSHE Token system using blockchain technology will record the amount of recyclable waste, calculate, and record points for each participant from waste sorting. It also calculates the amount of greenhouse gas reduction from recyclable waste and tracks the accumulated amount of greenhouse gas emission reduction.



PTT has reduced
6
tonnes of CO₂ equivalent
of greenhouse gas from
recyclable waste sorting
in 2018.

“We are moving towards a greener approach. I am very pleased to see that PTT is actively acting as a leader of social responsibility in reducing excess plastic use. A survey was carried out to inquire the opinions of PTT employees about the most preferable and effective measure to reduce the use of plastic bag. The ideas were developed into “Grab & Go Station” – service points to borrow and return cloth bags donated from employees, including myself. Furthermore, the “S-U-P (Single Use Plastic) Free day” is initiated in collaboration with employees, suppliers, and office building users to reduce the daily use of single use plastic bags, particularly on Friday in PTT’s offices and the surrounding areas.”

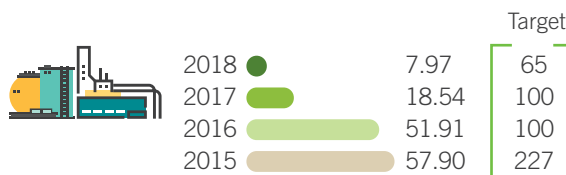


Assistant Professor
Dr. Thon Thamrongnawasawat
PTT Director

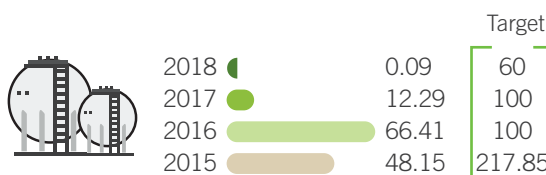
Hazardous Waste to Landfill

(tonne)

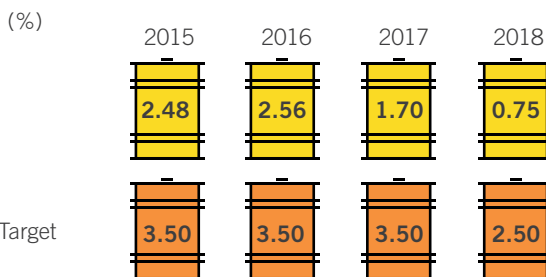
Rayong Gas Separation Plant



LPG and Oil Terminal



Percentage of Routine Hazardous Waste to Landfill to Total Routine Hazardous Waste



Air Quality Control

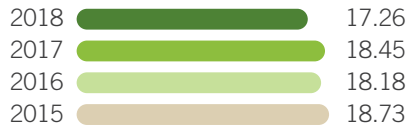
PTT selects technologies that can reduce air pollution from the source, including the installation of the Dry Low NOx Emission (DLE) system, as well as bringing in internationally-accepted Selective Catalytic Reduction (SCR) pollution treatment system to control the air quality released to the environment. These actions reduce the environmental impacts and control the air quality as required by law.

In addition, PTT has also taken steps to reduce and prevent the leakage of volatile organic compounds (VOCs) from the source by checking and measuring the amount of leakage of VOCs from the equipment continuously, using infrared cameras and a photo-ionized gas detector in accordance with international measurement standards. This allows immediate control of leakage from their points of origin. Moreover, PTT also uses the Continuous Emissions Monitoring System (CEMS) which will send online air quality measurement data to the Map Ta Phut Industrial Estate Authority of Thailand. In addition, the air quality simulation is used to assess the dispersion of pollutants to different receiving stations to monitor and develop plans for environmental impact reduction from air emissions.



VOCs Intensity

(tonne of VOCs per million barrels of oil equivalents)

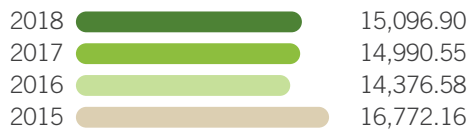


Remark:

The scope of data covers the Rayong Gas Separation Plant, LPG and Oil Terminals.

Oxides of Nitrogen (NOx)

(tonne)



Remark:

Oxides of Nitrogen (NOx) is mainly emitted from the petroleum drilling and production activities.

Sulfur Dioxide (SO₂)

(tonne)



Remarks:

- 1 In 2015, the scope of data covers PTT, PTTEP, GC, TOP, IRPC, and GPSC.
- 2 In 2016-2018, the scope of data covers PTT, PTTEP, GC, TOP, IRPC, IRPC's Upstream Project for Hygiene and Value Added Product (UHV), and GPSC.

Oil and Chemical Spills



Preparation for response and emergency response from oil and chemical contamination is another significant mission for the organization. PTT therefore determines both personnel and equipment standards in order to ensure that it will respond to events in all cases in a timely manner by setting up a full emergency plan for every area of PTT's operations annually with internal and external agencies. PTT also installs equipment such as gas detector, oil buoys in all operational areas at risk of oil spills, and satellite valve control systems in natural gas transmission systems. PTT has additionally become a member of organizations focused on oil spill clean-ups and responses, such as the Oil Spill Response & East Asia Response Limited (OSRL) and Oil Industry Environmental Safety Group (IESG), to provide support in case of oil spills that are located in various areas around the world.

In addition, the management of the environment after the occurrence of oil spills is of great importance in order to prevent and reduce environmental impacts. The scope covers setting up guidelines for assessing environmental impacts from oil spills in accordance with international standards in order to define measures to reduce and control environmental impacts, as well as establishing guidelines for the restoration of the environment to ensure that the ecosystems and biodiversity are restored to balance quickly.

Biodiversity

The primary objective of PTT’s biodiversity management is to protect against losses and negative impacts to biodiversity by declaring the PTT Group Biodiversity Statement, which serves as the basic principles for how PTT Group should manage biodiversity across the entire organization. PTT requires that all projects undergo a biodiversity risk assessment and analysis of geographical locations and relevant environmental conditions, and an analysis of the types and characteristics of activities concerning the context, scope, and level of impact of the risk in each project phase. Projects assessed with high biodiversity risk need to prepare a Biodiversity Action Plan (BAP) to reduce the impacts that may occur to plants, wildlife, and the environment. The risks must be reviewed at least once a year. Currently, risk assessment is conducted in 48 operational areas. Two areas are found to be high-risk: Khanom Gas Separation Plant and Phuket Aviation Depot. Both areas have completed their BAPs. Moreover, PTT is now preparing the guideline for no net loss assessment in order to implement such assessment methods in the pilot areas within PTT Group, which will be completed by 2019.



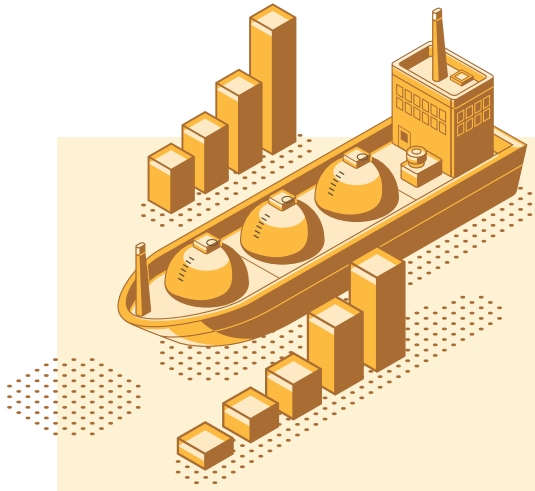
In 2018, PTT conducted a biodiversity survey project around the operational areas, including the pilot areas based on the assessment of the high level of biodiversity risk and the assessment of communities around the operational areas. The chosen pilot areas consist of Khanom Gas Separation Plant, Phuket Aviation Depot, Songkhla Petroleum Terminal, Nakhon Sawan Petroleum Terminal, Saraburi Oil Terminal, and Phitsanulok Oil Terminal. There is a new discovery of a biennial plant called Purple Khanom (*Microchirta involucrata* (Craib) Yin Z.Wang var. *gigantiflora* C. Puglisi), which is an endemic plant found only in Khanom District, Nakhon Si Thammarat Province. Not only that, a new species of moth is found in the surrounding area of the Saraburi Oil Terminal. It was given the name *Gatesclarkeana thailandica* to honor Thailand and indicates that the moth is reported to be found in Thailand only.

Total Number of IUCN Red List Species Found in Operational Areas

| 0 | 0 | 1 | 2 | 59 |
|-----------------------|------------|------------|-----------------|---------------|
| | | | | |
| Critically endangered | Endangered | Vulnerable | Near threatened | Least concern |



For more information, please visit www.pttplc.com and refer to the “Sustainability” heading and “Biodiversity” sub-heading.



PTT Performance Summary



Economic

| GRI | Required Data | Unit | PTT | | | |
|-----------|---|--------------|-----------|-----------|-----------|---------------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 201-1 | Direct economic value generated | | | | | |
| | Sales revenues | Million baht | 2,025,552 | 1,718,846 | 1,995,722 | 2,336,155 |
| | Economic value distributed | | | | | |
| | Operating costs | Million baht | 1,802,311 | 1,464,614 | 1,688,461 | 2,023,002 |
| | Employee wages and benefits ¹ | Million baht | 8,792 | 9,651 | 10,683 | 9,953 ² |
| | Dividend payments for the performance of the year | Million baht | 28,561 | 45,699 | 57,108 | 57,126 ³ |
| | Income taxes payment | Million baht | 25,701 | 26,593 | 28,307 | 53,647 |
| | Social investment | Million baht | 1,408 | 919 | 1,186 | 1,559 |
| | Economic value retained | Million baht | 158,779 | 217,069 | 244,235 | 190,868 |
| GRI 201-4 | Tax privileges from the Board of Investment, Thailand | Million baht | 3,727 | 4,030 | 6,180 | 1,525 |

Remark:

¹ Employee wages and benefits for employees managed under PTT include: PTT's employees, PTT's secondment and employees in subsidiaries under PTT financial management. The scope does not include the Chief Executive Officer and top executives. Employee wages and benefits include salaries, bonuses, contributions to provident funds, etc., (if applicable).

² Employee wages and benefits decreased from 2017 due to the transfer of oil business to PTTOR. A certain amount of employees were transferred to PTTOR accordingly, resulting in lower expenses of PTT during July-December 2018.

³ Dividend payment from the 2nd half of 2018 is subjected to approval from the 2019 Annual General Meeting (AGM).



Social



People

| GRI | Required Data | Unit | 2015 | | 2016 | | 2017 | | 2018 | | |
|----------------------|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|------|
| | | | Male | Female | Male | Female | Male | Female | Male | Female | |
| GRI 102-8 | Permanent employees | Manpower | 3,083 | 1,577 | 3,052 | 1,564 | 3,080 | 1,617 | 2,303 | 1,412 | |
| | Outsourced workers ¹ | Service Point | 2,113 | | 2,089 | | 2,139 | | 1,019 | | |
| | Employees by area | | | | | | | | | | |
| | • Bangkok | Manpower | 1,594 | 1,361 | 1,560 | 1,348 | 1,591 | 1,401 | 1,128 | 1,216 | |
| | • Others ² | Manpower | 1,442 | 200 | 1,448 | 201 | 1,451 | 199 | 1,148 | 181 | |
| • Overseas | Manpower | 47 ³ | 16 ³ | 44 ⁴ | 15 ⁴ | 38 ⁵ | 17 ⁵ | 27 ⁶ | 15 ⁷ | | |
| GRI 405-1 | Employees by level and age group | | | | | | | | | | |
| | Executive (Level 14 - 19) | | Manpower | 159 | 71 | 157 | 83 | 162 | 89 | 120 | 87 |
| | • Over 50 years old | Manpower | 115 | 60 | 116 | 68 | 121 | 72 | 87 | 62 | |
| | • 30 - 50 years old | Manpower | 44 | 11 | 41 | 15 | 41 | 17 | 33 | 25 | |
| | • Below 30 years old | Manpower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Middle management (Level 11 - 13) | | Manpower | 325 | 253 | 368 | 262 | 375 | 280 | 290 | 253 |
| | • Over 50 years old | Manpower | 178 | 98 | 169 | 106 | 158 | 116 | 103 | 100 | |
| | • 30 - 50 years old | Manpower | 147 | 155 | 199 | 156 | 217 | 164 | 187 | 153 | |
| | • Below 30 years old | Manpower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Senior (Level 9 - 10) | | Manpower | 842 | 462 | 827 | 458 | 848 | 486 | 677 | 467 |
| | • Over 50 years old | Manpower | 235 | 137 | 217 | 122 | 205 | 102 | 138 | 75 | |
| | • 30 - 50 years old | Manpower | 605 | 324 | 607 | 333 | 642 | 381 | 533 | 386 | |
| | • Below 30 years old | Manpower | 2 | 1 | 3 | 3 | 1 | 3 | 6 | 6 | |
| | Employee (Level 8 and below) | | Manpower | 1,757 | 791 | 1,700 | 761 | 1,695 | 762 | 1,216 | 605 |
| | • Over 50 years old | Manpower | 124 | 36 | 100 | 33 | 83 | 22 | 46 | 12 | |
| • 30 - 50 years old | Manpower | 933 | 410 | 968 | 434 | 981 | 415 | 683 | 318 | | |
| • Below 30 years old | Manpower | 700 | 345 | 632 | 294 | 631 | 325 | 487 | 275 | | |
| GRI 401-1 | Total new employees | | Manpower | 305 | | 149 | | 144 | | 222 | |
| | New employees | | Manpower | 177 | 128 | 90 | 59 | 64 | 80 | 118 | 104 |
| | New hire rate | | % | 5.74 | 8.12 | 2.95 | 3.77 | 2.08 | 4.95 | 5.12 | 7.37 |
| | New employees by area | | | | | | | | | | |
| | • Bangkok | Manpower | 94 | 110 | 62 | 53 | 47 | 73 | 91 | 91 | |
| | | % | 3.05 | 6.98 | 2.03 | 3.39 | 1.53 | 4.51 | 3.95 | 6.44 | |
| | • Others ² | Manpower | 83 | 18 | 28 | 6 | 17 | 7 | 27 | 13 | |
| | | % | 2.69 | 1.14 | 0.92 | 0.38 | 0.55 | 0.43 | 1.17 | 0.92 | |
| | New employees by age | | | | | | | | | | |
| | • Over 50 years old | Manpower | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | |
| | | % | 0.00 | 0.00 | 0.07 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | |
| | • 30 - 50 years old | Manpower | 11 | 14 | 5 | 8 | 3 | 15 | 6 | 13 | |
| % | | 0.36 | 0.89 | 0.16 | 0.51 | 0.10 | 0.93 | 0.26 | 0.92 | | |
| • Below 30 years old | Manpower | 166 | 114 | 83 | 50 | 61 | 65 | 112 | 91 | | |
| | % | 5.38 | 7.23 | 5.32 | 3.71 | 1.98 | 4.02 | 4.86 | 6.44 | | |

| GRI | Required Data | Unit | 2015 | | 2016 | | 2017 | | 2018 | | |
|-----------|--|-------------------|-------|--------|-------|--------|--------|--------|--------|--------|--|
| | | | Male | Female | Male | Female | Male | Female | Male | Female | |
| | Total employee turnover ⁹ | Manpower | 90 | | 76 | | 77 | | 80 | | |
| | Employee turnover ⁹ | Manpower | 51 | 39 | 38 | 38 | 38 | 39 | 50 | 30 | |
| | Employee turnover rate ⁹ | % | 1.65 | 2.47 | 1.25 | 2.43 | 1.23 | 2.41 | 2.17 | 2.12 | |
| | Employee turnover by area ⁹ | | | | | | | | | | |
| | • Bangkok | Manpower | 42 | 38 | 26 | 33 | 26 | 34 | 39 | 28 | |
| | | % | 1.36 | 2.41 | 1 | 2.11 | 0.84 | 2.10 | 1.69 | 0.02 | |
| | • Others ² | Manpower | 9 | 1 | 12 | 5 | 12 | 5 | 11 | 2 | |
| | | % | 0.29 | 0.06 | 0.39 | 0.32 | 0.39 | 0.31 | 0.48 | 0.14 | |
| | Employee turnover by age ⁹ | | | | | | | | | | |
| | • Over 50 years old | Manpower | 10 | 7 | 0 | 0 | 0 | 0 | 11 | 7 | |
| | | % | 0.32 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.48 | 0.50 | |
| | • 30 - 50 years old | Manpower | 22 | 20 | 19 | 17 | 19 | 17 | 27 | 16 | |
| | | % | 0.71 | 1.27 | 0.62 | 1.09 | 0.62 | 1.05 | 1.17 | 1.13 | |
| | • Below 30 years old | Manpower | 19 | 12 | 19 | 21 | 19 | 22 | 12 | 7 | |
| | | % | 0.62 | 0.76 | 0.62 | 1.34 | 0.62 | 1.36 | 0.52 | 0.50 | |
| GRI 401-3 | Number of employees entitled to parental leave | Manpower | 3,083 | 1,577 | 3,052 | 1,564 | 3,080 | 1,617 | 2,303 | 1,412 | |
| | Number of employees taking parental leave | Manpower | 0 | 38 | 70 | 47 | 81 | 45 | 69 | 58 | |
| | Number of employees returning to work after parental leave | Manpower | 0 | 38 | 70 | 47 | 81 | 44 | 68 | 58 | |
| | Number of employees returning to work after parental leave who are still employed for the next 12 months | Manpower | 0 | 36 | 69 | 46 | 81 | 44 | 68 | 58 | |
| | Retention rate | % | 0.00 | 94.74 | 98.57 | 97.87 | 100.00 | 100.00 | 100.00 | 100.00 | |
| GRI 404-1 | Average hours of training per employee ⁸ | Hour per employee | 48.84 | 64.06 | 38.82 | 71.35 | 37.85 | 43.51 | 76.69 | 68.78 | |

Remarks:

¹ Outsourced workers refers to contractors who deliver tasks specified in the annual TOR and do not include short-term outsourced workers during the year e.g. sub-contractors, consultants, housekeepers, etc.

Workforce = Permanent employees + Outsourced workers.

² Others refers to other provinces outside Bangkok where PTT's offices are situated.

³ Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore and Indonesia.

⁴ Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Indonesia and England.

⁵ Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Indonesia, England and the United States.

⁶ Including employees working abroad in Cambodia, Myanmar, Malaysia, the Philippines, Singapore, Indonesia and England.

⁷ Including employees working abroad in Cambodia, Laos, the Philippines, Singapore, England, China and the United States.

⁸ Hours of training and further study are included in the average hours of training per year per employee.

⁹ Recalculate employee turnover, excluding retired employees.



Safety

| Reporting Scope | | Year | PTT Operated Business | | | | | | | | | | | | | | 2018 Coverage (%) | | | |
|--|-------------------------|------|-----------------------|------------------|--------------------------|---------------|----------------------------|----------------------------|------------------------|--------------|--------------|----------|--------|-------------|----------------|-----|-------------------|----------------------------|----|-----|
| | | | PTT Building | | | | | Terminal | | | | | | | | | | | | |
| | | | Head Office | Prakanong Office | PTT Innovation Institute | Rayong Office | Oil Business Academy (OBA) | Gas Separation Plant (GSP) | Gas Transmission (GTM) | Gas Terminal | Oil Terminal | Aviation | Retail | Lubrication | Transportation | NGV | | Café Amazon Roasting Plant | | |
| Near miss incident | Employee and contractor | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | Employee and contractor | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee and contractor | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee and contractor | 2015 | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | • | NR | • | |
| Occupational illness frequency rate (OIFR) | Employee | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2015 | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | Contractor | | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | • | NR | • | |
| Fatalities | Employee | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2015 | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | Contractor | | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | • | NR | • | |
| Absentee rate (AR) | Employee | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2015 | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | Contractor | | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | • | NR | • | |
| Lost workday case (LWC) | Employee | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Contractor | | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | Employee | 2015 | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | Contractor | | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | • | NR | • | |

| Reporting Scope | Year | PTT Operated Business | | | | | | | | | | | | | | 2018 Coverage (%) | | | |
|---|------------|-----------------------|------------------|--------------------------|---------------|----------------------------|----------------------------|------------------------|--------------|--------------|----------|--------|-------------|----------------|-----|-------------------|----------------------------|-----|---|
| | | PTT Building | | | | | | Terminal | | | | | | | | | | | |
| | | Head Office | Prakanong Office | PTT Innovation Institute | Rayong Office | Oil Business Academy (OBA) | Gas Separation Plant (GSP) | Gas Transmission (GTM) | Gas Terminal | Oil Terminal | Aviation | Retail | Lubrication | Transportation | NGV | | Café Amazon Roasting Plant | | |
| Lost day rate (LDR) | 2018 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| | 2017 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| | 2016 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| 2015 | Employee | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | NR | | | |
| | Contractor | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | | | |
| Total recordable injuries case (TRIC) | 2018 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 | | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2017 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2016 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | |
| 2015 | Employee | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | NR | | | |
| | Contractor | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | | | |
| Total recordable injuries rate (TRIR) | 2018 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | 100 | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2017 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2016 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | |
| 2015 | Employee | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | NR | | | |
| | Contractor | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | | | |
| Lost time injury frequency rate (LTIFR) | 2018 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 | | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2017 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | | • |
| | 2016 | Employee | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | |
| | | Contractor | • | • | • | • | • | • | • | • | • | • | • | • | • | • | | • | |
| 2015 | Employee | • | • | • | • | NR | • | • | • | • | • | • | • | • | • | NR | | | |
| | Contractor | • | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | | | |

Remarks:

NR: Not relevant

- Working hours at service stations include those working at PTT-owned and operated stations only. Reporting includes total workforce only.

- Working hours at NGV Service Stations cover NGV Mother Station and PTT-owned and operated service stations only.

| GRI | Required Data ⁵ | Unit | PTT | | | |
|------------------------|---|-----------------------------------|-------------|------|------|----------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 403-2 ¹ | Lost workday case (LWC) ² | | | | | |
| | • Employee | Person | NA (4)* | 3 | 2 | 1 |
| | • Contractor | Person | NA (0)** | 5 | 2 | 7 |
| | Lost day rate (LDR) | | | | | |
| | • Employee | Lost day per 200,000 hours worked | NA (0.28)* | 0.84 | 1.01 | 0.07 |
| | • Contractor | Lost day per 200,000 hours worked | NA (0)** | 0.68 | 0.11 | 0.61 |
| | Lost time injury frequency rate (LTIFR) ³ | | | | | |
| | • Employee | Person per 200,000 hours worked | NA (0.03)* | 0.07 | 0.04 | 0.02 |
| | • Contractor | Person per 200,000 hours worked | NA (0.02)** | 0.03 | 0.01 | 0.04 |
| | Total recordable injuries case (TRIC) ³ | | | | | |
| | • Employee | Person | NA (5)* | 8 | 4 | 2 |
| | • Contractor | Person | NA (1)** | 9 | 8 | 16 |
| | Total recordable injuries rate (TRIR) ³ | | | | | |
| | • Employee | Person per 200,000 hours worked | NA (0.03)* | 0.18 | 0.09 | 0.04 |
| | • Contractor | Person per 200,000 hours worked | NA (0.02)** | 0.05 | 0.04 | 0.09 |
| | Occupational illness frequency rate (OIFR) ³ | | | | | |
| | • Employee | Person per 200,000 hours worked | 0 | 0 | 0 | 0 |
| | • Contractor | Person per 200,000 hours worked | NA | NA | NA | NA |
| | Absentee Rate (AR) | | | | | |
| | • Employee | % | 1.53 | 1.74 | 1.64 | 1.58 |
| | • Contractor | % | NA | NA | NA | NA |
| | Fatalities | | | | | |
| | • Employee | Person | 0 | 0 | 0 | 0 |
| | • Contractor | Person | 0 | 0 | 0 | 1 ⁴ |
| | Near Misses | | | | | |
| | • Employee and contractor | Case | 146 | 164 | 104 | 113 |
| Zero | Number of accidents from using corporate vehicles | Case | 14 | 14 | 13 | 6 |
| Accident | | Target | 6 | 6 | 6 | 10 |
| | Number of land transport accidents | Case per 1,000,000 km | 0.10 | 0.07 | 0.05 | 0.01 |
| | | Target | 0.05 | 0.05 | 0.05 | 0.05 |

Remarks:

NA: Not available

¹ The reporting boundary covers domestic operations only, not broken down at the regional level. OH&S data is also not broken down by gender because PTT equally regards the importance of safety for all, employees, in accordance with PTT's Code of Business Ethics. The data excludes contractors working on construction projects that have not yet been handed over to PTT, such as the Natural Gas Transmission Pipeline Project.

² Monitored by working day, and is recorded after the day on which the incident occurred. 2020 target is equal to zero.

³ Do not include first aid cases.

⁴ In 2018, there was 1 accident with contractors which resulted in fatality. PTT has investigated the cause and taken actions to prevent a repeat of such incident. The case itself has been communicated to all relevant personnel.

⁵ Workers have been recategorized according to GRI Standards 2016 from 2016 - 2018.

* All employees refer to employees and contractors under PTT's operational control, in accordance to the approach stipulated by GRI G4

** Contractors refer to independent contractors only, in accordance to the approach stipulated by GRI G4



Environment

| Reporting Scope | Year | PTT Operated Business | | | | | | | | | | | | | | 2018 Coverage (%) | | |
|--|------|-----------------------|------------------|--------------------------|---------------|----------------------------|------------------------|--------------|--------------|----------|--------|-------------|----------------|-----|----------------------------|-------------------|----|-----|
| | | PTT Building | | | | Gas Separation Plant (GSP) | Gas Transmission (GTM) | Terminal | | | Retail | Lubrication | Transportation | NGV | Café Amazon Roasting Plant | | | |
| | | Head Office | Prakanong Office | PTT Innovation Institute | Rayong Office | | | Gas Terminal | Oil Terminal | Aviation | | | | | | | | |
| Direct GHG emissions (Scope 1) | 2018 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | 2017 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2016 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2015 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| Indirect GHG emissions (Scope 2) | 2018 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | 2017 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2016 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2015 | • | • | • | NA | • | • | • | • | • | • | • | • | • | • | • | • | |
| Direct energy consumption | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| Electricity purchased | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| Water withdrawal | 2018 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | |
| | 2015 | • | • | • | NA | • | • | • | • | • | • | • | NR | • | NR | • | • | |
| Effluents | 2018 | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | • | NR | 100 |
| | 2017 | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | • | NR | |
| | 2016 | • | • | • | NR | • | • | • | • | • | • | • | NR | • | NR | • | NR | |
| | 2015 | NR | NR | NR | NR | • | NR | • | • | • | • | NR | NR | • | NR | • | NA | |
| Produced water | 2018 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | 100 |
| | 2017 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2016 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2015 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| Waste disposal | 2018 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | NR | • | • | • | • | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | NR | • | NR | • | • | |
| Oil and chemical spills | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | • | |
| Nitrogen oxides (NOx) | 2018 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | 100 |
| | 2017 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2016 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2015 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NA | |
| Sulfur dioxide (SO ₂) | 2018 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | 100 |
| | 2017 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2016 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2015 | NR | NR | NR | NR | • | • | NR | NR | NR | NR | NR | NR | NR | NR | NR | NA | |
| Volatile Organic Compounds (VOCs) | 2018 | NR | NR | NR | • | NR | • | • | NA | NR | NR | NR | NR | NR | NR | NR | NR | 100 |
| | 2017 | NR | NR | NR | • | NR | • | • | NA | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2016 | NR | NR | NR | • | NR | • | • | NA | NR | NR | NR | NR | NR | NR | NR | NR | |
| | 2015 | NR | NR | NR | • | NR | • | • | NA | NR | NR | NR | NR | NR | NR | NR | NA | |
| Volume of methane (CH ₄) emitted | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NA | |
| Direct methane (CH ₄) emissions | 2018 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | 100 |
| | 2017 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | 2016 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NR | |
| | 2015 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | NA | |

Remarks:
 NA: Not available
 NR: Not relevant



Water

| GRI | Required Data | Unit | PTT | | | |
|------------------------|--|-------------------------|-----------------------------------|-------|-------|-------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 303-1 | Total water withdrawal | Million m ³ | 3.63 | 3.59 | 3.64 | 3.68 |
| | • Surface water | Million m ³ | 0.27 | 0.31 | 0.25 | 0.18 |
| | | % | 7.44 | 8.75 | 6.87 | 4.89 |
| | • Seawater: other purposes | Million m ³ | 0.01 | 0.02 | 0.02 | 0.02 |
| | | % | 0.19 | 0.56 | 0.55 | 0.54 |
| | • Water supply | Million m ³ | 3.18 | 3.03 | 3.17 | 3.26 |
| | | % | 87.50 | 84.56 | 87.09 | 88.59 |
| | • Groundwater | Million m ³ | 0.15 | 0.17 | 0.14 | 0.15 |
| | | % | 4.10 | 4.72 | 3.85 | 4.08 |
| | • Rainwater | Million m ³ | 0.03 | 0.05 | 0.06 | 0.07 |
| | | % | 0.72 | 1.41 | 1.65 | 1.90 |
| | Total salt/brackish water (seawater + once through cooling) | Million m ³ | 0.01 | 0.02 | 0.02 | 0.02 |
| | Water from all other sources (surface water + groundwater) | Million m ³ | 0.42 | 0.48 | 0.38 | 0.33 |
| | GRI 303-3 | Recycled & reused water | Percentage of water withdrawal | 6.00 | 5.87 | 3.57 |
| Million m ³ | | | 0.23 | 0.21 | 0.13 | 0.24 |
| Water intensity | | m ³ /mboe | 0.009 | 0.009 | 0.009 | 0.009 |

Remarks:

- Strategic Objective 2020: Reduce water consumption in high risk areas and limit the increase of water consumption in areas with high consumption.
- In 2018, the amount of surface water use has decreased because WECozI was out of PTT's Scope
- In 2018, the amount of water supply use has increased as the scope of reporting has expanded to cover PTT's 7 new owned and operated service stations.
- In 2018, the amount of recycle & reused water has increased due to recycled water used for planting .



Effluents

| GRI | Required Data | Unit | PTT | | | |
|-----------|---------------------------------|------------------------|--------|--------|--------|--------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 306-1 | Total water discharge | Million m ³ | 1.49 | 1.47 | 1.41 | 1.41 |
| | Chemical oxygen demand (COD) | Tonne | 132.64 | 117.76 | 132.60 | 123.12 |
| | Biochemical oxygen demand (BOD) | Tonne | 4.72 | 7.59 | 6.21 | 5.50 |

Remark:

- Water discharge remained in line with the legal requirements.



Waste

| GRI | Required Data | Unit | PTT | | | |
|---------------------------------------|--|--------|-----------|-----------|-----------|-----------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 306-2 | Waste from routine operations | Tonne | 15,517.39 | 16,847.63 | 20,014.48 | 20,503.21 |
| | Total hazardous waste disposal | Tonne | 4,448.45 | 4,773.07 | 3,421.64 | 3,971.09 |
| | • Secure landfill | Tonne | 110.42 | 122.16 | 58.20 | 29.89 |
| | • Reuse | Tonne | 0.05 | 0.00 | 0.00 | 7.09 |
| | • Recycle | Tonne | 537.36 | 279.42 | 438.51 | 914.37 |
| | • Recover | Tonne | 3,335.31 | 3,676.94 | 2,469.10 | 2,915.47 |
| | • Others (incineration, compositing, deep well injection) | Tonne | 465.30 | 694.55 | 455.84 | 104.27 |
| | Total non-hazardous waste disposal | Tonne | 11,068.95 | 12,074.56 | 16,592.83 | 16,532.12 |
| | • Landfill | Tonne | 24.04 | 247.76 | 1,328.92 | 358.93 |
| | • Reuse | Tonne | 0.12 | 0.03 | 59.00 | 72.87 |
| | • Recycle | Tonne | 1,788.62 | 2,696.53 | 2,834.09 | 724.48 |
| | • Recover | Tonne | 161.18 | 215.58 | 247.68 | 433.59 |
| | • Domestic waste | Tonne | 9,095.00 | 8,870.36 | 12,121.30 | 14,942.25 |
| | Waste from non-routine operations (e.g. construction waste, spill clean-up waste, crisis management waste) | Tonne | 2,993.39 | 7,675.01 | 244.86 | 0.03 |
| | Total hazardous waste disposal | Tonne | 1,725.25 | 3,485.42 | 29.48 | 0.03 |
| | • Secure landfill | Tonne | 131.83 | 44.95 | 14.45 | 0.00 |
| | • Recycle | Tonne | 0.00 | 0.00 | 0.00 | 0.03 |
| | • Recover | Tonne | 1,537.48 | 3,369.90 | 0.00 | 0.00 |
| | • Others | Tonne | 55.94 | 70.57 | 15.03 | 0.00 |
| | Total non-hazardous waste disposal | Tonne | 1,315.47 | 4,189.59 | 215.38 | - |
| | • Landfill | Tonne | 25.43 | 0.00 | 0.00 | 0.00 |
| | • Reuse | Tonne | 710.00 | 3,721.90 | 183.00 | 0.00 |
| | • Recycle | Tonne | 287.30 | 67.69 | 32.38 | 0.00 |
| • Domestic waste | Tonne | 5.31 | 0.00 | 0.00 | 0.00 | |
| Total on-site waste storage | Tonne | 467.85 | 118.25 | 102.93 | 225.36 | |
| • On-site hazardous waste storage | Tonne | 208.59 | 96.73 | 80.83 | 52.78 | |
| • On-site non-hazardous waste storage | Tonne | 259.26 | 21.52 | 22.10 | 172.58 | |

Remarks:

- Waste to landfill from routine operations is separated at the beginning of the disposal process, allowing for more appropriate waste disposal methods, in alignment with the Strategic Objective 2020 "Zero Hazardous Waste to Landfill."
- The amount of waste from non-routine operations includes waste generated from the construction of capital projects, oil and chemical spillage, and risk & crisis management.
- There is no established threshold for hazardous waste, as all operations must report their total volume of hazardous waste sent for disposal.
- Domestic waste is disposed by the municipality by either landfill and/or incineration. However, we have limited access to information from the municipality.



Spills

| GRI | Required Data | Unit | PTT | | | |
|-----------|--|------------------|--------|-------|-------|-------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 306-3 | Oil and chemical spills | | | | | |
| | From PTT operational boundary | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 0 | 1 | 0 | 0 |
| | • Volume of hydrocarbon spills | m ³ | 0.00 | 3.00 | 0.00 | 0.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | From 3 rd party (transportation): truck transportation | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 4 | 2 | 3 | 0 |
| | • Volume of hydrocarbon spills | m ³ | 18.25 | 16.09 | 18.66 | 0.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | From 3 rd party (transportation): ship and barge transportation | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | Significant spill (Volume ≥ 100 barrels) | | | | | |
| | From PTT operational boundary | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 0 | 1 | 0 | 0 |
| | • Volume of hydrocarbon spills | m ³ | 0.00 | 17.87 | 0.00 | 0.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | From 3 rd party (transportation): truck transportation | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 4 | 0 | 0 | 2 |
| | • Volume of hydrocarbon spills | m ³ | 129.35 | 0.00 | 0.00 | 59.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | From 3 rd party (transportation): ship and barge transportation | | | | | |
| | • Number of hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |
| | • Number of non-hydrocarbon spills | Number of spills | 0 | 0 | 0 | 0 |
| | • Volume of non-hydrocarbon spills | m ³ | 0.00 | 0.00 | 0.00 | 0.00 |

Remark:

- Volume of hydrocarbon and non-hydrocarbon spills include spills which occur in operational areas, as well as those from truck and shipping transportation, that result in a volume of more than 1 barrel of oil spilled to the environment. In spill cases, PTT executes spill response procedures to control spills within the shortest time possible in order to minimize environmental impacts, for instance, with the use of booms and skimmers.



Emissions

| GRI | Required Data | Unit | PTT | | | |
|-----------|-----------------------------------|---|----------|----------|-----------|----------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 305-7 | Volatile Organic Compounds (VOCs) | Tonne | 9,472.17 | 9,937.58 | 10,384.24 | 9,670.56 |
| | VOCs Intensity | Tonne per million barrel oil equivalents (mboe) | 24.38 | 24.76 | 25.47 | 23.66 |
| | Nitrogen oxides (NOx) | Tonne | 1,145.90 | 1,090.25 | 1,097.85 | 1,050.62 |
| | NOx intensity | Tonne per million barrel oil equivalents (mboe) | 2.95 | 2.72 | 2.69 | 2.57 |
| | Sulfur dioxide (SO ₂) | Tonne | 77.35 | 97.58 | 106.58 | 60.93 |
| | SO ₂ intensity | Tonne per million barrel oil equivalents (mboe) | 0.20 | 0.24 | 0.26 | 0.15 |

Remarks:

- Strategic Objective 2020: Zero emission rate of SO₂, NOx, and VOCs.
- SO₂ and NOx emissions from all facilities remain below the legal threshold for air quality.
- VOCs emission has increased as the scope of reporting has expanded to cover PTT's 7 new owned and operated service stations.



Energy

| GRI | Required Data | Unit | PTT | | | |
|-----------|-----------------------------------|-----------------------------------|-------------|-------------|-------------|-------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 302-1 | Total direct energy consumption | GJ | 48,339,286 | 44,600,252 | 45,351,329 | 44,415,197 |
| | Total indirect energy consumption | GJ | 2,620,978 | 2,516,002 | 2,330,158 | 2,340,957 |
| | • Electricity purchased | GJ | 2,620,978 | 2,516,002 | 2,330,158 | 2,340,957 |
| | Total energy sold | GJ | NA | NA | 0 | 0 |
| | • Electricity sold | GJ | NA | NA | 0 | 0 |
| GRI | Required Data | Unit | PTT Group | | | |
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 302-1 | Total energy consumption | GJ | 284,641,463 | 265,716,839 | 330,098,149 | 314,737,645 |
| | Total direct energy consumption | | | | | |
| | • PTT operational control | GJ | 260,217,367 | 238,851,349 | 314,370,090 | 300,101,305 |
| | Total indirect energy consumption | GJ | 24,424,096 | 26,865,490 | 15,728,059 | 14,636,340 |
| GRI 302-3 | Direct energy intensity | | | | | |
| | • Oil and gas production | GJ/mboe | 190,238 | 196,716 | 188,682 | 205,577 |
| | • Refinery | GJ/Tonne refinery throughput | 1.91 | 2.14 | 2.42 | 1.57 |
| | • Petrochemical | GJ/Tonne petrochemical throughput | 2.88 | 9.14 | 8.29 | 5.62 |

Remarks:

NA: Not available

- Only electricity purchase is counted as part of indirect energy consumption.
- The organizational boundary of PTT Group based on the equity share approach includes all domestic subsidiaries in which PTT directly owns more than 20% of shares or indirectly owns 100% of shares.
- Organizational boundary of energy intensity of Oil & Gas, Refinery, and Petrochemical sectors is similar to the greenhouse gas inventory.



GHG Emissions

| GRI | Required Data | Unit | PTT | | | |
|-----------|---|--|-------------|-------------|-------------|-------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| | Total GHG emissions | Tonne CO ₂ equivalents | 11,762,998 | 10,652,132 | 11,280,532 | 10,594,964 |
| GRI 305-1 | Direct (Scope 1) GHG emissions | Tonne CO ₂ equivalents | 11,407,679 | 10,334,822 | 11,050,978 | 10,369,260 |
| GRI 305-2 | Energy indirect (Scope 2) GHG emissions | Tonne CO ₂ equivalents | 355,319 | 317,309 | 229,554 | 225,704 |
| GRI 305-3 | Other indirect (Scope 3) GHG emissions | Tonne CO ₂ equivalents | 125,722,575 | 127,078,140 | 124,488,019 | 127,046,865 |
| GRI | Required Data | Unit | PTT Group | | | |
| | | | 2015 | 2016 | 2017 | 2018 |
| GRI 305-1 | GHG Scope 1 | | | | | |
| | • PTT operational control | Tonne CO ₂ equivalents | 31,115,981 | 29,979,970 | 30,163,397 | 29,780,139 |
| | • PTT equity share | Tonne CO ₂ equivalents | 20,701,762 | 19,693,954 | 20,047,851 | 19,558,025 |
| GRI 305-2 | GHG Scope 2 | | | | | |
| | • PTT operational control | Tonne CO ₂ equivalents | 1,800,870 | 1,606,220 | 1,669,446 | 1,444,897 |
| | • PTT equity share | Tonne CO ₂ equivalents | 1,080,016 | 950,828 | 921,565 | 822,646 |
| GRI 305-3 | PTT operational control | Tonne CO ₂ equivalents | 125,722,575 | 127,078,140 | 124,488,019 | 105,524,090 |
| GRI 305-4 | GHG Intensity | | | | | |
| | • Oil and gas production | Tonne CO ₂ equivalents/Million barrel oil equivalents | 38,130 | 38,045 | 38,257 | 38,672 |
| | • Refinery | Tonne CO ₂ equivalents/Tonne refinery throughput | 0.0899 | 0.1416 | 0.1540 | 0.1275 |
| | • Petrochemical | Tonne CO ₂ equivalents/Tonne petrochemical product | 0.5499 | 0.5432 | 0.5782 | 0.3857 |

Remarks:

- The organizational boundary of PTT Group based on the equity share approach includes all domestic subsidiaries in which PTT directly owns more than 20% of shares or indirectly owns 100% of shares.
- Scope 3 emissions include the combustion of fuel sold by PTT only.
- In 2017, PTTAC, PTTMCC, PTTPL, PTTM and HMC, since PTT sold equity shares of PTTAC, PTTMCC, PTTPL, PTTM and HMC to GC.



Methane Emissions

| GRI | Required Data | Unit | PTT | | | |
|--------|---|----------------|------------|------------|------------|------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| | Volume of methane emitted (leakage, venting, and flaring) | m ³ | 34,851,750 | 30,606,285 | 24,873,057 | 25,663,456 |
| | Direct CH ₄ emissions (extracted from GHG) | Tonne | 23,548 | 20,679 | 16,807 | 17,339 |
| G4-OG6 | Volume of flared hydrocarbon | m ³ | 346,722 | 197,367 | 155,751 | 192,662 |
| | Volume of vented hydrocarbon | m ³ | 55,562 | 21,474 | 30,317 | 23,911 |

| GRI | Required Data | Unit | PTT Group | | | |
|--------|---|----------------|------------|------------|------------|------------|
| | | | 2015 | 2016 | 2017 | 2018 |
| | Volume of methane emitted (leakage, venting, and flaring) | m ³ | 77,698,553 | 71,332,568 | 64,181,617 | 63,540,364 |
| | Direct CH ₄ emissions (extracted from GHG) | Tonne | 52,686 | 48,335 | 43,448 | 43,023 |
| G4-OG6 | Volume of flared hydrocarbon | m ³ | 764,932 | 1,210,395 | 1,224,651 | 1,282,503 |
| | Volume of vented hydrocarbon | m ³ | 55,562 | 21,474 | 30,636 | 24,003 |

Remarks:

- The volume of methane emitted includes leakage (fugitive), gas vented from processes (CO₂ separation and ethylene production), methane emitted from vented emissions, and flaring.
- Direct CH₄ emissions include those from aforementioned sources, as well as direct CH₄ emitted from combustion sources.



Environmental Management

| Required Data | Unit | PTT | | | |
|--|--------------|-------|------|------|------|
| | | 2015 | 2016 | 2017 | 2018 |
| Environmental Policy/Management System | | | | | |
| Capital investments | Million baht | 1,857 | 132 | 123 | 53 |
| Operating expenses | Million baht | 156 | 356 | 322 | 331 |
| Total expenses (Capital Investment + Operating Expense) | Million baht | 2,013 | 488 | 445 | 384 |
| Savings, cost avoidance, income, tax incentives, etc. | Million baht | 367 | 142 | 285 | 43 |
| Operations covered (by revenue, production volume, or employees, etc.) | % | 100 | 100 | 100 | 100 |
| Environmental Violations | | | | | |
| Number of violations of legal obligations/regulations | Case | 0 | 0 | 0 | 0 |
| Amount of fines/penalties related to the above | Baht | 0 | 0 | 0 | 0 |
| Environmental liability accrued at year end | Baht | 0 | 0 | 0 | 0 |

Remarks:

- In 2015, PTT developed the methodologies to quantify and consolidate environmental expense that occurred under PTT's budget as well as to approximate return on environmental investment from major environmental projects.
- Since 2016, PTT improved the methodologies for completeness and to be in accordance with the Environmental Management Accounting Procedures and Principles developed by the United Nations. Return on environmental investment calculation was improved by including the projects registered under PTT's Productivity Improvement Circle Programs.
- Major decline in environmental investment in 2016 comparing to 2015 was due to the completion of the Waste Heat Recovery Unit at Rayong Gas Separation Plant. This project accounted for approximately 80% of the total environmental budget in 2015.
- In 2018, PTT has improved SAP systems to quantify and consolidate actual environment costs.
- Environmentally-related assets has declined from 2017 because PTT has transferred its Oil Business Unit to PTTOR since July 1st, 2018.

Awards and Recognition



Award for Promoting Prevention and Efforts Against Corruption, First Honor, 2018

Given by the Office of the National Anti-Corruption Commission (NACC)

Rated in Integrity & Transparency Assessment (ITA) for a State Organization's Performance as Excellent for the 5th consecutive year

Given by the Office of the National Anti-Corruption Commission (NACC)

Corporate Governance Report (CGR) of Thai Listed Companies

PTT was ranked at the Excellent CG Scoring for 10 consecutive years, and was ranked in the Top Quartile of listed companies with a market value of at least 10,000 million baht.

Given by the Thai Institute of Directors (Thai IOD) and the Stock Exchange of Thailand (SET)

SET Sustainability Awards 2018 and Sustainable Stock Awards

Given by the Stock Exchange of Thailand (SET)

PTT renews the membership of Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) for the 2nd consecutive year

Given by the committee of Private Sector Collective Action Coalition Against Corruption Council (CAC)

Sustainability Report Award

Rated for Excellence

Given by the Securities and Exchange Commission (SEC), Thai Listed Companies Association by CSR Club, and Thaipat Institute

National Awards

25 / 47
Institutions / Awards include

Thailand Corporate Excellence Awards 2018 granted from HRH Princess Maha Chakri Sirindhorn

comprises 2 excellence awards, as follows

1. Financial Management Excellence
2. Corporate Improvement Excellence

- 6 Outstanding Awards, including
1. Human Resource Management Excellence
 2. Excellence in Innovation and Initiation
 3. Leadership Excellence
 4. Marketing Excellence
 5. Product/Service Excellence
 6. Excellence in Sustainable Development/ Corporate Social Responsibility

Given by the Association of Business Management of Thailand (TMA) and Sasin Graduate Institute of Business Administration of Chulalongkorn University
Outstanding State-owned Enterprise Award (SOE Award) 2018

- Include
1. Outstanding State-owned Enterprise Award 2018 for 3 consecutive years
 2. CEO Leader Award
 3. Best Transparency and Disclosure Award for 4 consecutive years
 4. Outstanding Social and Environmental Performance Award
 5. Outstanding Collaboration for Development (Mentorship Project)
 6. Innovation Award from digital machine's damage and malfunction forecast in Rayong Gas Separation Plant

Given by Ministry of Finance

International Awards

8 / 22
Institutions / Awards include

Asian Excellence Awards 2018

Individual category:

- Asia's Best CEO
Mr. Tevin Vongvanich
- Asia's Best CFO
Mrs. Nitima Thepvanangkul

Organization category:

- Best Investor Relations Company
- Given by the Corporate Governance Asia Magazine

The No. 1 Brand Thailand 2017-2018

- Grants 3 awards for
- PTT Service Station under Fuel Station Category
 - Amazon Café under Coffee Shop Category
 - Lubricants under Engine Oil Car Category

Ranked by Credibility Survey as the 1st for 8 consecutive years

Given by the Marketeer Magazine

4 Outstanding Awards

- Most Organised Investor Relations
- Best Senior Management IR Support
- Most Consistent Dividend Policy
- Best Strategic Corporate Social Responsibility

Given by the Alpha Southeast Asia Magazine

As of 2018, PTT received

33 / 69
Awards / Institutions

The Asset Awards 2018

include

- The Asset Corporate Award – Platinum Award 2018 for the 10th consecutive year
- Best Initiatives in Innovation – “The Soothsayer” an innovation to forecast damage and malfunction that may occur to machines and equipment in Gas Separation Plant's production process in Rayong
- Best Initiatives in Social Responsibility – Floating solar cells for sustainable water management
- Best Initiatives in Environmental Stewardship Water Risk Assessment
- Best Investor Relations Team

Given by the Asset Magazine

ASEAN Corporate Governance Awards as one of the Thai Listed Companies assessed according to ASEAN CG Scorecard

- Ranked TOP 3 PLCs (Thailand)
- Ranked TOP 50 ASEAN PLCs (TOP 1-10)

Given by ASEAN Capital Markets Forum

PTT maintains its position for 7 consecutive years as a member of the Dow Jones Sustainability World Index (DJSI World).

With the highest score in the Oil & Gas Upstream & Integrated Industry (OGX), PTT was named Industry Leader for the 2nd consecutive year. Classified as Gold Class in RobecoSAM Sustainability Yearbook 2018

Given by RobecoSAM and S&P Dow Jones Indices

MEMBER OF

Dow Jones Sustainability Indices

In Collaboration with RobecoSAM



GRI, IR, UNGC and UN SDGs Content Index

GLOBAL REPORTING INITIATIVE (GRI)

| GRI Standard | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|-------------------------------|---|--|--------------------------|
| Organizational Profile | | | |
| GRI 102-1 | Name of the organization | 4 | |
| GRI 102-2 | Activities, brands, products, and services | 4-5 | |
| GRI 102-3 | Location of headquarters | 5 | |
| GRI 102-4 | Location of operations | 5 | |
| GRI 102-5 | Ownership and legal form | 4 | |
| GRI 102-6 | Markets served | 4-5 | |
| GRI 102-7 | Scale of the organization | 5, 66 | |
| GRI 102-8 | Information on employees and other workers | 66 | 8.5 |
| GRI 102-9 | Supply chain | 28-29 | |
| GRI 102-10 | Significant changes to the organization and its supply chain | 1 | |
| GRI 102-11 | Precautionary principle or approach | 19-20, 54-55, 63-64 | |
| GRI 102-12 | External initiatives | 14-15, 23, 59, http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Pages/Collaboration.aspx | |
| GRI 102-13 | Membership of associations | 2-3, 14-15, 23, 78-79 | |
| Strategy | | | |
| GRI 102-14 | Statement from senior decision-maker | 2-3 | |
| GRI 102-15 | Key impacts, risks, and opportunities | 2-3, 6-7, 19-22, 58, 60 | |
| Ethics and Integrity | | | |
| GRI 102-16 | Values, principles, standards, and norms of behavior | 20-22, 40 | |
| GRI 102-17 | Mechanisms for advice and concerns about ethics | 22 | |
| Governance | | | |
| GRI 102-18 | Governance structure | http://www.pttplc.com/en/About/Organization/Pages/Organization-Chart.aspx | |
| GRI 102-19 | Delegating authority | http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Governance/Pages/Corporate-Governance.aspx | |
| GRI 102-20 | Executive-level responsibility for economic, environmental, and social topics | 18-19, http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Governance/Pages/Sustainability-Governance-and-Framework.aspx | |
| GRI 102-21 | Consulting stakeholders on economic, environmental and social topics | 8-11 | 16.7 |
| GRI 102-22 | Composition of the highest governance body and its committees | http://www.pttplc.com/en/About/Organization/Pages/Organization-Chart.aspx | 16.7 |
| GRI 102-23 | Chair of the highest governance body | http://www.pttplc.com/en/About/Organization/Pages/PTT-committee.aspx | |
| GRI 102-24 | Nominating and selecting the highest governance body | http://www.pttplc.com/en/About/Organization/Pages/Corporate-Nomination-Committee.aspx | 16.7 |
| GRI 102-25 | Conflicts of interest | 22 | 16.6 |
| GRI 102-26 | Role of the highest governance body in setting purpose, values, and strategy | 5.0 Responsibilities of the Board (pg. 31), http://www.pttplc.com/en/About/Documents/CG%20Handbook%202017%20EN/PTT_CGbookEN_rev4.pdf | |
| GRI 102-27 | Collective knowledge of highest governance body | 21-23 | |

| GRI Standard | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|--|--|--|--------------------------|
| GRI 102-28 | Evaluating the highest governance body's performance | 5.8 Evaluation of the Performance of the Board (pg. 45), http://www.pttplc.com/en/About/Documents/CG%20Handbook%202017%20EN/PTT_CGbookEN_rev4.pdf | |
| GRI 102-29 | Identifying and managing economic, environmental and social impacts | 6-7, 19-20 | 16.7 |
| GRI 102-30 | Effectiveness of risk management process | 19-20 | |
| GRI 102-31 | Review of economic, environmental, and social topics | 19-20 | |
| GRI 102-32 | Highest governance body's roles in sustainability reporting | 10 | |
| GRI 102-38 | Annual total compensation ratio | http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Governance/Pages/Corporate-Governance.aspx | |
| Stakeholder Engagement | | | |
| GRI 102-40 | List of stakeholder groups | 8-9 | |
| GRI 102-41 | Collective bargaining agreements | 41 | 8.8 |
| GRI 102-42 | Identifying and selecting stakeholders | 8 | |
| GRI 102-43 | Approach to stakeholder engagement | 8-9, 34-35 | |
| GRI 102-44 | Key topics and concerns raised | 8-9, 34-35, http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Stakeholder-Engagement/Pages/default.aspx | |
| Reporting Practice | | | |
| GRI 102-45 | Entities included in the consolidated financial statements | 1 | |
| GRI 102-46 | Defining report content and topic boundaries | 1, 10-11 | |
| GRI 102-47 | List of material topics | 10 | |
| GRI 102-48 | Restatements of information | 26-27, 67, 70 | |
| GRI 102-49 | Changes in reporting | 10 | |
| GRI 102-50 | Reporting period | 1 | |
| GRI 102-51 | Date of most recent report | PTT Sustainability Report 2017 | |
| GRI 102-52 | Reporting cycle | 1 | |
| GRI 102-53 | Contact point for questions regarding the report | 1 | |
| GRI 102-54 | Claims of reporting in accordance with the GRI Standards | 1 | |
| GRI 102-55 | GRI content index | 80-85 | |
| GRI 102-56 | External assurance | 87-88 | |
| GRI 201: Economic Performance | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 4-5, 10-11 | |
| GRI 103-2 | The management approach and its components | 4-5 | |
| GRI 201-1* | Direct economic value generated and distributed | 65 | 8.1 |
| GRI 201-2 | Financial implications and other risks and opportunities due to climate change | 57-59 | 13.1 |
| GRI 201-4 | Financial assistance received from government | 65 | |
| GRI 203: Indirect Economic Impact | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 24-27, 42-49 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 203-1 | Infrastructure investments and services supported | 24-27, 42-49 | |
| GRI 203-2 | Significant indirect economic impacts | 44-45, 47-48, 65 | 8.5 |
| GRI 205: Anti-Corruption | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 21-23 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 205-2 | Communication and training about anti-corruption policies and procedures | 21-23 | 16.5 |
| GRI 205-3 | Confirmed incidents of corruption and actions taken | 22 | 16.5 |

| GRI Standard | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|--|---|--|--------------------------|
| GRI 302: Energy | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 56-59 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 302-1* | Energy consumption within the organization | 75 | 7.2, 7.3, 12.2, 13.1 |
| GRI 302-3* | Energy intensity | 59, 75 | 7.3, 12.2, 13.1 |
| GRI 302-4 | Reduction of energy consumption | 59 | 7.3, 12.2, 13.1 |
| GRI 303: Water (2016) | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 60, http://www.pttplc.com/en/Sustainability/Environment/Pages/Water-Management.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 303-1* | Water withdrawal by source | 72 | |
| GRI 303-3 | Water recycled and reused | 60, 72 | 12.2 |
| GRI 304: Biodiversity | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 56, 64, http://www.pttplc.com/en/Sustainability/Environment/Biodiversity/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 304-2 | Significant impacts of activities, products, and services on biodiversity | 64 | 14.2, 15.1, 15.5 |
| GRI 305: Emissions | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 56-59, http://www.pttplc.com/en/Sustainability/Environment/Stewardship/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 305-1* | Direct (Scope 1) GHG emissions | 59, 76 | 12.4, 13.1, 14.3, 15.2 |
| GRI 305-2* | Energy indirect (Scope 2) GHG emissions | 59, 76 | 12.4, 13.1, 14.3, 15.2 |
| GRI 305-3* | Other indirect (Scope 3) GHG emissions | 59, 76 | 12.4, 13.1, 14.3, 15.2 |
| GRI 305-4* | GHG emissions intensity | 59, 76 | 13.1, 14.3, 15.2 |
| GRI 305-7* | Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions | 63 | 12.4, 14.3, 15.2 |
| GRI 306: Effluents and Waste | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 56, 60-63, http://www.pttplc.com/en/Sustainability/Environment/Stewardship/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 306-1* | Water discharged by quality and destination | 72 | 12.4, 14.1 |
| GRI 306-2* | Waste by type and disposal method | 73 | 12.4, 12.5 |
| GRI 306-3* | Significant spills | 74 | 12.4, 14.1, 15.1 |
| GRI 307: Environmental Compliance | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 56-64 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 307-1 | Non-compliance with environmental laws and regulations | 77 | |

| GRI Standard | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|---|---|--|--------------------------|
| GRI 308: Supplier Environmental Assessment | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 28-29, http://www.pttplc.com/en/Sustainability/Economics/Supply-Chain-Management/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 308-1 | New suppliers that were screened using environmental criteria | 28 | |
| GRI 308-2 | Negative environmental impacts in the supply chain and actions taken | 28 | |
| GRI 401: Employment | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 36-37, http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 401-1 | New employee hires and employee turnover | 66-67 | 8.5 |
| GRI 401-3 | Parental leave | 67 | 8.5 |
| GRI 403: Occupational Health and Safety (2016) | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 50-53 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 403-2* | Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities | 70 | 8.8 |
| GRI 404: Training and Education | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 36-39, http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 404-1* | Average hours of training per year per employee | 37, 67 | 8.5 |
| GRI 404-2 | Programs for upgrading employee skills and transition assistance programs | 36-37 | 8.5 |
| GRI 404-3 | Percentage of employees receiving regular performance and career development reviews | 36 | 8.5 |
| GRI 405: Diversity and Equal Opportunity | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 405-1 | Diversity of governance bodies and employees | 66 | 8.5 |
| GRI 406: Non-Discrimination | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 41, http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 406-1 | Incidents of discrimination and corrective actions taken | 41 | 8.8 |
| GRI 408: Child Labor | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 28, 41 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 408-1 | Operations and suppliers at significant risk for incidents of child labor | 28, 41 | |
| GRI 410: Security Practices | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 54 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 410-1 | Security personnel trained in human rights policies or procedures | 54 | |

| GRI Standard | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|---|---|--|--------------------------|
| GRI 411: Right of Indigenous Peoples | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | http://www.pttplc.com/en/Sustainability/Social/Human-Rights/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 411-1 | Incidents of violations involving rights of indigenous peoples | No incidents of violations involving rights of indigenous peoples in 2018. | |
| GRI 412: Human Rights Assessment | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 41, http://www.pttplc.com/en/Sustainability/Social/Human-Rights/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 412-1 | Operations that have been subject to human rights reviews or impact assessments | 41 | |
| GRI 412-2 | Employee training on human rights policies or procedures | 41 | |
| GRI 413: Local Communities | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 41, 26-27, 42-49, http://www.pttplc.com/en/Sustainability/Social/Human-Rights/Pages/default.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 413-1 | Operations with local community engagement, impact assessments, and development programs | 26-27, 41-42 | |
| GRI 413-2 | Operations with significant actual and potential negative impacts on local communities | 41, 26-27, http://www.pttplc.com/en/Sustainability/Social/Human-Rights/Pages/default.aspx | |
| GRI 414: Supplier Social Assessment | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 28, 41 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 414-1 | New suppliers that were screened using social criteria | 28 | 8.8 |
| GRI 414-2 | Negative social impacts in the supply chain and actions taken | 28 | 8.8 |
| GRI 415: Public Policy | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Pages/Collaboration.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 415-1 | Political contributions | Political contributions are prohibited under PTT regulations. | 16.5 |
| GRI 416: Customer Health and Safety | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 34-35, http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 416-2 | Incidents of non-compliance concerning the health and safety impacts of products and services | 35 | 16.3 |
| GRI 417: Marketing and Labeling | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 34-35, http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 417-2 | Incidents of non-compliance concerning product and service information and labeling | 35 | 16.3 |
| GRI 419: Socio-economic Compliance | | | |
| GRI 103-1 | Explanation of the material topic and its boundary | 26-27 | |
| GRI 103-2 | The management approach and its components | | |
| GRI 103-3 | Evaluation of the management approach | | |
| GRI 419-1 | Non-compliance with laws and regulations in the social and economic area | 26-27 | |

Green text means indicators with added commentary in GRI Oil and Gas Sector Disclosure (OGSD).

* These indicators have been externally verified by an independent third party organization, whose assurance statement is available on page 87-88.

| GRI Oil and Gas Sector Disclosure | Description | Sustainability Report (Page / URL) and Remarks (Omission / Comment) | Relations to SDG Targets |
|-----------------------------------|---|---|-----------------------------------|
| Organizational Profile | | | |
| G4-OG4* | Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored | 64 | 14.2, 15.1, 15.5 |
| G4-OG6* | Volume of flared and vented hydrocarbon | 77 | 7.3, 12.2, 12.4, 12.5, 13.1, 14.3 |
| G4-OG10 | Number and description of significant disputes with local communities and indigenous peoples | 27 | |
| G4-OG12 | Operations where involuntary resettlement took place | 27 | |
| G4-OG13* | Process safety events, by business activity | 52 | 8.8 |
| G4-OG14 | Volume of biofuels produced and purchased | 33 | 7.2, 15.2, 15.5 |

Green text means indicators with added commentary in GRI Oil and Gas Sector Disclosure (OGSD).

* These indicators have been externally verified by an independent third party organization, whose assurance statement is available on page 87-88.

INTEGRATED REPORTING <IR>

| Content Elements | Page |
|--|---|
| Organizational overview and external environment | 4-5, 6-7, 40 |
| Governance | 12-13, 18-20, 30-31 |
| Business model | 4-5, 16-17 |
| Risks and opportunities | 6-7, 10-11, 19-20 |
| Strategy and resource allocation | 6-7, 8-9, 12-13, 24-25, 30 |
| Performance | 8-9, 10-11, 14-15, 16-17, 18-23, 24-35, 36-55, 56-64, 65-77 |
| Outlook | 6-7, 24-25, 36-39 |
| Basis of preparation and presentation | 1, 10-11 |

| Capital | Description | Page |
|-------------------------|--|---|
| Financial | The pool of funds that is available to an organization for use in the production of goods or the provision of services; and obtained through financing, such as debt, equity or grants, or generated through operations or investments. | 16-17, 24, 65 |
| Manufactured | Manufactured physical objects that are available to an organization for use in the production of goods or the provision of services (e.g. buildings, equipment, and infrastructure). | 16-17, 26-27 |
| Intellectual | Organizational, knowledge-based intangibles including intellectual property (e.g. patents, copyrights, software, rights and licenses) and organizational capital (e.g. tacit knowledge, systems, procedures and protocols). | 16-17, 30-33 |
| Human | People's competencies, capabilities and experience, and their motivations to innovate. | 16-17, 30-31, 36-40, 50-53 |
| Social and Relationship | The institutions and relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being (e.g. shared norms, common values and behaviors; key stakeholder relationships; intangibles associated with the brand and reputation; social license to operate). | 8-9, 16-17, 22-23, 26-27, 28-29, 34-35, 42-49 |
| Natural | All renewable and non-renewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization (e.g. air, water, land, minerals and forests, biodiversity and eco-system health). | 16-17, 46-47, 56-64 |

UNITED NATIONS GLOBAL COMPACT (UNGC)

Communication on Progress - Advanced Level

| Criterion | Description | Page |
|-----------|---|-------------------------|
| 1 | The COP describes mainstreaming into corporate functions and business units | 18-23 |
| 2 | The COP describes value chain implementation | 4-5, 16-17, 28-29 |
| 3 | The COP describes robust commitments, strategies or policies in the area of human rights | 41 |
| 4 | The COP describes effective management systems to integrate the human rights principles | 41 |
| 5 | The COP describes effective monitoring and evaluation mechanisms of human rights integration | 41 |
| 6 | The COP describes robust commitments, strategies or policies in the area of labor | 41 |
| 7 | The COP describes effective management systems to integrate the labor principles | 41 |
| 8 | The COP describes effective monitoring and evaluation mechanisms of labor principles integration | 41 |
| 9 | The COP describes robust commitments, strategies or policies in the area of environmental stewardship | 56-64 |
| 10 | The COP describes effective management systems to integrate the environmental principles | 56-64 |
| 11 | The COP describes effective monitoring and evaluation mechanisms for environmental stewardship | 33, 56-64 |
| 12 | The COP describes robust commitments, strategies or policies in the area of anti-corruption | 18-23 |
| 13 | The COP describes effective management systems to integrate the anti-corruption principle | 21-23 |
| 14 | The COP describes effective monitoring and evaluation mechanisms for the integration of anti-corruption | 22 |
| 15 | The COP describes core business contributions to UN goals and issues | 12-15 |
| 16 | The COP describes strategic social investments and philanthropy | 42 |
| 17 | The COP describes advocacy and public policy engagement | 12-15 |
| 18 | The COP describes partnerships and collective action | 14-15, 22-23, 32, 58-60 |
| 19 | The COP describes CEO commitment and leadership | 2-3 |
| 20 | The COP describes Board adoption and oversight | 18-19 |
| 21 | The COP describes stakeholder engagement | 8-9, 26-27 |

THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

| TCFD recommendation | Pages / Remarks |
|--|---------------------------------------|
| Governance: Disclose the organization's governance around climate related risks and opportunities. | |
| a) Describe the board's oversight of climate-related risks and opportunities. | 57-58 |
| b) Describe management's role in assessing and managing climate-related risks and opportunities. | 57-58 |
| Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material. | |
| a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term. | 58 |
| b) Describe the impact of climate related risks and opportunities on the organization's businesses, strategy, and financial planning. | 58 |
| c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario. | 57-58 |
| Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks. | |
| a) Describe the organization's processes for identifying and assessing climate-related risks. | 58 |
| b) Describe the organization's processes for managing climate-related risks. | 57-58 |
| c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management. | 58 |
| Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material. | |
| a) Disclose the metrics used by the organization to assess climate related risks and opportunities in line with its strategy and risk management process. | Information is currently unavailable. |
| b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. | 59, 76 |
| c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets. | 57, 59 |



KPMG Phoomchai Audit Ltd.
50th Floor, Empire Tower,
1 South Sathorn Road, Yannawa
Sathorn, Bangkok 10120, Thailand
Tel +66 2677 2000
Fax +66 2677 2222
Website kpmg.com/th

บริษัท เคพีเอ็มจี ภูมิภาค สอบบัญชี จำกัด
ชั้น 50 เอ็มไพร์ทาวเวอร์
1 ถนน สาทรใต้ แขวงยานนาวา
เขตสาทร กรุงเทพฯ 10120
โทร +66 2677 2000
แฟกซ์ +66 2677 2222
เว็บไซต์ kpmg.com/th

Independent limited assurance report

To the Directors of PTT Public Company Limited (“PTT”)

Conclusion

Based on the procedures performed, as described below, nothing has come to our attention that causes us to believe that the selected subject matters (“Subject Matters”) identified below and included in the Sustainability Report 2018 (the “Report”) for the year ended 31 December 2018 and disclosures regarding their adherence to the three AccountAbility Principles of Inclusiveness, Materiality and Responsiveness under AA1000APS (2008), and reliability of Subject Matters, are not, in all material respects, prepared in compliance with the reporting criteria (the “Criteria”).

Our Responsibilities

We have been engaged by PTT and are responsible for providing a limited assurance conclusion in respect of the Subject Matters for the year ended 31 December 2018 to be included in the Report as identified below.

Our assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 *Assurance Engagements other than Audits or Reviews of Historical Financial Information* and ISAE 3410 *Assurance on Greenhouse Gas Statements*. We have also conducted our engagement in accordance with the Accountability Assurance Standard of Sustainability AA1000AS (2008) at moderate level that corresponds to a limited assurance as per ISAE 3000 with a Type 2 engagement, which covers not only the nature and extent of the organisation’s adherence to the AA1000APS, but also evaluates the reliability of Subject Matters as indicated below. These standards require the assurance team to possess the specific knowledge, skills and professional competencies needed to provide assurance on sustainability information, and that we plan and perform the engagement to obtain limited assurance on whether the Subject Matters are prepared, in all material respects, in compliance with the Criteria. We have complied with the requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants to ensure their independence. The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have not been engaged to provide an assurance conclusion on any other information disclosed within the Report.

Subject Matters

Subject Matters comprised of the following data expressed numerically or in descriptive text for the year ended 31 December 2018:

- GRI 302-1 Energy consumption within organization
- GRI 302-3 Energy intensity
- GRI 303-1 Water withdrawal by source
- GRI 305-1 Direct (Scope 1) GHG emissions
- GRI 305-2 Energy indirect (Scope 2) GHG emissions
- GRI 305-3 Other indirect (Scope 3) GHG emissions
- GRI 305-4 GHG emissions intensity
- GRI 305-7 Nitrogen Oxide (NOx), Sulfur Oxide (SOx), and other significant air emissions (Volatile Organic Compounds: VOCs)
- GRI 306-1 Water discharge by quality and destination
- GRI 306-2 Waste by type and disposal method
- GRI 306-3 Significant spills
- GRI 403-2 Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities
- GRI 404-1 Average hours of training per year per employee
- GRI 201-1 Economic value distributed – Community Investment

- OGSD – OG4 Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored
- OGSD – OG6 Volume of flared and vented hydrocarbon
- OGSD – OG13 Process safety events, by business activity

Criteria

The Subject Matters were assessed according to the following criteria:

- The Sustainability Reporting Standards of the Global Reporting Initiative (“GRI Standards”);
- The Oil and Gas Sector Disclosures (“OGSD”); and
- AA1000 AccountAbility Principles Standard (2008) (“AA1000APS”).

Directors’ and management’s responsibilities

The directors and management of PTT are responsible for the preparation and presentation of the Subject Matters, specifically ensuring that in all material respects the Subject Matters are prepared and presented in accordance with the Criteria. This responsibility also includes the internal controls relevant to the preparation of the Report that is free from material misstatement whether due to fraud or error.

Procedure performed

In forming our limited assurance conclusion over the Subject Matters, our procedures consisted of making enquiries and applying analytical and other evidence gathering procedures including:

- Interviews with senior management and relevant staff at corporate and operating sites;
- Inquiries about the design and implementation of the systems and methods used to collect and process the information reported, including the aggregation of source data into the Subject Matters;
- Inquiries about managements practices and procedures related to identifying stakeholders and their expectations, determining material sustainability matters and implementing sustainability policies and guidelines;
- Visits 3 sites; Region 8 Gas Transmission Pipeline Operation, Ban Rong Po Gas Terminal, and Rayong Gas Separation Plant, selected on the basis of risk analysis including the consideration of both quantitative and qualitative criteria;
- Agreeing the Subject Matters to relevant underlying sources on a sample basis to determine

whether all the relevant information has been included in the Subject Matters and prepared in accordance with the Criteria.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and 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. Accordingly, we do not express a reasonable assurance opinion.

Inherent limitations

Due to the inherent limitations of any internal control structure it is possible that errors or irregularities in the information presented in the Report may occur and not be detected. Our engagement is not designed to detect all weaknesses in the internal controls over the preparation and presentation of the Report, as the engagement has not been performed continuously throughout the period and the procedures performed were undertaken on a test basis.

Restriction of use of our report

Our report should not be regarded as suitable to be used or relied on by any party wishing to acquire rights against us other than PTT, for any purpose or in any other context. Any party other than PTT who obtains access to our report or a copy thereof and chooses to rely on our report (or any part thereof) will do so at its own risk. To the fullest extent permitted by law, we accept or assume no responsibility and deny any liability to any party other than PTT for our work, for this independent limited assurance report, or for the conclusions we have reached.



KPMG Phoomchai Audit Ltd.

Bangkok

8 March 2019

Please indicate an X in the selection box and provide your comments in the space provided.

- 1** Please indicate the group of stakeholder relevant to you.
- Business Partner Employee School Student/ University Student/ Educational Institute
 Customer Shareholder/Investor Public Sector/Government Sector
 Media Other, please specify

- 2** Where did you receive PTT Corporate Sustainability Report 2018?
- Annual General Meeting for Shareholders PTT Employee
 Seminar/ Exhibition/ Lecture PTT Website
 Other, please specify

- 3** Please indicate your interest in reading PTT Corporate Sustainability Report 2018.
- To get to know PTT For research/education To support investment decisions
 To prepare my own sustainability report Other, please specify

4 Please provide your view on the completeness and credibility of PTT Corporate Sustainability Report 2018.

- Your understanding of PTT's material issues after reading the report
- Alignment between PTT's sustainability strategy and sustainability performance
- Completeness and reliability of content
- Relevance to your interests and expectations

| Very high | High | Medium | Low | Very low |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

5 Please indicate the 3 sustainability issues that are most important to you by prioritizing them according to the following criteria: 1- Highly important, 2 – Moderately important, and 3 – Slightly important.

- Sustainable Governance
- Stakeholder Dialogues
- Fair Operating Practices
- Capital Project Management
- Supply Chain Management
- Research & Development (R&D) and Innovation
- Product Stewardship
- Human Capital Development
- Talent Attraction and Retention
- Human Rights
- Corporate Citizenship
- Safety
- Security and Crisis Management
- Climate Change
- Integrated Water Management
- Air Pollution
- Effluents and Waste
- Biodiversity
- Other, please specify

6 In your opinion, does the report cover all of PTT's material sustainability issues?

- Yes No

If no, please explain and indicate which issue you believe should be included.

.....

.....

7 Please provide other comments and suggestions on how to improve future reports.

.....

.....

8 Additional comments on sustainability management at PTT.

.....

.....

Readers may scan the QR code to conduct this Reader Feedback Survey online.



Reader Feedback Survey

PTT Corporate Sustainability Report 2018

Feedback received from this survey will be used to improve the content and design of PTT's 2019 Corporate Sustainability Report.



Thank you very much for your kind cooperation.

Email: sm@ptplc.com
Tel: +66-2537-2172

10900 Thailand
Chatchak, Bangkok
555 Vibhavadi Rangsit Road,

PTT Public Company Limited

Corporate Management System Department

ใบอนุญาตที่ ป.น. (น.) 12 ป.น. จตุจักร
สำนักงานส่งเสริมการค้า
ในต่างประเทศ

บริการลูกค้าออนไลน์



PTT News
We Love PTT



PTT Group Official

ขอบคุณทุกพลังความรัก  ที่ร่วมสร้างกันมาตลอด 40 ปี และตลอดไป



птк. สานพลังสู่ความยั่งยืน



Corporate Sustainability Report 2018
PTT Public Company Limited

PROSPERITY

PLANET

Reader
Feedback
Survey

PEOPLE



บริษัท ปตท. จำกัด (มหาชน)
PTT Public Company Limited

555 Vibhavadi Rangsit Rd., Chatuchak,
Bangkok 10900, Thailand
Tel. 66 (0) 2537-2000
www.pttplc.com



This report has used recycled paper
and soy-based ink.