



# SUSTAINABLE GROWTH FOR ALL



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PTT Public Company Limited has published its 10<sup>th</sup> annual sustainability report to communicate the company's approach to sustainability management and to disclose its economic, social, and environmental performance. This report covers the period from 1<sup>st</sup> January to 31<sup>st</sup> December 2017, where the material information disclosed herein reflects the expectations of its stakeholders as well as the company's performance in key areas. The scope of this report covers PTT-operated businesses, consisting of the Natural Gas Business Unit, Oil Business Unit, International Trading Business Unit, and Infrastructure and Sustainability Management Business Unit. It also includes the following PTT Group Flagship companies: PTT Exploration and Production Public Company Limited (PTTEP), PTT Global Chemical Public Company Limited (PTTGC), Thairoil Public Company Limited (TOP), IRPC Public Company Limited (IRPC), and Global Power Synergy Public Company Limited (GPSC) – unless otherwise indicated.

This report was prepared according to the Global Reporting Initiative (GRI)'s Sustainability Reporting Standard 2016 and the Oil and Gas Sector Disclosures (OGSD) for the "In Accordance – Core" option. It further reports the 6 capitals for value creation as required by the Integrated Reporting <IR> Framework, and outlines the company's progress on the Ten Principles of the United Nations Global Compact (Advanced Level). As demonstrated through its performance, PTT has also affirmed its commitment to the United Nations' Sustainable Development Goals (SDGs). For the 7<sup>th</sup> consecutive year, PTT has engaged an independent assurer to verify the completeness, accuracy, and credibility of the economic, social, and environmental indicators reported.



Readers may click or scan the QR codes presented in the sustainability report for further information on each topic and visit [www.pttplc.com](http://www.pttplc.com) for more information on PTT's performance.

**PTT Group  
Sustainability  
Management  
Project**



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## Message from the President and CEO

In 2017, we witnessed an unprecedented and monumental moment in history when the Thai people across the nation came together to bid a final and a fondest farewell to His Majesty King Bhumibol Adulyadej, Rama IX, at the Royal Cremation Ceremony most befitting of His Late Majesty. In remembrance of His Majesty's immeasurable grace, PTT joined hands with the Thai people to volunteer in support of the activities of the Royal Cremation to its fullest capacity, and remained steadfast in its commitment to carry forth His Majesty's teachings on the Sufficiency Economy Philosophy by applying it as the path to sustainable development and ensure that the goodness of his deeds for this country is felt across all future generations.

PTT's business is confronting significant challenges ahead. Amid situations of rapid technological changes and the increase in their diversity, shifting forms of energy use and lifestyles of consumers, and higher demand for clean energy to reduce the impacts of climate change, PTT must continue in its mandate to foster energy security for the country and source a sufficient and fair priced energy supply for all – while creating added value for all stakeholder groups in a balanced manner. Over the past year, PTT Group pushed forward in building its organizational strength by regularly increasing production output, reducing costs, and running operations with no interruptions, which successfully resulted in a value gained of more than 3 billion baht.



PTT Group invested in basic infrastructure such as the construction of the Onshore Gas Transmission Pipeline No. 5 and the Natural Gas Receiving Terminal, among others, to bring natural gas – a clean energy – in sufficient amounts to serve as the main fuel for Thailand's electricity generation. Furthermore, PTT embarked on business activities involving natural gas imports, providing storage and regasification units, developing batteries for electricity storage, and servicing electric vehicle charging stations to prepare for the expected rise in demand for electric vehicles.

Likewise, PTT focused on the development of new technologies and innovations for new products, services, and business models by jointly investing in energy technology funds in the United States of America to identify new innovations in the energy business. It also joined forces with the Ministry of Science and Technology, where it worked with the National Science and Technology Development Agency (NSTDA) to develop the Wang Chan Valley in Rayong Province into a key production base for the Eastern Economic Corridor. Here, the inclusive research and development of highly technological innovations can respond to the needs of both the industrial sector and communities while leaving no one behind. By extension, this can create added value and increase the country's competitive advantage in line with the ambitions of the Thailand 4.0 Policy as well. In addition, PTT set up a company called Sarn Palung Social Enterprise Company Limited to conduct inclusive business in tandem with developing a sustainable and self-sufficient society. Relevant projects in this regard have already been initiated, and include a project to source coffee beans directly from communities for Café Amazon, and a project that promotes disabled and disadvantaged groups as management of Café Amazon branches. The first of such a branch will open in 2018 at Mahidol University in Salaya, Nakhon Pathom Province.

Regarding climate change impact mitigation, PTT announced a new target to reduce the Group's greenhouse gas intensity by at least 16%. That means controlling the volume of intensity of emitted greenhouse gases at no more than 76.8 kg CO<sub>2</sub>e/BOE by 2030. This target aligns with Thailand's national target as well as supports that of the Paris Agreement to contain global warming temperatures at below the 2-degree Celsius threshold by 2030. To increase efficiency in its environmental management, PTT adopted the United Nations' Environmental Management Accounting Procedures and Principles to

develop the company's own system for consolidating data on environmental expenditure, revenue, and investments. Having such data will accurately reveal any hidden or embedded costs of the company's environmental management, and help in developing a baseline understanding of future environmental costs. Data collection will begin in 2018.

To ensure that the company's Anti-Corruption Policy and stance on zero tolerance is genuinely implemented and fulfilled, PTT developed a control measure on internal corruption and installed technologies to help enhance protection measures and detect instances of wrongdoing from the very start. The company also carried out four additional key measures, as follows: adopting the Ministry of Commerce's Integrity Pact to increase the transparency of procurement processes for capital projects; adhering to the No-Gift Policy; preventing insider trading from the use of confidential company information; and hiring third party entities to audit internal processes. The Corporate Governance Board has been entrusted the central role in the fight against corruption in the organization.

Based on these commitments and the company's sincere willingness to continuously improve its business conduct, PTT received the Honorable Mention Corporate Transparency Award from the National Anti-Corruption Commission (NACC) for the first year. Similarly, following the 2017 annual Dow Jones Sustainability Indices (DJSI) Corporate Sustainability Assessment, PTT placed as an Industry Leader in the Oil & Gas Upstream and Integrated (OGX) Industry – and maintained its status as a DJSI member for the sixth consecutive year. None of this could have happened were it not for the support and drive of all PTT stakeholders, and on this occasion, I must offer all of our stakeholders my most sincere thanks. I am certain that continuing to do business along the path of sustainable development – and in keeping with the principles of the Sufficiency Economy Philosophy – PTT will be able to meet a challenging future head-on and become the Pride and Treasure of all Thai people.



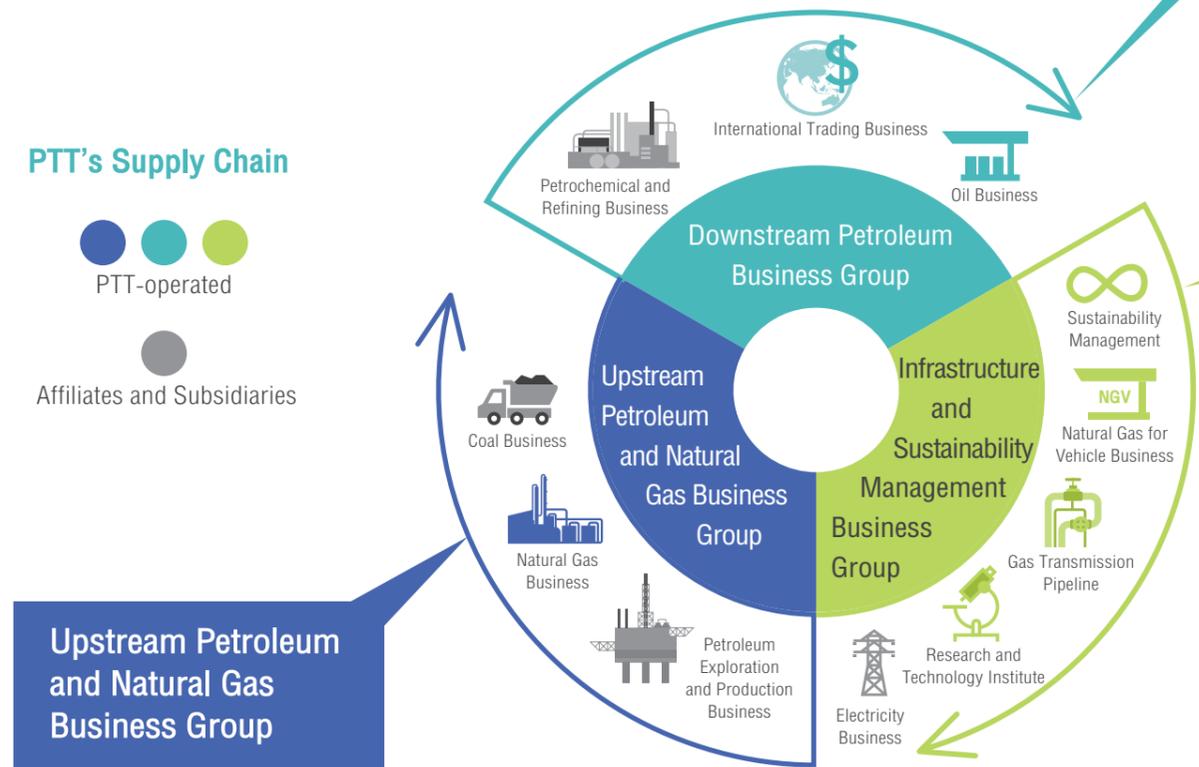
**Tevin Vongvanich**

President and Chief Executive Officer

# PTT Business

## Getting to Know PTT

PTT Public Company Limited, or PTT, is Thailand's national energy company, which has been listed on the Stock Exchange of Thailand (SET) since 2001. Due to PTT's state-owned enterprise status, it operates under the supervision of the Ministry of Energy, with the Ministry of Finance as a major shareholder. Given this, PTT has a major role in developing and implementing Thailand's energy policies, conducting business in the energy sector, and offers comprehensive services and products in the petrochemical sector through PTT's core business and affiliates/subsidiaries. PTT's 3 main business groups are: Upstream Petroleum and Natural Gas Business Group, Infrastructure and Sustainability Management Business Group, and Downstream Petroleum Business Group. PTT has invested in 22 countries around the globe and is currently headquartered in Bangkok, Thailand.



### Petroleum Exploration and Production Business

This business segment focuses on exploration, excavation, production and sales of petroleum products (crude oil and natural gas) domestically and internationally to assist Thailand in achieving energy security.

### Natural Gas Business

PTT's Natural Gas Business encompasses the exploration for natural gas sources domestically to satisfy natural gas demand in Thailand, the distribution to energy companies and industrial customers, and the marketing and selling of natural gas byproducts to be used in petrochemical products, shipping, and household items.

### Coal Business

The Coal Business conducts exploration for potential new coal mines and secondary sources of energy for exporting internationally within the Asian continent.

## Downstream Petroleum Business Group

### Oil Business

The Oil Business sells petroleum products such as fuel products, petroleum-based lubricants, and commercial petroleum products for commercial and business uses in accordance with Sections 7 and 10 of the Oil and Fuel Selling Act through domestic and international investments.

### Petrochemical and Refining Business

This business segment operates through investing in companies in the refining and petrochemical businesses and provides support in the development of environmentally-friendly products to create a competitive advantage in the global petrochemical marketplace.

### International Trading Business

The International Trading Business seeks to find business and investment opportunities through the trading of crude oil, petroleum products, and petrochemicals in international markets. This business segment also facilitates the transportation of oil via ships to further promote PTT petroleum products, assist Thailand in national energy security, and broaden business opportunities in other countries.

## Infrastructure and Sustainability Management Business Group

This business group's activities involve the setting up of infrastructure to facilitate the transportation of natural gas through pipeline systems, electric grids, and trucks. The Infrastructure and Sustainability Management Business Group also engages in research and development in technology and innovations through PTT's Research and Technology Institute, as well as engages in company-wide sustainability programs.



Countries with PTT Investments

22

PTT Group Employees

29,733

# Input

## Financial Capital

- Issued and additional paid-in capital  
2,856,299,625 shares
- Cash generated through operations and investments (Free Cash Flows)  
91,521 million baht in 2016

## Manufacturing Capital

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

## Intellectual Capital

- Knowledge-based Assets
- Licensed technology
- Innovation and other initiatives

## Human Capital

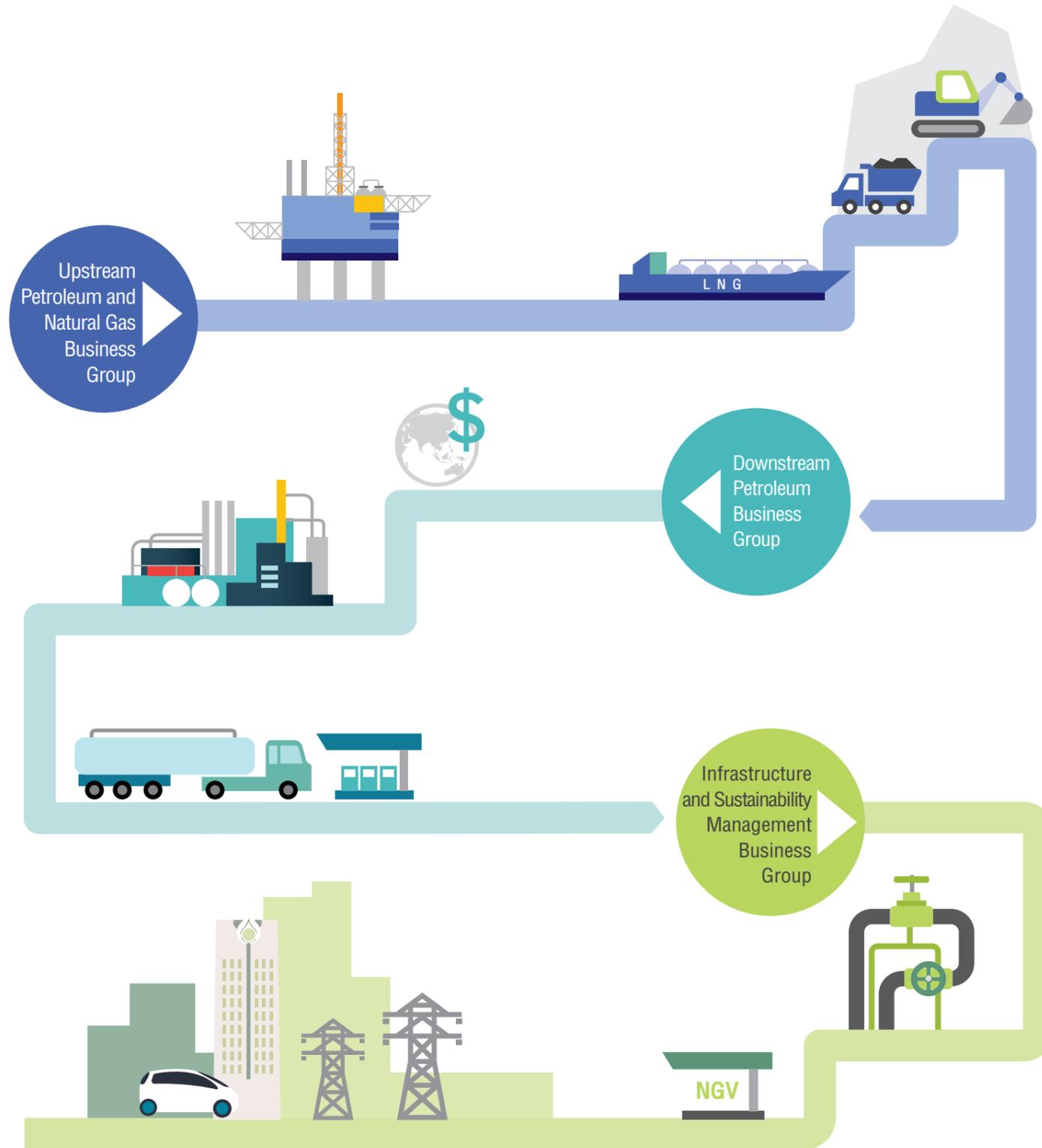
- 4,697 PTT employees
- Skills and experiences of our people, suppliers, and partners
- 39.80 hours of average training time of employees and managers
- Motivation for improving processes, goods, and services

## Social and Relationship Capital

- The relationship between PTT and stakeholders
- PTT's brand and reputation
- PTT's social development – 1,186 million baht

## Natural Capital

- Renewable and non-renewable natural resources
- Environmental investments – 445 million baht



Remark:

<sup>1</sup> The data is limited to PTT's Gas Separation Plant in Rayong Province, PTTEP, PTTGC, TOP, and IRPC.

# Value Creation

## Financial Capital

- Revenue from products and services  
1,995,722 million baht
- EBITDA (Earnings Before Interest/Tax/Depreciation)  
345,395 million baht
- Net Debt / EBITDA – 0.39
- Basic earnings per share  
46.74 baht/share

## Manufacturing Capital

- 6 gas separation plants with production capacity –  
2,820 million cubic feet/day
- Natural gas pipelines of approximately 4,226 km in length
- 1,627 service stations
- 6 pilot EV stations

## Intellectual Capital

- Program to increase production and raise EBIT to 5,132 million baht
- 54 new products, with 5 products in the patent registration process
- A 10% increase in the knowledge base, compared to 2016

## Human Capital

- Human capital return on investments – 200
- Employee engagement score of 70%
- Employee turnover rate; Male employees – 1.23  
Female employees – 2.41
- Employee succession rate of 93%

## Social and Relationship Capital

- 100% community engagement in operational areas
- Corporate reputation score of 87
- No community conflicts

## Natural Capital

- Reduced energy intensity from Energy Efficiency project<sup>1</sup> by 2.04%
- 7.36 million cubic meters of reused water
- 160,000 hectares of reforestation project to Honor His Majesty the King Bhumibol Adulyadej, to offset 30.27 million tonnes of carbon dioxide emissions



# Sustainability Strategy

## Corporate Strategy

Rapid changes to the economic and social environment, coupled with the volatility of the energy industry, all pose critical challenges to PTT's business. Whether that translates into the changing lifestyles of today's consumers – who embrace innovation and technology as a part of everyday life – or the priority given to environmentally-friendly products and services, PTT must critically analyze these factors as input for its corporate strategy development. By doing so, PTT can fulfill its vision to become the premier multi-national energy company with a responsibility for securing national energy security, as well as create added value for all stakeholders in a balanced and sustainable manner.

### Factors in Corporate Strategy Development

Disruptive technologies capable of overhauling existing business models and creating new business opportunities



Global megatrends towards a green economy and the widespread awareness of environmentally-friendly business practices



PTT Group's competitive advantage in creating synergy within the Group and expanding business amidst a volatile energy industry

#### Internal Factors

Being accepted and achieving trust within the framework of good governance and stakeholder management

Limited and depleting domestic resources



Globalization and global interconnectivity, which provides consumers with more readily available information for decision-making



#### External Factors

Besides analyzing the effects of these challenges and various other influencing factors on the business, PTT develops its business strategy by embedding the principles of the Sufficiency Economy Philosophy as espoused by His Majesty King Bhumibol Adulyadej, Rama IX, as well as the stipulations of Thailand's 20-Year National Strategy which inherently aligns with the United Nations' Sustainable Development Goals (SDGs), the State Enterprises Strategy, and the Ministry of Energy's strategy. Such a comprehensive approach is required to maintain a balance between PTT's 2 equally important roles – that of a national energy company and a listed company on the Stock Exchange of Thailand. Through this, PTT is continuing steadfast in mission to become the Pride and Treasure of Thailand and to respond to national policies, stakeholder expectations, and the SDGs.

**Pride with Inclusiveness.  
Treasure for Sustainability.**

# Pride and Treasure of Thailand

PTT Group's strategic direction in 2017 was a continuation of the 'Treasure' strategy's 'PTT 3D' approach: DO NOW, DECIDE NOW, and DESIGN NOW. DO NOW refers to building organizational strength to become a top quartile performer. DECIDE NOW is about expanding growth and managing investments for all business groups. DESIGN NOW focuses on seeking new business opportunities to prepare the organization for exponential growth and to strengthen the existing 'Pride' strategy, the latter of which is to be achieved through stakeholder engagement and the building of ethical and exceptional individuals. In this regard, it is also PTT's objective to receive the National Anti-Corruption Commission's Integrity Award by 2018 – the symbol of recognition for being a model organization, and to continually support the SDGs. Under this overarching framework, PTT Group decided to collectively analyze and review its material issues to develop a more carefully articulated and tangible strategy for the SDGs. The analysis revealed that PTT Group's objectives aligned with 13 goals, but after further prioritization that factored in the impacts to stakeholders and its current business performance, PTT Group selected 6 key goals for strategic responses: SDG Goals 7, 8, 12, 14, 15, and 16. For these 6 goals, PTT has devised 5-year action plans to align with its larger strategy, where performance over the past year was as follows:

# Pride



## National wealth creator & energy security enhancer

### 2017 Performance

- Signed a long-term agreement on natural gas purchases with Petronas to purchase 1.2 million tonnes of natural gas per year, and expanded the capacity of its Natural Gas Receiving Terminal No. 1 to 10 million tonnes per year.
- Promoted the use of natural gas in electricity generation by expanding the natural gas market to 12 new power plants.
- Began expanding PTT service stations as a ‘Compact Model’ (consisting of an oil service station, Café Amazon, and convenience store) to secondary roads to facilitate better energy access for all.
- Assumed leadership in the Energy Storage System (ESS) business, and pushed forward with renewable and alternative energy electricity generation through Global Power Synergy Public Company Limited.



## Business transparency

### 2017 Performance

- Established the Laws and Regulations Management Function, assigned responsibilities to relevant individuals, and revised work processes to internationally-accepted standards to create connectivity and integration in the embedding of anti-corruption principles, and the prevention and elimination of corruption at PTT.
- Integrated the ‘Three Lines of Defense’ risk management mechanism into the organization to expand the coverage and connectivity of internal controls across all work levels.
- Established the State Enterprise Anti-Corruption Center at PTT.
- Signed the Integrity Pact for the Onshore Gas Transmission Pipeline No. 5 (Phase 2) and a new LNG Receiving Terminal in Rayong Province.
- Received the ‘Honorable Corporate Transparency’ Award from the National Anti-Corruption Commission (NACC).



## Promoting shared value creation for society and demonstrating environmental responsibility

### 2017 Performance

- Established Sarn Palung Social Enterprise Company Limited initiating a project on sustainable coffee sourcing and an initiative on employing disabled or disadvantaged individuals to manage Café Amazon.
- Completed the “Power to the Rice Farmers” project by selling 3,706 tonnes of rice and generating 108 million baht in revenue in rice sales for farmers.
- Signed a Memorandum of Understanding on the Pracharat Ruam Jai – Road Safety project to promote road safety, and to embed discipline and a responsible conscience among drivers.
- Re-envisioned PTT’s service stations into a ‘PTT Friendly Design Concept’ to better cater to disabled customers.
- Implemented the ‘Clean Energy for the Community’ project to develop a water supply system using a hydraulic ram pump to address the issue of community water access.
- Reduced greenhouse gas emissions according to the target.
- Conserved and restored land and marine ecosystems through the reforestation project, both terrestrial forests and mangroves.
- Carried out the “Water, Forest and Khung Bang Kachao Conservation Project” to restore green areas around Bangkok and the Metropolitan Area.

# Treasure

<div style="text-align: center; margin-bottom: 10px;">  </div> <div style="text-align: center; margin-bottom: 10px;">  </div> <p style="text-align: center;"><b>Building organizational strength to become a top quartile performer</b></p> <p style="text-align: center;"><b>2017 Performance</b></p> <ul style="list-style-type: none"> <li>• All business units carried out regular productivity improvements, resulting in reduced costs and a maximum operating capacity of all manufacturing units compared to 2016. Such measures generated 31,178 million baht in earnings before interest and taxes (EBIT) for PTT Group (with 5,132 million baht in productivity improvements from PTT and 26,046 million baht from PTT Group companies).</li> </ul>	<div style="text-align: center; margin-bottom: 10px;">  </div> <div style="text-align: center; margin-bottom: 10px;">  </div> <p style="text-align: center;"><b>Expanding growth and managing investments for all business units</b></p> <p style="text-align: center;"><b>2017 Performance</b></p> <ul style="list-style-type: none"> <li>• Together with PTTEP, expanded investment opportunities for a complete LNG business in Malaysia under the 'MLNG Train 9' Project.</li> <li>• Expanded the number of service stations domestically to 1,627 locations and overseas to 216 locations.</li> <li>• Expanded the Café Amazon franchise to Cambodia, Myanmar, Philippines, and Laos – bringing the total number of branches to 1,999 in Thailand and 124 overseas.</li> <li>• Set up a company tasked with expanding business to China.</li> <li>• Increased the transaction volume for out-out trading by 9%, covering all regions globally, and increased the trade of non-oil commodities by 117%.</li> </ul>	<div style="text-align: center; margin-bottom: 10px;">  </div> <div style="text-align: center; margin-bottom: 10px;">  </div> <p style="text-align: center;"><b>Preparing the organization for exponential growth through the search for new business opportunities</b></p> <p style="text-align: center;"><b>2017 Performance</b></p> <ul style="list-style-type: none"> <li>• Signed a Memorandum of Understanding (MOU) with the National Science and Technology Development Agency (NSTDA) to develop the Eastern Economic Corridor of Innovation (EECi) at Wang Chan Valley, and signed an MOU with the navy to develop basic energy infrastructure at U-Tapao airport.</li> <li>• Launched the Corporate Venture Capital business by investing in four funds focused on sustainable energy and technology in the United States of America.</li> </ul>
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## Sustainability at PTT

PTT's sustainability management is designed to align with the organization's strategic direction, strategies and targets, and at the same time to support the missions of various global sustainability networks such as the United Nations Global Compact (UNGC) and the World Business Council for Sustainable Development (WBCSD) in the achievement of the SDGs. The PTT Group Sustainability Alignment Committee (SAC) – chaired by the Executive Vice President for Sustainability Management and comprised executives from all business units and PTT Group Flagship companies – is responsible for establishing policies and action plans, supporting the implementation of, and monitoring the Group's sustainability performance according to the PTT Group Sustainability Management System and Framework. In 2017, the SAC approved the proposed 3<sup>rd</sup> revision of the Framework to keep PTT's sustainability performance in touch with changing international guidelines and the SDGs. Not only that, the SAC organized a workshop for PTT Group to assess its material issues, set targets, and determine management approaches for each issue. In January 2018, PTT revised its organizational structure and moved the sustainability management responsibility from the Infrastructure and Sustainability Management Business Unit to the reporting line under the Senior Executive Vice President for Organization Management and Sustainability.

# Risk and Opportunity Management

PTT remains alert to changing economic, social, and environmental conditions, as well as external factors that may impact upon the organization's sustainability – be it the oil price situation, the slow growth rate of the global economy, climate change-related disasters, or the development in energy technologies that are fundamentally transforming the world's approach to energy use. Not to mention the Ministry of Energy's Energy 4.0 Policy focused on the use of clean energy, improving energy use efficiencies, and the liberalization of the natural gas market. Given these conditions, PTT manages its various risks with caution and carefully considers them as part of its strategy development, which will enable PTT to appropriately respond to volatility and at the same time, transform these risks into opportunities for new business models to create shared value between the organization, communities and society, and environment.

## Enterprise Risk Management System

The Enterprise Risk Management Committee (ERMC), in operating according to good governance principles and regularly reporting its performance to the PTT Board of Directors, ensures that PTT's risk management effectively meets set targets and decreases the negative risks associated with business uncertainty. In 2017, the ERMC was assigned the additional responsibility of managing and closing monitoring the results of stakeholder management every quarter.

PTT adopts the COSO ERM Framework and ISO 31000 standard in its regular risk assessments. The assessment evaluates the level of impact from 2 perspectives, likelihood of occurrence, and magnitude of impact – to financial performance, business and operational processes, corporate reputation, customers/suppliers, employees, and the environment. Organizational risks assessment includes appointing persons in charge on the senior executive vice president level to take responsibilities in developing risks management plans and reporting actions taken monthly to the Corporate Plan and Risk Management Committee (CPRC) and quarterly to the Audit Committee (AC). Appointment of persons in charge and the periodically reports to the related committees are to ensure that the planned actions have been executed and responding sufficiently and appropriately to organizational risks.

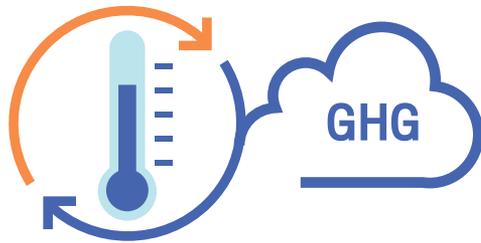
In order to enhance capabilities and knowledge of the Board and to prepare for emerging risks management, PTT Board of Directors and ERMC held a meeting in May 2017 together with executives from TESLA, GM, GE Digital and 24M Technologies. The meeting incorporated manufacturing process viewing to amplify knowledge and understandings that will ultimately assist PTT in future projection and defying the responding directions/policy. Furthermore, this meeting also helped prepare for PTT for risks that will occur to the company caused by disruptive technology changes that are predicted to highly affect the business in the future.

## Price Risk Management



During the years 2015-2017, global crude oil price rapidly dropped due to multiple factors such as increasing supply over demand, growing level of shale oil and gas production in the United States, and unchanging production capacity of the OPEC. These factors cast an impact upon business operations within PTT Group and throughout its value chain as downstream petroleum business is facing price risk from the low global crude oil price. As a result, the business revenue has come under pressure. Upstream petroleum business has also been affected from the lower than predicted price spread risk of petroleum and petro-chemical products and risks from the decreased oil price which may cause a deficit from oil reserves.

Following these situations, PTT has taken Price Risk Management in earnest by developing risk management plan to reduce cost, increasing financial disciplinary, and hastening productivity improvement. As a result, PTT Group has added value by 31,178 million baht. Additionally, investments have been made throughout value chain of PTT Group's operations leading to the group's business profit recovering more timely than many oil companies.



## Climate Change Risk Management

Climate change is a significant environmental issue concerned globally, especially in oil and gas business. PTT recognizes the alarming nature of this issue and continuously employs systematic management process. Accordingly, PTT achieved the goal of reducing intensity of greenhouse gas emission at least 5% in 2016, ahead of the target year of 2020. PTT has set a long-term goal of PTT Group in greenhouse gas emission which, by 2030, aims to reduce the emission to 16% compared to the emission intensity of 2012. This goal is in compliance with Thailand's and global goal, please see more in details in Chapter 7 – Environmental Management.

## Emerging Risks and Opportunities



### Electric Vehicles

Overarching trends in energy utilization and crucial technology development for energy efficiency such as clean energy, renewable energy, artificial intelligence technology, autonomous technology, the development of electrical vehicle efficiency advancement, and energy storage technology contribute to the price reduction of electric vehicles and batteries. PTT views that these trends will negatively impact the quantity demand of petroleum products which are PTT Group's oil refinery and service station businesses principal product. Nevertheless, natural gas demand to generate electricity for car batteries is surging. This offers an opportunity to further invest in natural gas business to accommodate the growing electricity needs in the future. Accordingly, PTT has started liquid natural gas import business: LNG Shipper, gas conversion reserves servicing business: LNG Terminal, electrical vehicle battery business, and electric vehicle charging service stations business. However, the tendency of electric vehicle growth in Thailand is still deemed a beginning stage and lacks a distinct support from the government in forms of tax support and electricity price structure for charging stations. Thus, it can be predicted that the electric vehicle situation will not yet affect PTT's domestic business operation in the near future.



### Cyber Security

While digital increasingly plays a role in livelihood business operation, other dimension that cannot be overlooked is the cyber threats and cyber security. Cyber threats are on the rise causing multiple dangerous impact and present themselves in different activities and forms such as critical information thefts, computer virus attacks, ransomwares, and penetration to the country's important infrastructure control systems. PTT stays cognizant of those threats and sees the importance of taking preventative actions to control risks that might be attack targets and will alter stakeholders' perception in business continuity, trust, and organization reputation of the company. Consequently, PTT applies ISO/IEC 27001 operational framework in Information Security Management System to improve cyber security. Primary activities within the framework include the annual surveillance audit, vulnerability assessment of possible gaps in information systems. These activities have been implemented in parallel to educating employees on information systems security standards and cyber threat in digital economy era through different channels such as trainings and seminars, and internal communication via emails so that the employees are well aware of the threats and employ safety cyber behaviors to reduce risks.

# Materiality

## Materiality Assessment Process

### 01 Identification

Revision and update of issues that are material to PTT’s business and its stakeholders to include newly emerging issues, and to reduce the importance of those lesser relevant.

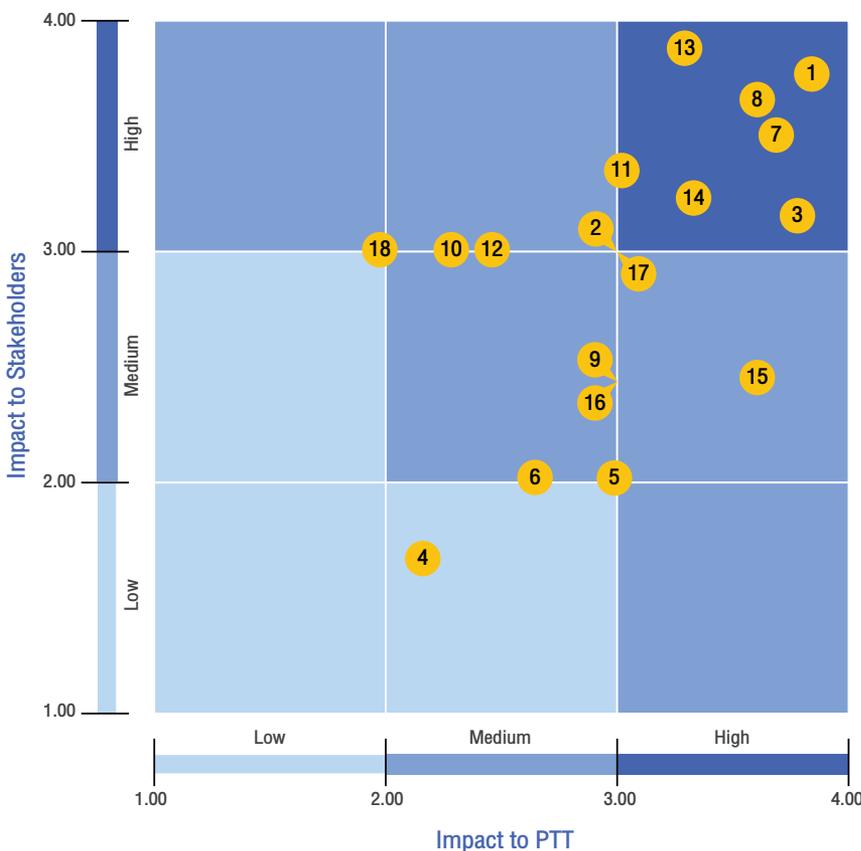
### 02 Prioritization

Responsible functions in the company undertake the prioritization of material issues by engaging with stakeholders and evaluating an issue’s impact on financial performance, business processes and operations, and the company’s reputation, customers, suppliers, and employees.

### 03 Validation

Results of the annual materiality assessment are validated by the PTT Group Sustainability Alignment Committee (SAC).

## PTT Materiality Assessment Matrix



### Revisions to PTT’s 2017 Material Issues:

- Separation of the Operational Eco-efficiency issue into: Integrated Water Management, Air Pollution, and Effluents and Waste.
- Addition of Research and Development and Security and Crisis Management as material issues.
- Merging of Knowledge Management with Human Capital Development.
- Merging of Risk Management with Sustainable Governance.

Material Issues		Details
1	Sustainable Governance	Implementing business strategies and managing risks to build a sustainable business.
2	Stakeholder Dialogue	Processes of engaging with stakeholders to gather their feedback and opinions.
3	Fair Operating Practices	Good corporate governance, board responsibility, transparency, and anti-corruption.
4	Supply Chain Management	Engaging with suppliers to enhance their capabilities, improve performance, and to identify new business opportunities.
5	Research and Development	Research and development of products and services that factor in customers' needs and health, safety, and environmental impacts.
6	Product Stewardship	Impacts of PTT's products and services on customers, and customer relationship management.
7	Human Capital Development	Individual employee development and capacity-building through means such as training and knowledge management.
8	Talent Attraction and Retention	Building company engagement, organizational culture, and opportunities for career advancement, work-life balance and fair compensation.
9	Human Rights	Management of human rights risk across the supply chain.
10	Capital Project Management	Assessing the impacts of capital projects on society and the environment, and engaging with communities throughout a project's life cycle.
11	Corporate Citizenship	Community engagement aimed at improving livelihoods, developing the nation's human resources, and conserving natural resources and the environment.
12	Safety	Ensuring safety at all PTT operations, including workplace occupational health and safety, safety in manufacturing processes, and in ground transportation and logistics.
13	Security and Crisis Management	Prevention of crises and suppression of any emergencies to protect against business interruptions.
14	Climate Change	Energy management and greenhouse gas emissions reduction.
15	Integrated Water Management	Managing water use together with local communities to prevent water shortages.
16	Air Pollution	Control of air pollutants such as nitrogen oxides, sulfur oxides, and volatile organic compounds (VOCs).
17	Effluents and Waste	Effluents and waste management.
18	Biodiversity	Managing the impacts of PTT's operations and new projects on surrounding biodiversity.

Following the necessary management of urgent issues in 2016, the following issues were considered of lesser impact in 2017: Climate Change, Stakeholder Dialogue, Human Capital Development, Corporate Citizenship, and Safety. On the other hand, given certain events that impacted the company's reputation, the issues of Sustainable Governance and Fair Operating Practices became more important and challenging. Details on these issues can be found in their relevant chapters.



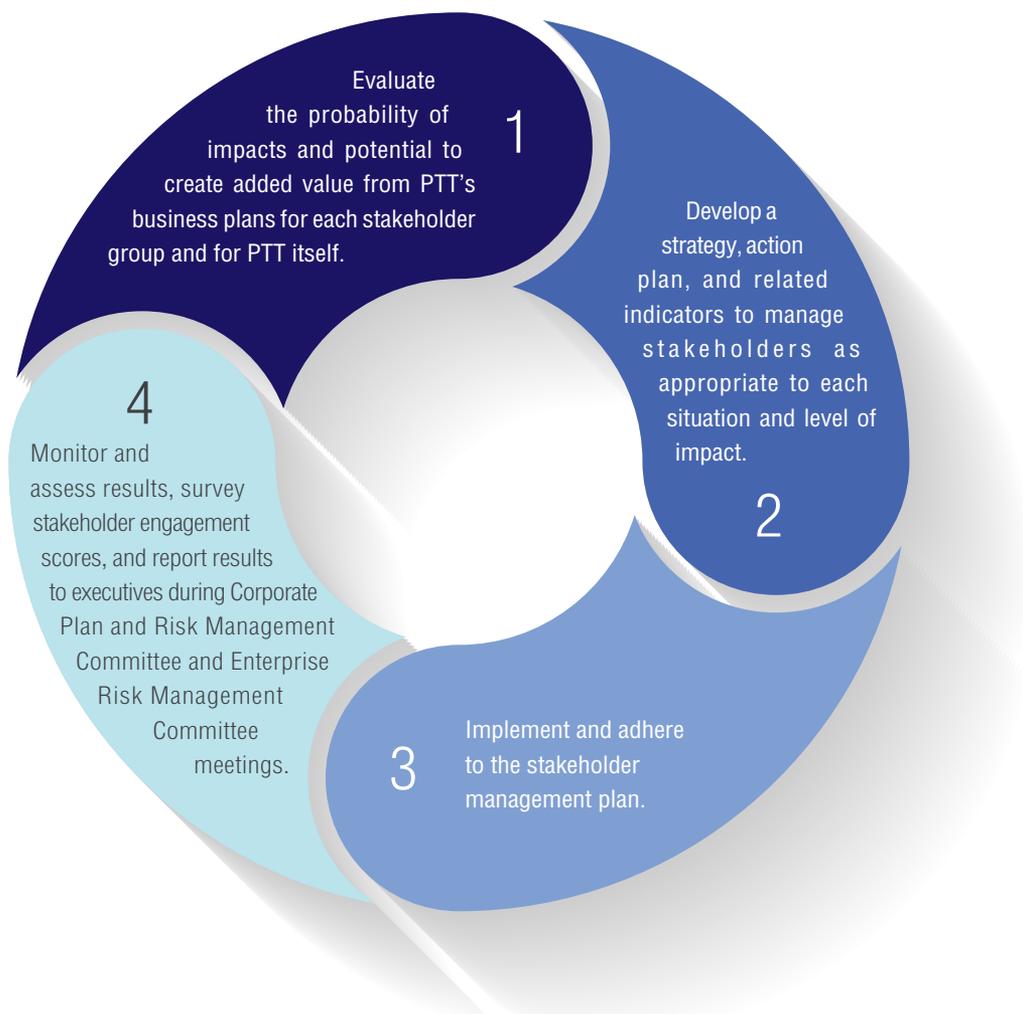
**Remark:**  
For more information about the impact boundary for each material issue, please visit <http://www.pttplc.com> under Sustainability for Materiality Assessment.

# Stakeholder Engagement

PTT’s business operations impact a wide range of stakeholders. Therefore, it is vital for PTT to engage with these diverse groups to not only be able to understand and prioritize its own material issues, but also effectively respond to the sustainability challenges and opportunities that may affect each stakeholder group. PTT’s core stakeholders consists of the following 6 groups: Country, Communities and Society, Shareholders, Customers, Partners, and Employees.

## Stakeholder Management Framework

In 2017, PTT developed the Stakeholder Management Framework to identify both the positive and negative impacts of its business activities on stakeholders. The Enterprise Risk Management Committee was assigned the responsibility of governing and closely monitoring the results of stakeholder management on a quarterly basis, and of providing recommendations on PTT’s performance. The Stakeholder Management Framework is made up of 4 main processes:



In terms of its 2018 performance, PTT expanded the coverage of its assessment of stakeholder impacts from solely capital projects to a greater number of its business plans and projects. The company further revised its stakeholder impact assessment criteria for higher accuracy, and plans to evaluate the results of stakeholder management in each group by using the stakeholder engagement score.

## Stakeholder Engagement Channels

PTT adopts both formal and informal means of engaging with each stakeholder group – means that differ based on considerations of opportunities and level of engagement – to jointly bring about positive change and reduce negative impacts for all parties involved. Issues of interest to stakeholders are managed through PTT’s stakeholder engagement and materiality assessment processes, which both allow the organization to respond to the specified expectations of each issue. More details will be provided in the following chapters.

Further to that, PTT has collaborated with an external organization to evaluate its corporate image and reputation based on stakeholder perceptions and expectations of its dual role – as a public organization that creates energy security, and as a private company that supports business growth, is socially and environmentally responsible, and that practices ethical governance. The past year’s assessment revealed an increase in PTT’s corporate image and reputation score as all stakeholder groups were confident in PTT’s ability to create security for the country.

### Country

- Information-sharing with government agencies
- Collaboration with private sector organizations (Chamber of Commerce, Federation of Thai Industries, Pracharat Committee)



### Communities and Society

- Community relations activities through social projects
- Meetings and consultations, seminars, and monthly small group meetings with communities
- On-the-ground engagement by public relations employees and functions responsible for community/social projects



### Employees

- Employee engagement and satisfaction surveys conducted every 3<sup>rd</sup> quarter
- Two-way performance assessments
- Labor relations meetings



### Partners

- Supplier Relationship Management Seminars, held monthly, quarterly, or annually depending on each group
- Survey of suppliers’ satisfaction in PTT’s procurement process and on doing business with PTT



### Shareholders

- Annual General Shareholders Meetings
- Annual general shareholders’ site visits to PTT and PTT Group operations



### Customers

- Customer satisfaction survey
- Grievances/recommendations received from the 1365 Hotline, PTT’s website, and social media
- Sales promotion activities
- Post-sales services



# ECONOMIC



## Corporate Governance

What allows PTT to stand firm through times of challenge is its unwavering commitment to honesty and transparency, and to stand against corruption in all forms. It is this resolute belief which forms the mutual trust between the organization and investors, financial institutions, and business partners – a trust which ultimately enhances its competitive advantage over the short term and long term.

For this reason, the PTT Board of Directors is dedicated to creating an organization that is recognized with pride as Thailand's national energy company; as one that embodies integrity and demonstrates transparency and accountability in all processes, and where management is uncompromising against corruption. This also comes with developing management systems and approaches that can timely and accurately respond to challenges, to transform the organization into the pride of all Thai people now and in the future.

### Board Accountability towards Sustainability

The Board of Directors is tasked with the essential responsibility of building a fair, transparent, and accountable governance culture that demonstrates the utmost respect for laws and regulations. To achieve this, the Board encourages cooperation in implementing good governance and combatting corruption, and promotes building a network for transparency. Key achievements by the Board in 2017 include:

Revising the Governance, Risk Management and Control, and Compliance (GRC) Framework by integrating the 'Three Lines of Defense' risk management concept into the organization. This is to make sure that all employees carry out their assigned duties effectively and transparently, and help to strengthen the organization's risk management and internal controls. Moreover, the Board established a department to oversee and consolidate company laws and regulations and monitor the company's regulatory compliance to safeguard against any violations.

Ensuring that PTT adheres to the Integrity Pact of the Comptroller General's Department, Ministry of Commerce – an agreement to collectively prevent and eliminate corruption in procurement between state organizations and bidders – by requiring members of civil society to be present as observers in all stages of the process to ensure transparency. By committing to the Pact, PTT is demonstrating honesty in all its conduct with the guarantee that no actions could purportedly pave the path to corruption, bribery, or the receiving of any benefits. At the same time, PTT must require that the Integrity Pact is a part of the procurement paperwork, and that bidders not signing on to the Integrity Pact are not allowed to participate in the bidding process. Projects that were put through the processes of the Integrity Pact in 2017 included the Onshore Natural Gas Pipeline No. 5, Phase 2 (Chachoengsao – Nonthaburi); a new LNG Receiving Terminal in Rayong Province, and 3 ongoing Integrity Pact projects that are still regularly monitored.

Encouraging PTT's suppliers and sales representatives to voluntarily declare their commitment to Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) to encourage transparency across the supply chain and eliminate corruption risks. In 2017, this intent was expressed to suppliers during the Supplier Relationship Management seminar (SRM), as well as to 330 attendants during seminars for suppliers that transport petroleum products by ships and by trucks.

Participating in the activities of public and private sector anti-corruption networks to forward the anti-corruption agenda, such as the Anti-Corruption Day (ACT Day) organized by the Anti-Corruption Organization of Thailand. The Board also provided recommendations to the Thai Institute of Directors for the development of a collective assessment criteria on corruption in SMEs, and developed PTT's master plan and action plan on moral promotion for the National Moral Promotion Committee of the Department of Religious Affairs, Ministry of Culture.

In addition, the Board of Directors assigned the Corporate Governance Board – which comprises 3 independent directors – with the responsibility of overseeing good governance implementation and to report directly to the PTT Board of Directors. CG Board directors are also assigned a key performance indicator related to good governance and sustainability as part of their annual performance targets. For more information about the performance of the Corporate Governance Board, please refer to PTT's 2017 Annual Report.

## Three Lines of Defense



**3<sup>rd</sup>**  
Line of Defense

**Level 3** Independent parties that are responsible for verifying the effectiveness of work processes to protect Level 1 and 2 risks.



**2<sup>nd</sup>**  
Line of Defense

**Level 2** Departments/Functions that are responsible for enacting policies, regulations, standards, and overseeing its various other duties.



**1<sup>st</sup>**  
Line of Defense

**Level 1** All employees and staff who must adhere to the systems, regulations, and standards in place.

## Building a Good Governance Culture

Creating an organizational culture based on fairness and good governance is of paramount importance. It is fundamentally about instilling an ethical work culture into the hearts of all employees. It is why PTT enacted company regulations on good governance in 2001 and developed the Corporate Governance and Code of Ethics Handbook (CG Handbook). The handbook is regularly updated to ensure that it continues to align with the principles of good governance for listed companies of the Stock Exchange of Thailand; integrates the comments and suggestions received from the Corporate Governance Report of the Thai Institute of Directors (IOD) – which also aligns with those of the ASEAN Corporate Governance Scorecard – and considers the good practices of leading international companies. In 2017, PTT released the 4<sup>th</sup> revision of the CG Handbook and distributed it across the organization for all management and employees to formally sign and acknowledge their understanding of its requirements. This certifies that everyone is formally bound to these principles – both in their understanding and in the application of them. In addition, employees are evaluated on integrity and ethics in the workplace as part of their annual performance reviews and career growth.



### PTT CG Handbook 4<sup>th</sup> revision

The 4<sup>th</sup> revision to the PTT CG Handbook was designed to maintain its relevance and timeliness. Important updates and additions include:



- Information on grievance channels for morality and ethics – via e-mail (cghelpdesk@pttplc.com) and regular mail (for the Office of the President and the company secretariat).
- Regulations on the use of insider information, which specify that the PTT Board of Directors, management, and those with access to information must avoid buying or selling PTT Group assets at all times. In case of necessity, individuals must inform the company secretariat in advance for transparency purposes.
- Requirements for the qualifications of directors and company appointees, such as independence of the chairman.

- Duties and responsibilities of committees and the chairman.
- Qualifications and responsibilities of members of specialized committees.
- The topic of performance assessments and committee development.
- Ethics for Anti-Money Laundering to raise awareness on relevant laws related to anti-money laundering, and to protect the company from being used as a tool in money laundering processes or the financing of terrorism.
- Guidelines on ethics for Receiving and Offering Gifts, Assets or Other Benefits, in line with the company's No-Gift Policy.



the National Anti-Corruption Commission (NACC) convening on stage for a panel discussion on “Positive Forces...Building Strength from Within to Create Transparency for Sustainability.”

It is not only about fostering a good governance culture from within, however. PTT engaged with other companies in the Group through the PTT Group CG Day 2017 to provide opportunities for top executives to communicate their visions and share their recommendations on governance at the Group level. Under the theme, “CG in DNA: Together We Can,” PTT Group committed to building CG as its unified strength, to cooperate on ensuring transparency and anti-corruption, and to make sure that the effects of the Group’s efforts are felt across private sector networks, society, and the country.

Good governance principles are communicated to all employees in all operational areas through many different channels and activities. Electronic means of communication, in particular, are very effective given today’s world where communication revolves around digital platforms. Examples include the CG Intranet, videos, CG Comics, CG Tips, and the CG E-Learning System. The E-Learning System uses different scenarios to create awareness on corporate governance in a way that allows employees to apply their learning in real-life situations as appropriate. At the end of each course, employees are assessed on their understanding. In 2017, PTT added content on the CG E-Learning System on anti-money laundering, behaviors towards creditors, and the Anti-Corruption Policy. To date, 2,953 employees have received training on and been assessed through the CG E-Learning System, or about 63% of all employees.

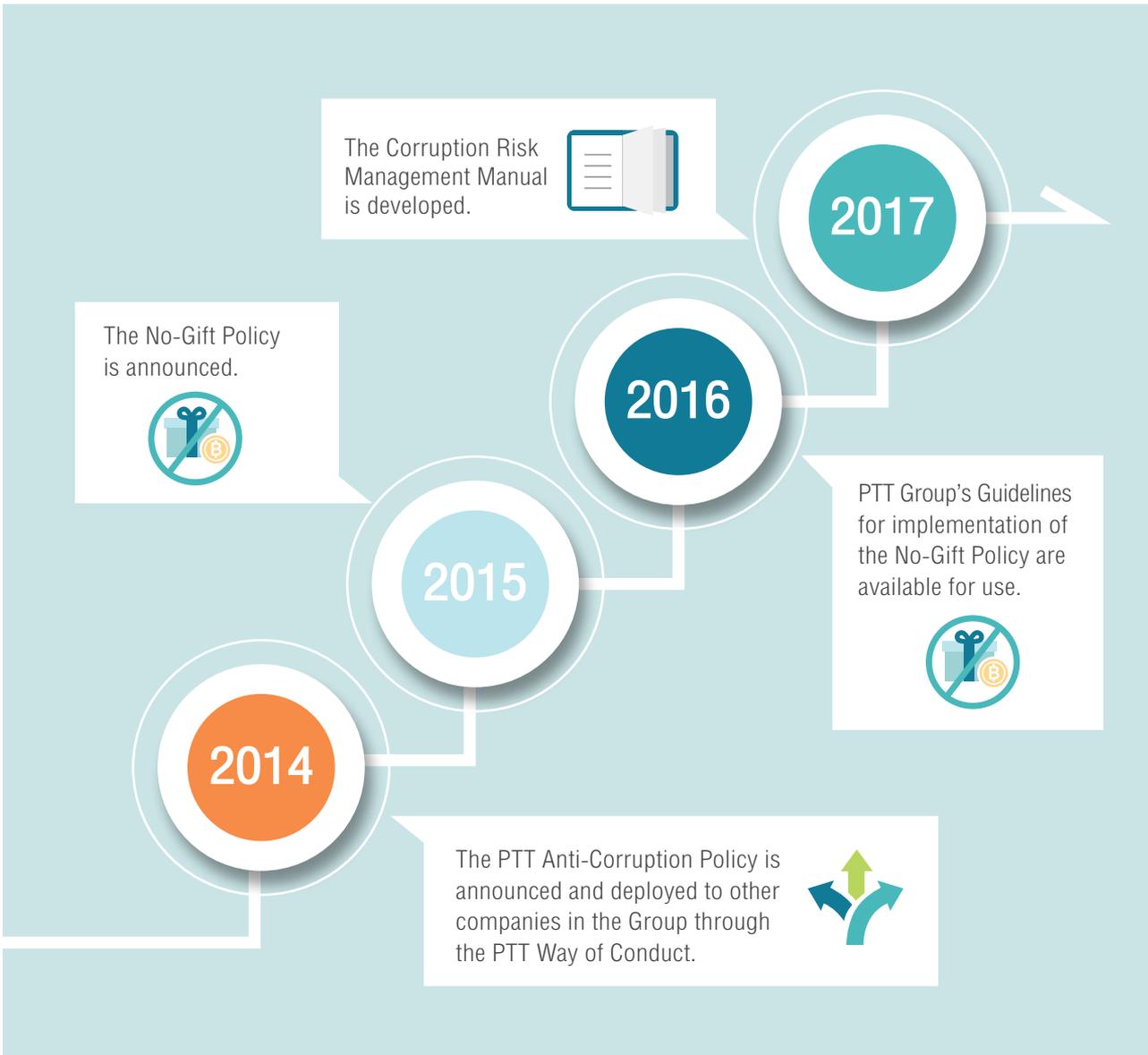
Finally, to embed an awareness and understanding of ethical principles from the very beginning of the journey, all new employees at PTT must receive orientation training on good governance and anti-corruption. In 2017, three classes were held for around 70 participants in each class. There were no incidents of employee violations of the code of conduct that have been found guilty.

Apart from electronic channels, events such as PTT CG Camp and PTT CG Day are also designed to build employee knowledge and understanding of the issue. In 2017, PTT organized a CG Day event under the theme “CG 4.0: Doing Good is Easy: Be Good Sustainably.” The objective was to encourage employees to consider the importance of good governance principles and inspire them to create a positive force for good through activities such as seminars, speeches by management committing to zero tolerance for corruption, and the combined pledges of company directors, management, and employees to be ethical, professional, and responsible individuals.

The 2017 Integrity Forum was also held to serve as a platform for exchanging views and opinions on creating positive forces against corruption, with experts from various organizations such as the Securities and Exchange Committee of Thailand (SEC) and



## Combating Corruption at PTT Group



In 2017, PTT developed a corruption risk management manual to assess corruption risks in work processes and to design more proactive internal controls. All functions within PTT have assessed their risks and published their own risk reports, and are currently developing control measures to keep their risks within a level of tolerance. All risks are to be reviewed annually. PTT organized 2 management training courses on corruption management systems for executives at Vice President level and above, with approximately 70 participants in each, to impress upon them the methods of assessing corruption risks, important internal control measures, approaches to decision-making, as well as to provide appropriate recommendations. Looking forward to 2018, PTT plans to provide this training to employees at all levels. Such actions are aligned with PTT's 2017 Good Corporate Governance and Anti-Corruption Action Plan, which had the objectives to align the company's existing systems, mechanisms, and measures with those of leading companies and international standards, as well as with Thailand's own National Anti-Corruption Strategy – Phase 3 (2017-2021).



“Honorable Mention Corporate Transparency Award,” awarded by the National Anti-Corruption Commission (NACC). The award is a three-year aspiration goal under PTT’s Pride & Treasure of Thailand strategy.



“State Enterprise Excellence Award in Improving Ethics and Transparency in Work Processes,” awarded by the National Anti-Corruption Commission (NACC). PTT received two awards at the “Excellent” level, for the “Integrity Culture” and “Work Integrity” categories.

In 2017, 100% of PTT employees filed their conflicts of interest disclosures. No significant conflicts of interest were found.



“A study revealed that the likelihood of corruption – especially in the procurement process – is present in 3 stages:

1. Needs specifications
2. Purchasing
3. Pricing

What PTT has been doing is working to develop systems that increase procurement effectiveness, specifically by focusing on eliminating corruption. Besides improving processes, another important factor is having the cooperation of all employees, who must work together to report suspicious activities and behaviors. All this will ensure that PTT is truly a transparent and ethical organization.”

**Mr. Wirat Uanarumit**

Chief Operating Officer,  
Upstream Petroleum and Gas Business Group,  
Chairman of Working Team “I”: Integrity & Ethics, speaking during an employee meet-and-greet activity on 17 February 2017.

# Supply Chain Management

From upstream to downstream, PTT's supply chain consists of suppliers of varying sizes, business types, procurement values, and risks. To manage its supply chain, PTT employs the PTT Suppliers Sustainable Code of Conduct and risk management mechanisms that factor in the economic, social, and governance (ESG) impacts of its suppliers. As a result, PTT's suppliers always stand at the ready to do business, can play their part in creating energy security for Thailand, and grow sustainably with PTT.

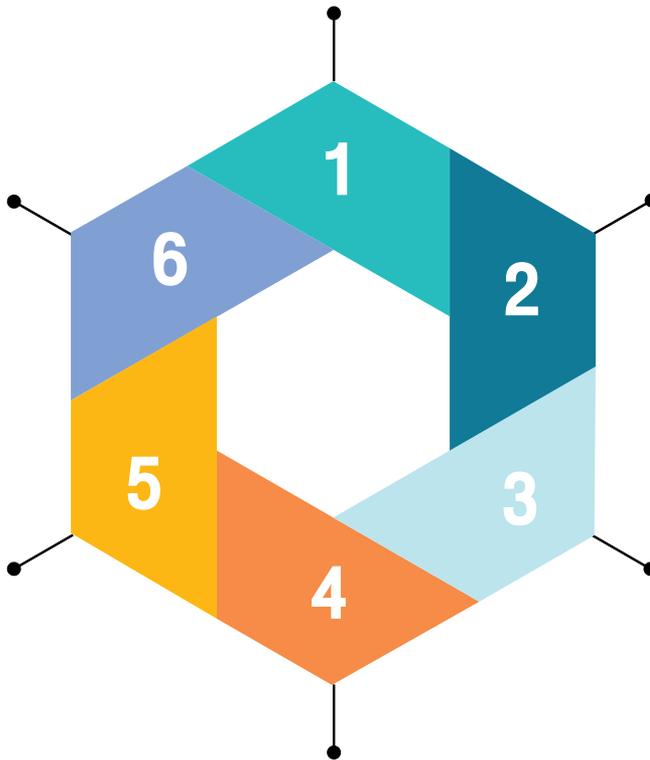
## Sustainable Supplier Management

Supply chain management at PTT is consisted of the following 6 stages:

**Needs Specification:** Requirements on business ethics, social responsibility, safety, and environmental management are integrated and aligned with the PTT Suppliers Sustainable Code of Conduct.

**Performance Reviews and Assessments** of suppliers at designated intervals. If a supplier's assessment results are below standard, they will be required to enact remedial measures. If no improvements are made, PTT may consider removing them as a listed supplier.

**Supplier Development:** Building an understanding among suppliers regarding PTT's sustainable management approach, and encouraging knowledge-sharing among supplier networks through training and seminars.



**Control, Monitoring, and Randomized Evaluations of Suppliers,** particularly critical and high-risk suppliers.

**Supplier Selection:** Suppliers are evaluated according to specified needs and, in the case of previously registered suppliers, their past performance (including ESG-related performance).

**Supplier Communication:** Informing suppliers of requirements in advance to allow for a fair bidding process, and organizing annual Supplier Relationship Management seminars (SRM) to communicate PTT's vision and work requirements to suppliers and to receive their recommendations on areas for improvement.

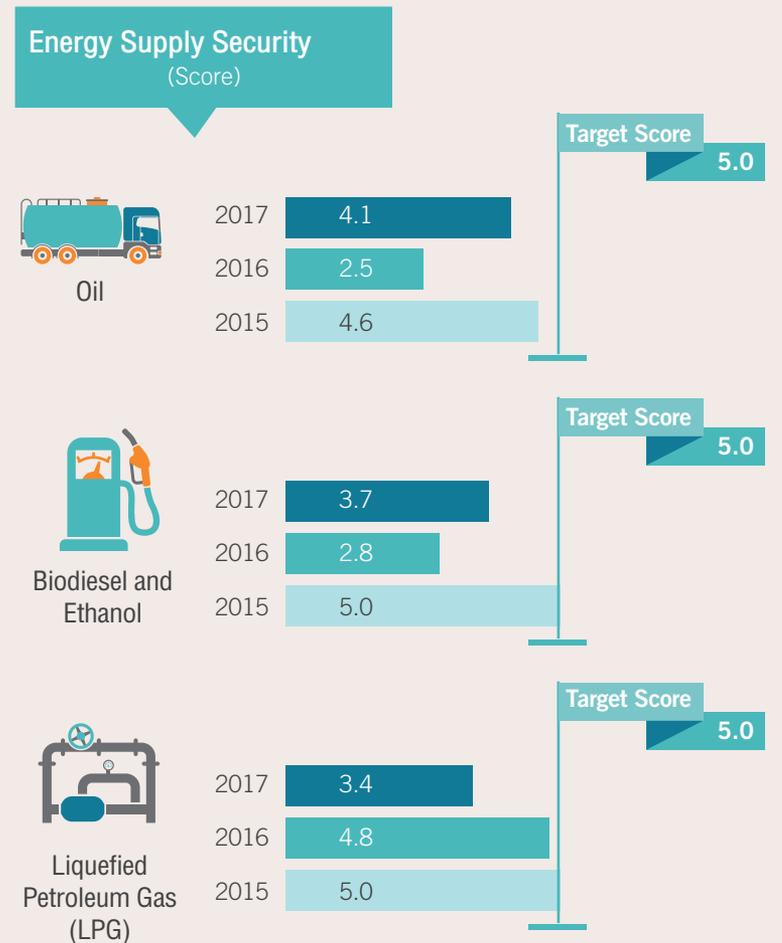
## Supplier Management

To efficiently and appropriately manage such a diverse group of suppliers, PTT prioritizes them according to their level of risk, which is determined based on a spend analysis and their ESG risks. Suppliers are classified into the categories ‘Manage’, suppliers with activities focused on the operations side, that have medium risks and impacts to customers and surrounding communities; ‘Key’ suppliers whose products are distributed to end-consumers and have high risks and impacts to buyers; and ‘Critical’ suppliers with high risks and impacts to other suppliers, customers, and surrounding communities, with whom PTT has a high spend volume and who are considered non-substitutable product or service suppliers. Critical suppliers are managed very stringently, as they must also undergo a sustainability assessment. Should their results not meet the standard required, critical suppliers must develop an ESG Corrective Action Plan to be completed within a specified timeframe. In 2017, PTT began classifying its Critical Non-Tier 1 Suppliers of core petroleum products through screening based on high volume and critical component suppliers.



## Energy Supply Security

It is PTT’s objective to secure energy from a variety of sources – namely oil, biofuels, and liquefied petroleum gas (LPG) – to forward the national energy security agenda. To assess the security of oil supply, PTT evaluates the proportion of products received from refineries against its monthly Supply and Logistics Optimization Plan. In 2017, PTT revised the criteria used to assess the supply security of biodiesel, ethanol, and liquefied petroleum gas (LPG) to continually improve the efficiency of assessments from 2016. The security of supply for biodiesel and ethanol is determined based on the adequacy of the quantity sourced and on the company’s long term strategic plan to meet demand. On the other hand, the security of LPG supply is assessed by whether such a supply can respond to the revised government policy in 2017 on greater LPG liberalization.



**Remark:**

In 2017, PTT revised the scoring criteria for energy supply security to better reflect improved efficiencies and adequacy of supply, and to factor in appropriate supply costs. The score for LPG decreased due to the aforementioned scoring revision, coupled with changes in government policy.

## Supplier Assessments

In 2017, PTT, together with Management System Certification Institute (Thailand): MASCI, assessed the sustainability performance of all its critical suppliers – 100% of critical suppliers according to plan. The assessment certifies that suppliers are complying with the requirements stipulated in PTT’s policies and are thereby reducing risks and preventing potential impacts to the organization. Suppliers were selected based on their ESG risks, supply volume, and whether they had any issue requiring immediate attention. Once assessed, suppliers will be selected again every 3 years. Results for 2017 revealed that suppliers in the product and service group performed well with regard to sustainability. For petroleum product suppliers, assessors recommended that their employees working at height should use personal protective equipment (PPE) – a recommendation that was well-received and will be followed up by a sustainability plan to be regularly monitored by PTT. Overall, PTT did not encounter any violations of requirements, laws, or ethics in its suppliers’ performance.



## Workshop on Improving Suppliers’ Sustainability Performance



PTT, in collaboration with Management System Certification Institute (Thailand): MASCI, organized a supplier workshop with the goal to promote their acknowledgement, understanding, and recognition of the importance of the environment, society and community, and good governance in their business conduct. A training workshop on sustainability self-assessments was also provided – attended by 20 suppliers – following which sustainability performance assessments with MASCI were arranged for suppliers with PTT employees as observers. This workshop will be continued in 2018 with the goal to increase the number of suppliers assessed by 10%.

## Tackling Corruption in the Supply Chain

Guided continually by its goal to become a transparent and ethical organization, PTT signed a Memorandum of Understanding with the National Anti-Corruption Commission of Thailand (NACC), the State Enterprise Policy Office, and other state enterprises to forward anti-corruption efforts for the successful and principled implementation of Thailand's National Anti-Corruption Strategy. Regarding procurement, PTT has disclosed information about its procurement processes and results monthly on [www.pttplc.com](http://www.pttplc.com) to allow for public review. PTT's information disclosures will be annually reviewed by the NACC.

In 2017, PTT received a 100% score on the NACC's Evidence-Based Integrity and Transparency Assessment (EBIT) for having complied with all of the assessment's requirements, which included: announcing the company's annual procurement action plan, publicly distributing procurement information, having an approach in place to assess potential conflicts of interest between PTT employees and bidders, publicly disclosing information on the company's top 5 procurement projects by value each year, and finally, evaluating procurement results yearly.

To promote the proper understanding of procurement throughout the organization – and to prevent any conduct that runs counter to its requirements – PTT's procurement function held a training during new employee orientation and developed the Procurement Academy course on procurement practices for employees at all levels. At the same time, PTT also provided training to procurement staff to strengthen their expertise in specific areas, such as procurement-related laws and regulations, and strategic procurement.

## Value Creation through Business Collaboration

Collaboration between PTT and its business partners – especially supplier partners within PTT Group – to create new business opportunities and increase competitiveness is the key to joint and robust growth. Over the past year, PTT Group collaborated on projects related to process improvements, value creation, and capacity-development. These included:



### The PTT-PTTGC Logistics Improvement project

The PTT-PTTGC Logistics Improvement project, a partnership between PTT and a refinery of PTT Global Chemical, to improve the efficiency of product supply and delivery. The project involved implementing improvements to PTT's logistics management system and the oil loading process for trucks at the refinery to increase the volume loaded – by 78% compared to 2016 – and to better respond to the demand for improved loading efficiency. The improvement reduced logistics costs by approximately 6.4 million baht per year.



### PTT and PTTGC

A partnership between PTT and PTTGC to expand distribution channels for specialized products such as JP-8 jet fuel. With originally limited distribution points for JP-8, the project expanded that number and brought about an increase in refills by 1.2 million liters and savings from supply costs of approximately 0.6 million baht.



### PTT and PTT Group companies

PTT and PTT Group companies joined hands to share in the procurement of common goods and services used by the Group. Starting with products in the 'Common Goods' group and office equipment and extending eventually to other types of products and services, this joint approach gave the Group higher bargaining power with suppliers and by extension encouraged suppliers to expand their service capabilities to PTT Group. Procurement is currently organized according to ten categories of products and services, with 20 items in each category. In 2017, the Group reduced costs by 206.52 million baht.

# Product Stewardship

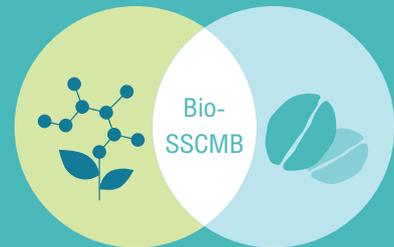
Driven by the forces of a business environment that is currently entering a technological era and by the increasing preferences of consumers for more environmentally-friendly products and services, PTT Group has joined forces to explore, research, and develop products and services that serve such needs – all the while guided by its commitment to build up technological capabilities and drive the nation’s economy forward through innovation.

## Value-Added Innovation

PTT’s innovation development is classified into 3 categories: project-based, business request (an innovation request from each business unit), and contracted research. The scope of development is diverse yet consistent with PTT Group’s various businesses, such as research on the environment, fuels, lubricants, polymers, chemicals, automobiles, and prolonging the lifetime of natural gas pipelines. Emphasis is placed on the adoption of innovation to improve product quality and reduce costs. At the same time, innovations should also support the expansion to new markets, where research should focus on potential business directions and channels for future promising technological advancements, such as hydrogen energy storage, solar cells, health and medicine, to name a few. Moreover, in keeping with the country’s Research and Development Promotion Policy, PTT has earmarked a budget for research and development at no less than 3% of its net profit per year.



## Bioplastic Compound-Based Silver Skin of Coffee (Bio-SSCMB)



Bio-SSCMB is a bioplastic developed by PTT Group using a mixture of Silver Skin of Coffee (SSC), an organic waste from Café Amazon’s roasting plant.

Based on a 10-year forecast (2017-2026), Bio-SSCMB will reduce the amount of



organic waste from Café Amazon’s roasting plant from entering communities and the environment by 17 tonnes per year.



Equivalent to waste disposal costs of **100,000** baht/year

Or the rate of carbon dioxide emissions of approximately





Biodegradable



Wood-like texture



Characteristics similar to regular plastic



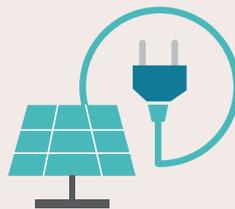
The product has been successfully patented, and PTT is now in the process of developing a business model will provide bio-plastic producers with sufficiently competitive costs to transform Thailand into an international leader in the comprehensive bio-industrial sector.



- Awarded the gold medal at the 45<sup>th</sup> International Exhibition of Innovation Geneva 2017
- Awarded special recognition by the Association of Polish Inventors and Rationalizers
- 2017 Best State Enterprise Award for 'Best Innovation' from the State Enterprise Policy Office

PTT Group does not only focus on developing innovations to support its own business. We are also currently carrying out research to support strategies in the energy sector to build Thailand up as a green society based on clean energy. We have put forth an S-Curve strategy to identify novel opportunities in electric technologies, with a focus on charging stations for electric vehicles, hydrogen energy storage, and solar photovoltaic cells.

## Electric Vehicle (EV) Charging Stations



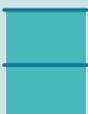
In response to the government's Energy 4.0 Policy that is aiming to move the country towards an era of innovation-based energy and clean energy use, PTT has, since 2013, undertaken studies on EV-charging technologies. Six charging stations have been installed to date, and PTT plans to increase this number to 20 by 2018. In addition, the company has developed an EV Wall Charger which can be installed with ease against a concrete wall by plugging in the 220V cables commonly used in residential areas and offices. This has already been piloted with the director of PTT Board's official car in June 2017, and will be set up for other executives' official vehicles as well. Moreover, there are plans in development to commercialize and market the wall charger at 7 kW capacity to charge electric vehicles in households. The next steps are for PTT to conduct a risk assessment, develop a marketing plan, and seek certifications for its product.



## Green Products and Services

PTT Group regularly conducts research and development on green products and services, from biofuels and bioplastics to other environmentally-friendly products. To be 'green' or environmentally-friendly, a product or service must efficiently use natural resources, mitigate environmental and social impacts, as well as meet consumers' needs. Given this, PTT evaluates the environmental impacts of its products and services throughout their entire life cycles, and raises awareness of green products amongst consumers through its self-certified Green for Life label. In 2017, six products and 109 service stations were certified as Green for Life, covering those developed within PTT Group companies, the Group's raw materials that are used by customers as a component, and services that utilize PTT's logo. Not only that, PTT has supported green product marketing by developing a web database of environmentally-friendly products and services – the 'Eco-Product Directory 4.0' – together with the Federation of Thai Industries to communicate on, campaign for, and promote consumption behaviors that have a higher preference for green products and services.



 <p><b>ENVIICO Bathroom Cleaner</b> PTT Public Company Limited Global Green Chemical Public Company Limited</p>	 <p><b>PTT NGV Stations</b> 3-star level PTT Public Company Limited</p>	<p><b>65</b> Stations</p>
 <p><b>PTT Hydraulic Biosyn,</b> available in 3 types:</p> <ul style="list-style-type: none"> <li>• PTT Hydraulic Biosyn 32</li> <li>• PTT Hydraulic Biosyn 46</li> <li>• PTT Hydraulic Biosyn 68</li> </ul> <p>PTT Public Company Limited</p>	 <p><b>PTT NGV Stations</b> 1-star level PTT Public Company Limited</p>	<p><b>35</b> Stations</p>
 <p><b>PTT Performa Super Synthetic 0W-20</b> PTT Public Company Limited</p>	 <p><b>PTT Service Station</b> Saraphi Branch, 2-star level PTT Public Company Limited</p>	<p><b>1</b> Station</p>
 <p><b>POLIMAXX SVNR (GRADE: NRHI635)</b> IRPC Public Company Limited</p>	 <p><b>PTT Service Station</b> 1-star level PTT Public Company Limited</p>	<p><b>8</b> Stations</p>

For more information on environmentally-friendly products and services, please visit [www.pttplc.com](http://www.pttplc.com), 'Product Stewardship' under the Sustainability tab.





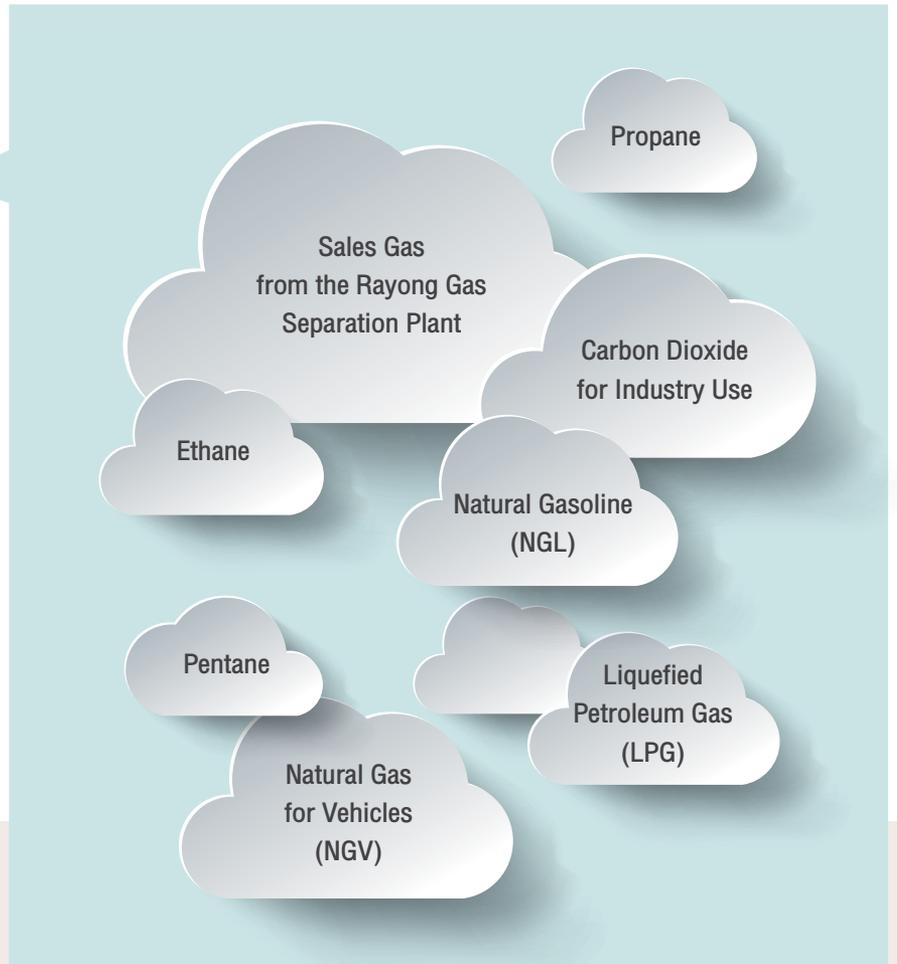
**Products certified with the Carbon Footprint Label**



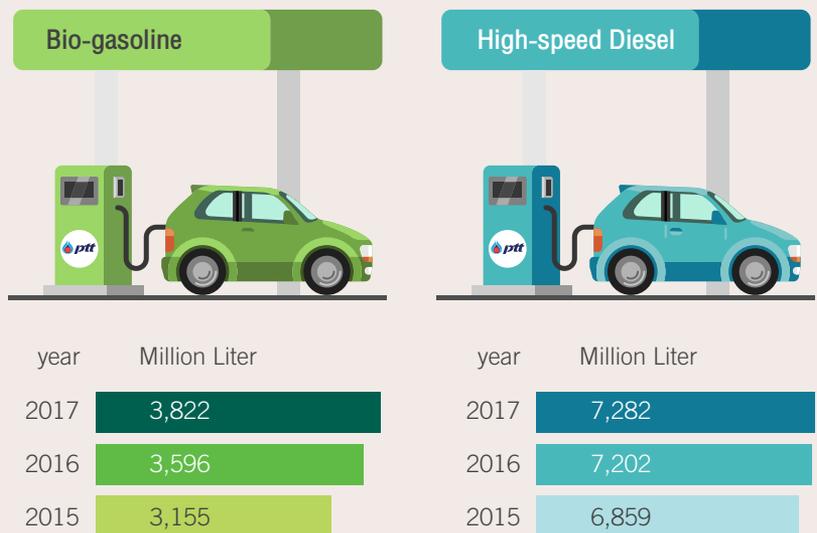
“PTT Group is another organization that values the environment and that has long supported the Pollution Control Department – especially in the production and consumption of environmentally-friendly products. This is evident through the Group’s development of the ‘Green for Life’ label that is used for the registration of environmentally-friendly goods and services and its public promotion of the use of such goods and services, all of which are much in line with the Department’s policy to move towards sustainable production and consumption.”

**Mrs. Sunee Piyapanpong**

Director-General of  
the Pollution Control Department



**Biofuel Production in Thailand**



Remark:  
Data on bio-gasoline production volume was adjusted in 2016.

## Customer Relationship Management

PTT has in place clear guidelines that govern how it approaches its customers and consumers, from providing customer feedback channels for business operators (Business to Business: B2B) and consumers (Business to Customer: B2C) – where the feedback collected can be used for further analysis and in developing strategies to respond to the needs and expectations of all groups – all the way to the monitoring of performance against metrics for continuous improvements. The needs and expectations of all PTT customers are assessed according to each business segment to cater to their unique needs, however all business units employ a similar customer relationship management approach – annual assessments of customer satisfaction and the use of customer feedback channels such as the 1365 hotline, customer visits, and customer seminars. Such an approach allows PTT to improve its product and service development to better meet customer demands in the future.

Based on results from the annual customer satisfaction survey, customers from the Oil business group (customers of products such as fuel, lubricants, LPG and Café Amazon) overall demonstrated higher satisfaction scores that exceeded the target. This was due to promotional marketing activities that directly connected with consumers; improved services, and increased product distribution channels.



As for the Natural Gas business group, the overall trend of results was higher in comparison to previous years owing to changes in pricing structure. However, the score fell short of meeting the target because of price volatility in the global market impacting production volume; changes in pricing structure, and fewer numbers of customer activities. In consideration of these factors, PTT took swift action to care for and work closely with its customers to provide more information, and redesigned its customer relationship management system to have each regional sales department manager accountable for customers by business group to increase their convenience and the efficiency of the grievance process.

The International Trading business group, on the other hand, saw an increased satisfaction score compared to the previous year. This was because the group had taken any problems identified in the survey to improve the efficiency of its internal processes, and throughout the year had organized activities to promote customer relations.

In 2017, PTT did not encounter any incidents of non-compliance with rules, regulations and laws relating to occupational health and safety in the sales of its products and services. The same applies to regulations concerning product labeling, data privacy of customers, and product marketing.



## 180 PTT Friendly Design Stations

Guided by the concern that individuals of all genders, ages, and physical capabilities should be able to access and use PTT's service stations in a safe and convenient way, PTT decided to transform its stations into a 'Friendly Design' model under the mindset of 'Care and Safety for All.' Building a safe and convenient service station in every regard called for improvements in facilities and components such as disabled and women only parking spots, special bathrooms for all, wheelchair ramps on sidewalks and in front of convenience stores, CCTVs, and emergency alert buttons. Signs and symbols have also been redesigned to more clearly designate the locations of each service. The PTT Friendly Design concept was introduced to upgrade the services of PTT's service stations beyond the 'PTT Life Station' concept, which had originally catered to the new generation's lifestyle by providing all types of conveniences in a one-stop service location. To date there are 180 PTT Friendly Design stations located on both primary and secondary roads, and PTT will continue onwards to upgrade all its service stations accordingly.



# SOCIAL



## Human Resource Management

Developing human capital and creating a culture of learning within the workforce is an important aspect in achieving PTT's mission and making the company's vision a reality. Thus, PTT has focused on creating a culture of continuous learning to develop leadership skills and instilling the company values of integrity, intellect, professionalism, and a willingness to learn amongst employees at all levels within the company. PTT also seeks to create a culture of empathy towards the larger society and the environment by promoting values of caring, sharing, and compassion towards other employees. These traits and characteristics will allow PTT to continue to do business into the foreseeable future.

### Human Capital Development

The development of human capital is not just about assisting individuals in achieving company goals or supporting company growth objectives, but it is also about helping PTT improve its competitiveness in the present and in the future. Therefore, PTT has set regular performance appraisals so that managers and employees can keep track of their progress and evaluate their performance throughout the year. PTT also reviews skills development in different lines of work to promote the necessary and desired qualities in each line of work according to the Individual Development Plan. In 2017, 74% of all employees have received the details of their Individual Development Plan.

PTT uses a system to designate potential pool development protocols to cover each and every line of work to support changes in the business. PTT also has programs for upgrading employee skills and assisting in transitions to offset the large number of retirements within 2018. Looking at the next 5 years and the Individual Development Plan, PTT has also identified the desired qualities and characteristics of future vacancies within the leadership pool for Vice President, Assistant to the President, and Department Manager positions to prepare candidates for these new and important positions. The succession rate for upper management has reached 93%, exceeding the set goal of 75%.

Aside from the above, to address the challenge of developing high-quality individuals in time for the changing business environment and to support PTT's growing business abroad, PTT has continued the Young People to Globalize Program (YP2G), a program in place since 2014. Currently, there are 475 employees participating in the program, which gives participants work opportunities domestically and internationally (such as Myanmar, Laos, Cambodia, Vietnam, the Philippines, China, Singapore, Indonesia, and the United States of America). In 2017, the YP2G program received an honorable mention from the Association for Talent Development Excellence in Practice Awards in Career Development among 220 other submissions all over the globe, organized by the Association for Talent Development (ATD) based in Atlanta, USA.



**Ms. Natchar Tuchinda**

Graduate of the Young People to Globalize (YP2G) Program, Year 1  
Acting Manager, Finance Department, Laos Division

“The difficult task of this program is for the Human Resources department to find challenging lines of work for the program participants and to oversee their development in such a short period of time, plus giving them detailed work instructions during the 6-month period. It gives the participants exposure to unfamiliar situations and pushes participants to adapt to a different country and the local culture. The program was also an experience to meet other PTT employees. This program is ideal for Gen Y and will motivate people to come and work at PTT. It will make people want to stay at PTT longer as well. What we gain from this program will help make PTT and us ready for the future.”

## Supporting the Learning Process

### Education and Training

PTT has developed 3 distinct curricula for both managers and employees through the PTT Leadership and Learning Institute (PLLI) as follows:

#### 1. Leadership Development Program

upgrades employee skills and provides a transition assistance program for employees to become leaders within PTT. It builds skills in managing workloads and people, as well as focuses on the utilization of these skills on the individual, the team, and the larger organization.

#### 2. Compulsory Program

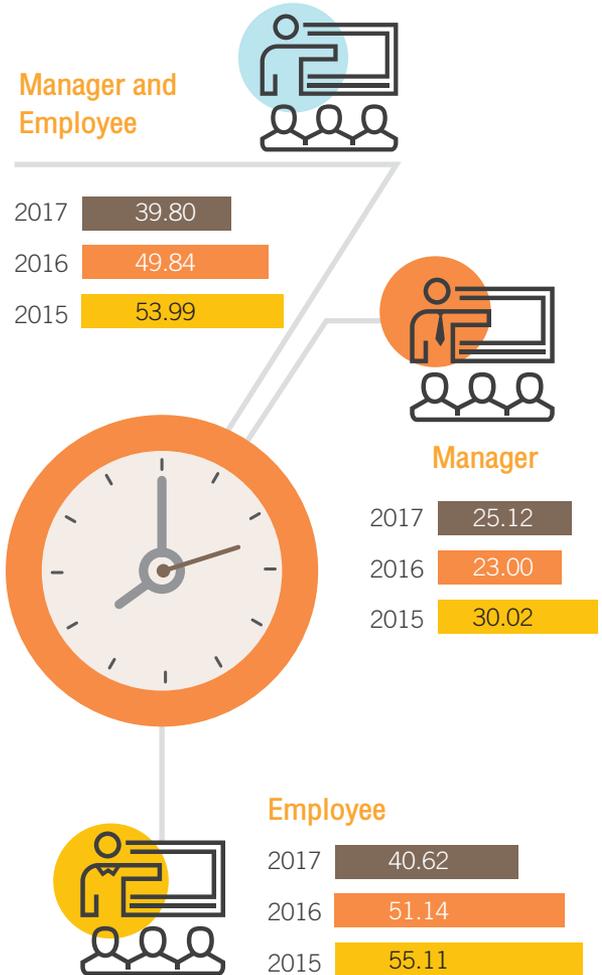
aims to improve employee skills in all levels and all lines of work within PTT. The core courses include an introduction in the workflow and corporate culture of PTT, the development of leadership skills, and functional courses that are line of work-specific. These courses aim to develop and hone the skills of the employees within each line of work.

#### 3. Elective Program

is offered to allow individuals to improve their own skillset. Examples of elective programs include English as a Second Language courses and classes to develop presentation skills.

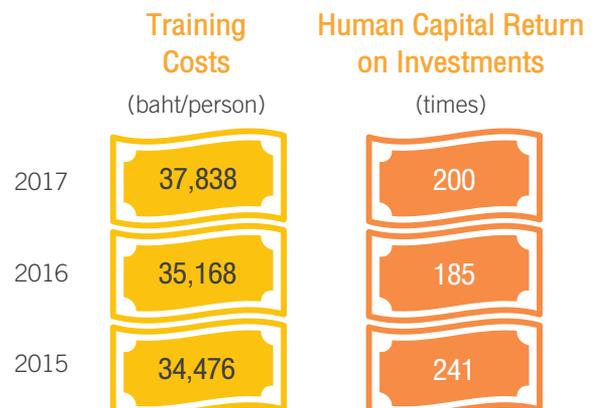
### Average Hours of Training

#### Manager and Employee



**Remark:**

In 2016, PTT made changes to the core course component of the training program to make the program more applicable among different job levels and combined classes to make the program run more efficiently. However, SAP system still counts the training hours according to the older version of the program, so the figures in the graph above for hours spent training may be inflated. Changes were made to 2016 figures for accuracy reasons.



## Knowledge Management

PTT has set up a framework for knowledge management to focus on value creation that includes the classification of essential company knowledge, the storage of such knowledge, the sharing of such knowledge, and the application of the knowledge in PTT's business activities to create a lasting competitive edge. This knowledge is supported by technology to increase efficiency and accessibility for employees. This framework will also support the instilling of PTT's company values amongst employees as well. The core of the knowledge management framework are all PTT stakeholders who will share opinions, experiences, and suggestions to continuously improve the knowledge management system.

In 2017, PTT evaluated the knowledge management framework and gave the system an average of 67% rating, which is higher than the previously set goal of 60% and in line with projections to reach a score of 80% by 2020, when set to a standard of other global companies. Aside from this, PTT has amassed 10% more data than previously forecasted. PTT has used the knowledge in a variety of methods that have resulted in direct and indirect value creation as follows:



Work Standards Group through creating a framework for explaining the change in quality of natural gas



Company Culture Group through creating the CVMS (Control Valve Monitoring System) by using predictive maintenance to prevent control valve issues that result in lost production



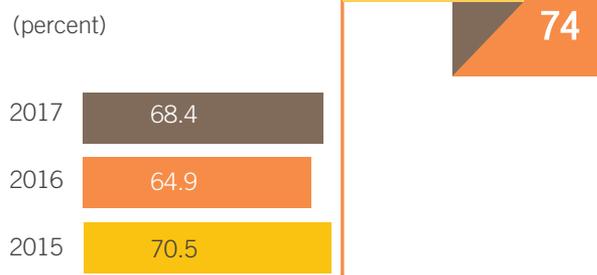
Corporate Social Responsibility Group through creating the CSR Practice handbook which compiled different social outreach strategies like disaster relief, cold weather relief, emergency relief, and gas tank maintenance.

## Inspiring Company Values



The SPIRIT values are values PTT hopes to instill in every company employee to foster cohesion within the company and inspire integrity, intelligence, and responsibility within PTT and in the larger society. PTT utilizes the top-down approach in spreading the SPIRIT values within the company by having managers set the example for their employees through performing their duties in accordance with the SPIRIT values. PTT also utilizes a bottom-up approach to spread the SPIRIT values by inspiring employees to cohesively promote the SPIRIT values in their own work. PTT also performs annual evaluations that include SPIRIT values in all levels, incentivizing employees to give suggestions about top-down management approaches that they deem effective. SPIRIT Workshops are also organized to analyze problems and their causes and to review the SPIRIT values promotion process. These workshops also seek to integrate employee suggestions on transforming the company culture continuously through analysis and assessments between employees, managers, and evaluators. The breadth of stakeholders in the framework will allow for the system to reach a wide range of issues and to tackle them with more efficiency, representing the bottom-up approach.

### SPIRIT Value Commitment Score





## Employee Engagement

Every year, PTT conducts research and designates important factors in inspiring employee engagement and increasing employee satisfaction through collecting field data, conducting interviews with managers, large employee forums, and employee engagement surveys. This process is done so that PTT understands what motivates different groups of employees. The current challenge for PTT is to inspire engagement within Generation Y (Gen Y) employees. The importance of understanding Gen Y is due to the fact that Gen Y will make up a larger share of the labor market and their eventual ascension into leadership positions at PTT in the future. PTT has conducted research with Gen Y employees and found that they place great importance in compensation and benefits. Looking at research among employees in the oil and gas industry, PTT is among the other industry leaders in the recruitment of employees. Due to PTT's below industry average compensation scale, PTT has begun re-evaluating the compensation of promoted employees and reviewed previous promotions and position changes. In the long-term, PTT is committed to revise the compensation scale to accurately reflect PTT's industry leadership role, further strengthening PTT's relationship with GenY employees and raising the company engagement score among Gen Y from 60% in 2016 to 63% by 2017.

In 2017, PTT has evaluated employee engagement and found that previous evaluations yielded overall results that are difficult to measure and compare in detail. PTT has since updated the employee engagement evaluations to allow for greater detail and to be more applicable to PTT specifically. From PTT's research, 99% of employees participated in the employee engagement survey. Company engagement stands

at 70%, up 1% from 2016, due to improvements in employee evaluations that distinguish between employees who express company engagement and employees who do not. In last year's employee engagement survey, PTT has found that the top issues facing employees concern performance management and career opportunities. Thus, PTT has supported managers to increase communication with employees regarding indicators, follow-up, and the results to properly evaluate employees and their work output. Aside from that, managers also participate in two-way evaluation, allowing employees to suggest Individual Development Plans and planning the employee's future prospects to better understand the promotional scheme at PTT.

## Supporting the Careers of Disabled Professionals

PTT is the first state-owned enterprise that started a program to support disabled professionals outside of the traditional financial support that disabled professionals receive. Hiring seeks to improve the economic situation of disabled professionals directly. In 2017, PTT worked with organizations that discourage drunk driving to hire those affected from drunk driving by hiring 46 victims of drunk driving for jobs within PTT service stations in 6 provinces (Chantaburi, Nakhon Ratchasima, Nakhon Sri Thammarat, Pathumthani, Nongkhai, and Uthaitani). These programs will help dissuade drunk driving and inspire victims of these accidents in surrounding areas as well. PTT also seeks to educate those in society, schools, universities, and industries regarding the dangers of drunk driving. In addition, this program received commendations for its societal contribution and supporting disabled professionals from the Ministry of Labour in 2017.



# Human Rights

PTT has voluntarily demonstrated its commitment to respecting human rights in all of its business operations. In practice that means preventing and avoiding any violations of the rights of its diverse stakeholders and remedying any unforeseen impacts resulting from the company's activities. Given these considerations, PTT developed the Human Rights Management System in line with the United Nations Guiding Principles on Business and Human Rights so that all of PTT's conduct regarding this issue is clear-cut, verifiable, and coherent across the organization. Moreover, PTT has inserted clauses on human rights into its Ethical Standards and Code of Business Ethics Handbook and the Supplier Sustainable Code of Conduct specifically to cover human rights risks to make sure that human rights principles encompass the entire supply chain.

PTT's 2017 annual human rights risk assessment covered the Group's activities and operations in 82 locations globally. The assessment revealed that 23 of PTT Group's operational areas (or 28% of total operations) have a possibility to be at risk of human rights violations and are at a level which requires continuous monitoring. These plausible risks are: unsafe working conditions, occupational health and safety, forced labor, violations of community rights in operational areas, and the rights of minorities and vulnerable groups. To mitigate these risks, PTT Group has developed the necessary control measures and action plans for 100% of its high-risk areas, thus ensuring that any risks have been thoroughly inspected, monitored, and managed within controllable limits.

PTT has set up channels to respond to and manage human rights-related grievances from all its stakeholders – inside and outside of the organization. Internal channels for employees include the labor unions and the labor relations grievance system, whereas external channels for non-employees and the public are the customer relations center, the Office of the President and the company secretariat, and the investor relations department. At the same time, PTT also realizes the importance of protecting all who have come forward with grievances, and has therefore mandated that grievances must be resolved within a specified timeframe. For employee grievances, this means no more than 30 days. Externally-filed grievances, on the other hand, must be investigated, resolved, and reported back to the issue owner (either on its successful resolution or, should the process take longer, its status) within 7 working days. In 2017, there were no grievances related to human rights violations, or actions in violation of human rights laws.

Furthermore, PTT's employees receive regular training and knowledge-sharing on human rights issues. Since 2014, the company has held the PTT Group Sustainability Management training course, which covers content on human rights and business, risks and opportunities, and best practices on human rights management. A total of 24 of the Sustainability Management classes have been held for 79% of all employees in the organization. Over the past year PTT has, in addition, organized a technical seminar on 'Business and Human Rights' for PTT Group management and employees to understand the importance of respecting human rights in business, and of collaborating with other businesses, the public sector and civil society to push for the successful implementation of human rights principles. The seminar, which was attended by 76 PTT Group employees, featured prominent human rights experts in Thailand as Dr. Seree Nonthasoot, Thailand's Representative to the ASEAN Intergovernmental Commission on Human Rights (AICHR), Ms. Prakairat Tonthirawong, Chair of the Sub-committee on Economic, Social and Cultural Rights, Ms. Pitikan Sithidej, Director-General of the Rights and Liberties Protection Department, Ministry of Justice, and Ms. Nada Chaiyajit, representative from the Manushya Foundation.



# Capital Project Management

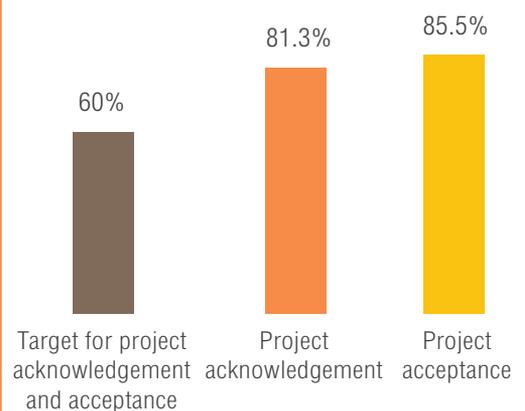
Engagement with stakeholders in all sectors throughout a project's lifecycle is one of PTT's priorities in addition to maintaining compliance and quality of operation with relevant laws, regulations, standards and practices. Starting with ensuring that stakeholders have a full understanding of a project's management and operations, the level and form of community engagement is dependent on the process, potential impact, and number of stakeholders involved. The results from their participation are then used to devise preventive measures and mitigation methods. For expansion and modification projects that require environmental impact assessments (EIA), PTT will regularly provide the EIA to the Office of Natural Resources and Environmental Planning and Policy (ONEP) and other relevant agencies within the required timeframe. Interested parties may access the EIA reports through ONEP.

Stakeholders who anticipate direct impact from a project are invited to participate in decision-making and project planning since the R&D, pre-construction, construction, and post-construction stages. For instance, PTT invited all stakeholders to express their opinions on the appropriate route selection that will have the least impact on communities, society and environment as part of the Onshore Gas Transmission Pipeline project. Furthermore, a public hearing was held during the pre-construction stage to assess the environmental impacts and mitigation methods to allow community members to express their concerns. The public hearing required that all stakeholders and environmental assessments in accordance with ONEP are reviewed throughout all phases and stages of the project. PTT has set up communication channels to proactively respond to stakeholders' concerns. Stakeholders and community members can regularly express their grievances to the Project Coordination Center or to PTT's Call Center. All grievances are fully investigated, and all information are used to develop further impact prevention measures. A tripartite board composed of representatives from local community leaders or area representatives, PTT, and related governmental agencies was formed to evaluate and mitigate these concerns following the prevention measures. PTT did not encounter any cases of community grievances or conflicts in 2017. No cases of community resettlement took place.

## Community Consultations

34 operations = 100% of total operations.

3 development projects = 100 of total projects.



## Capital Projects in 2017

### Onshore Gas Transmission Pipeline Nakhon Ratchasima (Phase 2)

The pipeline passes through Nakhon Ratchasima Province, encompassing 11 communities and 2 districts, and is scheduled for completion by the 4<sup>th</sup> quarter of 2018. It is expected to deliver gas to customers by the scheduled date without opposition from the public and communities in the surrounding areas. There were no community grievances due to PTT's active engagement with public participation throughout the project's lifecycle along with providing these findings to the contractor for adherence with the EIA.

As of December 2017, the Community Engagement Score is 4.00.



Target at 5



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

PTT encouraged community engagement during the pre-construction stage of the pipeline by holding 31 meetings with 3,559 participants to ensure all stakeholders' expectations and concerns are met. With the EIA approval from ONEP in September 2017, construction is scheduled to begin during the 1<sup>st</sup> quarter of 2018, and for completion in 2020. The pipeline will pass through 62 sub-districts and 10 districts in the 4 provinces of Nonthaburi, Nakhon Pathom, Ratchaburi, and Kanchanaburi.

As of December 2017, the Community Engagement Score is 3.95.



Target at 5



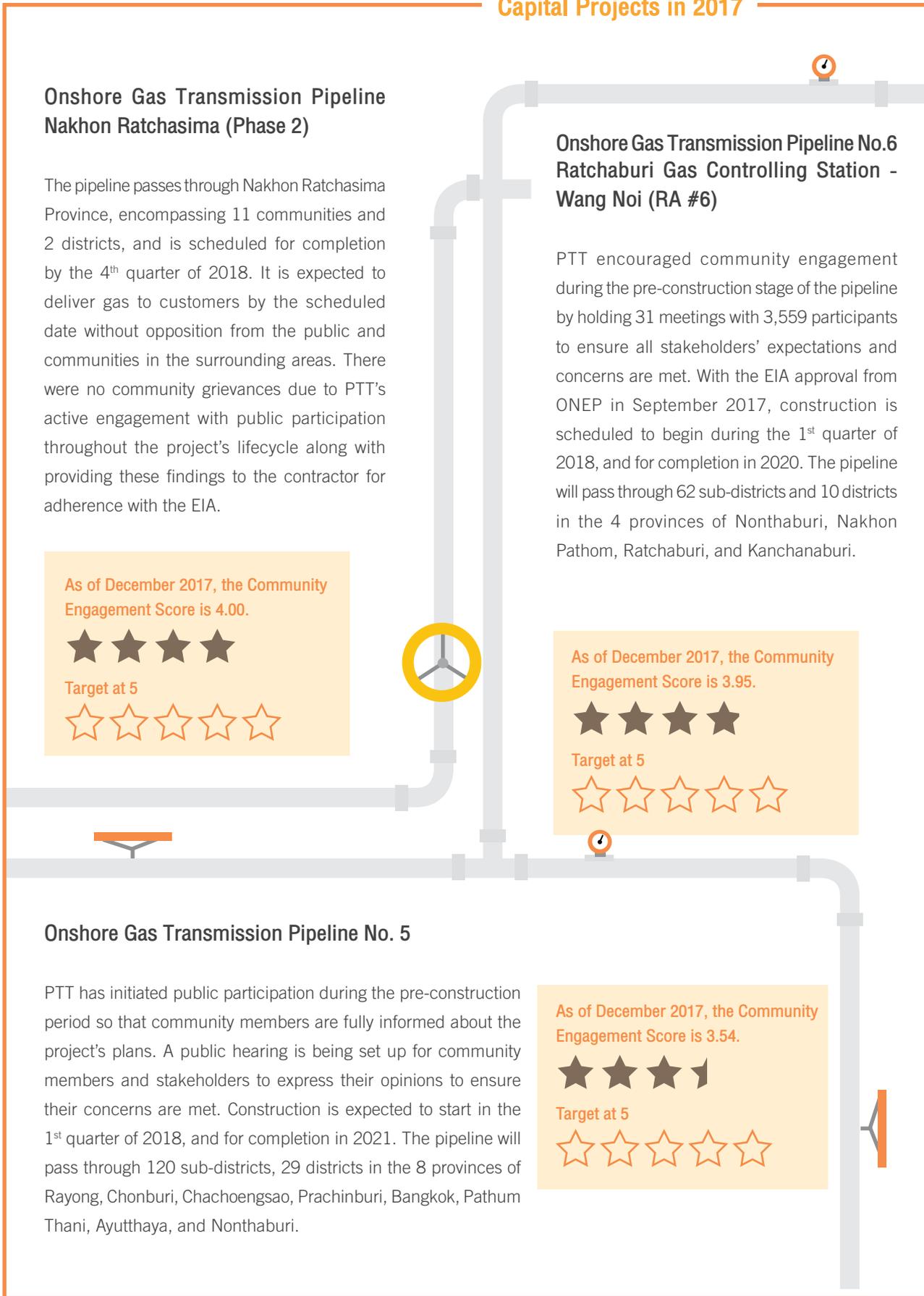
### Onshore Gas Transmission Pipeline No. 5

PTT has initiated public participation during the pre-construction period so that community members are fully informed about the project's plans. A public hearing is being set up for community members and stakeholders to express their opinions to ensure their concerns are met. Construction is expected to start in the 1<sup>st</sup> quarter of 2018, and for completion in 2021. The pipeline will pass through 120 sub-districts, 29 districts in the 8 provinces of Rayong, Chonburi, Chachoengsao, Prachinburi, Bangkok, Pathum Thani, Ayutthaya, and Nonthaburi.

As of December 2017, the Community Engagement Score is 3.54.



Target at 5



# Corporate Citizenship

PTT is committed to becoming an organization that not only creates economic growth, but also an organization that contributes to social advancement, community development, and natural resource conservation. PTT recognizes the challenges to the business which are the emphasis of the Sustainable Development Goals. These include awareness on global warming, degradation of natural resource and the environment, socio-economic inequality and disparities, and access to suitable forms of energy. PTT integrated these factors into its corporate citizenship programs for human development in all dimensions. PTT focuses on promoting long and healthy life, education and capacity building, quality of life for people at all ages, conservation of land and marine resources, and reduction of greenhouse gas emissions. Our approach is to raise awareness and foster collaboration with all sectors to create a sustainable society for all.



## Social Development Projects

In addition to the integration of national and global social trends, PTT also takes into account the needs and expectation of communities and society in developing sustainable growth strategy. PTT uses our expertise to manage the environment and enhance the quality of life of communities and society while also driving the business towards excellence for increased competitiveness and

transparency. PTT's corporate citizenship activities focus on 3 main areas: Human Resource Development, Community and Social Development, and Natural Resource Conservation. The total budget for social development was 1,186.33 million baht, in which 6% was for commercial initiatives, 39% was for community investment, and 55% was for charitable donations.





## Human Resource Development

PTT places a high emphasis on developing human resources as an essential factor for the development of the country. PTT has therefore dedicated our efforts to strengthening education system by providing opportunities in education, fostering creativity and enhancement of skills, and moral improvement for youth. PTT uses its knowledge and expertise in science and technology to improve the education system in collaboration with local agencies, government, private sector and relevant networks.

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

PTT signed the memorandums of understanding with the National Science and Technology Development Agency (NSTDA) to combine the development of PTT's Wang Chan Valley in Rayong and the Eastern Economic Corridor of Innovation (EECi). The objective is to support EECi development in PTT's Wang Chan Valley to effectively enhance national competitiveness with science, technology, and innovation. VISTEC and KVIS, the education and research institute dedicated to science and technology, would contribute to the development of personnel for science, technology and innovation who would support the creation of innovation ecosystem in the future.



Kamneotvidya  
Science Academy  
(KVIS)

3

Academic  
Years

216

High school  
students

Vidyasirimedhi  
Institute of Science  
and Technology  
(VISTEC)

3

Academic  
Years

156

Master and  
PhD students

enrolled in Materials Science and  
Materials Engineering, Chemical  
Engineering, Science and  
Biomolecular Engineering, and  
Science and Information Technology





### The 21<sup>st</sup> Century School Project

PTT provides children surrounding the operational areas with opportunities to get access to high quality education. PTT Group companies in Rayong Province signed a memorandum of understanding with Rayong Primary Educational Service Area and Lamplimat Pattana School to launch the 21<sup>st</sup> Century School Project for the year 2016-2020. The objective is to support the development of schools under the responsibility of the Office of the Basic Education Commission on learning and environment management as well as teacher development on teaching process. These schools are expected to become model school in learning and teaching reform. The Project also promoted collaboration with parents and communities in building the environment that is conducive to the development of students' intelligence and behavior. In addition, it also strengthened the students with the knowledge, skills and attributes that are required in the 21<sup>st</sup> century. These included analyzing skills, mathematics, language, and technology. This helped prepare students for the socio-economic changes. Our aim is also to make these students become "good" and "smart". In 2017, PTT Group carried out this project for 2 consecutive years. Two model schools were successfully developed while 5 schools became network schools. All these 7 schools were invited by the Office of the Basic Education Commission to become role model for 3,000 public schools nationwide.

### Petro Camp to Champ Petro

PTT still supported the "Petro Camp to Champ Petro" Youth Camp for 12 consecutive years. High school students are selected to join the youth camp to learn more about petrochemical industry, refinery, and energy, as well as to enhance their creativity for new innovation. In 2017, a total of 55 students from 13 schools nationwide was selected to join the youth camp. Students had the opportunity to learn and participate in activities and workshop on science, petroleum science, and environment. In addition, PTT also collaborated with the Faculty of Engineering, King Mongkut's University of Technology Thonburi to grant scholarships to study at the Department of Chemical Engineering and Environmental Engineering. As of present, there were 55 students who were granted scholarship, of which 27 students already graduated. Some graduates furthered their Master degree in Energy Science while others became quality engineers in both public and private sector.





## Community and Social Development

PTT places great emphasis on enhancing the quality of life of communities surrounding the operations nationwide. PTT addresses the needs and expectation of communities and encourages them to become resilient, sustainable and self-sufficient, as defined by the sufficiency economy philosophy. PTT shares its knowledge and expertise on energy technology and encourages community engagement in community development projects. In particular, PTT aims to build capacity of communities on energy management based on their ways of life in an effort to drive communities towards energy self-reliance.

### Clean Energy for Community Project

PTT is committed to taking care of communities surrounding its operational areas. PTT helps to mitigate impacts from the operation and emphasize the effort to enhance the quality of life of communities in various aspects. Our work in maintaining the pipeline and taking care of communities around the natural gas pipeline allowed us to understand the challenge of getting access to basic infrastructure, especially access to clean water for consumption and agriculture. PTT uses its 30-year expertise in engineering and energy science to enhance the quality of life of communities through the Clean Energy for Community Project. In 2013, to address water scarcity in the highland, PTT developed a water supply system for the first time for Khanun Klee Village in Tha Khanun Sub-district, Thong Pha Phum District, Kanchanaburi Province which is one of the communities along the Eastern LPG pipeline grid (Thailand-Myanmar). PTT collaborated with the



community in surveying the geography of the area, studying and designing water supply system using hydraulic ram pump that does not require electricity or fuel. This project helped to solve water scarcity problem and enabled the community to get access to water. PTT used knowledge gained from this project to further develop water management model for various geographical areas. In 2017, PTT expanded the project to 14 areas throughout Thailand, enabling communities and organizations to get access to and use more than 190,431 cubic meters of clean water in the household, for agriculture, and for preventing wildfire.

## Research on Electricity Generation from Floating Solar Photovoltaic Panels for Water Management

Recognizing the reduction of fossil fuels and the importance of the development and promotion of renewable energy, PTT collaborated with Chaipattana Foundation to conduct a research on floating solar photovoltaic panels in Rama IX reservoir under the Royal Initiative. The scope of the project was expanded to cover usage of solar panels in communities which helped to promote the use of clean renewable energy to substitute fossil fuels. In 2017, PTT further expanded the usage of floating solar photovoltaic panels for agricultural irrigation in network communities in 5 areas including Dong Khilek Sub-district, Mueang Prachin Buri District, Prachin Buri Province, Tha Manao Sub-district, Chai Badan District, Lopburi Province, Lam Sin Sub-district, Srinagarindra District, Phatthalung Province, Kham Khaen Sub-district, Manchakhiri District, Khon Kaen Province, and Mae Tha Sub-district, Mae On District, Chiang Mai Province. The solar panels helped to generate electricity by 114,690 units per year which helped communities to reduce energy cost by more than 771,496 baht. They also resulted in a reduction of carbon dioxide emissions by 67.64 tonnes per year.



## Community Biogas System from Pig Farming Project

PTT carried out energy development projects for communities to support communities in becoming energy self-sufficient. PTT developed the Community Biogas System from Pig Farming Project at Tha Manao Sub-district, Chai Badan District, Lopburi Province to reduce odor from pig farm and turn waste into biogas for the community to use as a substitute of LPG and charcoal. The scope of community biogas system was further extended to 2 locations; Kham Khaen Sub-district, Manchakhiri District, Khon Kaen Province and San Sai Sub-district, Phrao District, Chiang Mai Province. These 3 communities became model community in public participation in local energy management. The project helped 183 households in these communities to reduce cost and generate income for 1.12 million baht per year and contributed to the reduction of greenhouse gas emissions by 1,287 tonnes of CO<sub>2</sub> equivalent per year.



## Livable City

PTT launched the Livable City Project in 33 communities surrounding PTT’s operational areas to promote the development of the communities’ livelihood in social, economic, health and environmental aspects. PTT engaged with the communities in each operational area and all relevant parties in developing strategy and community development plan and master plan through forums, working group meetings, sub-group meetings, and workshops. Local committees were also set up to gather opinions/concerns or to receive complaints from all stakeholders. In 2017, PTT carried out activities in different areas, such as:



**Organized forum to gather opinions** from all stakeholders for future community development projects including green space development, enhancement of knowledge on tourism, waste management in the community, family relations, natural resource recover, drought management, and health promotion. The forum was organized at Baan Rong Po Gas Tank Farm, Phitsanulok Oil Tank Farm, Nakhonsawan Petroleum Tank Farm, Songkhla Petroleum Tank Farm, and Region IV and VI Gas Operations Division.



**Promote community safety** through safety inspection of cooking gas cylinder in the houses surrounding Sriracha Oil Tank Farm and Khao Bo Ya Gas Tank Farm. PTT also organized a workshop on fire prevention and primary fire extinguishing for communities surrounding Phitsanulok Oil Tank Farm. More than 450 families benefited from these activities.



**Promoted community health** through mobile medical units for communities surrounding PTT’s operational areas for 23 times in 2017. These mobile units provide general consultation, eye checkup and free glasses for long-sightedness, hairdressing, and relaxing massage. The units also helped promote dental health and dengue prevention and control. A total of 7,028 people benefited from these activities.



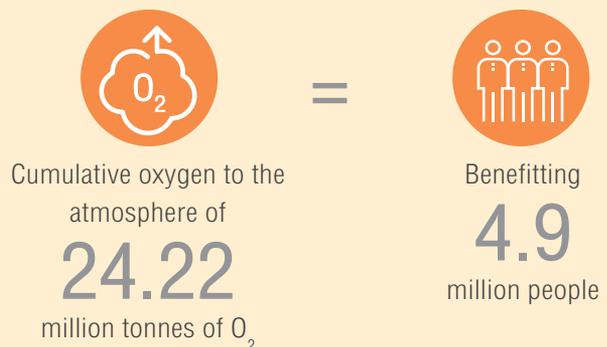
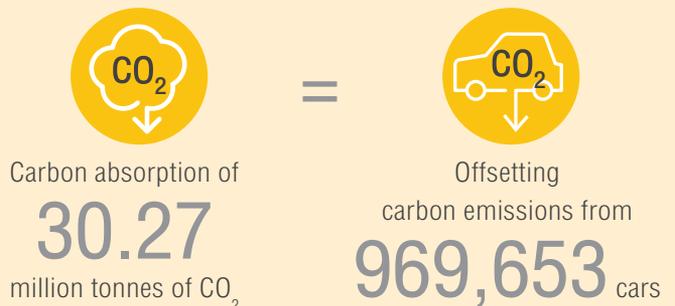
## Natural Resource Conservation

PTT collaborates with communities and networks from all sectors for the rehabilitation and conservation of natural resources in all operational and other areas across the country. This effort must be done along with continuous awareness raising on natural resource conservation through PTT Reforestation Institute. In 2017, PTT carried out important projects as follows:

### PTT Reforestation Institute

Through the reforestation initiatives to rehabilitate the ecosystem and mitigate global warming, PTT Group continues its mission to maintain the 160,000 hectares of forest areas planted in honor of the 50<sup>th</sup> anniversary of His Majesty the King Bhumibol Adulyadej's ascension to the throne. In 2017, more than 413 hectares of forest areas were planted. This comprised of 64 hectares of watershed forest in Nan Province, more than 249 hectares of community forests in Khon Kaen, Yasothon, and Roi Et Province, and more than 100 hectares of mangrove forests in Rayong and Chumphon Province. More than 5,081 hectares of forest areas planted during 2013-2016 were also maintained. The total forest areas under our care accounts for approximately 161,210 hectares.

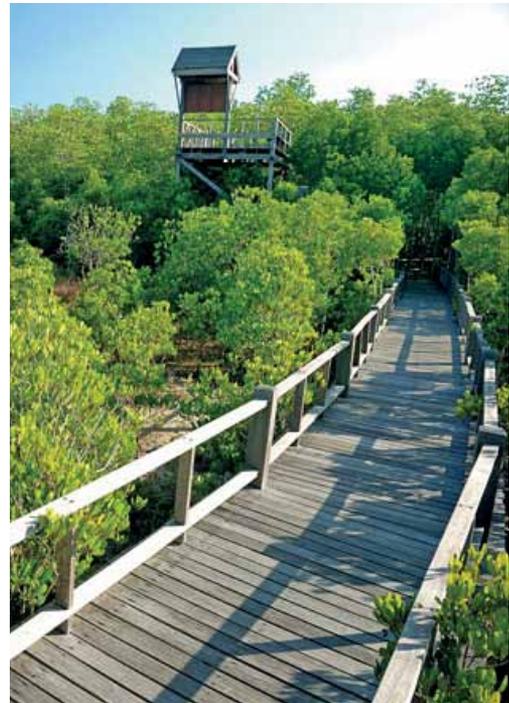
From the study by Forestry Research Center at the Faculty of Forestry, Kasetsart University on the achievement of the project to plant 160,000 hectares forest areas in honor of the 50<sup>th</sup> anniversary of His Majesty the King Bhumibol Adulyadej's ascension to the throne,



In addition to its mission to grow and conserve forests, PTT Reforestation Institute also gathers knowledge on reforestation for the public through its website ([www.pttreforestation.com](http://www.pttreforestation.com)). PTT also established learning centers on forestry and forest restoration, serving as a public resource for education. These learning centers include:

### Wang Chan Forest Learning Center

Wang Chan Forest Learning Center at Pa Yup Nai Sub-district, Wang Chan District, Rayong Province is our reforestation learning center in the Eastern region. The objective of the center was to gather knowledge and innovation on reforestation, especially on agroforestry concept which is the integrated reforestation where trees are grown around or among crops or pastureland as well as rice field in the same area. PTT created demonstration plot to exemplify the approach for socio-economic and environmental co-existence according to the self-sufficient philosophy. Since 2015, the plot has demonstrated traditional rice farming practices of people in Wang Chan from growing to harvesting. In 2017, there were 66,795 visitors in total.



### Sirinart Rajini Ecosystem Center for Mangrove Forestation

Sirinart Rajini Ecosystem Center for Mangrove Forestation at Prachuap Khiri Khan Province is the learning center that collected knowledge on transformation of an abandoned shrimp farm into a rich mangrove forest. It is the national and regional mangrove learning center and is a model for sustainable forest management in collaboration with communities, public and private sector. In 2017, there were 53,045 visitors in total. It helped communities to generate a total of 360,640 baht of income from provision of food and beverage to visitors, boat service to see mangrove ecosystem and community way of life, mangrove market, development of products from mangrove, trainer fees, and mangrove youth guide fees. In addition, PTT also launched the Natural Classroom Project to transfer knowledge on mangrove in the form of 9-month long workshop to 1,291 students from network schools.

### PTT Green in the City

PTT Green in the City locates on Sukhaphiban 2 Road, Prawet District, Bangkok covering the area of 1.92 hectares. The building was designed to be in harmony with nature and is energy efficient. It is the model for green building innovation in line with Thailand 4.0 Model for driving clean and sustainable energy. It also provided knowledge on metro forest. In 2017, there were 117,420 visitors in total.



## Water, Forest and Khung Bang Kachao Conservation Project



In response to the Royal Address of His Majesty the Late King on conservation of green space at Bang Kachao as Bangkok's green lung, PTT is committed to supporting the conservation of this 1,891 hectares of green space. Recognized as the Best Urban Oasis of Asia in 2006, currently this unique ecosystem was not well-maintained and faced existential threat from the increasing confluence of fresh water and seawater. PTT launched the Water, Forest and Khung Bang Kachao Conservation Project in response to this. In 2017, PTT worked with the Royal Forest Department to develop and rehabilitate green spaces at His Majesty the King Bhumibol Adulyadej's 80<sup>th</sup> Birthday Anniversary Park and collaborated with Kasetsart University to conduct research on prevention of shoreline erosion and restoration of mangrove forest. In addition, PTT also carried out other activities with communities to recover green space around Bang Kachao. These activities included improvement of green space in front of the house, provision of plant seedlings, and canal rehabilitation. These also helped to develop Bang Kachao into eco-tourism destination, thus enabling communities to sustainably conserve green space while still keeping their ways of life.



## Promoting Social Enterprise



Social Enterprise is the concept of an organization that applies sustainable commercial strategies to maximize improvements in financial, social and environmental well-being. This supports PTT's commitment to elevate corporate citizenship activities to become businesses that society and communities could participate and grow together. PTT established Sarn Palung Social Enterprise Company Ltd. (PTTSE) in collaboration with PTTEP, PTTGC, TOP, IRPC, GPSC, and PTT Oil and Retail Business Company Limited (PTTOR). Utilizing PTT's strength to enhance the lives of communities, farmers, the poor, the disabled, and the underprivileged, the newly established company would conduct business in providing products and services for society. The piloted projects included Café Amazon for the Underprivileged Project and Sustainable Coffee Sourcing Project for Café Amazon. Profits from these projects would be used for other social enterprise projects or for social benefits.

# Safety

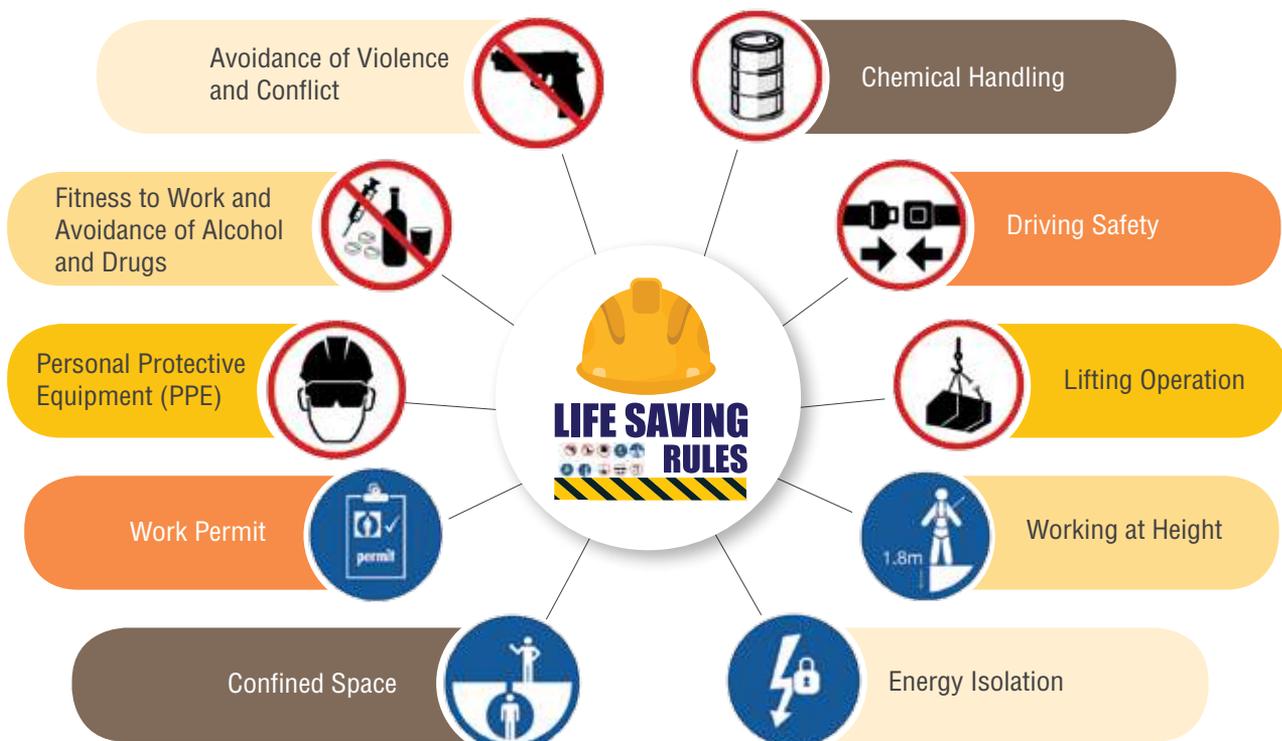
PTT upholds its security, safety, and occupational health management under the notion that “Accidents are Preventable”. This mindset not only aligns with laws and PTT Group policies, but international standards as well, and guarantees a safe and secure working environment – and quality of life – for PTT employees, suppliers, and contractors.

## Occupational Health and Safety Behavior

With the aim to foster a safety culture, PTT is working to create an organization that has safety embedded in all processes – 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 the PTT Group Quality, Safety, Health and Environment (QSHE) Policy, which is revised annually to encourage continuous improvements in areas like laws, regulations, applications of the operational excellence system, research and development, and communication. The Policy applies not only to PTT, but is also deployed to PTT Group companies as well. Not only that, PTT has established related targets and a group-wide 2020 Strategic Objective based on its previous safety performance, the performance of leading companies, international policies, and recommendations from the public sector.

Importantly, PTT has established the ‘PTT Life Saving Rules’ to serve as the basis for all conduct related to QSHE management. Indeed, these rules cover all the rights and responsibilities of employees in relation to occupational health and safety.

### PTT Life Saving Rules



PTT's performance on occupational health in 2017 saw 100% of employees receiving risk-based health assessments. No abnormal symptoms or illnesses related to occupational health were found, which resulted in a total recordable occupational illness rate (TROIR) of zero. Moreover in 2017, the PTT Group Occupational Health Working Team introduced the use of Health Performance Indicators (HPI) to collect baseline health data for future management improvements. The HPI Score for 2017 was 3.03 out of a total score of 4, and the target for 2018 is to increase the score to 3.21.

## Safety Culture at the Gas Separation Plant

The Gas Separation Plant has applied the Incident and Injury Free (IIF) Principles – an approach to work characterized by the absence of incidents and injuries – since 2014 to spur a behavioral shift in safety through training and relationship-building between colleagues. Using interviews and surveys, PTT carried out the Integral Safety Assessment (ISA) of employees and assistant staff at the Gas Separation Plant to evaluate changes in safety across four dimensions: Behavior, Management System, Personnel, and Culture. The most recent assessment in 2016 revealed that the Gas Separation Plant received a score of 2.98 – at Level 3, 'Achieving'.



### Scoring Criteria for the Integral Safety Assessment (ISA) (Based on the Incident and Injury Free (IIF) Principles)



## Process Safety

In 2017, 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 the process safety management system, which was developed within the framework of the PTT Group Process Safety Working Team’s 5-year strategy and its target of zero process safety incidents. Measures for achieving this target include the development of the PTT Group Process Safety Management Guideline, criteria for process safety assessments, and courses for process safety trainers.

Equally important in this regard is the sharing of technical knowledge on process safety controls – gleaned from PTT Group’s risk assessment and the experiences of specialists from the PTT Group Operational Excellence Management System (OEMS) – to strengthen standards and measures for major accident prevention. Thus, in 2017, PTT developed a specialized assessment for process safety incidents. The assessment will be rolled out in 2018 starting with PTT’s own operational areas, to establish confidence in the process safety of each site.

### PTT Group Process Safety Incidents

Tier 1 <sup>1</sup> Process Safety Incident				
Year	2015	2016	2017 <sup>2</sup>	
Performance	6	7	6	
Target	0	0	0	

Tier 2 Process Safety Incident				
Year	2015	2016	2017 <sup>2</sup>	
Performance	19	8	5	

**Remarks:**

<sup>1</sup> PTT Group’s Tier 1 Process Safety Incidents are reported according to the requirements of the American Petroleum Institute (API) Recommended Practice 754

<sup>2</sup> No Tier 1 or Tier 2 Process Safety Incidents were reported at PTT.



## Transport and Logistics Safety

Accidents occurring during the transport of petroleum products not only impact human lives, but the wider environment as well. With this in mind, PTT began pushing forth the zero-accident logistics target in 2011, when it formed the Logistic Zero Accident Steering Committee and enacted the policy requiring all transport contractors to 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 in 2017, and that there should be zero lost time accidents. PTT worked with logistics providers to install an In-Vehicle Monitoring System (IVSM), a GPS system, and CCTV cameras in petroleum transport vehicles – to allow for real-time 24-hour logistics monitoring. These measures will enable the Transportation Control Center (TCC) to develop timely responses in any situation, including by sending alerts to drivers to drive more carefully when faced with the risk of an accident. Data collected from these various channels will be recorded and analyzed to develop more precise safety measures and to improve the PTT Group



### The 5 Principles of PTT Group's Road Safety Management



Road Safety Management Guideline. An example of the former is the creation of a Fatigue Detection System for natural gas transport vehicles, which in the future will also be used in the Oil and International Trading Businesses.

Looking beyond modern logistics technologies, drivers are integral to transportation safety and accident reduction as well. PTT therefore works with transport service providers to improve driver competencies through regular trainings on defensive driving. In 2017, the company awarded the PTT Group Logistics Zero Accident and Eco-Driving Award 2017 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 2.5 million liters per year – the equivalent of 63 million baht in savings per year and a reduction of greenhouse gas emissions by 6,929 tonnes per year.

### Number of Land Transport Accidents

(per 1,000,000 km)

2015	0.101	2016	0.070	2017	0.049
Target 0.050		Target 0.050		Target 0.050	

**Remark:**

Major land transport accidents in PTT Group 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 2017, there were a total of 16 major land transport accidents, 10 from the Oil Business, 1 from the Natural Gas for Vehicles Business, 3 from the International Trading Business, 1 from PTT Asahi Chemical Company Limited, and 1 from IRPC Public Company Limited. There were 2 fatalities from the Oil Business and 1 from International Trading. In response, PTT has undertaken inspections of the underlying causes of these accidents to use as lessons for drivers, and monitored the performance of its transport providers to ensure that they strictly adhered to the agreed requirements for service.

## Security and Crisis Management

PTT's business operations are geographically located across many different areas – both in the country and overseas. It is no wonder then that the company must engage with a wide range of stakeholder groups and, as a result, is susceptible to diverse types of threats, from natural disasters, fires, accidents, threats from political instability and terrorism, to others that are more difficult to predict. Such threats, once manifested, could cause significant losses and damages to personnel, assets, the environment, business operations, company reputation, financial status, and not to mention business opportunities.

The risk of such situations arising means that PTT must constantly be on the watch for news and information that would help in the planning and identification of effective control, protection, and response measures. In establishing security across all areas of operations and effectively managing crises, PTT can prevent business interruptions and maintain the interests of all stakeholder groups in a balanced manner.



### Security

PTT Group has had in place, since 2011, the PTT Group Security Management System, which serves as the cornerstone of its security management. It is in the process of developing a security management strategy – to be completed by 2018 – consisting of the following elements: building good community relations, facilitating access to external agency support in both normal and crisis conditions, managing risks within the appropriate risk appetite and investment value, and finally, communicating with staff and employees in areas of operations to instill a sense of ownership and responsibility for both the organization's protection and its losses.

In 2017, PTT Group's Security Working Team and Security Assessment Team revised the verification standard for security management systems and security equipment inspections. The

revision was to ensure that such systems and equipment would be more accurate and appropriate to each operational area, and that they were up-to-date with new design requirements and advancements in technology. The Teams carried out random inspections of operational areas across all business groups and upped the surveillance in points of security vulnerabilities that were found. These included damaged fences, CCTV systems, and entry-exit control systems – particularly at night and in poorly-lit areas adjacent to public spaces, among others.

PTT further provided training on the Aikido self-defense technique to the security forces at the Headquarter in order to develop their skills in confronting potential perpetrators without violence. Six classes were held, with 20 participants in each class.

Its security personnel also received training on human rights laws and adherence to human rights principles, and a “train the trainers” course was organized for a class of 20 participants.

Beyond that, PTT gives priority to building a network between the Group and relevant government parties to exchange security-related news and information through seminars on security topics and regular meetings with other state-owned enterprises. In 2017, PTT organized a seminar on “Improving Vocational Standards on Security Protection to Cope with Threats in the Digital Age”. Panelists consisted of experts from PTT Group, government agencies, state-owned enterprise agencies, and private sector networks. More than 100 participants attended.

### Security Academy

The effective protection and control of threats rests upon having expert and qualified security personnel. In recognizing this, PTT Group established the Security Academy in 2017 to increase the capabilities of its security force, where it is currently developing a standard curriculum and building a teaching staff. The knowledge and results gained from the Academy will eventually be shared with PTT Group’s employees and management.



## Crisis Management

To manage risks that could lead to business interruptions, PTT has developed a company-wide crisis management approach – the Business Continuity Management System (BCMS) – which since 2016 has been certified to the international ISO 22301:2012 standard. PTT requires that all of its functions be aware of the processes integral to their own business continuity, including processes that can be stalled for up to two weeks without affecting business operations, as well as any other forms of threats that may impact the business. They are also required to rehearse business continuity management plans with external organizations at least once a year.

To manage emergency and crisis situations, PTT adheres to its Business Continuity Management Plan, which is revised annually and supervised by the Crisis and Business Continuity Management Center. During post-crisis management, the Center undertakes the responsibility of facilitating with relevant functions within the organization to repair, restore, remedy, and reduce grievances – and to maintain the mental well-being of staff and all affected surrounding communities as quickly as possible.

In 2017, PTT carried out maintenance operations on a valve on the natural gas production platform of the Malaysia-Thai Joint Development Area (JDA), a procedure which affected the company’s ability to distribute natural gas to the Chana District of Songkhla Province and to natural gas vehicles in Thailand’s southern region. In response, the Natural Gas for Vehicles Department opened a crisis management center and deployed its business continuity management plan, which in part ensured the uninterrupted delivery of natural gas products to all customer groups – and therefore business continuity. PTT likewise communicated with the general public, customers, and suppliers about the situation at hand, resulting in no grievances being reported.



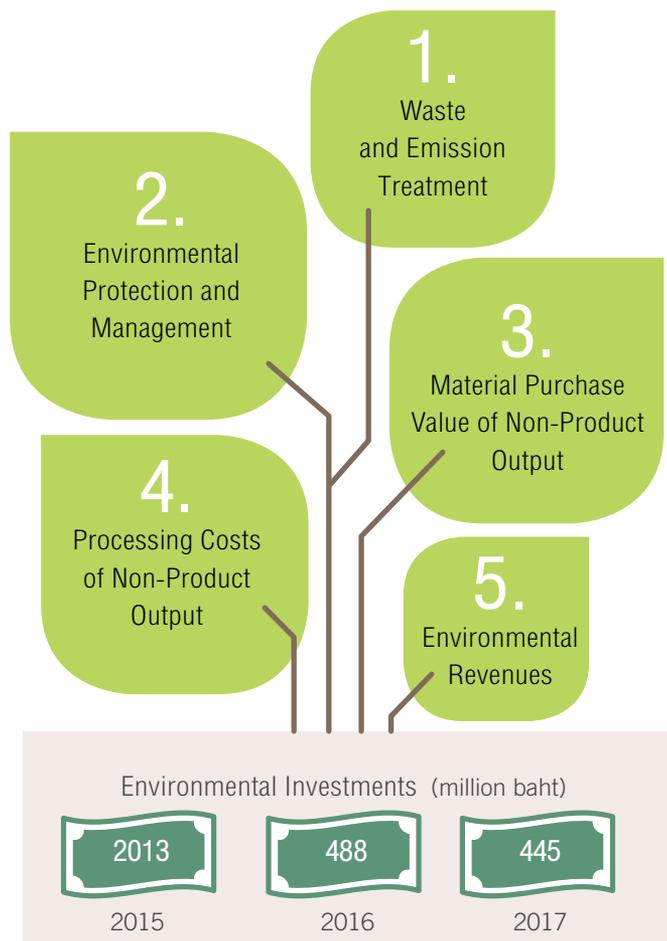
## Environmental Management

Energy business is reliant upon natural resources for raw materials in its production of fuel and petroleum products, not only to meet industrial and transportation needs, but also to respond to the consumption demand of the general population nationwide. Environmental responsibility is at the heart of how PTT approaches its environmental management efficiently, and the company is guided by the 2 operating principles of “Environmental Protection and Impact Reduction”, and “Supporting Business and Environmental Sustainability in the Supply Chain”. It is these principles that resulted in no violations of environmental or safety laws and regulations in 2017.

### Environmental Management Accounting (EMA)

PTT recognizes the key benefit of collecting data on environmental expenses, revenue, and investments because they factor in as important considerations in the analysis, decision-making, investment planning, and strategy-setting for better environmental management. Indeed, such information can reflect the true value of the organization’s natural capital. Therefore, in 2017, PTT adopted the principles of accounting on environmental expenses, revenue, and investments to develop its own Environmental Management Accounting (EMA) system in line with the United Nations’ “Environmental Management Accounting Procedures and Principles”. Environmental accounting will help to expose any hidden costs in a more accurate, complete, and transparent way, and likewise help to create stakeholder trust. PTT will begin collecting, consolidating, and reporting on environmental accounting data using this system from 2018 onwards, and plans to expand this system to other PTT Group companies by 2020.

#### Environmental Expenditure Categories





## Climate Change and Energy Management

PTT has integrated its Climate Change Adaptation Policy into the overarching PTT Group Quality, Security, Safety, Health and Environment (QSHE) Policy to make sure that all functions across PTT Group's supply chain have a part to play in supporting and driving its successful implementation. A greenhouse gas accounting database has been developed using the PTT Greenhouse Gas Accounting and Reporting Standard, which likewise was formulated based on international standards such as ISO 14064-1. The data and information contained in the accounting database are used as input in assessments of climate change risks and opportunities, such as legal and regulatory risks, consumer behavioral change risks, and technological risks, among others.

PTT Group has set greenhouse gas emissions reduction targets that align with both national targets and the internationally-agreed target to contain global warming within the 2-degree Celsius threshold (the Science-Based Target Initiative).

	Short-term 2020 Target	Long-term 2030 Target
<b>Thailand's Greenhouse Gas Reduction Target</b> 	Nationally Appropriate Mitigation Actions (NAMAs): Reduce greenhouse gas emissions by 7 - 20% from business as usual level	Nationally Determined Contributions (NDCs): Reduce greenhouse gas emissions by 20 - 25% from business as usual level
<b>PTT Group's Greenhouse Gas Reduction Target</b> 	<ul style="list-style-type: none"> <li>Reduce greenhouse gas emissions intensity by 5% compared to the 2012 baseline year by controlling the volume of intensity of greenhouse gas emissions at not more than 87.2 kg CO<sub>2</sub>e/BOE.</li> <li>Control Scope 1 and 2 emissions to be under 40 MtCO<sub>2</sub>e.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce greenhouse gas emissions intensity by 16% compared to the 2012 baseline year by controlling the volume of intensity of greenhouse gas emissions at not more than 76.8 kg CO<sub>2</sub>e/BOE.</li> <li>Control Scope 1 and 2 emissions to be under 44.7 MtCO<sub>2</sub>e.</li> </ul>



To meet these targets, PTT Group has in place the following projects and initiatives:



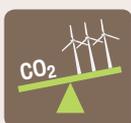
Projects and actions designed to improve and maximize energy use efficiency such as the reuse of waste energy; replacement of older equipment with those with higher efficiency; and flare reduction projects, such as the Flash Gas Recovery Unit Project at the Bongkot Gas Field and the Natural Gas for Agricultural Communities and the Environment Project at the Nongtum-A Outstation of PTTEP.



PTT Group Methane Management Project, a collaboration with the United Nations Environment Programme (UNEP) under the framework of the Climate and Clean Air Coalition: Oil and Gas Methane Partnership (CCAC: OGMP), to reduce methane leakages from various activities. The project has reduced methane leakages by 10,700 tonnes CO<sub>2</sub>e, which is equivalent to approximately 3 million baht in cost savings per year.



The use of carbon pricing in risk assessments, the sales and purchase of carbon credits, and in risk assessments for investments in high carbon-emitting businesses. In 2017, PTT Group determined a carbon price at 200 baht per tonne of CO<sub>2</sub>.



Carbon offset projects to offset carbon emissions from PTT Group's QSHE direction-setting workshops and the 2017 PTT Group Annual General QSHE Meeting. Offsets are achieved through the purchase of carbon credits from projects under the Clean Development Mechanism (CDM) and the Thailand Voluntary Emission Reduction Program (T-VER).



### Direct and Indirect Greenhouse Gas Emissions<sup>1</sup>

(million tonnes of CO<sub>2</sub> equivalents)



**Remarks:**

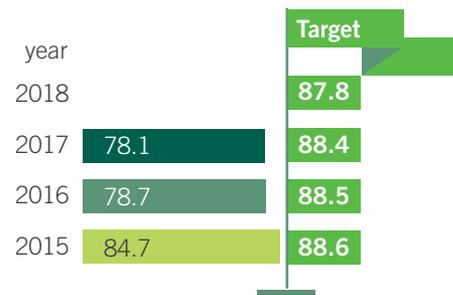
<sup>1</sup> The scope of data covers companies in Thailand in which PTT holds direct shares more than 20% and hold indirect shares for 100%.

<sup>2</sup> Scope 3 emissions cover the combustion of PTT fuel products. 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).

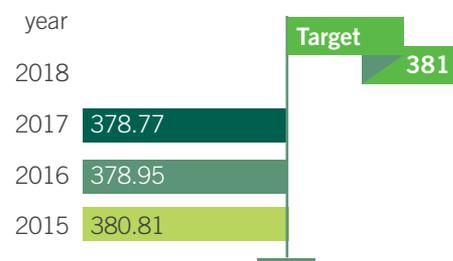
### Greenhouse Gas Intensity

(kilogram CO<sub>2</sub> per barrel of oil equivalents)

Direct and indirect greenhouse gas emissions from PTT activities (Scopes 1 and 2)



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

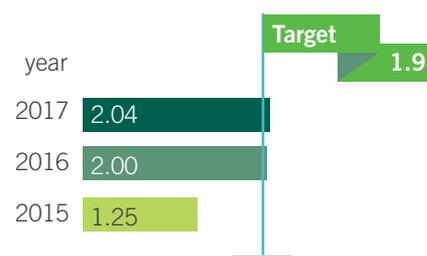


**Remark:**

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

### Energy Intensity Reduction from Energy Management Project

(percent per year compared to business as usual)



**Remark:**

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

## Water Management

PTT Group has adopted the following approaches for water management: water risk assessments in water-scarce operational areas, water use risk analysis by business type, community impact assessments from water use, and monitoring and reporting of the volume and quality of water used. Throughout these processes, PTT actively works with relevant stakeholders in both the public sector and in surrounding communities. For critical PTT Group production bases in Rayong and Chonburi Provinces, there was an increase in water demand by approximately 12% per year (based on business as usual level) due to higher production. As a result, the PTT Group Water Management Committee has carried out the following actions to efficiently manage water resources and appropriately meet the needs of all stakeholders:

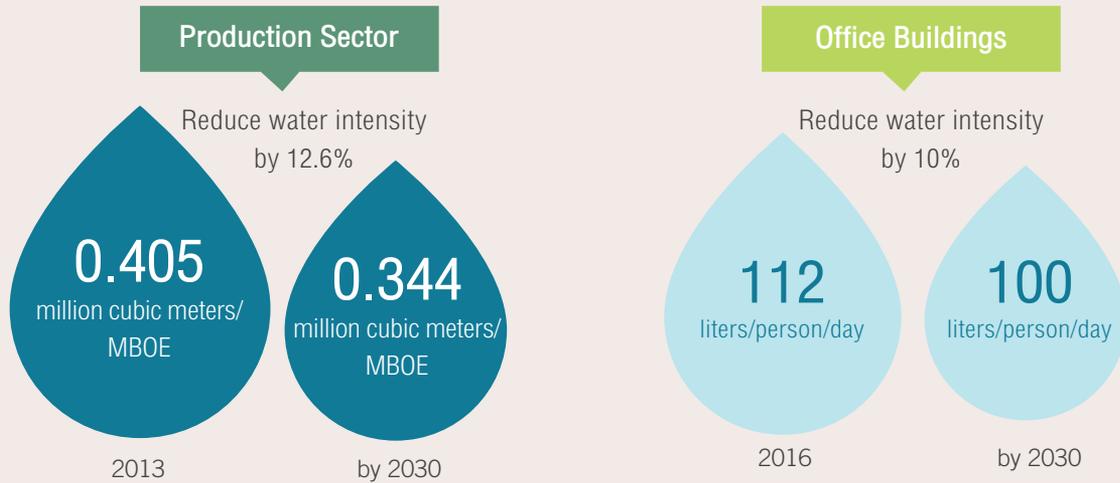
- Conduct regular risks assessments in areas that have previously seen or could potentially encounter problems concerning water quality and scarcity, in North-eastern industrial areas. Enact protective measures by evaluating factors that could impact business operations in different ways, such as risks from the future impacts of climate change; risks concerning annual incidents of drought, electricity shortages impacting the raw water transmission system, water quality below minimum thresholds, water pricing structure, and legislations on water use and wastewater.
- Analyse and develop risk management plans for each company by evaluating water demand and implementing measures to respond to situations of lower water availability due to drought, using assumptions of 10%, 30% and 50% decreased water withdrawal volume compared to regular conditions.
- Manage water according to the 2Rs Principle (Reserve and Re-visualize) or by using the Water Resource and Reservoir Efficiency Development Plan, which involves working with the 'Water War Room' in Rayong that comprises of government agencies, Eastern Water Resources Development and



Management Public Company Limited (or East Water), and private sector representatives, to develop measures for water management prior to and during conditions of drought. At the same time, PTT also initiated a project to scope out water sources to respond to the anticipated higher water demand from the Eastern Economic Corridor in the next 20 years.

- Support the 3Rs Principle: Reduce, Reuse, Recycle, and evaluate the likelihood of desalinating sea water for use in PTT Group to reduce its dependency on public water resources.
- Conduct studies on the water footprint of products to reduce the impacts of PTT Group products across their entire life cycles.

For water management in the production sector and office buildings, PTT has set the following targets:

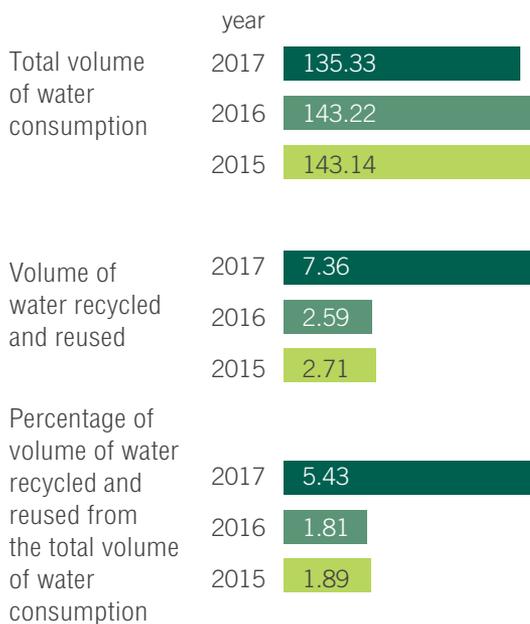


Measures for the production sector include increasing water use efficiency in cooling towers; identifying locations of unnecessary water loss to reuse water; installing metering systems to monitor processes that have high water consumption; reusing backwash water from multimedia filtering tanks; reusing water from the pelletizing process, and reusing water from the condensation process.

Measures for the office buildings include increasing water use efficiency in cooling towers, general improvements in water efficiency, reusing water from bathrooms that have been treated, improved in quality and disinfected, and managing water use for watering green areas.

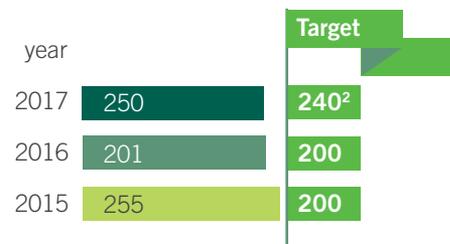
### Water Management

(million cubic meter)



### Water Storage Capacity for PTT's Operational Areas in Rayong Province<sup>1</sup>

(million cubic meter)



**Remarks:**

- <sup>1</sup> The scope of data covers 3 main reservoirs in Rayong Province: Dok Krai, Nong Pla Lai, and Khlong Yai.
- <sup>2</sup> The water storage capacity target was adjusted higher due to the diversion of water from Pra Sae reservoir to the Nong Pla Lai and Khlong Yai reservoirs, as well as the increase in the total reservoir capacity which was achieved through the construction of a spillway for overflowed water, allowing for higher water storage capacity.

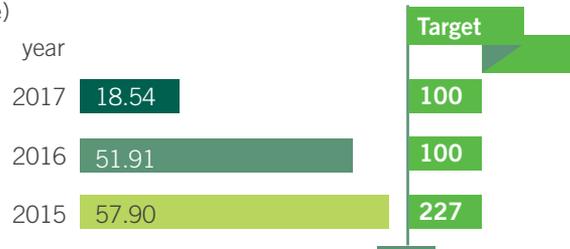
## Waste Management

PTT has established the target to reduce the amount of hazardous waste to landfill to zero by 2020. This is to be accomplished through the regular adoption of the 3Rs Principle: ‘Reduce’ the amount of waste at origin, ‘Recycle’, and ‘Reuse’. In 2017, measures to that end involved separating contaminated containers and returning them to manufacturers for reuse – thereby reducing PTT’s contaminated container disposal; separating insulation waste to develop into a fuel mixture, and extracting valuable metal from molecular sieves for reuse. These actions reduced the amount of waste to landfill by 320 tonnes per year.

Furthermore, PTT carried out the Green Turnaround Project, an annual maintenance activity, which involved assessing the type and volume of waste generated during the annual maintenance process and separating wastewater from each maintenance activity to reduce the volume of highly impure wastewater. This reduced the amount of waste disposed by 1,849 tonnes. In 2017, PTT Group consolidated the industrial waste management methods of each operational area of 12 PTT Group companies in Rayong and Chonburi Provinces to use in analyzing, planning, and improving waste management efficiency with the target to reduce the routine hazardous waste to landfill to total routine hazardous waste by 2.50% for PTT Group.

## Hazardous Waste to Landfill

Rayong Gas Separation Plant  
(tonne)



LPG and Oil Terminals  
(tonne)



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



The 3Rs Principle consists of Reduce, Recycle, and Reuse. This principle is aimed at reducing the amount of hazardous waste to landfill to zero by 2020.



## Air Quality Control

Air quality control is essential in the reduction of air emissions. Given this, PTT employs technologies to control air emissions from their point of origin, and regularly improves the efficiency of emissions treatment systems such as by installing a Dry Low NOx Emission (DLE) System and the Selective Catalytic Reduction (SCR) System to control external air emissions and minimize environmental impact as much as possible.

Aside from those emissions reduction measures, PTT also focuses on monitoring and controlling emissions using internationally-accepted methods. These include the use of the Continuous Emissions Monitoring System (CEMs), which sends data on air quality monitoring online to the Map Ta Phut Industrial Estate Department of the Industrial Estate Authority of Thailand; monitoring and measuring the volume of volatile organic compounds (VOCs) leakages from equipment according to international standards by using infrared cameras and a photo-ionized detector – resulting in the timely reduction and prevention of VOCs leakages from their points of origin. Not only that, PTT also uses an air quality simulation to assess the dispersion of pollutants to different receiving stations, which will help in monitoring and developing plans for environmental impact reduction from air emissions.

### VOCs Intensity

(tonne of VOCs per million barrels of oil equivalents )

year	Intensity
2017	18.45
2016	18.18
2015	18.73

**Remark:**

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

### Oxides of Nitrogen (NOx)

(tonne)

year	Intensity
2017	14,990.55
2016	14,376.58
2015	16,772.16

**Remark:**

Nitrogen oxide (NOx) is mainly emitted from the petroleum drilling and production activities. In 2016, PTT has reduced its operations of these activities.

### Sulfur Dioxide (SO<sub>2</sub>)

(tonne)

year	Intensity
2017 <sup>2</sup>	5,497.11
2016 <sup>2</sup>	11,123.87
2015 <sup>1</sup>	7,881.31

**Remarks:**

<sup>1</sup> In 2015, the scope of data covered PTT, PTTEP, PTTGC, TOP, IRPC, and GPSC.

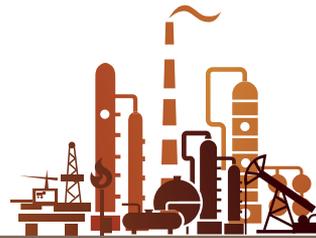
<sup>2</sup> In 2016-2017, the scope of data covered PTT, PTTEP, PTTGC, TOP, IRPC, IRPC's Upstream Project for Hygiene and Value Added Product (UHV), and GPSC.

## Oil and Chemical Spills

Ensuring the preparedness of responses to emergencies from oil spills and chemical contamination is another essential mandate for the organization. PTT thus enacted measures covering both personnel and equipment to ensure a ready emergency response in all situations. This involved means such as forming an emergency response team, using equipment to detect gas leakages, installing oil buoys in all operational areas at risk of oil spills, installing satellite valve control systems in natural gas transmission systems, and developing emergency plans that are rehearsed by all functions within PTT, provincial and national government agencies. 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 at sea.

In 2017, there were no significant oil and chemical spills to the environment in PTT's operational areas. Whereas in the transportation of products and raw materials, PTT had 3 incidents of oil and chemical spills in volumes between one to less than 100 barrels. These incidents resulted from accidents in the transport of gasoline by contractor vehicles, which led to spills in the Cha-Am District of Phetchaburi Province, the Bang Kruai District of Nonthaburi Province, and the Khian Sa District of Surat Thani Province. At the time of their occurrence, PTT responded timely to these situations by bringing in an emergency team, extracting the spilled oil back into their vessels, and by working with representatives from the Department of Rural Roads to clean up oil slicks in the area as swiftly as possible to prevent impacts to communities. Investigations into the causes of these accidents revealed that the drivers of these transport vehicles did not practice safe driving behaviors. To prevent reoccurrence, PTT implemented additional measures to evaluate driver behavior, enacted a policy to limit the driving speed during rainy conditions to below 40 kilometers per hour, and required drivers that transported petroleum products to undergo Defensive Driving courses, for which 100% of these drivers – 1,079 individuals – have completed the training.

### PTT Group Implementation Manual for the 2016 Ministerial Regulations on the Control of Soil and Underground Water Contamination in Industrial Areas



In 2017, PTT Group – PTT, PTTGC, TOP, IRPC, PTT Asahi, PTT Tank Terminal, and HMC Polymers – worked with the Environmental Engineering Department of the Engineering Faculty at Kasetsart University to develop the “PTT Group Implementation Manual for the 2016 Ministerial Regulations on the Control of Soil and Underground Water Contamination in Industrial Areas”. The Soil Pollution Group of the Industrial Environment Technology Promotion Division, Department of Industrial Works, Ministry of Industry acted as advisers to provide recommendations and closely review the content, which will serve as a management approach for PTT Group's reporting of soil and underground water contamination. This manual should align with the 2016 ministerial regulations on the control of oil and underground water contamination. PTT Group also presented this manual to the public sector to distribute to relevant parties who must also adhere to these ministerial regulations, such as petrochemical industry groups, refineries, and downstream petroleum industries.





“I felt privileged to have been a part of the advisory and review team of the ‘PTT Group Implementation Manual for the 2016 Ministerial Regulations on the Control of Soil and Underground Water Contamination in Industrial Areas’. This manual contains critical information on not only laws, but also means of implementation in each stage, examples of practices, and legal references. This manual was developed by a committee of experts in diverse fields and has undergone processes of legal interpretation, testing, and analyses of potential issues and obstacles before it was finalized. That means that the content is concise, clear, and easy to understand. On behalf of those who would benefit from this manual, I would like to commend and thank PTT Group for developing such a manual that can become the go-to resource in legal compliance, and for distributing this to relevant industries for their benefit as well.”

**Mrs. Nopalak Supatanasinkasem**

Soil Pollution Group Director  
Industrial Environment Technology  
Promotion Division,  
Department of Industrial Works



## Biodiversity

The primary objective of PTT Group’s biodiversity management is to protect against losses and negative impacts to biodiversity in all areas surrounding its operations and from projects that are run by PTT Group. Part of the achievement of this objective involved the announcement of the PTT Group Biodiversity Statement, which served as the basic principles for how PTT Group should manage biodiversity across the entire organization. Not only that, PTT has required 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 with high biodiversity risk need to have a Biodiversity Action Plan (BAP) to reduce the impacts that may occur to plants, wildlife, and the general environment, where the risks must be reviewed again at least once per year. At present, risk assessments have been conducted for all of PTT Group’s operational areas. Two areas were found to be high-risk: Khanom Gas Separation Plant and the Phuket Aviation Depot. BAPs for both these locations have now been completed.



Moreover, PTT has joined together with the Bird Conservation Society of Thailand, Kasetsart University, and Siamensis – an environment and biodiversity conservation group – to implement projects assessing the biodiversity of flora and fauna in areas surrounding PTT operations. The objective was to analyze and collect biodiversity information of each location to develop into a biodiversity database, and to produce recommendations on environmental management to restore and improve biodiversity, as well as maintain the quality of the environment in all areas. Types of organisms assessed included birds, mammals, reptiles, amphibians, insects, fish, plants, and crustaceans. For its assessment in 2017, PTT selected 4 areas for the assessment based on risk and on issues that were raised by communities. These were: Khanom Gas Separation Plant, Phuket Aviation Depot, Songkhla Petroleum Terminal, and Nakhon Sawan Petroleum Terminal. PTT also developed projects to promote knowledge on mangrove ecosystems and biodiversity to the public, such as the Sirinart Rajini Ecosystem Center for Mangrove Forestation – a tripartite collaboration between the Royal Forest Department, communities from the Pak Nam Pran Sub-district, and PTT, and finally, an Environment Learning Center for students in 5 neighboring schools to the Center.

In terms of on-the-ground community engagement, PTT organized a seminar on assessing biodiversity in the areas surrounding the Khanom Gas Separation Plant in Nakhon Si Thammarat Province, with the aim to develop a database on biodiversity and offer recommendations on environmental development in the area. Local government agencies, education institutions, community groups and local media all took part in the seminar.

# PTT Performance Summary



## Economic

GRI	Required Data	Unit	PTT		
			2015	2016	2017
GRI 201-1	Direct economic value generated				
	Sales revenues	Million baht	2,025,552	1,718,846	1,995,722
	Economic value distributed				
	Operating costs	Million baht	1,802,311	1,464,614 <sup>2</sup>	1,688,461
	Employee wages and benefits <sup>1</sup>	Million baht	8,792	9,651	10,683
	Dividend payments for the performance of the year	Million baht	28,561	45,699	22,850 <sup>3</sup>
	Income taxes payment <sup>4</sup>	Million baht	25,701	26,593	28,307
	Social development	Million baht	1,408	919	1,186
	Economic value retained	Million baht	158,779	217,069	244,235
GRI 201-4	Tax privileges from the Board of Investment, Thailand	Million baht	3,727	4,030	6,180

**Remarks:**

<sup>1</sup> 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. (data from separate financial statements).

<sup>2</sup> Revised numbers in 2016.

<sup>3</sup> 2017 Interim dividends payment

<sup>4</sup> 2015 and 2016 revised to consolidated numbers



## People

GRI	Required Data	Unit	2015		2016		2017	
			Male	Female	Male	Female	Male	Female
GRI 102-8	Permanent employees	Manpower	3,083	1,577	3,052	1,564	3,080	1,617
	Outsourced workers <sup>1</sup>	Service Point	2,113		2,089		2,139	
	Employees by area							
	• Bangkok	Manpower	1,594	1,361	1,560	1,348	1,591	1,401
	• Others <sup>2</sup>	Manpower	1,442	200	1,448	201	1,451	199
	• Overseas	Manpower	47 <sup>3</sup>	16 <sup>3</sup>	44 <sup>4</sup>	15 <sup>4</sup>	38 <sup>5</sup>	17 <sup>5</sup>
GRI 405-1	Employees by level and age group <sup>6</sup>							
	Executive (Level 14 - 19)	Manpower	<b>159</b>	<b>71</b>	<b>157</b>	<b>83</b>	<b>162</b>	<b>89</b>
	• Over 50 years old	Manpower	115	60	116	68	121	72
	• 30 - 50 years old	Manpower	44	11	41	15	41	17
	• Below 30 years old	Manpower	0	0	0	0	0	0
	Middle management (Level 11 - 13)	Manpower	<b>325</b>	<b>253</b>	<b>368</b>	<b>262</b>	<b>375</b>	<b>280</b>
	• Over 50 years old	Manpower	178	98	169	106	158	116
	• 30 - 50 years old	Manpower	147	155	199	156	217	164
	• Below 30 years old	Manpower	0	0	0	0	0	0
	Senior (Level 9 - 10)	Manpower	<b>842</b>	<b>462</b>	<b>827</b>	<b>458</b>	<b>848</b>	<b>486</b>
	• Over 50 years old	Manpower	235	137	217	122	205	102
	• 30 - 50 years old	Manpower	605	324	607	333	642	381
	• Below 30 years old	Manpower	2	1	3	3	1	3
	Employee (Level 8 and below)	Manpower	<b>1,757</b>	<b>791</b>	<b>1,700</b>	<b>761</b>	<b>1,695</b>	<b>762</b>
	• Over 50 years old	Manpower	124	36	100	33	83	22
• 30 - 50 years old	Manpower	933	410	968	434	981	415	
• Below 30 years old	Manpower	700	345	632	294	631	325	
GRI 401-1	Total new employees	Manpower	305		149		144	
	New employees	Manpower	177	128	90	59	64	80
	New hire rate	%	5.74	8.12	2.95	3.77	2.11	4.95
	New employees by area							
	• Bangkok	Manpower	94	110	62	53	47	73
		%	3.05	6.98	2.03	3.39	1.53	4.51
	• Others <sup>2</sup>	Manpower	83	18	28	6	17	7
		%	2.69	1.14	0.92	0.38	0.55	0.43
	New employees by age							
	• Over 50 years old	Manpower	0	0	2	1	0	0
		%	0.00	0.00	0.07	0.06	0.00	0.00
	• 30 - 50 years old	Manpower	11	14	5	8	3	15
	%	0.36	0.89	0.16	0.51	0.10	0.93	
• Below 30 years old	Manpower	166	114	83	50	61	65	
	%	5.38	7.23	5.32	3.71	1.98	4.02	

GRI	Required Data	Unit	2015		2016		2017	
			Male	Female	Male	Female	Male	Female
	Total employee turnover	Manpower	158		76		77	
	Employee turnover	Manpower	103	55	38	38	38	39
	Employee turnover rate	%	3.34	3.49	1.25	2.43	1.23	2.41
	Employee turnover by area							
	• Bangkok	Manpower	26	22	26	33	26	34
		%	0.84	1.40	1	2.11	0.84	2.10
	• Others <sup>2</sup>	Manpower	7	1	12	5	12	5
		%	0.23	0.06	0.39	0.32	0.39	0.31
	Employee turnover by age							
	• Over 50 years old	Manpower	70	32	0	0	0	0
		%	2.27	2.03	0.00	0.00	0.00	0.00
	• 30 - 50 years old	Manpower	14	11	19	17	19	17
		%	0.45	0.70	0.62	1.09	0.62	1.05
	• Below 30 years old	Manpower	19	12	19	21	19	22
		%	0.62	0.76	0.62	1.34	0.62	1.36
GRI 401-3	Number of employees entitled to parental leave	Manpower	3,083	1,577	3,052	1,564	3,080	1,617
	Number of employees taking parental leave	Manpower	0	38	70	47	81	45
	Number of employees returning to work after parental leave	Manpower	0	38	70	47	81	44
	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
	Retention rate	%	0	94.74	98.57	97.87	100	100
GRI 404-1	Average hours of training per employee <sup>7</sup>	Hour per employee	48.84	64.06	38.82	71.35	37.85	43.51

**Remarks:**

NA: Not available

<sup>1</sup> 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.

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

<sup>3</sup> Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore and Indonesia

<sup>4</sup> Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Indonesia and England

<sup>5</sup> Including employees working abroad in Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Indonesia, England and the United States of America

<sup>6</sup> Employee level numbering is adjusted in 2016 in order to standardize throughout PTT Group

<sup>7</sup> Hours of training and further study are included in the average hours of training per year per employee.



Reporting Scope	Year	PTT Operated Business															2017 Coverage (%)		
		PTT Building					Terminal												
		Head Office	Prakanong Office	Research & Technology 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 time injury frequency rate (LTIFR)	Total workforce	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	100
	Independent contractor		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Total workforce	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Independent contractor		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	Total workforce	2015	•	•	•	•	NR	•	•	•	•	•	•	•	•	•	•	NR	
	Independent contractor		•	•	•	•	NR	•	•	•	•	•	•	•	NR	•	•	NR	

**Remarks:**

NA: Not available

NR: Not relevant

- Total Workforce refers to employees and supervised contractors
- Contractor refers to independent contractors only
- 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	Unit	PTT		
			2015	2016	2017
GRI 403-2 <sup>1</sup>	Lost workday case (LWC) <sup>2</sup>				
	• Total workforce	Person	4	4	4
	• Independent contractor	Person	0	4	0
	Total recordable injuries case (TRIC) <sup>3</sup>				
	• Total workforce	Person	5	13	9
	• Independent contractor	Person	1	4	3
	Total recordable injuries rate (TRIR) <sup>3</sup>				
	• Total workforce <sup>4</sup>	Lost days per 200,000 hours worked	0.03	0.09	0.05
	• Independent contractor <sup>5</sup>	Lost days per 200,000 hours worked	0.02	0.06	0.06
	Lost day rate (LDR)				
	• Total workforce	Lost days per 200,000 hours worked	0.28	0.37	0.39
	• Independent contractor	Lost days per 200,000 hours worked	0.00	1.42	0.00
	Absentee Rate (AR)				
	• Total workforce	%	1.53	1.74	1.64
	• Independent contractor	%	NA	NA	NA
	Lost time injury frequency rate (LTIFR) <sup>3</sup>				
	• Total workforce	Lost days per 200,000 hours worked	0.03	0.03	0.02
	• Independent contractor	Lost days per 200,000 hours worked	0.02	0.06	0.00
	Occupational illness frequency rate (OIFR) <sup>3</sup>				
	• Total workforce	Lost days per 200,000 hours worked	0.00	0.00	0.00
• Independent contractor	Lost days per 200,000 hours worked	NA	NA	NA	
Fatalities					
• Total workforce	Person	0	0	0	
• Independent contractor	Person	0	0	0	
Near Misses					
• Total workforce and independent contractor	Case	146	164	104	
Accident	Number of accidents from using corporate vehicles	Case	14	14	13
		Target	6	6	6
	Number of land transport accidents per 1,000,000 km	Case	0.10	0.07	0.05
		Target	0.05	0.05	0.05

**Remarks:**

NA: Not available

<sup>1</sup> 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.

<sup>2</sup> Monitored by calendar day, and is recorded after the day on which the incident occurred. 2020 target is equal to zero.

<sup>3</sup> Do not include first aid cases.

<sup>4</sup> 2020 target for total workforce is equal to 0.066 per 200,000 hours.

<sup>5</sup> 2020 target for independent contractors equals to 0.086 per 200,000 hours.



# Environment

Reporting Scope	Year	PTT Operated Business													2017 Coverage (%)			
		PTT Building				Terminal												
		Head Office	Prakanong Office	Research & Technology Institute	Rayong Distribution Services Office	Gas Separation Plant (GSP)	Gas Transmission (GTM)	Gas Terminal	Oil Terminal	Aviation	Retail	Lubrication	Transportation	NGV		Café Amazon Roasting Plant		
Direct GHG emissions (Scope 1)	2017	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	100
	2016	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	
	2015	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	
Indirect GHG emissions (Scope 2)	2017	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	100
	2016	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	
	2015	•	•	•	NA	•	•	•	•	•	•	•	•	•	•	•	•	
Direct energy consumption	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Electricity purchased	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Water withdrawal	2017	•	•	•	•	•	•	•	•	•	•	•	•	NR	•	•	•	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	NR	•	•	•	
	2015	•	•	•	NA	•	•	•	•	•	•	•	•	NR	•	NR	•	
Effluents	2017	•	•	•	NR	•	•	•	•	•	•	•	•	NR	•	NR	•	100
	2016	•	•	•	NR	•	•	•	•	•	•	•	•	NR	•	NR	•	
	2015	NR	NR	NR	NR	•	NR	•	•	•	•	•	NR	NR	•	NA	•	
Produced water	2017	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	100
	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	2017	•	•	•	•	•	•	•	•	•	•	•	•	NR	•	•	•	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	NR	•	•	•	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	NR	•	NR	•	
Oil and chemical spills	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NR	
Nitrogen oxides (NOx)	2017	NR	NR	NR	NR	•	•	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	100
	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	
Sulphur dioxide (SO <sub>2</sub> )	2017	NR	NR	NR	NR	•	•	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	100
	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)	2017	NR	NR	NR	•	NR	•	•	NA	NR	NR	NR	NR	NR	NR	NR	NR	100
	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 <sub>4</sub> ) emitted	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NR	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NR	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NA	
Direct methane (CH <sub>4</sub> ) emissions	2017	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NR	100
	2016	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NR	
	2015	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	NA	

**Remarks:**  
NA: Not available  
NR: Not relevant



## Water

GRI	Required Data	Unit	PTT		
			2015	2016	2017
GRI 303-1	Total water withdrawal	Million m <sup>3</sup>	3.63	3.59	3.64
	• Surface water	Million m <sup>3</sup>	0.27	0.31	0.25
		%	7.44	8.75	6.87
	• Seawater: other purposes	Million m <sup>3</sup>	0.01	0.02	0.02
		%	0.19	0.56	0.55
	• Water supply	Million m <sup>3</sup>	3.18	3.03	3.17
		%	87.50	84.56	87.09
	• Groundwater	Million m <sup>3</sup>	0.15	0.17	0.14
		%	4.10	4.72	3.85
	• Rainwater	Million m <sup>3</sup>	0.03	0.05	0.06
		%	0.72	1.41	1.65
		Total salt/brackish water (seawater + once through cooling)	Million m <sup>3</sup>	0.01	0.02
	Water from all other sources (surface water + groundwater)	Million m <sup>3</sup>	0.42	0.48	0.38
GRI 303-3	Recycled & reused water	Percentage of water withdrawal	6.00	5.87	3.57
		Million m <sup>3</sup>	0.23	0.21	0.13
	Water intensity	m <sup>3</sup> mboe	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 2017, the amount of surface water use has decreased because of increasing water supply use.
- In 2017, the amount of water supply use has increased as the scope of reporting has expanded to cover PTT's 23 new owned and operated service stations.
- In 2017, the amount of recycle & reused water has decreased because the water quality improvement process was undergoing maintenance and demand of treated water in the process has decreased.



## Effluents

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

**Remarks:**

- Water discharge remained in line with the quality of legal requirements.



## Emissions

GRI	Required Data	Unit	PTT		
			2015	2016	2017
GRI 305-7	Volatile organic compounds (VOCs)	Tonne	9,472.17	9,937.58	10,384.24
	VOCs Intensity	Tonne per million barrel oil equivalents (mboe)	24.38	24.76	25.47
	Nitrogen oxides (NOx)	Tonne	1,145.90	1,090.25	1,097.85
	NOx intensity	Tonne per million barrel oil equivalents (mboe)	2.95	2.72	2.69
	Sulphur dioxide (SO <sub>2</sub> )	Tonne	77.35	97.58	106.58
	SO <sub>2</sub> intensity	Tonne per million barrel oil equivalents (mboe)	0.20	0.24	0.26

### Remarks:

- Strategic Objective 2020: Zero emission rate of SO<sub>2</sub>, NOx, and VOCs.
- SO<sub>2</sub> 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 23 new owned and operated service stations.



## Waste

GRI	Required Data	Unit	PTT		
			2015	2016	2017
GRI 306-2	Waste from routine operations	Tonne	15,517.39	16,847.63	20,014.48
	Total hazardous waste disposal	Tonne	4,448.45	4,773.07	3,421.64
	• Secure landfill	Tonne	110.42	122.16	58.20
	• Reuse	Tonne	0.05	0.00	0.00
	• Recycle	Tonne	537.36	279.42	438.51
	• Recover	Tonne	3,335.31	3,676.94	2,469.10
	• Others (incineration, composting, deep well injection)	Tonne	465.30	694.55	455.84
	Total non-hazardous waste disposal	Tonne	11,068.95	12,074.56	16,592.83
	• Landfill	Tonne	24.04	247.76	1,328.92
	• Reuse	Tonne	0.12	0.03	59.00
	• Recycle	Tonne	1,788.62	2,696.53	2,834.09
	• Recover	Tonne	161.18	215.58	247.68
	• Domestic waste	Tonne	9,095.00	8,870.36	12,121.30
	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
	Total hazardous waste disposal	Tonne	1,725.25	3,485.42	29.48
	• Secure landfill	Tonne	131.83	44.95	14.45
	• Recycle	Tonne	0.00	0.00	0.00
	• Recover	Tonne	1,537.48	3,369.90	0.00
	• Others	Tonne	55.94	70.57	15.03
	Total non-hazardous waste disposal	Tonne	1,315.47	4,189.59	215.38
	• Landfill	Tonne	25.43	0.00	0.00
	• Reuse	Tonne	710.00	3,721.90	183.00
	• Recycle	Tonne	287.30	67.69	32.38
	• Domestic waste	Tonne	5.31	0.00	0.00
	On-site waste storage	Tonne	467.85	118.25	102.93

### 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 chemill 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.
- Less maintenance activity results in decreasing routine hazardous waste.
- Increasing non-hazardous routine waste to landfill is generated from tank polishing maintenance.



# Spills

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

**Remarks:**

- 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.



## Energy

GRI	Required Data	Unit	PTT		
			2015	2016	2017
GRI 302-1	Total direct energy consumption	GJ	48,339,286	44,600,252	45,351,329
	Total indirect energy consumption	GJ	2,620,978	2,516,002	2,330,158
	• Electricity purchased	GJ	2,620,978	2,516,002	2,330,158
	Total energy sold	GJ	NA	NA	0
	• Electricity sold	GJ	NA	NA	0

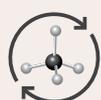
  

GRI	Required Data	Unit	PTT Group		
			2015	2016	2017
GRI 302-1	Total energy consumption	GJ	284,641,462	265,716,839	330,098,149
	Total direct energy consumption				
	• PTT operational control	GJ	260,217,367	238,851,349	314,370,090
	Total indirect energy consumption	GJ	24,424,096	26,865,490	15,728,059
GRI 302-3	Direct energy intensity				
	• Oil and gas production	GJ/mboe	190,238	196,716	188,682
	• Refinery throughput	GJ/Tonne	1.91	2.14	2.42
	• Petrochemical throughput	GJ/Tonne	2.88	9.14	8.29

### 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.



## Methane Emissions

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

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

### Remarks:

- The volume of methane emitted includes leakage (fugitive), gas vented from processes (CO<sub>2</sub> separation and ethylene production), methane emitted from vented emissions, and flaring.
- Direct CH<sub>4</sub> emissions include those from aforementioned sources, as well as direct CH<sub>4</sub> emitted from combustion sources.



## GHG Emissions

GRI	Required Data	Unit	PTT		
			2015	2016	2017
	Total GHG emissions	Tonne CO <sub>2</sub> equivalents	11,762,998	10,652,132	11,280,532
GRI 305-1	Direct (Scope 1) GHG emissions	Tonne CO <sub>2</sub> equivalents	11,407,679	10,334,822	11,050,978
GRI 305-2	GHG Scope 2	Tonne CO <sub>2</sub> equivalents	355,319	317,309	229,554
GRI 305-3	GHG Scope 3	Tonne CO <sub>2</sub> equivalents	125,722,575	127,078,140	124,488,019

GRI	Required Data	Unit	PTT Group			
			2015	2016	2017	
GRI 305-1	GHG Scope 1	• PTT operational control	Tonne CO <sub>2</sub> equivalents	31,115,981	29,979,970	30,163,397
		• PTT equity share	Tonne CO <sub>2</sub> equivalents	20,701,762	19,693,954	20,047,851
GRI 305-2	GHG Scope 2	• PTT operational control	Tonne CO <sub>2</sub> equivalents	1,800,870	1,606,220	1,669,446
		• PTT equity share	Tonne CO <sub>2</sub> equivalents	1,080,016	950,828	921,565
GRI 305-3	PTT operational control	Tonne CO <sub>2</sub> equivalents	125,722,575	127,078,140	124,488,019	
GRI 305-4	GHG Intensity	• Oil and gas production	Tonne CO <sub>2</sub> equivalents/Million barrel oil equivalents	38,130	38,045	38,257
		• Refinery	Tonne CO <sub>2</sub> equivalents/Tonne refinery throughput	0.0899	0.1416	0.1540
		• Petrochemical	Tonne CO <sub>2</sub> equivalents/Tonne petrochemical product	0.5499	0.5432	0.5782

**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 equityshares of PTTAC, PTTMCC, PTTPL, PTTM and HMC to PTTGC.



## Environmental Management

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

# Awards and Recognition

## National Awards



37  
Awards

31  
Institutions

include

### Thailand Sustainability Investment (THSI) or Sustainable Stock Awards

Given by **the Thai Institute of Director (IOD), the Stock Exchange of Thailand (SET), and Money and Banking Magazine**



### Sustainability Report Award

for 5 consecutive years  
Given by **The Securities and Exchange Commission, Thai Listed Companies Association, Thaipat Institute**

### Thailand Corporate Excellence Awards 2016 granted from HRH Princess Maha Chakri Sirindhorn

- Corporate Improvement Excellence Award
- 7 Outstanding Awards, including, Excellence in Sustainable Development/ Corporate Social Responsibility, Financial Management Excellence, Human Resource Management Excellence, Excellence in Innovation and Initiation, Leadership Excellence, Marketing Excellence, Product/Service Excellence

Given by **the Association of Business Management of Thailand and Sasin Graduate Institute of Business Administration of Chulalongkorn University**

### Outstanding State-owned Enterprise Award 2017

Include

- Outstanding State-owned Enterprise Award 2017 for 2 consecutive year.
- Best Transparency and Disclosure Award for 3 consecutive year
- Best Innovation Award for 8 consecutive years
- Outstanding Social and Environmental Performance Award

Given by **Ministry of Finance**



### Corporate Honor Award from the NACC

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

### Prime Minister's Export Award

PTT Lubricants received Best Thai Brand for large-scale corporate

Given by **Ministry of Commerce**

### Corporate Governance Report: CGR of Thai Listed Companies

PTT was ranked at the Excellent CG Level (Maximum Score: 5) for 9 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 Director (IOD), and the Stock Exchange of Thailand (SET)**

## International Awards



17 Awards | 11 Institutions

include

**ATD Excellence in Practice Awards at Honorable Mention Citation level in the Career Development Category**

From Young People to Globalization or YP2G project that promotes young generation of human capital to be ready for business expansion and overseas operation

Given by **The Association for Talent Development (ATD)**



PTT maintained its position for 6 consecutive years as a member of the Dow Jones Sustainability World Index (DJSI World). With the highest score in the Oil and Gas Upstream & Integrated Industry (OGX), PTT was named Industry Leader for the first time.

Given by **RobecoSAM and S&P Dow Jones Indices**

MEMBER OF

**Dow Jones Sustainability Indices**

In Collaboration with RobecoSAM

Classified as Gold Class in RobecoSAM Sustainability Yearbook 2018

### 3 Outstanding Awards

Include

- Most Consistent Dividend Policy
- Strongest Adherence to Corporate Governance
- Best Strategic Corporate Social Responsibility

Given by **the Alpha Southeast Asia Magazine**

### The Asset Corporate Awards 2017

- The Asset Corporate Award – Platinum Award for 9 consecutive years
- Best Chief Executive Officer Award Mr. Tevin Vongvanich
- Best Initiatives in Innovation Award for 2 consecutive years
- Best Initiatives in Diversity and Inclusion Award for 2 consecutive years

Given by **The Asset Magazine**



### Gold Medal and Special Medal of the Association of Polish Investors and Rationalizers

Based on research results of Bio-based coffee pulp from Amazon coffee roaster (Bio SSCMB)

Given by **the Confederation of Inventors of Poland**

### Asian Excellence Awards

Include

- Individual category: Asia's Best CEO Mr. Tevin Vongvanich
- Organization category: Best Investor Relations Company

Given by **the Corporate Governance Asia**

### Brand of the Year (National Tier 2017-2018) Award

PTT Service Station and Café Amazon received award under Petrol/Gas Stations and Retailer – Coffee Category, respectively.

Given by **World Branding Forum**

### Asia Marketing Company of the Year Award or Top Marketing Companies in Asia

Given by **the Asia Marketing Federation (AMF)**

# GRI, IR, UNGC and UN SDGs Content Index

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GRI 103-1	Explanation of the material topic and its Boundary	24-26
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Sustainability/Economics/Supply-Chain-Management/Pages/default.aspx">http://www.pttplc.com/en/Sustainability/Economics/Supply-Chain-Management/Pages/default.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 308-1	New suppliers that were screened using environmental criteria	25
GRI 308-2	Negative environmental impacts in the supply chain and actions taken	25-26
<b>GRI 401: Employment</b>		
GRI 103-1	Explanation of the material topic and its Boundary	34-37
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx">http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 401-1	New employee hires and employee turnover	68-69
GRI 401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	37
GRI 401-3	Parental leave	69
<b>GRI 403: Occupational Health and Safety</b>		
GRI 103-1	Explanation of the material topic and its Boundary	50-55
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	71
GRI 403-3	Workers with high incidence or high risk of diseases related to their occupation	50-53
<b>GRI 404: Training and Education</b>		
GRI 103-1	Explanation of the material topic and its Boundary	34-36
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx">http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 404-1*	Average hours of training per year per employee	35, 69
GRI 404-2	Programs for upgrading employee skills and transition assistance programs	34-37
GRI 404-3	Percentage of employees receiving regular performance and career development reviews	34
<b>GRI 405: Diversity and Equal Opportunity</b>		
GRI 103-1	Explanation of the material topic and its Boundary	38
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx">http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 405-1	Diversity of governance bodies and employees	68
<b>GRI 406: Non-Discrimination</b>		
GRI 103-1	Explanation of the material topic and its Boundary	38
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx">http://www.pttplc.com/en/Career/Sustainable-Human-Resource-Management/pages/Sustainable-Human-Resource-Management.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 406-1	Incidents of discrimination and corrective actions taken	38
<b>GRI 407: Freedom of Association and Collective Bargaining</b>		
GRI 103-1	Explanation of the material topic and its Boundary	24-25, 38
GRI 103-2	The management approach and its components	
GRI 103-3	Evaluation of the management approach	
GRI 407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	24-25, 38

GRI Standard	Description	Page/Link/Comment
<b>GRI 408: Child Labor</b>		
GRI 103-1	Explanation of the material topic and its Boundary	24-25, 38
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	24-25, 38
<b>GRI 410: Security Practices</b>		
GRI 103-1	Explanation of the material topic and its Boundary	54-55
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	54-55
<b>GRI 411: Right of Indigenous Peoples</b>		
GRI 103-1	Explanation of the material topic and its Boundary	38-39 <a href="http://www.pttplc.com/en/Sustainability/Social/Pages/Human-Rights.aspx">http://www.pttplc.com/en/Sustainability/Social/Pages/Human-Rights.aspx</a>
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 2017.
<b>GRI 412: Human Rights Assessment</b>		
GRI 103-1	Explanation of the material topic and its Boundary	38 <a href="http://www.pttplc.com/en/Sustainability/Social/Pages/Human-Rights.aspx">http://www.pttplc.com/en/Sustainability/Social/Pages/Human-Rights.aspx</a>
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	38
GRI 412-2	Employee training on human rights policies or procedures	38
<b>GRI 413: Local Communities</b>		
GRI 103-1	Explanation of the material topic and its Boundary	38-49
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	38-49
GRI 413-2	Operations with significant actual and potential negative impacts on local communities	38-49
<b>GRI 414: Supplier Social Assessment</b>		
GRI 103-1	Explanation of the material topic and its Boundary	<a href="http://www.pttplc.com/en/Sustainability/Economics/Supply-Chain-Management/Pages/default.aspx">http://www.pttplc.com/en/Sustainability/Economics/Supply-Chain-Management/Pages/default.aspx</a>
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	25
GRI 414-2	Negative social impacts in the supply chain and actions taken	25-26
<b>GRI 415: Public Policy</b>		
GRI 103-1	Explanation of the material topic and its Boundary	<a href="http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Pages/Collaboration.aspx">http://www.pttplc.com/en/Sustainability/PTT-Sustainability/Pages/Collaboration.aspx</a>
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.
<b>GRI 416: Customer Health and Safety</b>		
GRI 103-1	Explanation of the material topic and its Boundary	30-33 <a href="http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx">http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx</a>
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	32

GRI Standard	Description	Page/Link/Comment
<b>GRI 417: Marketing and Labeling</b>		
GRI 103-1	Explanation of the material topic and its Boundary	30-33
GRI 103-2	The management approach and its components	<a href="http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx">http://www.pttplc.com/en/Sustainability/Environment/Product-Stewardship/Pages/Product-Safety.aspx</a>
GRI 103-3	Evaluation of the management approach	
GRI 417-2	Incidents of non-compliance concerning product and service information and labeling	32
<b>GRI 419: Socio-economic Compliance</b>		
GRI 103-1	Explanation of the material topic and its Boundary	39-40
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	39-40

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	Page/Link/Comment
<b>Organizational Profile</b>		
G4-OG4*	Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored	65-66
G4-OG6*	Volume of flared and vented hydrocarbon	76
G4-OG10	Number and description of significant disputes with local communities and indigenous peoples	39
G4-OG12	Operations where involuntary resettlement took place	39
G4-OG13*	Process safety events, by business activity	52
G4-OG14	Volume of biofuels produced and purchased	31

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>

### Integrated Reporting <IR> Capitals

Capital	Description	Page
Financial	The pool of funds that is available to an organization for use in the product of goods or the provision of services; and obtained through financing, such as debt, equity or grants, or generated through operations or investments.	6-7, 28, 35, 67
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).	6-7
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).	6-7, 28, 36
Human	People's competencies, capabilities and experience, and their motivations to innovate.	6-7, 34-37
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).	6-7, 16-17, 32, 39-49
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).	6-7, 56-66

## UNITED NATIONS GLOBAL COMPACT (UNGC)

### Communication on Progress – Advanced Level

Criterion	Description	Page
1	The COP describes mainstreaming into corporate functions and business units	18-19
2	The COP describes value chain implementation	4-5, 24-27
3	The COP describes robust commitments, strategies or policies in the area of human rights	38
4	The COP describes effective management systems to integrate the human rights principles	38
5	The COP describes effective monitoring and evaluation mechanisms of human rights integration	38
6	The COP describes robust commitments, strategies or policies in the area of labor	38
7	The COP describes effective management systems to integrate the labor principles	38
8	The COP describes effective monitoring and evaluation mechanisms of labor principles integration	38
9	The COP describes robust commitments, strategies or policies in the area of environmental stewardship	28-31, 56-66
10	The COP describes effective management systems to integrate the environmental principles	28-31, 56-66
11	The COP describes effective monitoring and evaluation mechanisms for environmental stewardship	28-31, 56-66
12	The COP describes robust commitments, strategies or policies in the area of anti-corruption	20-22
13	The COP describes effective management systems to integrate the anti-corruption principle	20-22
14	The COP describes effective monitoring and evaluation mechanisms for the integration of anti-corruption	20-22
15	The COP describes core business contributions to UN goals and issues	9-11
16	The COP describes strategic social investments and philanthropy	41-49
17	The COP describes advocacy and public policy engagement	9-11
18	The COP describes partnerships and collective action	19, 22, 27, 58
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	16-17, 39-40

## UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (UN SDGs)

Goal	Description	Page
7	Ensure access to affordable, reliable, sustainable and modern energy for all	10-11, 25, 31, 44-45
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	10-11, 34-38
12	Ensure sustainable consumption and production patterns	10, 56-66
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	10, 65-66
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	10, 65-66, 47-49
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	10, 27, 38, 42, 46



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# 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 2017 (the “Report”) for the year ended 31 December 2017, 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 2017 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*, ISAE 3410 *Assurance on Greenhouse Gas Statements*, and AA1000 Assurance Standard (2008). 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 for the year ended 31 December 2017:

- Energy consumption within organization (GRI Standard 302-1)
- Energy intensity (GRI Standard 302-3)
- Total water withdrawal by source (GRI Standard 303-1)
- Direct greenhouse gas emissions (scope 1) (GRI Standard 305-1)
- Energy indirect greenhouse gas emissions (scope 2) (GRI Standard 305-2)
- Other indirect greenhouse gas emissions (scope 3) (GRI Standard 305-3)
- Greenhouse gas emissions intensity (GRI Standard 305-4)
- Nitrogen Oxide (NOx), Sulphur Oxide (SOx), and other significant air emissions (Volatile Organic Compounds: VOC) (GRI Standard 305-7)
- Total water discharge by quality and destination (GRI Standard 306-1)
- Total weight of waste by type and disposal method (GRI Standard 306-2)
- Total number and volume of significant spills (GRI Standard 306-3)
- Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender (GRI Standard 403-2)
- 
-



- Average hours of training per year per employee by gender, and by employee category (GRI Standard 404-1)
- Economic value distributed – Community Investment (GRI Standard 201-1)
- Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored (OGSD – OG4)
- Volume of flared/ vented (OGSD – OG6)
- Process safety events, by business activity (OGSD – OG13)
- The description given by PTT in the “About this report” section regarding adherence to the accountability principles set forth in the AA1000 APS standard on inclusivity, materiality and responsiveness in the process adopted to prepare the Report

#### 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 Account Ability Principles Standard (2008) (“AA1000 APS”).

#### Director’s and management’s responsibilities

The director 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.

#### Limited assurance over Subject Matters

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 to 4<sup>1</sup> sites, 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.

#### 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

6 March 2018

<sup>1</sup> Lum Luk Ka NGV Mother Station, Lum Luk Ka Oil Terminal, Region 9 Pipeline Operation, and Khanom Gas Separation Plant

# Reader Feedback Survey PTT Corporate Sustainability Report 2017



Feedback received from this survey will be used to improve the content and design of PTT's 2018 Corporate Sustainability Report. Thank you very much for your kind cooperation.

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

01

Please indicate your interest in reading PTT's 2017 Sustainability Report.

- To get to know PTT
- For research/education
- To prepare my own sustainability report
- To support investment decisions
- Others (please specify) .....

02

Please provide your view on the completeness and credibility of the 2017 Sustainability Report.

	Very high	High	Medium	Low	Improve
• Your understanding of PTT's material issues	<input type="radio"/>				
• Alignment between PTT's sustainability strategy and sustainability performance	<input type="radio"/>				
• Completeness and reliability of content	<input type="radio"/>				
• Relevance to your interests and expectations	<input type="radio"/>				

03

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
- 3 – Slightly important

- Corporate Governance
- Fair Operating Practices
- Human Rights
- People
- Security, Safety, Health and Environment
- Product Stewardship
- Corporate Citizenship
- Reporting
- Supply Chain Management
- Stakeholder Engagement
- Others (please specify) .....

04

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.

.....

.....

.....

05

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

.....

.....

.....

06

Additional comments on sustainability management at PTT.

.....

.....

.....

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### PTT Group Sustainability Management Project

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โครงการ CSR 12 ปี



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# Reader Feedback Survey

PTT Public Company Limited  
Corporate Sustainability Report 2017







รายงานฉบับนี้จัดพิมพ์โดยกระดาษรีไซเคิลแล้ว  
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(Soy-based Ink)



**บริษัท ปตท. จำกัด (มหาชน)**  
PTT Public Company Limited

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