

SUSTAINABILITY REPORT 2018



PTTEP



A photograph of an oil rig worker in a blue uniform and white hard hat, working on a blue pipe. In the background, a tall metal tower has a flame at the top. The sky is clear blue.

PTTEP

INNOVATING for 

SUSTAINABILITY 



From the beginning ... to today,
PTT Exploration and Production Public Limited Company or PTTEP
has continued to learn, improve, share and pass on the knowledge on
petroleum exploration and production by Thais from one generation
to the next, to secure a sufficient and lasting energy source for
the Thai people.

Besides energy security, PTTEP also strives to better the
standard of living and well-being of the communities and
societies wherever we operate through the implementation
of social projects focusing on 4 aspects: basic needs,
education, environment and culture. The objective is to instill
foundational knowledge in the communities, so that they
can become self-reliant and together with PTTEP achieve
sustainable growth.

We are committed to good corporate governance, business
ethics, risk management and regulatory compliance,
with a view to fostering trust and confidence in all of our
stakeholders and contributing to building a good and
harmonious society.



Scan here for
MV MADE IN BONGKOT







We aim to achieve lasting success in tomorrow's world of energy by evolving to become an Energy Partner of Choice in delivering sustainable value to our partners through competitive performance and innovation. With this in mind, we have initiated our program for the future, ENTERPRISE-Transformation Program, at the heart of our corporate strategy.





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▶ Message from the President and Chief Executive Officer

For more than 33 years, PTT Exploration and Production Public Company Limited or PTTEP has conducted petroleum exploration and production operations both domestically and internationally supplying oil and natural gas for the energy security of the countries in which we are invested. 2018 was another year of outstanding achievements which saw PTTEP completing the acquisition of an additional stake in the Bongkot project which contributed immediately to increase in daily sales volume, cash flow, and petroleum reserves. Additionally, the company also won the bid for the new concessions covering the Bongkot and Erawan fields, both of which are major suppliers of natural gas to Thailand, as well as winning the bidding for 4 exploration blocks with high petroleum potential in Malaysia and Mexico.

2018 also marked the 25th year of PTTEP's operations in the Bongkot gas field. This has been a historical milestone for our company, and we take pride in the success of Bongkot as proof that PTTEP, as a Thai oil and gas company, has exponentially developed its capacity in petroleum exploration and production. Bongkot has become an "institution" through which PTTEP has been able to transfer expertise and knowledge of petroleum E&P, developing this capacity for Thais. This expertise has laid the groundwork for PTTEP's other success, as today we have expanded our operations to 40 projects in 11 countries and continuing to grow the business in target regions, for example, the bidding for exploration blocks in the United Arab Emirates.

The energy business will continue to face various challenges in the years to come from global oil prices, growth in renewable energy, new challenges from emerging technology and technological innovations and other factors. For PTTEP's continued strength and growth, we will have to maximize the value from our core business, while at the same time seek new opportunities through investing in the development of E&P related business which will contribute to greater value creation for our stakeholders and investors. Driving through organizational transformation is one of our core strategies that will allow us to move forward to grasp these new business opportunities throughout our value chain in the oil and gas business, including investments in the Natural Gas value chain, such as the Gas-to-Power project

in Myanmar, and in new business sectors including robotics and artificial intelligence (AI), predictive maintenance and inspection, and renewable energy. This diversification will create long-term growth and sustainability for both PTTEP and our partners under the new vision for PTTEP to become the "Energy Partner of Choice" or a leading business partner in the energy sector. We trust that the transformation strategy will drive the company to strong and sustainable growth and enable it to adapt to the challenging environment of the oil and gas industry.

Apart from our Transformation strategy, safety continues to maintain its prominence as a key indicator of performance, 2018 has resulted in better safety performances this year. Our records of process safety and personal safety in 2018 have achieved the goal set for our safety performances to be in the top quartile compared to the International Association of Oil and Gas Producers (IOGP) average performance. This success is the result of our efforts to implement proactive approaches to cultivate safety culture throughout the organization and with our business partners and suppliers. Amidst the improvements, we still continue to put a concerted effort to drive through stronger preventive measures to increase capacity in safety risk management among our personnel and contractors in taking process and personal safety as everyone's responsibility. This continued effort is to further reduce work-related accidents and to ensure that PTTEP is on track to achieving the "Target Zero" safety in the near future.

On the environment, PTTEP is well aware of its roles and responsibilities in climate change risk mitigation and has set a target for greenhouse gas emission reduction of 25% by 2030 which aligns with the 2 Degree-Celsius Scenario for the global energy industry sector, as proposed by the International Energy Agency's (IEA) as well as Thailand's national commitments to the Paris Agreement. While our greenhouse gas reduction projects yield good results as planned, we will continually analyze and assess the risks and opportunities that climate change will present to our business, and continue to promote our efforts from a medium- to long-term perspective.

Support on social development and improving livelihoods of communities in our areas of operation are also a key element in our sustainable performances. In 2018, PTTEP supported more than 130 CSR projects in the 4 areas of; basic needs, environment, education, and culture. Our pride for this year is that our efforts were recognized both in the social development arena through awards such as at the Asia Corporate Excellence and Sustainability Awards 2018, the 2018 Asia-Pacific Stevie Awards, and the 10th Annual Global CSR Summit and Awards and the Global Good Governance Awards 2018 and in the sustainable development arena as PTTEP was selected as a member of the 2018 Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream and Integrated Industry for a fifth consecutive year. We have also received the Silver Class distinction in the Sustainability Yearbook 2019 by RobecoSam for excellence in sustainability performance. These achievements are a reflection that our efforts have been acknowledged as contributing to sustainable value creation for our stakeholders and in the community we operate.

Challenges remain, but we trust that PTTEP will move forward as a sustainable organization with good corporate governance, transparency and accountability throughout the business value chain. We progress on the path towards sustainable growth and continue to share our best practices to support our suppliers, vendors and business partners in strengthening their governance and business ethics and together contribute to the advancement of the Ten Principles of the UN Global Compact. Last but not least, PTTEP is committed to creating value for society through sharing its best practices and its model as a company with strong corporate governance.



A handwritten signature in black ink, consisting of a stylized 'P' followed by a horizontal line and a small flourish.

(Phongsthorn Thavisin)
President and Chief Executive Officer

▶▶ About This Report

(GRI 102-50, GRI 102-51, GRI 102-52, GRI 102-54)

PTT Exploration and Production Public Company Limited (PTTEP) prepares this 2018 Sustainability Report to communicate economic, social and environmental material issues, commitments and annual sustainability performances to stakeholders that are both directly and indirectly related to PTTEP business operations. The report covers the period from 1 January to 31 December 2018

Our Reporting Approach

(GRI 102-50, GRI 102-51, GRI 102-52, GRI 102-54, GRI 102-56)

The content in this report is determined by PTTEP’s performances and material issues which have significant impacts on economic, social and environmental aspects. The report was prepared according to the Global Reporting Initiative (GRI) Sustainability Reporting Standard for the “In Accordance – Core” Option, Oil and Gas Sector Disclosures – OGSD, as well as international frameworks for sustainability management such as Oil and Gas Industry Guidance on Voluntary Sustainability of the International Petroleum Industry Environmental Conservation Association (IPIECA), Dow Jones Sustainability Indices (DJSI), AA1000 AccountAbility Principles Standard 2008 (AA1000APS) of AccountAbility, SASB Materiality Map™ of the Sustainability Accounting Standards Board (SASB). PTTEP also aims to strengthen the quality of this sustainability report for more comprehensive disclosure; therefore, we use the Integrated Reporting (IR) guidelines to describe relationships between our sustainability performances and corporate financial performances. The guideline will also be applied as the framework for our future performance disclosures.

The reporting process and performance content in this report are under the supervision of the Sustainable Development Council. Selected data on safety, occupational health and the environment, and the description on compliance with the accountability principles from the AA1000APS standard on inclusivity,

materiality and responsiveness in the process adopted to prepare this report, have been verified with a limited level of assurance by KPMG Phoomchai Business Advisory Co., Ltd. – the details of which are in the Assurance Statement. Financial statements have been audited by the Office of the Auditor General of Thailand, and the Audit Report can be found in the 2018 Annual Report.

Scope and Reporting Boundaries

(GRI 102-45, GRI 102-49)

This report covers performance data collected from PTTEP’s projects and subsidiaries operating in Thailand and overseas, within the scope indicated in the SD Performance Summary chapter. There was no significant change from the previous reporting period in the Scope and Reporting Boundaries. Economic and financial data are from the 2018 Annual Report covering all exploration and production projects that PTTEP operates and those in which PTTEP is a joint venture partner. In addition, as PTTEP is a subsidiary of PTT Public Company Limited, PTT Sustainability Report also contains information on PTTEP.

Stakeholder Engagement and Expectation

(GRI 102-40, GRI 102-42, GRI 102-43)

PTTEP organizes engagement activities with 6 stakeholder groups which are composed of 1) Government agencies and public organizations; 2) Suppliers and contractors; 3) Employees; 4) Shareholders, institutional investors and analysts; 5) Communities and society; and 6) Independent organizations, industrial associations and press and media. The objective of stakeholder engagement is to solicit feedback and expectations and communicate to exchange points of view. PTTEP uses issues raised by stakeholders during the engagement as input to improve the efficiencies of our business operations.

Stakeholders	Engagement Approach	2018 Performance Summary
 Government agencies and public organizations	<ul style="list-style-type: none"> ▶ Case-by-case meetings ▶ Monthly meetings with government agencies ▶ Monthly meetings with local government agencies ▶ Reporting to government agencies ▶ Participation in the government network ▶ Tripartite Committee Meeting ▶ Emergency plan exercise ▶ Whistleblowing through CG hotline 	<ul style="list-style-type: none"> ▶ Strict compliance with laws relating to business operation ▶ Communication with government officials for better understanding of their expectations ▶ 227 engagements with government agencies and organizations through various activities
 Suppliers and contractors	<ul style="list-style-type: none"> ▶ Conference, training, and seminars with suppliers and contractors ▶ Whistleblowing through CG hotline 	<ul style="list-style-type: none"> ▶ SSHE Contractor Forum with 96 contractors ▶ Engaged suppliers and contractors through 6 CSR activities ▶ Collaborated with 42 contractors to develop innovations to enhance operational efficiency for both sides, e.g. through Vendor Symposium
 Employees	<ul style="list-style-type: none"> ▶ CEO and employee meetings ▶ Employee engagement surveys ▶ Whistleblowing through CG hotline ▶ Regular email and other online communication 	<ul style="list-style-type: none"> ▶ Employee engagement score at 66% ▶ Organized 5 “CEO meets Employee” activities ▶ Continuous promotion of <i>EP SPIRIT</i> among employees
 Shareholders, institutional investors and analysts	<ul style="list-style-type: none"> ▶ Annual shareholder general meetings ▶ Analyst meetings ▶ Shareholder and investor roadshows ▶ Quarterly journals ▶ Whistleblowing through CG hotline ▶ Shareholder visits to the company ▶ Seminars 	<ul style="list-style-type: none"> ▶ Collaboration and provision of accurate information to relevant stakeholders through a variety of engagement activities ▶ Organized GRC Forum for listed companies, investors and public, with 350 attendees participated at the forum and approximately 3,100 audiences participated through online channels ▶ Organized shareholder and investor roadshows 25 times ▶ Issued 4 quarterly journals
 Communities and society	<ul style="list-style-type: none"> ▶ Monthly meetings with community and civil society groups ▶ Community field visits ▶ Public hearings ▶ Philanthropic activities ▶ Stakeholder Commitment Survey ▶ Emergency plan exercise ▶ Whistleblowing through organizational representatives and CG hotline 	<ul style="list-style-type: none"> ▶ Continuous efforts to prevent impacts on communities from operations and development of community projects to address the needs of stakeholders, in line with PTTEP social development ▶ Community engagement through 181 activities
 Independent organizations, industrial associations and press and media	<ul style="list-style-type: none"> ▶ PTTEP membership of various organizations ▶ Press releases and press conferences ▶ Press visit to company’s activities ▶ Online (social) media ▶ Websites ▶ Whistleblowing through CG hotline 	<ul style="list-style-type: none"> ▶ Knowledge sharing on business expansions, CSR project, GRC practices and the importance of concessions in the Gulf of Thailand that would expire soon ▶ 7 press visit company’s activities ▶ 35 interviews and press conferences ▶ 321 announcements and news released through social media (Facebook, Instagram, and YouTube) ▶ 25,572 visitors visited “News and Announcement” webpage on PTTEP’s website.

Stakeholders' Opinions

(GRI 102-44)

In 2018, PTTEP conducted a stakeholder engagement survey to solicit and gather opinions from all stakeholders (in accordance with stakeholder inclusiveness principle) regarding the company's ESG and sustainability practices through survey questionnaires. PTTEP uses stakeholder's feedback as inputs for prioritizing material issues and improving the company's ESG management. In 2018, the Key findings are:

 <p>PTTEP should focus its investments in areas of expertise to minimize risks, such as in Thailand or ASEAN countries</p> <p><i>Passion to Explore for a Sustainable Future</i></p>	 <p>PTTEP should disclose project information, and other business in its future plans, including non-Exploration and Production activities.</p> <p><i>Passion to Explore for a Sustainable Future</i> <i>Wisdom to Transform</i></p>	 <p>PTTEP should communicate its performances on governance, transparency, and compliance, in accordance with good governance principle, as these issues are material to the company.</p> <p><i>Governance, Risk Management and Compliance</i></p>
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Materiality Assessment

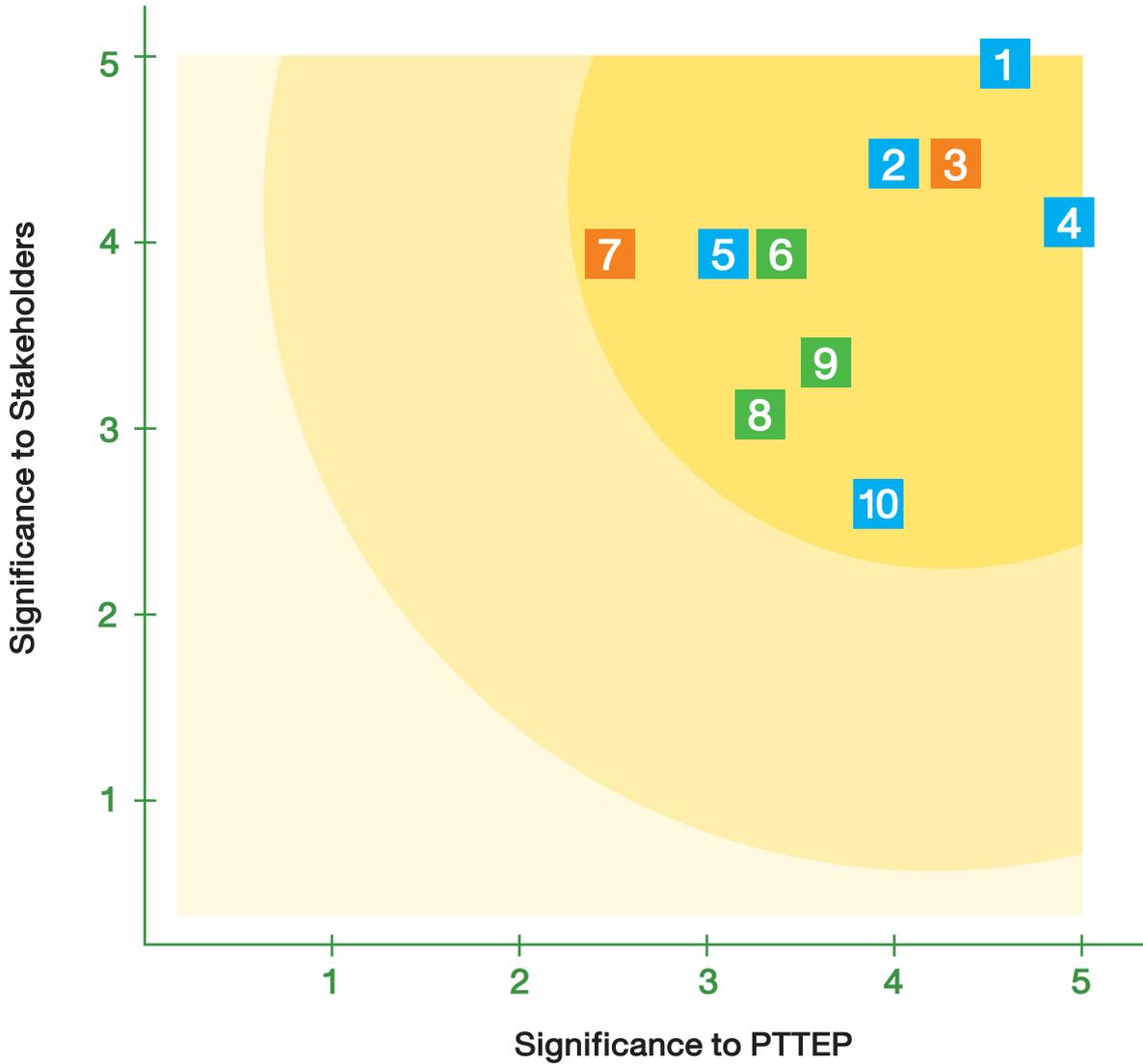
(GRI 102-46)

PTTEP reviewed the 2018 material issues based on their significance to the company's business performances and the level of significance to stakeholders, both internal and external stakeholders of the company. We also assessed the trends and directions of sustainability at the global scale, in line with Sustainable Development Goals (SDGs), the Dow Jones Sustainability Index (DJSI) and key issues related to the energy industry. The process of materiality assessment was in compliance with the Global Reporting Initiative (GRI) reporting framework, as follows:



Materiality Matrix

(GRI 102-47)



Business Dimension

- 1** Governance, Risk Management, and Compliance
- 2** Human Capital Development
- 4** Increasing Petroleum Reserve
- 5** Technology and Innovation
- 10** Supply Chain Management



Social Dimension

- 3** Occupational Health and Safety
- 7** Social Development



Environmental Dimension

- 6** Climate Change
- 8** Environmental Management
- 9** Oil and Chemical Spills



Material Issues and Boundaries

(GRI 102-46, GRI 102-47)

Material Issues	GRI Material Aspects	Chapter, Significance of the Material Issues, and Stakeholders' Expectations	Impact Boundaries ¹			
			PTTEP Internal	PTTEP External		
				Government	Suppliers and Contractors	Communities and Society
1 Governance, Risk Management, and Compliance	<ul style="list-style-type: none"> ▶ Anti-corruption ▶ Compliance 	<p>Governance, Risk Management, and Compliance</p> <ul style="list-style-type: none"> ▶ Key factors that support PTTEP's GRC performances ▶ Strengthening credibility, good reputation, and business relations. PTTEP also aims to become an exemplary company on good governance and business ethics in Thailand 	●	●	●	
2 Human Capital Development	<ul style="list-style-type: none"> ▶ Training and Education ▶ Employment ▶ Diversity and Equal Opportunity 	<p>Human Capital and Organizational Culture are Investments for Sustainable Growth</p> <ul style="list-style-type: none"> ▶ The key force that drives PTTEP to its goals, address the challenges and changes faced by the business, and co-develop PTTEP as a sustainable organization ▶ Mitigating impacts of institutional knowledge loss and lack of high-potential successors 	●			
3 Occupational Health and Safety	<ul style="list-style-type: none"> ▶ Occupational Health and Safety ▶ Project Security and Process Safety² 	<p>Maintaining High Safety Standards</p> <ul style="list-style-type: none"> ▶ Safety is fundamental to business operations and the organizational culture, with the aim to achieve Safety Target Zero ▶ Minimizing the impact on employees' safety and contractors, as well as communities surrounding our operations, which affects PTTEP's credibility, reputation and the company's operating expenses 	●		●	●
4 Increasing Petroleum Reserve	<ul style="list-style-type: none"> ▶ Economic Performance ▶ Petroleum Reserves² 	<p>Passion to Explore for a Sustainable Future</p> <ul style="list-style-type: none"> ▶ Adjusting investment strategies to tackle emerging risk and to build sustainable economic growth ▶ Directly impact PTTEP's turnover which affects the values the company can allocate to all stakeholder groups 	●	●	●	
5 Technology and Innovation	-	<p>Wisdom to Transform</p> <ul style="list-style-type: none"> ▶ Using technologies to improve operational capacity and create new business opportunities ▶ Increasing the company's capability and competitiveness, as well as strengthen growth in response to the volatility of the energy industry 	●		●	●

¹ PTTEP assessed direct and indirect impacts of each material issue on relevant external stakeholders.

² Reference from GRI G4 Sector Disclosures – Oil and Gas

Material Issues	GRI Material Aspects	Chapter, Significance of the Material Issues, and Stakeholders' Expectations	Impact Boundaries ¹			
			PTTEP Internal	PTTEP External		
				Government	Suppliers and Contractors	Communities and Society
6 Climate Change	<ul style="list-style-type: none"> ▶ Emissions 	Environmental Stewardship <ul style="list-style-type: none"> ▶ Reduce impacts of GHG emission ▶ Reduce risk and impacts of global warming as a result of PTTEP operations, as well as saving operating expenses ▶ The target of environmental impact minimization and transforming to a low-carbon company 	●	●	●	●
7 Social Development	<ul style="list-style-type: none"> ▶ Economic Performance ▶ Indirect Economic Impact ▶ Local Communities 	Creating Value for Society <ul style="list-style-type: none"> ▶ Responding to stakeholder expectations and operate in compliance with the company's corporate social responsibility policy and target ▶ Reducing potential impacts due to the lack of support from surrounding communities and other relevant stakeholders, which affect the company's reputation and social license to operate 	●			●
8 Environmental Management	<ul style="list-style-type: none"> ▶ Energy ▶ Water ▶ Emissions ▶ Effluent and Waste ▶ Compliance ▶ Environmental Compliance² 	Environmental Stewardship <ul style="list-style-type: none"> ▶ Reduce direct and indirect environmental impacts ▶ Affect the company's reputation, credibility and license to operate ▶ Natural resource and environmental sustainability 	●	●	●	●
9 Oil and Chemical Spills	<ul style="list-style-type: none"> ▶ Effluent and Waste 	Environmental Stewardship <ul style="list-style-type: none"> ▶ Prevent social and environmental impacts ▶ The spill target is "Zero" ▶ Creditability and social license to operate 	●	●	●	●
10 Supply Chain Management	<ul style="list-style-type: none"> ▶ Procurement Practices ▶ Supplier Environmental Assessment ▶ Supplier Human Rights Assessment ▶ Supplier Social Impact Assessment 	Supply Chain Management and Supplier and Vendor Development for Sustainability <ul style="list-style-type: none"> ▶ Efficient, transparent, fair, and accountable procurement ▶ Effective ESG (environmental, social, and governance) management throughout the company's supply chain ▶ Building business confidence, as well as minimize loss and operating cost incurred from ESG mismanagement in supply chain 	●	●	●	



Sustainability at PTTEP

From the first step over 30 years ago as the Exploration and Production unit of the Petroleum Authority of Thailand, the company has accumulated knowledge and experience from international petroleum companies. With this accumulated expertise, PTTEP founded as the Thai national petroleum company is able to operate to global standards in all phases of operations. Through the professionalism and capabilities of Thai national employees, PTTEP has expanded business operations both domestically and internationally. PTTEP invests in projects globally both as the operator and as a joint venture partner. Today PTTEP has become a leading Thai company, and we take pride as the pioneer for petroleum energy sources, which continues to contribute to national energy security and economic development.

Over the past three decades, PTTEP's strategy underpinning our business growth emphasized the need for prudence and to ensure positive impacts to society and community. We operate on the core fundamentals of creating mutual value with our stakeholders, developing our employees, caring for surrounding societies and communities, and sustainably protecting the environment. These fundamentals go hand in hand with our focus on research and development in exploration technology and innovation in response to the emerging challenges caused by various factors. This has resulted in strong organizational growth, steady growth in revenues and profitability, and gaining trust from all PTTEP's stakeholders.

▶▶ Passion to Explore for a Sustainable Future

PTTEP operates our business globally with the aim to ensure energy security and sustainable value creation to all stakeholders.

PTTEP Vision

**To become the “Energy Partner of Choice”
 through Competitive Performance and Innovation
 for Long-term Value Creation**

Cooperation is a crucial part of business operations today. Partnerships bring about value creation that enhances sustainability. Recognizing the importance of cooperation and partnerships, PTTEP is determined to become the “Energy Partner of Choice”, aiming to create mutually beneficial value for all groups of stakeholders. This will allow PTTEP to become a widely “accepted” and “trusted” petroleum E&P company, as we strive to be the most valued company in the eyes of our stakeholders.

 <h3>Shareholder</h3> <p>PTTEP will remain attractive to investors, due to our strong stable and sustainable growth and creating reasonable return on investment.</p>	 <h3>Employees</h3> <p>PTTEP will be the best organization for all employees. We will continue to promote capacity development for good and high-performing employees and strengthen their engagement to the company.</p>	 <h3>Partners, Customers, and Suppliers</h3> <p>PTTEP will be the company of choice for our partners, customers, and contractors, while we strive to operate our business with professionalism, transparency, equality, and fairness.</p>
 <h3>Government</h3> <p>PTTEP will be a company welcomed by all countries, as well as demonstrate our long-term commitment to the countries where we invest.</p>	 <h3>Society, Community and Environment</h3> <p>PTTEP will be a good and responsible corporate citizen with the aim to improve the quality of life for communities in all operation areas, domestically and internationally.</p>	 <h3>Competitors</h3> <p>PTTEP will compete fairly and treat competitors with professionalism and equality. We will turn our competitors into partners to create mutually stable and sustainable growth.</p>

At PTTEP, we operate our business under the organizational culture of  which consists of:



Explorer



Passion



Synergy



Performance Excellence



Integrity and Ethics



Responsibility for Society



Innovation



Trust and Respect

Business Overview

PTTEP's core business is petroleum exploration and production, with operations and investments in Thailand and overseas. As of 31 December 2018, PTTEP had 40¹ petroleum exploration and production projects in 11 countries: 18 projects in exploration phase, and 22 projects in production phase. In comparison to 2017, PTTEP has 4 new projects in the exploration phase in Malaysia and Mexico.

Canada

- ▶ **Mariana Oil Sands Project**
Participation Interest 100%
Operator PTTEP

Brazil

- ▶ **Barreirinhas AP1 Project**
Participation Interest 25%
Operator Shell Brasil
- ▶ **Brazil BM-ES-23 Project**
Participation Interest 20%
Operator Petrobras

Mozambique

- ▶ **Mozambique Rovuma Offshore Area 1 Project**
Participation Interest 8.5%
Operator Anadarko

Indonesia

- ▶ **Natuna Sea A Project**
Participation Interest 11.5%
Operator Premier Oil

Mexico

- ▶ **Mexico block 12 (2.4) Project²**
Participation Interest 20%
Operator PC Carigali Mexico
- ▶ **Mexico block 29 (2.4) Project²**
Participation Interest 16.67%
Operator Repsol Exploración México

Malaysia

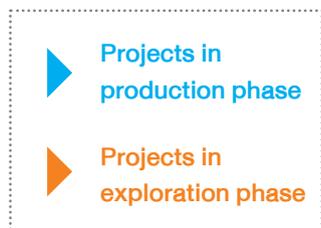
- ▶ **Sarawak SK410B Project**
Participation Interest 42.5%
Operator PTTEP
- ▶ **Sarawak SK417 Project³**
Participation Interest 80%
Operator PTTEP
- ▶ **Sarawak SK438 Project³**
Participation Interest 80%
Operator PTTEP

Algeria

- ▶ **Algeria Hassi Bir Rekaiz Project**
Participation Interest 24.5%
Operator PTTEP
- ▶ **Algeria 433a and 416b Project**
Participation Interest 35%
Operator GBRs

Overlapping Area: 2 projects

- ▶ **G9/43 Project**
Participation Interest 100%
Operator PTTEP
- ▶ **MTJDA Project**
Participation Interest 50%
Operator CPOC



¹ Excluding Indonesia Malunda and Indonesia Semai II projects in which PTTEP had submitted relinquishment documents to the Governments of Indonesia and was granted the approval on 10 April 2018 and 9 May 2018 respectively.
² PTTEP and its consortium have been selected as the successful bidders of 2 exploration blocks in Mexico: Block 12 and Block 29; with the concession agreement signed on 7 May 2018.
³ On 30 March 2018, PTTEP signed the Production Sharing Contracts for exploration and production rights of the 2 blocks in Malaysia: Sarawak SK417 and Sarawak SK438 projects.

Myanmar

- ▶ **Myanmar M3 Project**
 Participation Interest 80%
 Operator PTTEP
- ▶ **Myanmar M11 Project**
 Participation Interest 100%
 Operator PTTEP
- ▶ **Zawtika Project**
 Participation Interest 80%
 Operator PTTEP

- ▶ **Yadana Project**
 Participation Interest 25.5%
 Operator TOTAL
- ▶ **Yetagun Project**
 Participation Interest 19.31784%
 Operator Petronas
- ▶ **Myanmar MD-7 Project**
 Participation Interest 50%
 Operator PTTEP
- ▶ **Myanmar MOGE 3 Project**
 Participation Interest 75%
 Operator PTTEP

Vietnam

- ▶ **Vietnam 9-2 Project**
 Participation Interest 25%
 Operator HV JOC
- ▶ **Vietnam 16-1 Project**
 Participation Interest 28.5%
 Operator HV JOC
- ▶ **Vietnam B and 48/95 Project**
 Participation Interest 8.5%
 Operator Petrovietnam
- ▶ **Vietnam 52/97 Project**
 Participation Interest 7%
 Operator Petrovietnam



Thailand

- ▶ **Bongkot Project**
 Participation Interest 66.6667%⁵
 Operator PTTEP
- ▶ **S1 Project**
 Participation Interest 100%
 Operator PTTEP
- ▶ **PTTEP 1 Project**
 Participation Interest 100%
 Operator PTTEP
- ▶ **B6/27 Project**
 Participation Interest 100%
 Operator PTTEP
- ▶ **Arthit Project**
 Participation Interest 80%
 Operator PTTEP

- ▶ **E5 Project**
 Participation Interest 20%
 Operator ExxonMobil
- ▶ **Contract 3 Project**
 Participation Interest 5%
 Operator Chevron
- ▶ **Contract 4 Project**
 Participation Interest 60%
 Operator Chevron
- ▶ **G4/43 Project**
 Participation Interest 21.375%
 Operator Chevron
- ▶ **Sinhuhorm Project**
 Participation Interest 55%
 Operator PTTEP

Australia

- ▶ **PTTEP Australasia Project⁴**
 Participation Interest 90 - 100%
 Operator PTTEP
- ▶ **L22/43 Project**
 Participation Interest 100%
 Operator PTTEP
- ▶ **L53/43 and L54/43 Project**
 Participation Interest 100%
 Operator PTTEP

- ▶ **B8/32 and 9A Project**
 Participation Interest 25.001%
 Operator Chevron
- ▶ **G4/48 Project**
 Participation Interest 5%
 Operator Chevron

⁴ On 28 September 2018, PTTEP completed the divestment of Montara field (one of PTTEP Australasia Project). Apart from the divestment, PTTEP Australasia Project holds many petroleum blocks which have varying participation interests ranging from 90 - 100%.

⁵ PTTEP successfully completed the acquisition of additional 22.2222% stake in Bongkot Project from Shell on 21 June 2018, resulting in the current working interest of 66.6667%.

Managing Emerging Risks to Support Organizational Growth

Disruptive Technologies and the Impacts on Energy Industry

Today, technological innovations and alternative energy play a more significant role in the energy industry, such as energy storage systems and electric vehicles. With the trend of cost reduction and improved efficiency in renewable energy and electric vehicle businesses, the demands for petroleum have significantly reduced. These phenomena can affect the energy sector business models, and eventually bring about the end of the oil and gas industry in the future.

In 2018, PTTEP adjusted its business strategy to accommodate technology advancement, through the establishment of the Business and Organization Transformation Group and initiated the “ENTERPRISE” project to drive Transformation in the organization. These transformations include the utilization of digital technology in petroleum exploration

and production, organizational transformation, and process transformation to build an agile and efficient organization for expedient decision-making and responses, while cutting the cost and natural resources required for operations.

In addition, PTTEP has explored investment opportunities in potential new businesses to enhance the company’s competitiveness and future sustainable growth. We are focusing on three main businesses including 1) businesses in the natural gas value chain, such as gas turbine power plants (Gas to Power) or LNG related businesses; 2) commercialization of technological innovation projects developed within PTTEP, including Robotics and AI, and Predictive Maintenance; and 3) Renewable Energy.

Climate Change

PTTEP recognizes the significant risks and opportunities of Climate Change that may impact PTTEP’s operations in various ways, including 1) physical damages such as the damage to production bases’ structures and equipment, or inaccessibility to exploration and production sites due to severe storms and floods etc.; 2) legal issues including carbon tax or enforcement of stricter climate change-related laws and regulations; and 3) the increasing uses of green energy.

PTTEP manages climate change risks with a focus on improving work processes to increase energy efficiency, establishing plans to reduce the intensity of energy use by 5% in 2020, and decreasing GHG emissions by 25% in 2030 (compared to the base year 2012).

Moreover, we continued to support reforestation efforts to absorb GHG and offset Carbon through various mechanisms, as well as increase in R&D support on technologies to store CO₂, in cooperation with organizations such as Thailand Greenhouse Gas Management Organization (Public Organization) (TGO), in order to develop approaches to reduce GHG emissions under the Thailand Voluntary Emission Reduction Project (T-VER).

In addition, PTTEP has set a strategy to invest in new businesses, including businesses along the gas value chain, such as natural gas power plants, development of LNG, and seek new business opportunities to invest in Renewable Energy to promote alternative energy during the phase of changing energy sources to low carbon society.

For the Bright Future of Thailand

PTTEP is determined to maintain cost competitiveness in natural gas production, in order to strengthen national energy security and increase contributions to Thailand's economy. We have established a strategy to increase production capacity in our main production projects both in Thailand and Myanmar, while driving the development of exploration projects to increase petroleum reserves and future production capacity. At the same time, the company is seeking investment opportunities in potential operational areas in Thailand and Southeast Asia where PTTEP has expertise. We also continue to seek opportunities in high-potential areas with low production cost such as in the Middle East. Besides this, PTTEP is looking for new businesses to diversify our business portfolio, as well as other high-potential businesses including Robotics and AI, Predictive Maintenance, and renewable energy. PTTEP's business strategy and significant progress in 2018 as follows:



Business Strategy

PTTEP has a strategy to execute and create business expansion opportunities for future growth as follows:

RESET	REFOCUS	RENEW
Strategy to increase production capacity and maintain competitiveness	Strategy to expand the business, focusing on areas of PTTEP's expertise and areas with high potential and low production costs. Moreover, PTTEP is looking at expanding investment in the LNG value chain.	Strategy to build a sustainable organization through increasing technological capabilities and seeking new business opportunities.

Performances in 2018

Return on Investment

Return on Capital Employed (ROCE) is at
8.58%
 which is higher than the industry average in 2017.

Cost per unit at
31.7 USD
 per barrel of oil equivalent, which is at a competitive rate when comparing to other E&P companies in Asia

Business Sustainability

Proved reserved life ratio
 (R/P Ratio or 1P/Production)
is at 5.21 years,
 while our target is set to be
 at least 7 years.



Progress in Strategic Implementation

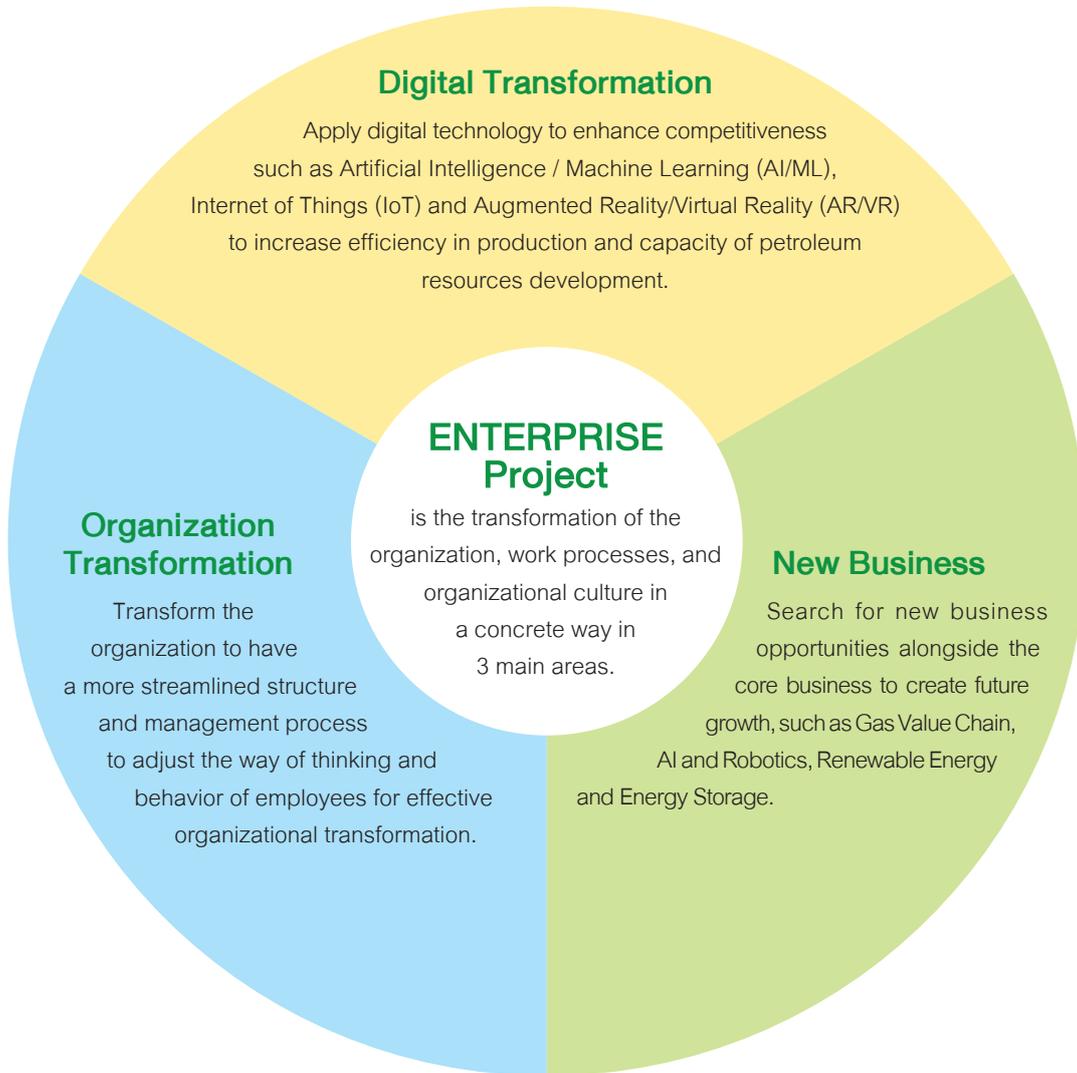
In 2018, PTTEP strategic implementation progressed as follows:

RESET	REFOCUS	RENEW
<ul style="list-style-type: none"> ▶ Continued to implement “SPEND SMART” project in 2018 to maintain cost competitiveness and improve work efficiency, with more than 500 initiatives implemented in the company’s operations including logistics and supply chain management, petroleum drilling, and construction and engineering, resulting in total cost reduction of 150 million USD. ▶ Sold PTTEP’s stake in the Montara Oil field offshore Timor Sea in Australia, as a part of the company’s divestment strategy of non-core assets. 	<ul style="list-style-type: none"> ▶ Acquired an additional stake in Bongkot Project from Royal Dutch Shell’s share, which increases PTTEP’s share in the project to 66.67%, and selling volume to 35,000 BOE/D. ▶ Won concession in petroleum E&P, as the operator of Erawan and Bongkot Gas Field. The Production Sharing Contract (PSC) is expected to be signed in the first quarter of 2019. ▶ Entered into a Joint Venture in Mexico for petroleum exploration in Block 12 project with participation interest of 20%, and Block 29 with a participation rate of 16.67%. PTTEP’s Joint Venture partners are operators experienced in petroleum exploration in the Gulf of Mexico. ▶ Co-invested in a Joint Venture to operate the Sarawak SK410B and Sarawak SK438 projects offshore Sarawak state, Malaysia. 	<ul style="list-style-type: none"> ▶ Transformed the organizational structure to increase business agility, enhance efficiency in work processes and promote an organizational culture better able to adapt and change. ▶ Applied digital technologies in line with the company’s Digital Transformation plan. 48 projects are in the pipeline in the first phase. ▶ Established subsidiary companies to accommodate future expanded investments in new technologies and innovations. ▶ Conducted feasibility study to invest in energy-related businesses, including renewable energy.



Transformation for the Future

In this time of abrupt changes, adaptability and ability to transform, determine how a business will maintain its competitiveness. If PTTEP is not ready and cannot adapt to the changes in time, the company will be left out of the competition.



The project will increase accumulated values created from Digital Transformation and the utilization of technological innovations in our business operations, in accordance with the 5-year strategy.

Transformation throughout PTTEP's Value Chain: through **48** projects which create positive impacts on the company, as follows;



Decrease subsurface data analysis time



Increase success rate in petroleum exploration



Increase drilling efficiency



Increase in production volume



Decrease unplanned shutdown

▶▶ Sustainable Development



To achieve the goal of business sustainability, PTTEP has been investing in organizational development and strengthening its competitiveness through technology and innovation. We stay focused on promoting business growth, energy security, environmental stewardship, and social development. The company's Sustainable Development Council, chaired by the CEO, sets the directions, policies, and governance structure to drive

PTTEP's sustainability strategy. At the working level, the Sustainable Development Working Team is represented by various departments that are mandated to support the SD Council, monitor PTTEP's sustainable performances, and implementation of policy and plans, to ensure that the company achieves its goal in bringing tangible sustainable benefits to all partners and stakeholders.

In 2018, SD Council has reviewed PTTEP's initiatives for sustainability as follow;

1. 

Long-term plan in line with the SDGs which align with our business strategy

2. 

The Sustainable Development Framework

3. 

PTTEP's Human Rights Policy and Human Rights Management System



Member of 2018 Dow Jones Sustainability Indices (DJSI) in the World Oil and Gas Upstream and Integrated Industry for a **5th** consecutive year



Selected as a constituent of the FTSE4Good Index Series: the FTSE4Good Emerging Index for a **3rd** consecutive year

PTTEP’s Sustainable Development Philosophy

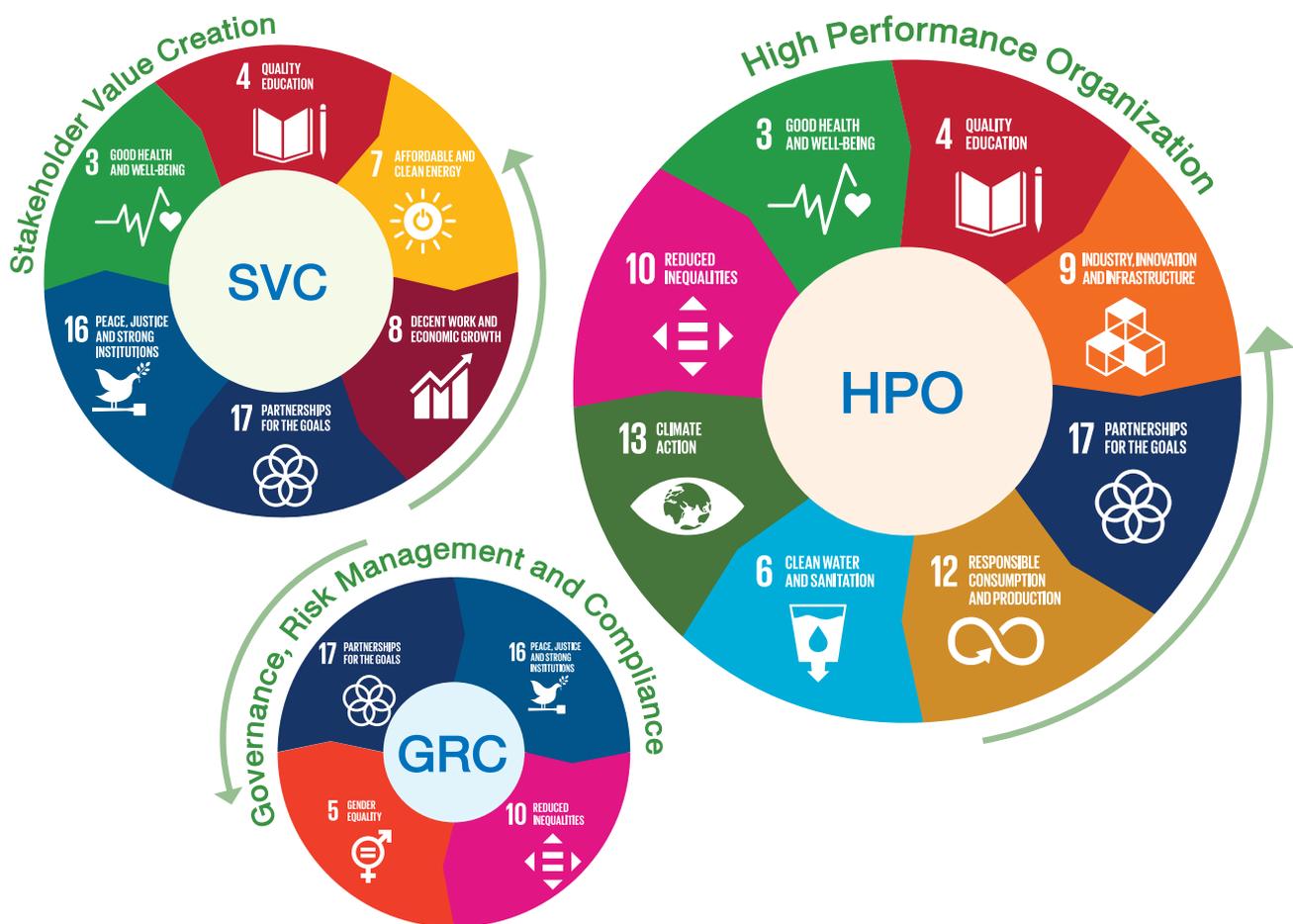
To build sustainable business operations and contribute to the drive towards sustainable development, PTTEP has started by building a strong foundation of corporate sustainability. We aim to be a High Performance Organization

(HPO) with robust structures and performance of Governance, Risk Management and Compliance (GRC) to achieve the goal of long-term Stakeholder Value Creation (SVC).

PTTEP’s Sustainable Development Framework

Long-term Value Creation to Our Stakeholders (Stakeholder Value Creation – SVC)

Aligns with PTTEP vision to be the “Energy Partner of Choice” and our commitment to driving the sustainable social development agenda, with the objective to promote mutual growths of PTTEP and its partners including Shareholders, Employees, Joint venture partners, Customers and Contractors, Government, Society, Community and Environment, and Competitors.



Governance, Risk Management and Compliance – GRC

PTTEP is committed to conducting its business upholding legality, transparency, and fairness, on the basis of equality. The company aims to achieve its goals of “sustainable and dignified growth” through effective work integration among Governance Units.

- ▶ Corporate Governance and Business Ethics
- ▶ Risk Management
- ▶ Compliance

Building a High Performance Organization (High Performance Organization – HPO)

Aiming at performance excellence in all elements of PTTEP’s business operations, to increase competitiveness and adaptability to changes (Competitive Performance)

- ▶ Capability Development
- ▶ Technology and Knowledge Management
- ▶ Operational Excellence
- ▶ Safety, Security, Health and Environment – SSHE
- ▶ Supply Chain Management



Performance Summary of 2018 Material Issues

According to PTTEP’s Sustainability Framework, we have set short-term and long-term targets for sustainable development in economic, social and environmental dimensions and disclose sustainability performances of our materiality issues. These identified materiality issues are the results of consultations in stakeholder engagement processes. In 2018, the main progress and achievements in reference to PTTEP’s plan and targets are as follows:

Materiality	Target	2018 Progress	Report Topics	SDGs Relevance
<p>1 Governance, Risk Management, and Compliance</p>	<ul style="list-style-type: none"> ▶ Create and strengthen the organizational work culture that complies with GRC principle. ▶ Listed among Thailand’s Leading GRC Listed Companies by 2022 through the implementation of the 5-year plan 	<ul style="list-style-type: none"> ▶ GRC organizational culture assessment conducted by independent external consultants shows that PTTEP employees at all level prioritize GRC practices and trust that GRC principle will drive the company towards sustainable growth. ▶ GRC awareness raising and promotion of GRC as a driver for business cooperation with external audiences were successfully carried out according to the plan: <ul style="list-style-type: none"> ▪ PTTEP was invited to 5 forums organized by regulators and private sectors to share the company’s GRC good practices; ▪ PTTEP shared GRC good practices at the seminar “Driving Proactive Sustainability” to 350 participants from public companies, investors, and interested individuals, as well as 3,100 persons who participated through online channels. ▶ The company continues to support anti-corruption efforts in cooperation with government and international organizations, such as Integrity Pact and Global Compact Network Thailand. 	<p>Governance, Risk Management, and Compliance</p>	 

Materiality	Target	2018 Progress	Report Topics	SDGs Relevance
<p>2 Human Capital Development</p>	<ul style="list-style-type: none"> ▶ Increase the average employee competency level by 3% per year. ▶ Achieve employee engagement score of 55% in 2018. 	<ul style="list-style-type: none"> ▶ Average competency level increased by 5% in 2018 ▶ Employee engagement score at 66% in 2018 	Human Capital and Organizational Culture are Investments for Sustainable Growth	
<p>3 Occupational Health and Safety</p>	<ul style="list-style-type: none"> ▶ Lost Time Injury Frequency (LTIF) of employees and contractors is not more than 0.14 cases per million hours worked in 2018. ▶ Total Recordable Injury Rate (TRIR) of employees and contractors is not more than 0.84 cases per million hours worked in 2018. 	<ul style="list-style-type: none"> ▶ Lost Time Injury Frequency (LTIF) of employees and contractors was at 0.07 cases per million hours worked in 2018. ▶ Total Recordable Injury Rate (TRIR) of employees and contractors was at 0.75 cases per million hours worked in 2018. 	Maintaining High Safety Standards	
<p>4 Increasing Petroleum Reserve</p>	<ul style="list-style-type: none"> ▶ Maintain proved reserve life ratio (R/P Ratio or 1P/Production) at no less than 7 years by 2025. ▶ Maintain return on capital employed (ROCE) at above the industry average. ▶ Achieve unit cost at 30 USD per barrel of oil equivalent. ▶ Maintain the proportion of natural gas production at 80% of all production. 	<ul style="list-style-type: none"> ▶ Proven R/P Ratio or 1P/Production is at 5.21 years. ▶ Return on Capital Employed (ROCE) was higher than the industry average with an EBITDA Margin of 8.58%. ▶ The unit cost is at 31.7 USD per barrel of oil equivalent which maintains PTTEP's competitive advantage in Petroleum E&P industry in Asia. ▶ The proportion of natural gas production accounted for 83% of production in 2018. 	Passion to Explore for a Sustainable Future	 





Materiality	Target	2018 Progress	Report Topics	SDGs Relevance
<p>5 Technology and Innovation</p>	<ul style="list-style-type: none"> ▶ Develop at least 5 new products and projects to be deployed or commercialized, and the values added from the deployment of new petroleum production related technologies should total 350 million USD in 2022. ▶ 15 patent applications by 2025 ▶ Technology and innovation projects receive academic awards and are published in academic journals, both at international and national levels. 	<ul style="list-style-type: none"> ▶ Deployment of 3 projects and 1 project has been commercialized. ▶ Patents registered for 1 project, and 12 projects are in the patent application process. ▶ Published 8 projects/research in academic journals and 4 projects have been received awards. 	Wisdom to Transform	 
<p>6 Climate Change</p>	<ul style="list-style-type: none"> ▶ Reduce greenhouse gas emissions intensity by at least 25% by 2030, compared to 2012 base year. ▶ Reduce greenhouse gas emissions by 220,500 tonnes of CO₂ equivalent in 2018. 	<ul style="list-style-type: none"> ▶ Reduced greenhouse gas emissions intensity by 7.2% compared to the 2012 base year. ▶ Reduced greenhouse gas emissions by 269,412 tonnes of CO₂ equivalent in 2018. 	Environmental Stewardship	
<p>7 Social Development</p>	<ul style="list-style-type: none"> ▶ Conduct community engagement in all project sites in the production phase. ▶ The stakeholder commitment survey result achieves “Commitment/Support” level (the highest level) by 2020. 	<ul style="list-style-type: none"> ▶ All projects in production phase conducted community engagement. ▶ Conducted Stakeholder Commitment surveys at Sinphuhorm project in Thailand, Zawtika project in Myanmar, and PTTEP Free Clinic project in Indonesia. The survey results show that two projects achieved “Awareness” level and one project achieved “Engagement” level. More than 50% of surveyed stakeholders held the view that PTTEP’s CSR projects aligned with their needs and benefit their communities. 	Creating Shared Value with Stakeholders	    

Materiality	Target	2018 Progress	Report Topics	SDGs Relevance
<p>8 Environmental Management</p>	<ul style="list-style-type: none"> ▶ Achieve Zero hazardous waste to landfill by 2020. ▶ Avoid operations in areas at risk from water scarcity and ensure there is no impact to the wider community of water users. ▶ No-net Loss for biodiversity as defined by IUCN and PTTEP does not carry out operations in any World Heritage sites. 	<ul style="list-style-type: none"> ▶ 0.25% of total hazardous waste sent to landfill in 2018. ▶ No PTTEP operations located in areas at risk from water scarcity. ▶ No PTTEP operations in areas of high biodiversity risks that require Biodiversity Action Plan (BAP), however; PTTEP adopted and implemented BAP in areas of medium biodiversity risks including Zawtika Project in Myanmar and Sinphuhorm project in Thailand. 	Environmental Stewardship	   
<p>9 Oil and Chemical Spill</p>	<ul style="list-style-type: none"> ▶ Reduce oil and chemical spill to lower than 0.22 tonnes per million tonnes of petroleum production in 2018. PTTEP also has the target of zero oil and chemical spill. 	<ul style="list-style-type: none"> ▶ Oil and chemical spill was at 0.6 tonnes per million tonnes of petroleum production in 2018. 	Environmental Stewardship	
<p>10 Supply Chain Management</p>	<ul style="list-style-type: none"> ▶ Cost saving from procurement process by 103 million USD in 2018 and enhance the efficiency of suppliers by improving the vendor selection criteria to put significant weight on quality-to-price in bids, to ensure that PTTEP procures quality suppliers at a reasonable price. ▶ Conduct environmental, social, and governance (ESG) on-site audits for 5 high-risk suppliers by 2018. ▶ Promote the company's green procurement. ▶ Develop and reduce steps in the procurement process, to shorten services and products delivery times. 	<ul style="list-style-type: none"> ▶ Cost saving from procurement process of more than 112 million USD in 2018 and selected high-quality vendors with good records on service delivery and safety, security, health and environmental management system. ▶ Conducted 7 environmental, social, and governance (ESG) on-site audits for high-risk suppliers in 2018. ▶ Developed the Green Procurement Criteria Manual (second phase) for 10 product and service categories, which were certified by Thailand Environment Institute (TEI). ▶ Green procurement accounted for 4% of the total procurement value in 2018. ▶ Conducted meeting with people involved in the procurement process and consulting companies to shorten the company's procurement process through applying digital solutions in the process as well as developing a long-term plan to improve procurement procedures. 	Supply Chain Management and Supplier and Vendor Development for Sustainability	  



Our Value Creation to Our Stakeholders

PTTEP's business does not only create economic value and organizational growth, but also builds direct and indirect mutual values to all stakeholder groups, as well as the environment.

INPUT

Financial Capital

- ▶ Debt to equity policy < 0.5
- ▶ Shareholders' equity* 11,769 million USD
- ▶ Interest bearing debt* 2,426 million USD
- ▶ Credit ratings BBB+ (S&P), Baa1 (Moody's), AAA (TRIS)

Natural Capital

- ▶ Natural resources
- ▶ Energy consumption 25 million gigajoules
- ▶ Water consumption 50 million m³
- ▶ Environmental management expenses over 23 million USD

Production Capital

- ▶ 40 Operations in 11 countries
- ▶ Thailand procurement of 886 million USD
- ▶ Over 500 projects to increase efficiency and reduce production cost

Human Capital

- ▶ 3,800 employees of more than 20 nationalities
- ▶ 2,575 Suppliers
- ▶ 55 Employee development and training hours /person/year
- ▶ Suppliers, contractors, and business partners' skills and experiences

Social and Relationship Capital

- ▶ 12.62 million USD spending on Corporate Social Responsibility Projects
- ▶ 9,280 volunteered hours by employees
- ▶ Environmental conservation and social development networks at community level and corporate level
- ▶ Activities to build networks of environmental conservation and social development, with a focus on engagements of stakeholders at all levels.

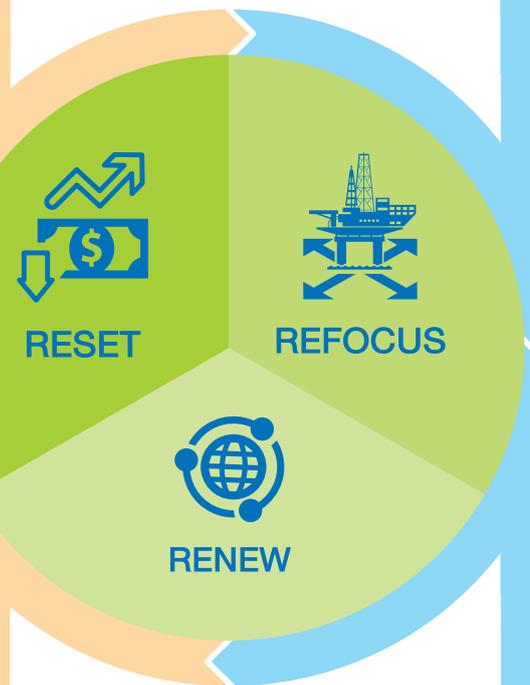
Intellectual Capital

- ▶ Investment in technological development and innovation over 18 million USD
- ▶ Collaboration with 13 external organizations to develop technology and innovations
- ▶ PTTEP committee and working team on technology development and innovation

VISION

Energy Partner of Choice through Competitive Performance and Innovation for Long-Term Value Creation

STRATEGY



*Remark: Average balance between YE2017 and YE2018

OUTPUT

IMPACT



Effective Capital Raising to support strategic growth, with reasonable cost of production and competitive and sustainable returns

- ▶ Revenue from operations 5,459 million USD
- ▶ Earnings before interest, depreciation and amortization (EBIDA) 3,860 million USD
- ▶ Net income 1,120 million USD
- ▶ Dividend payout 55% or dividend yield 4.4%
- ▶ Unit cost at 31.7 USD per BOE
- ▶ Return on capital employed (ROCE) is higher than the average of E&P industry in Asia
- ▶ Payment to Governments 1,331 million USD

PTTEP delivers competitive and sustainable returns to shareholders, with strong financial structure through effective capital raising in the context of risks and opportunities caused by volatility in the energy industry. This reflects the company's ability to maintain adequate liquidity to support operations and stay ready to seize investment opportunities. PTTEP has appropriate financial costs, creates benefits and dividends that are worthwhile, consistent, and competitive.



Shareholder and Government



Environmental Stewardship

- ▶ Reduce greenhouse gas emissions by 269,412 tonnes of CO₂ equivalent
- ▶ Reduce energy consumption and energy recycling 6 million gigajoules
- ▶ 30% reused and recycled waste
- ▶ 14% reused and recycled water
- ▶ 17 Research projects on green technology

Reducing and preventing any environmental impacts from PTTEP's operations as well as building trust and confidence in our operations among surrounding communities. To realize this, we put in place the Safety, Security, Health and Environment (SSHE) Management System certified to ISO14001:2015 in all PTTEP's areas of operations.



Nature and Environment



Increase natural gas production, boost exploration and development projects to increase efficiency, reduce cost by using the technology to maintain competitive performance.

- ▶ Total production of natural gas 0.6 trillion ft³ (97 million BOE)
- ▶ Total production of crude oil, LPG, condensate 34 million barrel
- ▶ Proved Reserve volume-oil/gas 677 million BOE

PTTEP has a defined business direction that is committed to maintaining and increasing production capacity in response to the market's need, and to manage the cost of production to maintain its competitiveness. In addition, PTTEP continues in its efforts to increase petroleum reserves and pursue continuous growth as set out in our strategy. We put in place required mechanisms to minimize business disruption, which corresponds to corporate's sustainability strategy.



Partners, Customers, and Suppliers



Develop organizational capabilities and cultivate SSHE/high-performance culture through capable and highly engaged workforce

- ▶ Lost time injury frequency rate 0.07 cases per million hours worked
- ▶ 80 % of all employees who have individual development plans (Individual Competency Development Plan: ICDP)
- ▶ Increased the average employee competency level by 5% per year
- ▶ Employee engagement score at 66%

PTTEP is committed to creating a safety culture, taking care of employees and building a high-performance organization by placing an emphasis on employees' development that will allow them to utilize their full potential in response to business' needs and manage their career development. We also focus on building capacities and preparing the next generation of leaders for succession to ensure business continuity. We emphasize a modern approach in human resource management to match the diversity in the business in the context of an Agile Organization that will drive the company to achieve the challenging goals.



Employees and Suppliers



Work with our partners for mutual growth and building a sustainable society

- ▶ Total compliance with the government requirements and regulations, and support for the sustainable social development agenda
- ▶ 135 social development projects based around 4 main themes (basic needs, education, environment and culture)
- ▶ Increase income and elevate livelihood of communities
- ▶ Increase biodiversity through environmental CSR projects
- ▶ Commitment and engagement of stakeholders and social license to operate

Building good relationships with all stakeholders by listening to their opinions and expectations, also creating engagement and delivering knowledge through CSR projects. Feedback from stakeholders used to support business development, enhance efficiency and garner trust in PTTEP's operations.



Society and Community



Deliver Competitive Technology Development for E&P and Create Business value through Innovation and Strategic Partnership

- ▶ 75 projects in the technology development process
- ▶ 1 patented project, and 12 projects in the patent registration process
- ▶ Cost saving at 187 million USD as a result of using new innovations
- ▶ Revenue from commercialized innovation, e.g. unmanned Aerial Vehicle-UAV for processing equipment inspection.

Technology and innovation help to increase our capabilities in tackling emerging challenges faced by the company today and in the future. This will leverage our competitive advantages and maintain PTTEP's competitive position in line with other leading international petroleum companies.



Innovation and Industrial Development



National Prosperity is Our Mission

As a leading petroleum exploration and production company, PTTEP aspires to create value for the Thai economy. We have maintained our role as an important contributor to national growth by strengthening domestic energy security and developing petroleum exploration and production expertise and knowledge to be transferred through the generations.

Change is a crucial driving force for PTTEP. Reflecting on our 25 years of operation in Bongkot project, we have evolved, adapted, and transformed our business. From a humble and challenging beginning, we have constantly developed our technical and managerial capacity, while striving to address the challenges of the ever-changing business environment.

Today, we have extensive experience and expertise that drive us forward as a leading oil and gas company with international standards.

Throughout the 33 years of our operations, PTTEP takes pride in our contribution to Thailand's economic growth. We deliver the fuels which are a crucial component of manufacturing and a vital resource for various industries, crucial for economic growth, as well as livelihoods of Thai people and every sector in the economy. For these reasons, PTTEP is committed to maintaining our stable growth in this ever-changing context of the industry, while expanding our value creation to the nation and all stakeholders.

Bongkot: 25 Years of Contribution



Every day, Bongkot project generates 900 million cubic feet of natural gas, equivalent to **20%** of domestic natural gas demand.



Used as fuel in households and industries, and as an essential raw material in the production of petrochemicals, and adds **477 million baht** to the Thai economy daily*.



Saved **42,000 million baht** from costs of LNG** imports, and provides Thailand increased flexibility in sourcing natural gas to address domestic demands.



The investment value in employment among Thai companies in the petroleum and exploration sector is over **20,000 million baht per year.**



Nearly **100%** operated by Thai personnel and fundamental in developing the E&P capacity of human capital and the industry in Thailand, the project has continuously created jobs for sustainable economic development.



Create **4.2 hundred billion baht** in revenues for the public sector in the form of royalty, taxes and other returns over the 25 years of operation.

* calculated from related E&P business both direct and indirect, and equivalent to 5% of GDP

** equivalent to 7 million tons per year – 1 million ton of LNG is equivalent to 130 MMscfd of natural gas, calculated at 10 USD of LNG per 1 million BTU



15 July 2018 marked the 25th anniversary of natural gas production in Bongkot gas field. Bongkot project is the first natural gas field operated by a Thai company. It is the largest natural gas source in Thailand, in terms of the volume of the underground natural gas reserves. Production from Bongkot project at 900 million cubic feet/day is equivalent to 20% of domestic natural gas demands.

Natural gas is a crucial resource that drives businesses and industries in Thailand. Used as fuel to generate electricity for industries and households and as a raw material in the petrochemical industry, natural gas has become an essential in our daily life. Looking back more than 2 decades, Thailand had limited expertise in natural gas production, and in particular none of the technical

expertise needed for the geological characteristics of natural gas reservoirs in the Gulf of Thailand that are comprised of small petroleum traps, which make the development of petroleum exploration and production projects in the Gulf of Thailand extremely challenging.

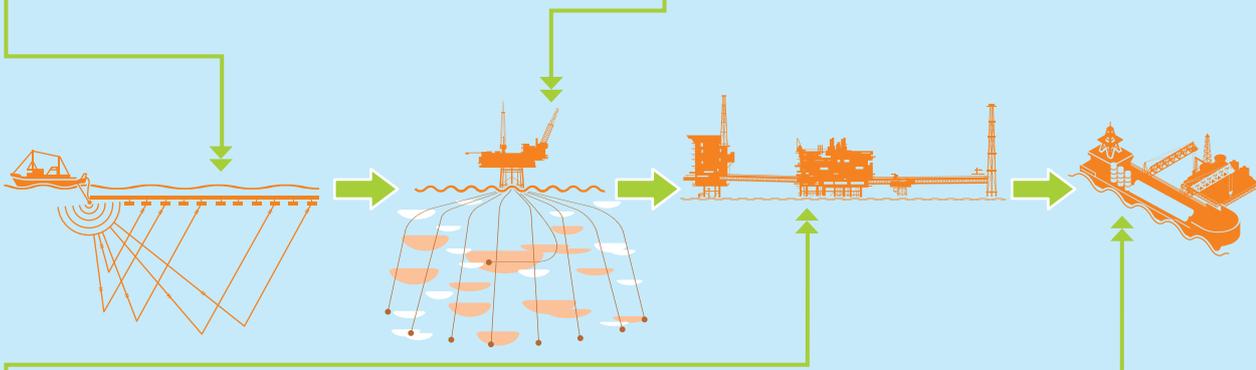
As the production operator of Bongkot project for the last 2 decades, PTTEP has strived to constantly develop new production innovations in response to domestic energy demands. Operations have to ensure cost-efficiency, while maintaining productivity and safety standards. Our extensive experience and accumulated expertise gained through petroleum production processes have become the standard of technology for natural gas production in the Gulf of Thailand.

Explore and locate petroleum reservoirs

- ▶ Accurately evaluate the size and properties of small, dispersed petroleum prospects, 3 km underground
- ▶ Developed Reservoir Modelling and Simulation to demonstrate petroleum accumulation and planning for efficient production

Bring the energy to life

- ▶ Design facilities and well construction which are suitable for reservoirs with complex and scattered geological characteristics
- ▶ Drill horizontal well and conduct Extended Reach Drilling (ERD) to reach and produce from distant reservoirs utilizing existing platforms to minimize cost.



Develop technology to increase production volumes and digital management systems

- ▶ Develop in-house software to plan and assess production capacity more precisely
- ▶ Install real-time monitoring system on all production platforms as well as connect offshore data to onshore for monitoring of production and timely decision-making purposes.
- ▶ Develop and install equipment on central-processing platform (CPP) to boost condensate production, while reducing CO₂ emissions and heavy metal contamination

Decommissioning Technology*

- ▶ Develop equipment removal technology to efficiently manage and minimize environmental impacts, such as a Converted Barge as an alternative method for decommissioning wellhead platforms and eliminate the use of Heavy Derrick Crane Vessel.
- ▶ Apply treatment technology to remove heavy metal decontamination technology in production platform, and subsea pipelines inspections
- ▶ Transform petroleum platform rigs into artificial offshore reefs (Rigs to Reefs)

* As Bongkot Natural Gas field would be the first operation field ceasing concession, PTTEP consequently has studied and tested decommissioning technology at the location.

SPEND SMART

- ▶ In addition to the implementation of the procedures mentioned above, PTTEP also implemented the SPEND SMART project to manage effective cost during the oil crisis to maximize value of the company's investment in operating costs.



Knowledge gained from the development of Bongkot project has become the foundation of offshore and onshore natural gas production in other areas. The project has provided PTTEP with the capability to explore, develop, and produce petroleum at “Zawtika Natural Gas field” located in the Gulf of Moattama, Republic of the Union of Myanmar. Zawtika gas field is a significant natural gas reserve, which is an important source of energy. Besides, experiences from Bongkot project have enhanced the potential and expertise of its employees, who are the main contributors to Thailand’s energy security and the main value creators of the E&P industry in Thailand. The development of our human resources goes hand in hand with the continued development of environmental management technologies to ensure that all PTTEP’s operations have the least environmental impact.

Natural gas from Bongkot project is a critical source of materials for petroleum-related and petrochemical industries, as well as one of the main drivers of Thailand’s economy. PTTEP understands the significance of the project, and competed in the bidding for exploration and operation concession in Erawan and Bongkot petroleum fields, whose concession agreements will discontinue in 2022 and 2023 respectively. With in-depth understanding and experience as operators in both petroleum fields, along with PTTEP’s expertise in petroleum E&P, the company won the concessions for both petroleum fields as its proposal was considered most beneficial for Thailand. PTTEP also committed to maintaining production volumes to support Thailand’s energy demand through submitting clear investment and operating plans to ensure the handover of operatorship after this concession period is smooth and efficient. The Company will begin to implement



Bongkot Natural Gas field has been a “model”

of petroleum exploration and production. It has served as the first learning center and the first human capital development institute for the petroleum E&P industry in Thailand. Today, knowledge and expertise have been passed on through the generations, contributing to the advancement of the petroleum exploration and production industry in Thailand, by Thai people.

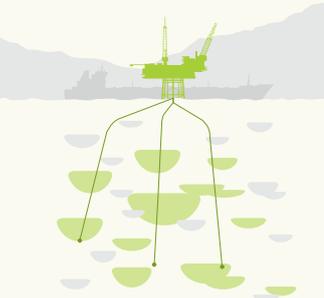
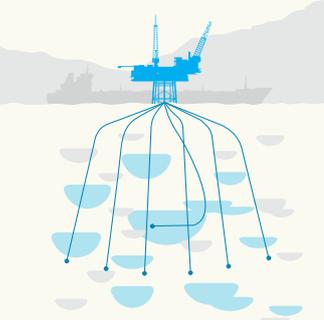
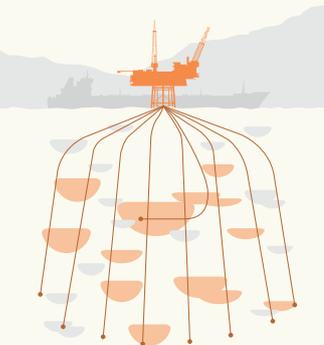
the transition plans to prepare for the transfer immediately on signing the production sharing agreement in February 2019 prior to taking over operations from Chevron in the Erawan field in 2022.

PTTEP will remain committed to our strategies to maintain continuous growth and production of natural gas at a competitive cost in accordance with the government policy. We will continue to maintain energy security for the future, while keeping an important source of energy for Thailand in the hands of a Thai petroleum production company. We are committed to maintaining our efficiency and productivity that meets international standards, and passing on our expertise in E&P to the next generation, for the sustainable future of petroleum production in Thailand.





3 Decades of Challenges in Energy Exploration

 Our Pride	 Challenges of Petroleum Exploration and Development of Bongkot Natural Gas field	
<p>Succeeded in the transfer of knowledge of offshore operations and production. PTTEP became the first Thai company to operate an offshore petroleum field, at the same time complying with all international standards on safety and environment.</p>	<p>The First Decade: 1990 - 1999</p> 	<p>Technology and geological data were limited in the pioneering period. Geological assessments concentrated on large reservoirs with high confidence relying on seismic attributes and reservoir models to ensure success rate. To reach the reserves, a production platform was built close to a major reservoir at which vertical to low-angle wells can be deployed to save cost. This method was comparable to pumping water directly from a major river. It was the beginning of operations and the company started to accumulate knowledge of subsurface geological characteristics, drilling technics and technologies, and the development of a specific model for efficient drilling in Bongkot gas field.</p>
<p>This knowledge was developed further enabling PTTEP to efficiently conduct operations and which led to the discovery of Bongkot South field and its eventual development by Thai people to produce and deliver energy to meet demand.</p>	<p>The Second Decade: 2000 - 2009</p> 	<p>As the volume of petroleum reserves in the reservoir decreased as a result production, PTTEP started to explore new prospects to ensure that Bongkot project can keep up with the energy demand. The company could locate accurately secondary petroleum reservoirs situated deeper and further from the drilling platform and apply a drilling technique in shallow play which is a high-risk area. This method was comparable to drawing water from multiple rivers at a distance.</p>
<p>Develop this wisdom further through technological innovations to reduce costs and increase operational efficiency, which was instrumental in enabling PTTEP to circumvent the most recent oil price crisis.</p>	<p>The Third Decade: 2010 - 2018</p> 	<p>The original petroleum sources were running low on reserves. Undeveloped gas sources were small, scattered and also located in Shallow or Deep Play. Petroleum in these reservoirs rested in the shallower or deeper layers of rocks with unstable pressure and highly challenging geological characteristics. They also were scattered and unconnected small petroleum traps, which requires more precision in exploration and assessment by using Advance Seismic Reprocessing technology. Our expertise and geological data were used to develop the Gulf of Thailand Model by conducting narrow well spacing to enable the extraction of as much as possible petroleum from the sources. The design of the well techniques and operations places an emphasis on drilling technology with better cost-efficiency and safety. This method is comparable to drilling multiple small groundwater wells to collect an adequate amount of water.</p>



Our Efforts



Success

Quickly developed our expertise in the development of petroleum resources and relied on our own operational capabilities with pride.

- ▶ Developed reservoir model and geological characteristics of subsurface conditions.
- ▶ Shifted from conventional well design to advance drilling technology known as Slim Hole Tubingless, saving over 30% of the actual cost. The technology became a model for drilling operation.

- ▶ PTTEP started to produce energy 3 years after the beginning of the project and doubled production capacity every 3 years; from 150 million cubic feet/day in 1993 to 550 million cubic feet/day in 1998; the year PTTEP became the operator.

More understanding of subsurface conditions and applied a variety of new technologies in operations to reach the production efficiency and reduce cost. The development plan for Bongkot South field was started.

- ▶ Accurately assess and identify petroleum prospects deeper and further away from platform.
- ▶ Introduced new technology to drill more efficiency and safely and reach target sources located deeper in the subsurface.
- ▶ PTTEP has produced petroleum from a source as deep as 2,770 meters and located 5,200 meters in distance from the operations platform, equivalent to the distance from Victory Monument to Chatuchak Park.

- ▶ Increased production capacity to 600 million cubic feet/day with reduced production costs of over 50%. PTTEP located new petroleum sources resulting in doubling of petroleum reserve to 1.2 trillion cubic feet of gas.

Driven by a well-rounded management approach to develop natural gas sources and maintain production and energy delivery at a competitive price per unit and ensure safety standards.

- ▶ Started production from the Bongkot South field, where petroleum reservoirs are located in high pressure environment, and applied advanced drilling technology to reach the high efficiency and ensure safety operation.
- ▶ Fully developed natural gas sources in shallow play which is highly challenging. Designed the drilling well with proper tools and production plan applying sand management technique to prevent eroding sand to from entering the production well.
- ▶ Applied Mature Field model to operations for increased efficiency and used digital technology to support agile working process.
- ▶ Implement zero-discharge policy (ship to shore).

- ▶ Since the first day of operation, Bongkot project has delivered 5.5 trillion cubic feet of energy to Thailand. The Wisdom accumulated from three decades at Bongkot will continue to be used as PTTEP in the future becomes the operator of both Bongkot and Erawan fields in 2022.

▶▶ Wisdom to Transform

Advances in technology have become one of the main challenges for the energy sector. With its 33 year accumulated expertise in petroleum exploration and production, PTTEP is ready to address these new challenges through the implementation of the RESET, REFOCUS, and RENEW strategy. The strategy aims to maximize the company’s potential while promoting sustainable growth, with a focus on increasing our petroleum reserves, maintaining petroleum production capacity, developing new technologies for environmental management, and creating new business opportunities to diversify our portfolio.

PTTEP began as a small petroleum exploration and production company; as a co-venturer in a domestic exploration and production project. Over 33 years, the company has evolved and grown amidst the ever-changing social and technological contexts; where today’s significant challenges are in relation to a Low Carbon Future and Energy Transition. These challenges will inevitably impact the energy sector in the future.

In response to such challenges, PTTEP sees adaptation and transformation as vital steps for ensuring its continued growth. To move forward, PTTEP needs varied strategic approaches, including Organizational Transformation to improve the company’s efficiency and change work processes to become more agile. The transformation aims to save time, reduce cost and uses of natural resources, while creating a new work culture that promotes and encourages employee’s adaptability to changes.

We believe that technology enhancements maximize the company’s potential to grow. PTTEP allocates 3% of its net income on technology development and works in collaboration with over 13 domestic and international public and private research institutes, academic institutions and business partners to implement our roadmap on research and technology development in 4 major areas:

1. Increase Exploration Success
2. Enhance Production
3. Green Practices
4. Technology for New Business

Research and Technology Development in 4 Major Areas

Focused Areas

- Methane Capturing and Utilization
- CO₂ Conversion
- CO₂ Removal
- Pipeline Interference Fit Connection
- AUV Pipeline Inspection 
- Subsea Inspection, Repair and Maintenance

1. 
Increase
Exploration Success

2. 
Enhance
Production

3. 
Green
Practices

4. 
Technology for
New Business

Drone for
Inspection 

Demulsifier for
Hydrocarbon
Extraction/
Recovery

Smart Field
Optimization

Advanced
Coating

Self-Cleaning
Production Separator

Diesel
Consumption
Reduction

Condensate
Purification

In-Pipe Inspection
Robot 

Decommissioning

Well Completion
Materials Optimization

Corrosion
Prediction and
Prevention

Seismic-While-Drilling
(SWD)

Enhance Recovery
CEOR, Absorption,
Desorption

Electromagnetic Fluid
Movement Monitoring



To drive technology development and innovation projects, PTTEP uses the Technology Funnel to assess the applicability of the developed projects. The company has set goals for the medium-term in 3 main areas:

► **Execution or commercialization of new products or technology projects**

By 2022, at least 5 technology development projects will have been spun off to be new businesses and increase returns from the implementation of technology in E&P business by 350 million USD.

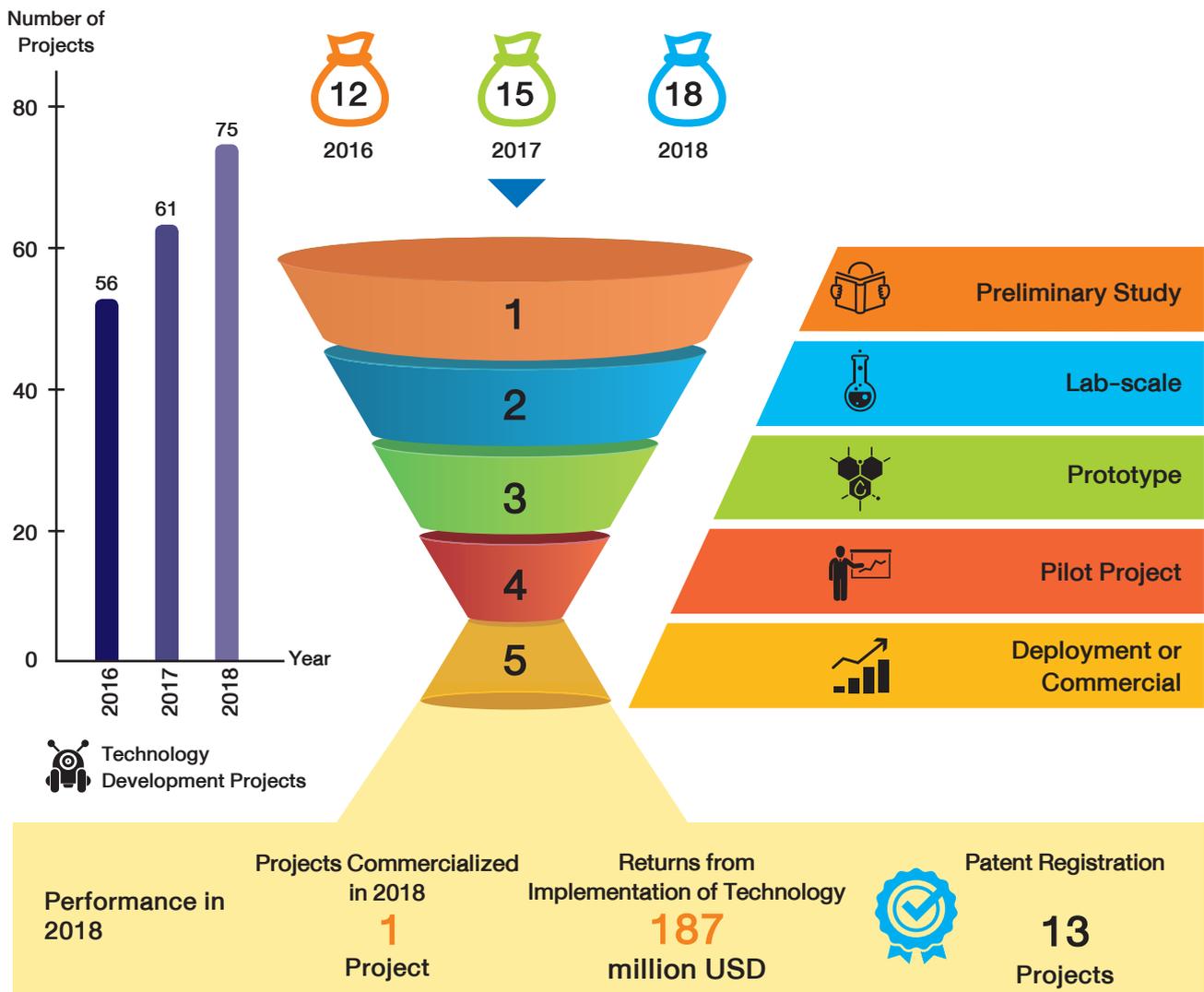
► **Patent registrations**

15 patents granted by 2025.

► **International and domestic awards and academic publications**

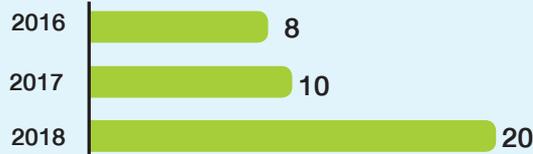
In 2018, the progress of PTTEP’s technology development and innovation exceeds the targets set in our roadmap. As a result, the company anticipates it will be able to utilize these technologies to support our core business, and deploy products to create new business opportunities earlier than expected. These innovations have already reduced cost and increased PTTEP’s operational capacity with an estimated value of more than 187 million USD as summarized below.

Budget for Technology Research and Development, 3% of net income (million USD)

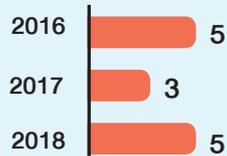




Number of Prototype Projects



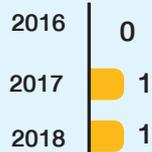
Number of Pilot Projects



Number of Projects Deployed



Number of Commercialized Projects



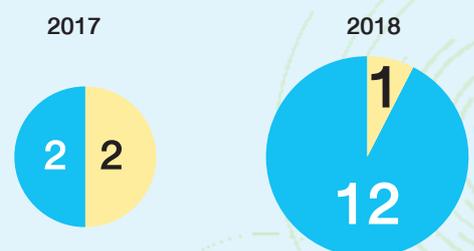
Number of Projects/ Studies Published or Received Awards



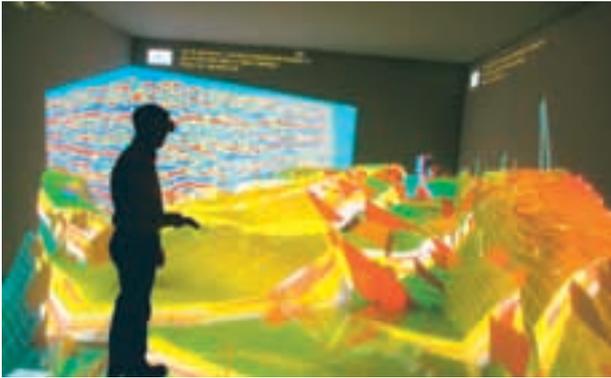
● Projects/ studies published ● Projects/ studies received awards



Patent Registration (projects)



● Patent granted, in the process of registration ● In the process of filing for a patent



Increase Exploration Success

Our target

Develop and deploy new technologies to increase exploration success and increase petroleum reserves.

Our efforts

100%

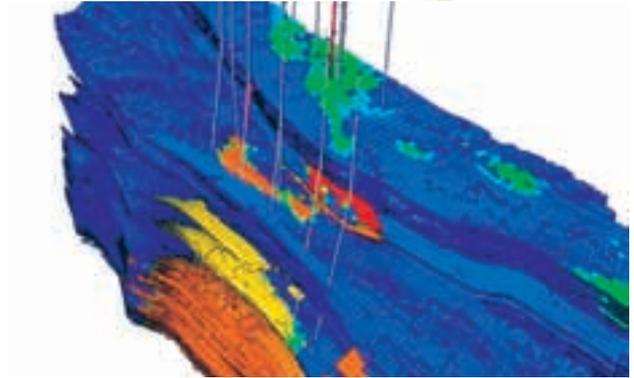
3 projects

Achievements in 2018

Dedicated Processing Center Project

To establish the Dedicated Processing Center to analyze geological data of explored areas and interpret data with imaging technology to eliminate the need to rely on external services.

- ▶ Processed data for over 30 projects and reduced expenses on hiring external experts saving more than 6 million USD in 2018.
- ▶ Limit risks in processes of exploration and drilling, which save the company's 100 million USD in 2018
- ▶ Planning to provide services for external users in the future.



Enhance Production

Our target

Develop technology to improve the efficiency of petroleum production process, which cut costs and reduce loss from unplanned shutdowns.

Our efforts

100%

46 projects

Achievements in 2018

LINOPT Project

Computerized production planning system using mathematical models for wells with limited petroleum reserves. By producing petroleum from multiple small reservoirs, the company can maximize cost-effectiveness from the total production volume.

- ▶ Increase production target with less planning time and achieve additional 60 million USD per year.
- ▶ Registered patents for the software, presented a published academic paper on this technology at international conferences and received international innovation awards.

Predictive Maintenance Project Using AI

Artificial Intelligence technology to monitor and predict maintenance needs for critical equipment and machines in operations.

- ▶ Prevent unplanned shutdowns which increase productivity with a value of approximately 5 million USD per year.
- ▶ Use AI technology to improve the efficiency of works in other areas.



Green Practices

Our target

Develop and introduce new technologies to minimize environmental impact from petroleum exploration and production processes.

Our efforts



17 projects

Achievements in 2018

In-Situ Mercury Decontamination for Pipeline Decommissioning Project

In collaboration with the government and other private agencies, PTTEP developed a project to collect samples of contaminants and chemicals and decontaminate subsea pipelines to prevent long-term environmental impact after decommission.

- ▶ Reduce cost of pipeline decommission.
- ▶ Patent registered, received international innovation awards, and presented published academic papers on this project at international conferences.



Technology for New Business

Our target

Develop high potential technologies to create new business opportunities and diversify PTTEP's portfolio.

Our efforts

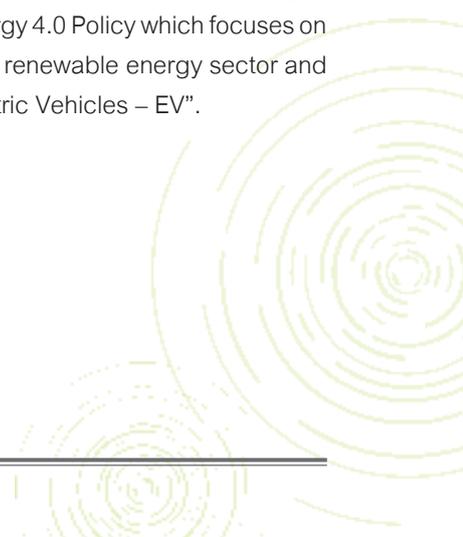


9 projects

Achievements in 2018

Advanced Lithium-based Battery, Integrated Offshore Tri-energy Complex Project

PTTEP initiated a technology development project on renewable energy and energy storage, which has huge growth potential in the future. This project aims to build capacity and seek investment partners in innovative clean energy business, energy management, and energy storage; all of which have the potential for continuous growth. The development of this technology also aligns with the government's Energy 4.0 Policy which focuses on the development of stable renewable energy sector and promotes the use of "Electric Vehicles – EV".





Building a Safe and Strong Business Foundation



“People” are the vital foundation of our business. For this reason, PTTEP emphasizes good safety practices in the workplace for our employees, suppliers, partners, contractors – and everyone who works for PTTEP. By fostering a safety culture and instilling safety as an ingrained behavior, PTTEP can ensure that everyone will come to work and return home each day, safe and sound.

Moreover, the company focuses on developing employee capabilities, building up their expertise and encouraging them to assimilate our organizational culture. We also

encourage our people to learn from diversity, either from different perspectives, experiences, or ages. Our employees are prepared to address incoming changes and challenges, and to further elevate the efficiency of the company to drive PTTEP towards excellence. We also work to strengthen awareness of good governance and compliance, and risk management to create a safe and efficient workplace that concurrently demonstrates transparency and accountability. Through these means, PTTEP can become a strong organization and a positive model for the private sector in Thailand.

▶▶ Governance, Risk Management and Compliance (GRC)



PTTEP recognizes the significance of effective integration of good governance, risk management and compliance (GRC) in the company's management processes and practices, to ensure that the company achieves its goals and sustainability. PTTEP has continued to promote GRC, both in the development of its work processes and other work systems, along with communication and building organizational culture on GRC, which is aligned with *EP SPIRIT* particularly on enhancing "Performance Excellence" and "Integrity and Ethics". In addition, PTTEP has established the GRC governance structure in line with the Three Lines of Defense Model principle.

- ▶ First line of defense is handled by front line staff and operational management who have day-to-day ownership and management over risks and controls. This group owns the risk and executes the corresponding control, as well as ensuring complete compliance with laws and regulations.

- ▶ Second line of defense is handled by internal monitoring and oversight functions. Second-line functions may develop, implement and modify internal control and risk processes of the organization.
- ▶ Third line of defense is handled by internal audit function. This function provides a level of independent assurance that the risk management and internal control framework is working as designed.

GRC was set as a part of the company's strategy, as it is a strategic enabler for the company to achieve its goal. PTTEP adopted the 5-year roadmap (2017-2022) to establish the direction of our GRC development. We conduct annual reviews of the plan, and aim to embed GRC principles at the heart of PTTEP's organizational culture by 2022. This implies that our employees will respect, understand, and comply with GRC principles, and integrate GRC harmoniously into their operations and work practices.



GRC 5 Year Roadmap



PTTEP has regularly organized GRC communication activities, particularly internal communication with a focus on the objectives of integrating GRC principles in operations, and building awareness of GRC with its applicability in all work processes and practices. In addition, executives frequently communicate GRC to promote integrity through “Tone from the top”. PTTEP is also aware that all relevant actors in our business ecosystem have important roles in driving the company to GRC success. We communicated GRC principles and approaches externally to joint venture partners, suppliers, and other external parties, e.g. through a seminar on “Driving Proactive Sustainability”. Our CEO was a panelist on a discussion on PTTEP’s GRC good practices in driving the company to sustainability, and exchanged progress of GRC with other private companies and regulators, such as The Securities and Exchange Commission of Thailand and Bank of Thailand.

External communication on GRC good practices
PTTEP organized a seminar on “Driving Proactive Sustainability”
 on 14 August 2018 for listed companies, investors, and the public. This seminar was an opportunity to provide a platform to exchange practices, ideas and guidelines on good governance, risk management, and compliance in order to drive the business to sustainability. 350 people attended the seminar and 3,100 people watched it online.

In 2018, PTTEP has made significant progress in strengthening GRC, to promote GRC within the company and to build GRC awareness for external parties. The progress in 2018 include:

▶ **Reviewing GRC Management System Manual**



to improve the integration of the GRC management framework, in accordance with the international guideline of Open Compliance and Ethics Group (OCEG);

▶ **Improving coordination and work process among Assurance departments, or the Second Line of Defense**



to increase efficiency and reduce duplication of work. Progress started with Corporate Governance Department, Enterprise Risk Management and Internal Control Division, Compliance Department, Internal Audit Division (in phase 1), and Insurance Department (in phase 2). The plan is to continue and expand this work integration to other relevant departments in 2019.

▶ **Publishing GRC Integrated Report**



quarterly report on overall GRC performance to Management

▶ **An evaluation was performed by external independent auditors with expertise in GRC in the 4th quarter of 2018**



has shown that GRC organizational culture in PTTEP is strong. PTTEP employees prioritize GRC as their work principle, support the integration of GRC into their operations, and trust that GRC principles will drive the company to sustainable growth. However, the company will continuously communicate and improve on GRC training to employees in order to create a better understanding and increase accessibility.

Complaint Handling and Reporting of Breaches

PTTEP has adopted Whistleblowing Regulations and whistleblower protection procedures to ensure that our complaint handling process is transparent, fair, and complies with international standards. We have established various channels to file complaints, including mail and email to committee, supervisors, Corporate Governance Department, Company Secretary Division, and through a complaint filing system on PTTEP website. The Corporate Governance Department and

the Company Secretary Division are the main bodies in complaint handling in accordance with the Whistleblowing Regulations and protection procedures.

In 2018, PTTEP has received 10 reports of breaches. After considering evidence and witness accounts, 6 cases were accepted for further investigation. Currently, PTTEP has closed 5 cases, while 1 case was under investigation. The information of these reported breaches are as follow:

Topics	2016	2017	Change
Whistleblowing cases	8	10	25% ↑
Whistleblower			
▶ External	4	2	50% ↓
▶ Internal	2	7	250% ↑
▶ Anonymous	2	1	50% ↓
Accepted cases after considering evidence and witnesses (Number of cases)	7	6	14% ↓
Wrongdoing cases (Number of cases)	3	3	-

From the investigation in accordance with the Whistleblowing Regulations and whistleblowers protection procedures, it was found that 3 cases are breaches of Good Corporate Governance and Business Ethics (CG&BE) Regulation. The wrongdoers have been penalized in accordance with the company's HR Regulations 2005. The 3 cases of wrongdoing were:

1. A conflict of interest relating to recruitment.
2. Use of the company's information for personal activity.
3. Fraud on a Low Value Procurement (less than 500,000 baht of value), resulting in total procurement value at 1.2 million baht.

All 3 cases of wrongdoing did not cause significant or financial damages to the company. The Corporate Governance Department has reported the result of the

complaint investigations to the complainants. The Audit Committee or the Corporate Governance Committee (as the case may be) and the Board will use the reports to further improve the company's internal control measures.

In addition, the company reviewed whistleblowing regulations and protection procedures in 2018 to ensure clarity, thorough coverage, and suitability of the process. The revision affected topics such as mediation and reporting information to government organizations by law. The revised regulations have become effective on 1 January 2019. Moreover, we have also improved the Whistleblowing System to allow for "Two Way Communication" in order to effectively communicate with the whistleblowers, and adjusted procedures to be in compliance with the revised regulations.



Risk Management and Emerging Risks

Through PTTEP’s perceptive approach to Integrated Risk Management and the refocus of the business portfolio to increase investments in new businesses, we are facing new business opportunities that come with new and unprecedented risks. PTTEP pays significant attention to these new risk factors and new impacts that would affect the organization. For these reasons, we have improved the risk management and risk governance frameworks through adjusting roles and responsibilities of the Risk Management Committee to cover risk governances in new businesses, as well as thoroughly reviewing the company’s risk appetite and improving the risk management process to accommodate the revised business strategy. All these adjustments in our risk management approaches and processes are to ensure that they support our future growth arising from investments in new businesses.

Risk Management in Operation Sites

In 2018, Zawtika project in Myanmar has been accredited the ISO 22301:2012 (Business Continuity Management) certification, adding into the list of ISO 22301: 2012 accredited operational sites including PTTEP Headquarters and the Petroleum Development Support Base (PSB) in Songkhla, Thailand, which were accredited in 2017.

The Business Continuity Management system minimizes significant risk impacts on natural gas production in the Zawtika Project, as the system provides contingency planning and risk mitigation measures to mitigate risks, including:

▶ **Risk preparedness at offshore production platforms, to mitigate impacts caused by the following risks:**

Damage to production platforms or subsea pipelines: Apply a preventive safety measurement, for example, pre-caution radar, intervened boat for vessel distraction, and temporary stop-work system.

Damage to critical equipment: Conduct preventive maintenance, regularly check sub-sea equipment, use earthquake resistant equipment, and reduce damage arising from corrosion.

Gas leaks and fires: Install gas and fire detection system, spare parts, CCTV, and have an emergency response plan.

▶ **Risk preparedness in office area, to mitigate impacts caused by the following risks:**

- Mob and Protest: Have an emergency response plan
- Fire: Smoke and fire detective system
- Other emergencies



▶▶ Supply Chain Management and Supplier and Vendor Development for Sustainability



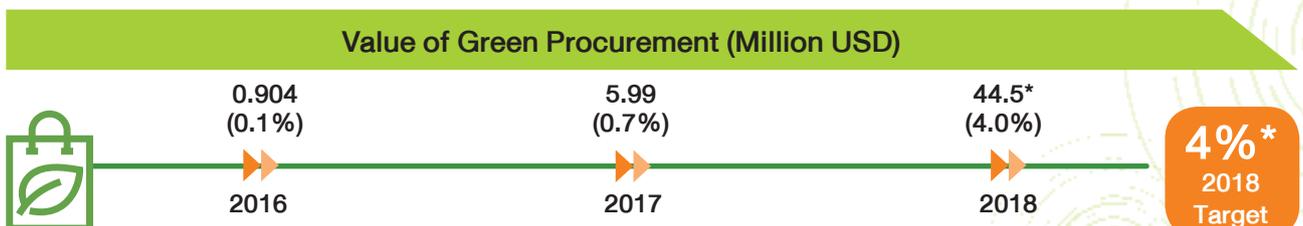
Supply chain management does not only prevent negative impacts on the business or the company’s reputation, but also help to improve work efficiency, transparency, and creates shared value for both the company and our suppliers. The company has an encompassing supply chain management framework that begins with the initial process of vendor and supplier selection, through to supplier risk management on environmental, social and governance (ESG) issues, and supplier relationship-building and capacity building. Across these processes, the company applies digital technologies to help improve our management efficiency and ensure that supply chain management is consistently more systematic at each stage, as examined below.

Procurement and Contract Policy and Strategy

PTTEP has in place the PTTEP Vendor Sustainable Code of Conduct which governs the conduct of vendors on issues relating to their business operations and ethics, human rights, occupational health and safety, as well as environmental expectations. This enables the company to achieve the highest value in economic terms, and reduce the risks associated with PTT Group’s procurement and contracting activities. In 2018, significant improvements relating to procurement and contracting included the following:

Green Procurement

A component of PTTEP’s Supply Chain Management Policy, the company developed a PTTEP Green Procurement Roadmap. Beginning in 2017, the company developed the “Green Procurement Criteria” for each of the work categories, which were then certified by the Thailand Environment Institute (TEI), and also developed an approach to evaluate the environmental considerations of procurement practices. In 2018, the company formulated additional Green Procurement Criteria for 10 more work categories, an increase from 6 work categories in 2017. These additional work categories that were selected from categories that had procurement plans for 2018, their value, and potential environmental impacts. Overall, green procurement constituted 4% of total procurement value in 2018, and the goal is to increase that number to 30% by 2022.

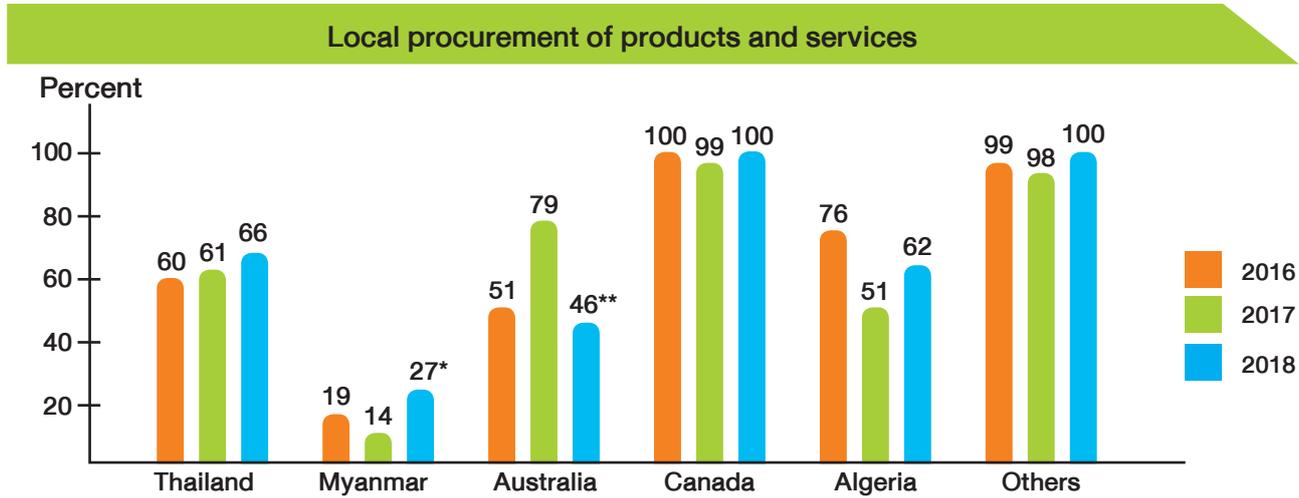


* The value of procurement that complied with Green Procurement Criteria covered by 16 work categories and the target for green procurement set in 2018



Local Content

To support local businesses, PTTEP encourages our local suppliers who have the capability of developing products and services through the use of various innovations, to make sure that the quality of their products and services are in line with PTTEP’s standards and requirements. In 2018, the percentage of local procurement of products and services for each business unit, in PTTEP’s various countries of operations, were as follows:



* Number of local suppliers in Myanmar is lower than other countries due to a lower number of qualified suppliers
 ** Total procurement value decreased due to Montara Project was divested on 1 January 2018

Code of Conduct

The company has developed a code of conduct for our vendors and suppliers in order to support ESG risk management as well as enhance and develop their capabilities, specifically on compliance with newly issued laws that may be difficult to understand and thereby slow down the procurement process. Given this, the Vendor Code of Conduct is a vital component in the smooth running of PTTEP’s business operations and in achieving the organization’s objectives.

In 2018, the Company developed the following standards, rules, and internal processes related to supply chain risk management:



Updated the PTTEP Vendor Sustainable Code of Conduct

by encouraging suppliers and vendors to communicate PTTEP’s policies and aforementioned guidelines to their own suppliers, or to develop their own supplier guidelines for PTTEP’s non-tier 1 suppliers and down to their own tier 1 and non-tier 1 suppliers, by focusing on 4 dimensions: 1) Business ethics 2) Human rights 3) Occupational health and safety, and 4) Environmental management.



Developed the Environment, Social, and Governance (ESG) Supplier Audit Manual

to create awareness amongst suppliers on practices in line with sustainability guidelines and reducing ESG risks that may occur throughout their supply chain. The Manual will also help PTTEP to communicate with our tier 1 suppliers about the company’s Human Rights Management System Guideline, focusing specifically on supplier engagement, and supplier ethics and labor rights, to reduce the risks of non-compliance with the company’s human rights principles and to ensure legal compliance.

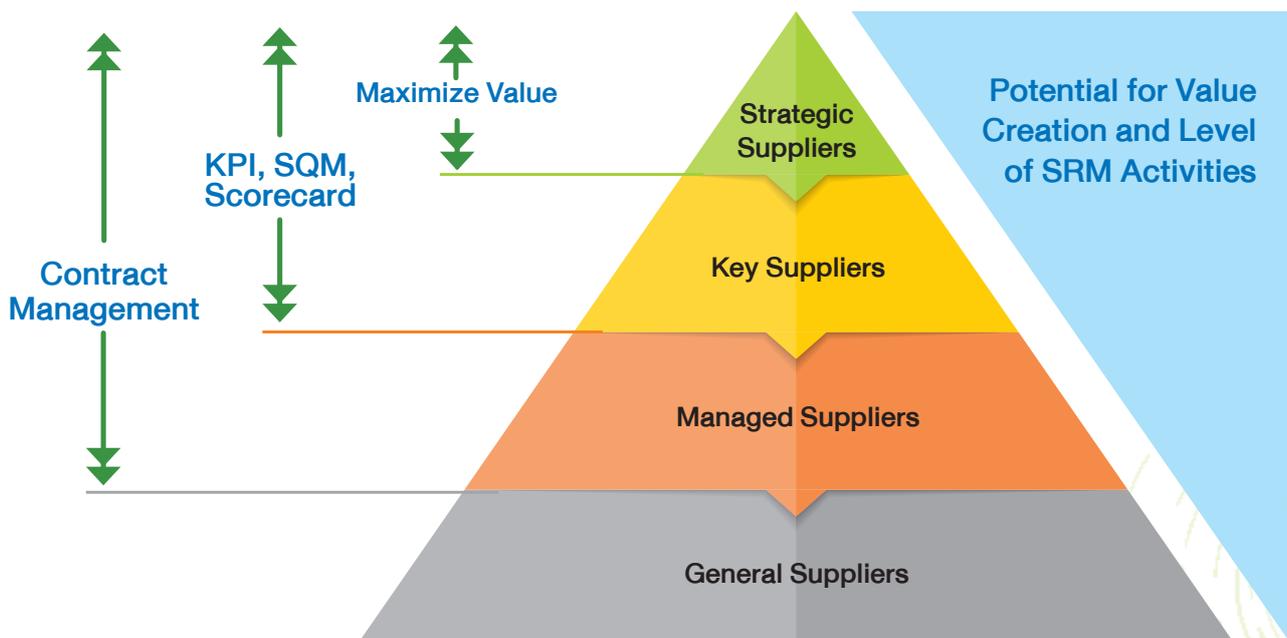
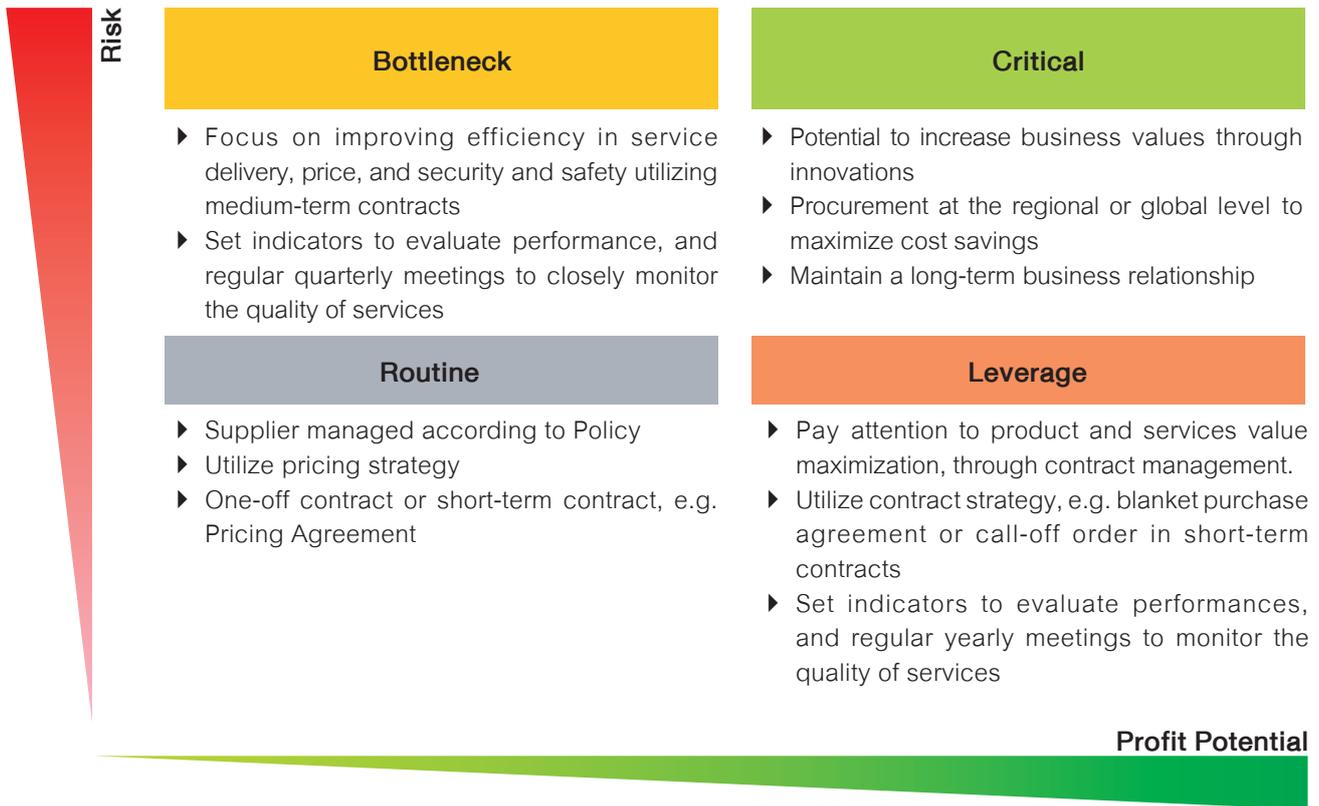


Revised the company’s Internal Procurement Rules to align with the Government Procurement and Supplies Management Act, B.E. 2560,

which will help us to maintain the highest benefits, select capable suppliers through an electronic bidding (e-bidding) process, and also increase the transparency and accountability of the procurement process.

Category Management

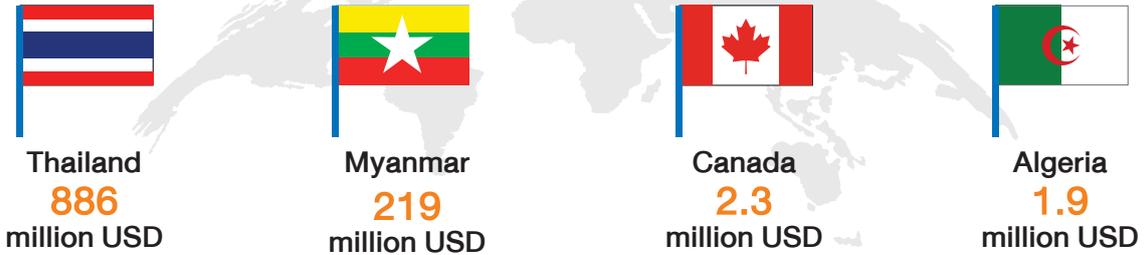
PTTEP manages its work and product categories according to value and risk, and regularly conducts analyses of markets and internal demands to determine the most efficient procurement strategy in terms of capital, punctuality, compliance to standards, and the degree of ESG integration into the procurement processes. All of these measures are to ensure that our approach to category management aligns with the company’s sustainability policy, as demonstrated by the following illustration:



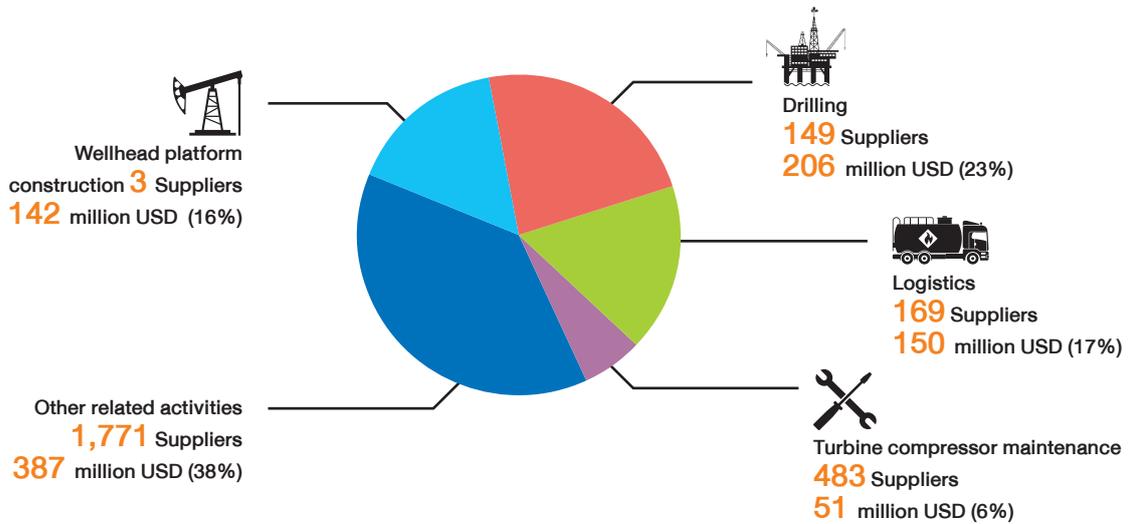
Furthermore, the company’s approach to category management is also used in categorizing suppliers for supplier relationship management, and to improve procurement processes so that they are suited to each type of product or service group.

PTTEP's 2018 Suppliers

As of 2018, PTTEP has the following number of suppliers in each country, categorized as follows:



PTTEP has 2,575 tier 1 suppliers in Thailand who represent a total procurement value of 886 million USD, and are divided into the following work categories:



Critical Supplier



36
constituting 1.4% of all suppliers,
account for
539 million USD
in procurement spending, or 61% of
total procurement spending.

Critical Non-tier 1 Supplier



55

80% of company's critical suppliers are from 6 main work categories: Wellhead platform construction, Drilling, Logistics, Casing, Tubing and Accessories, Turbine Compressor Maintenance, and Wireline Cased Hole Logging and Perforation

Quality, Transparent, and Accountable Procurement

PTTEP increased the portion of our suppliers secured through the bidding process to 80% of procurement spending in 2018 in order to improve our opportunities of identifying quality suppliers. This would not only open the door for capable suppliers to propose their products and services that align with the company's need, but also help to reduce the company's cost.

Moreover, the company has defined supplier control and audit process to ensure that they are complying with standards, contract agreement and in compliance with SSHE standards.

Significant Progress in the Sustainable Procurement Process

▶ Fair competition:

Carried out procurement activities while promoting competition in order to create transparency and provide opportunities for fair competition. Furthermore, the company worked to ensure compliance with relevant laws, such as the Government Procurement and Supplies Management Act, B.E. 2560, and verified that our processes aligned with the public sector's management quality criteria.

▶ Supplier selection:

Updated supplier selection methods by giving weighting to supplier quality and price, to ensure that the company will engage with quality suppliers at an appropriate price through a transparent and accountable procurement process.

▶ Update of procurement process:

In 2018, PTTEP developed a plan to improve our procurement, approval, and selection processes so that they are more efficient, high quality, and flexible. The company also applied digital technologies into procurement processes to increase speed and accuracy, and to keep up with constant information exchanges, such as during the process of requesting an electronic quotation, or e-RFQ. PTTEP also integrated principles on category management into the improvement of our procurement processes so that they were suitable for each product and service group.

Significant Progress in Contract Management

▶ Communicating the Vendor Sustainable Code of Conduct

PTTEP prioritizes communicating and collaborating with suppliers by creating an understanding of the company's standards and strategies. This will help our suppliers to fully comply with the company's expectations, as well as develop their own capabilities, advance their businesses, and work together as a team with PTTEP to reach the same objective.

In 2018, the company communicated our supply chain management policy and guidelines through various activities and projects, including a workshop on business ethics and the Vendor Symposium, which communicated to suppliers the future challenges of supply chain management at the international level and ways of working towards ESG integration in their own businesses. There were a total of 2 communication activities held, with a total of 96 participants attending the seminar and activities, or 6% of the company's suppliers

▶ Supplier Audit

Determine supplier management measures and audit suppliers to make sure that they are complying with international requirements; assess the capabilities of their production in maintaining the quality of products and services, and encourage their adherence to the Vendor Sustainable Code of Conduct. Examples of audits include the ESG On-site Audit and Key Supplier Site Visits.

PTTEP supports Thailand's
National Anti-Corruption
Strategy through our
participation in the
Integrity Pact
for the second consecutive year.



Sustainability in Supply Chain

Supplier ESG assessments in 2018

100%
of PTTEP's **149** new vendors were screened using business capability, environmental social, and governance (ESG) impacts, human rights, and labor rights criteria.

For the past 3 years, PTTEP has been conducting supplier risk assessment

1,100
tier 1 suppliers
(39%)

100
critical non-tier 1 supplier
(35%)

Increased on-site audits to cover 26 Tier 1 suppliers including Prequalification, environmental social, and governance.

Additionally SSHE On-site audit was done on **48** suppliers.

100% of sustainability high-risk suppliers audited in 2017 completed the corrective actions and passed the follow-up audit with good and excellence level resulting no further corrective actions.

100% of 7 sustainability high-risk suppliers audited in 2017 passed the audit with good and excellence level resulting no corrective action required.

Inventory and Logistics

To maintain the value of the company's inventory within a reasonable level, PTTEP initiated a project to manage our product inventory by focusing on the Bongkot, Arthit, and S1 Projects, whose combined inventories constitute 92% of the company's total inventory value. Following this, PTTEP was able to reduce our inventory value by 12.8%, compared to the target of 8%.

Significant Progress on Inventory Management

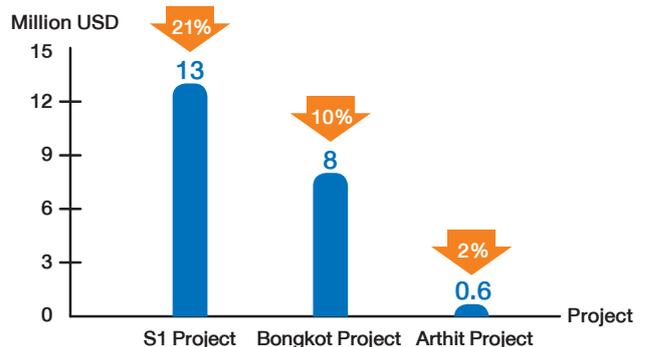
 **Revise approach for parcel management**, beginning with the design, characteristics, procurement, storage, disbursement and sales, so that the process is efficient and aligns with the company's internal controls and related government regulations.

 **Reduce the need for inventory storage** by applying the Vendor Management Inventory (VMI) principles, which eliminate the problem of stock shortages and reduce the need for storage.

 **Improve the levels of parcel storage** so that they are suited to actual need, in turn reducing the overall quantity of parcels stored and supporting the better management of the storage space.

 **Manage integrated parcel disbursement using the Custody Material Management System**, which helps to manage the disbursement of parcels that still retain their condition and can be reused – thus bringing the parcels back into the inventory to prevent overlapping purchases, reduce losses, and prevent the parcel from going out-of-date due to improper storage. This will directly deliver benefits to the company by reducing procurement and production cost.

Inventory value in Thailand decreased according to the 8% target



Apart from managing our inventory, PTTEP carries out various projects that aim to increase the efficiency of procurement practices that positively impact upon our operational capital, safety, and the environment. The company improves the efficiency of marine logistics through two main projects:

▶ **The “SPEND SMART” Project,**

which generated cost savings from procurement process of more than 112 million USD in 2018, from the target of 103 million USD. Moreover, the company improved other process management for increased efficiency and cost reduction in supply chain management. For example, increased the storage area on the vessel per trip,

from 82% in 2017 to 89% in 2018, and reduced the use of marine gas oil from 1,010 liters per hour in 2017 to 968 liters per hour in 2018. In turn, this reduced greenhouse gas emissions by more than 40,718 tons CO₂ equivalent, and increased the efficiency of inventory storage given that inventory value decreased by 12.8% from 2017.

▶ **The “Smart Marine Model” Project**

in the Republic of the Union of Myanmar, which operates using the Centralized Vessel Utilization Management approach which helped the company conserve fuel use by more than 1.4 million liters, or the equivalent of 5,000 tons CO₂ equivalent in greenhouse gas emissions reduction.

	Progress of the Spend Smart Project	2016	2017	2018
	Number of vessel trips between the Petroleum Support Base in Songkhla province and the petroleum exploration and production sites in the Gulf of Thailand (Number of trips per month)	34	27	22
	Vessel storage use per trip (Percent)	86	82	89
	Carbon footprint reduction (Tons CO ₂ equivalent)	49,788	51,974	40,718
	Cost reduction from efficient supply chain management under Spend Smart Project (Million USD)*	72.5	105	112

*Represent in carry over amount

In addition, the company has identified opportunities to apply digital systems into supplier management, as it will not only help to increase efficiency, but also manage risks in a more encompassing and comprehensive way. PTTEP therefore digitized our operational systems in various ways – under the framework of the ‘Transformation’ Project – covering the supply chain management process from the procurement and contracting stage to purchasing and delivery of products and services.

As for plans in 2019, the company will focus on consolidating our supply chain management systems and processes by increasing analyses of supplier data, the value chain, and external information – and integrating them into the company’s system. Plans are also focused on connecting supply chain processes from procurement planning to logistics and service payments in order to increase flexibility and better support electronic procurement



Updated the Vendor Management System to facilitate suppliers’

experiences and reduce the complexities associated with filling in supplier information forms, connecting information, and issuing purchase orders. This will, in turn, help to reduce potential mistakes during the registration and purchasing processes. The system also uses Shipment Tracking to monitor the status of the shipment by using a digital dashboard that allows for relevant departments to monitor the status of a product’s shipment from producer to receiver, thus reducing losses

Supplier Relationship Management

PTTEP oversees our suppliers by monitoring and conducting audits of supplier performance to make sure that suppliers are adhering to the standards and agreements stipulated in their contracts, and are also complying with the company's SSHE standards. The company manages supplier relations according to supplier group and the types of products and services that they provide. All of this is to ensure that PTTEP can build positive relationships and long-lasting partnerships with suppliers; create maximum efficiency in terms of capital, reduce risks, and jointly create innovations with suppliers in the future.



All suppliers have received communication about, and developed an understanding and acceptance of, the PTTEP Sustainable Vendor Code of Conduct. This was achieved through the company's Vendor Management System, which acts as a one-stop interface for suppliers and provides channels for them to get involved in various activities throughout the year. Through these means, PTTEP can foster mutual relations with suppliers as well as encourage their awareness and acceptance of the Sustainable Vendor Code of Conduct. Activities include SRM Day (SSHE Day), Supplier Site Visit, ESG Audit, Vendor Symposium, a CSR activity building salt licks at Khao Yai National Park, and M2M Management Meeting.

Supplier and Vendor Engagement in Social Projects and Activities

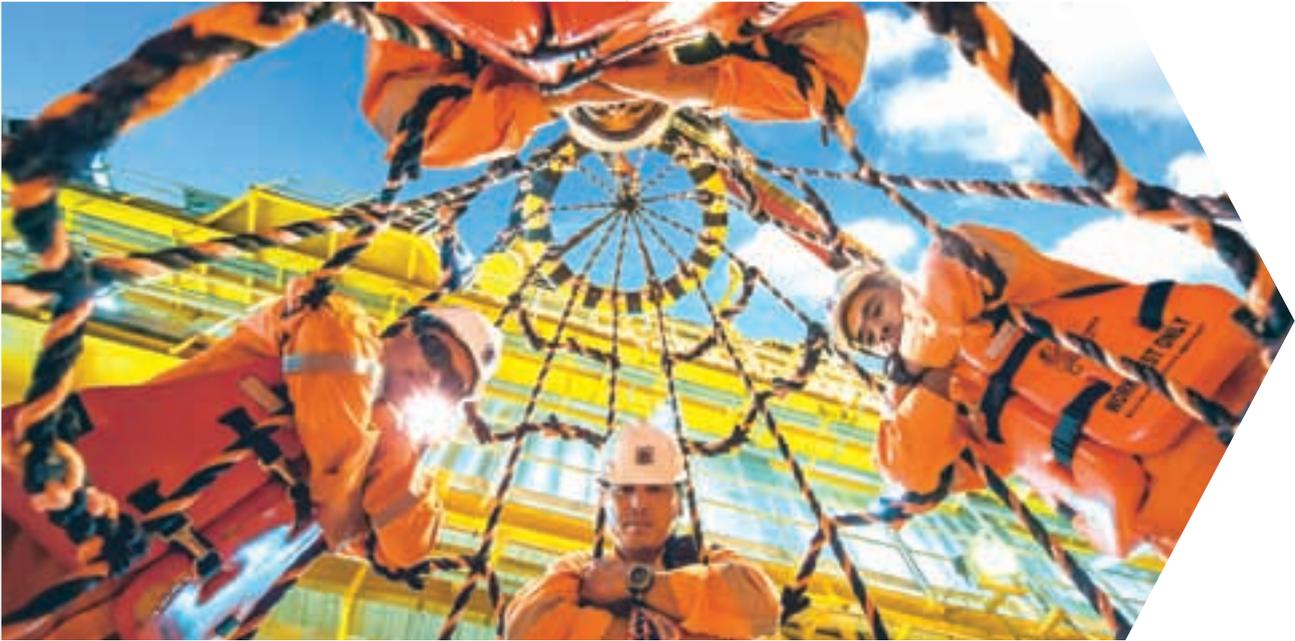
In considering the importance of community, social and environmental development in parallel with business operations, PTTEP, in collaboration with 16 representatives from 6 companies of our vendors and suppliers, carried out social activities to promote better livelihoods, community support and development, and to foster good relationships with communities surrounding our operations. There were a total of 63 people who participated in this activity.

In 2018, PTTEP organized the SSHE Contractor Forum

to communicate our policy on procurement and sustainable supply chain management. The Forum is a key platform for the company to jointly engage with suppliers to create awareness about good business practices, so that suppliers are able to build continuously upon those practices to deliver tangible results.



▶▶ Maintaining High Safety Standards



PTTEP creates a culture of safety for all of our employees and contractors, in every stage of work. The company has in place a policy and a Safety, Security, Health and Environment (SSHE) Management System, which aligns with international standards, to manage risks and ensure that no accidents occur in the workplace.

PTTEP's 2018 Safety Targets

Personal Safety



Lost Time Injury Frequency
(LTIF)
≤ 0.14 cases
per million hours worked

Total Recordable Incident Rate
(TRIR)
≤ 0.84 cases
per million hours worked

Occupational Health and Safety



Total Recordable
Occupational Illness Rate
(TROIR) for employees at
zero

Crises and Emergencies



Zero
incidents of security
breaches

Process Safety

PTTEP is fully invested in the safety of our production processes in order to protect against any negative impacts on the company, society, and environment. Our Safety, Security, Health and Environment (SSHE) Management System and Process Safety Management align with the requirements stipulated by the International Association of Oil and Gas Producers (IOGP) and PTT Group. In 2018, PTTEP saw positive improvements in

our process safety performance, where overall there was a continuous decrease in the number of accidents. Part of that achievement stems from our proactive management measures, which include conducting a Loss of Primary Containment Survey, Management of Change, as well as enhancing process safety management awareness and implementing the “My Barrier” program.

Personal Safety

	Loss Time Injury Frequency (LTIF) 2018 Target: ≤ 0.14 cases per million hours worked		
	2016	2017	2018
Employees	0	0.12	0
Contractors	0.14	0.09	0.10
Total	0.10	0.10	0.07

	Total Recordable Injury Rate (TRIR) 2018 Target: ≤ 0.84 cases per million hours worked		
	2016	2017	2018
Employees	0.56	0.75	0.59
Contractors	1.01	0.76	0.82
Total	0.88	0.74	0.75

The analysis of work-related accidents that was conducted in 2018 shows that the primary causes of accidents stemmed from the following issues: lifting and dropped objects, land transportation, leakages, leadership, and involved parties in communicating dangerous incidents. In response, PTTEP developed the 4Ls Safety Management Program, and in this past year we emphasized safety leadership for those in

charge of operations – empowering them to manage risks and dangers, communicate more effectively, and ensure the safe management of operations. The Program will be expanded to cover contractors through training sessions in 2019. At the same time, PTTEP will provide training for employees and contractors involved in activities related to lifting and dropping objects.

Program or Course	Training Sessions	Participants, including Contractors
Safe Lifting Operation Training	7	336
DROPS: Train the Trainer	1	32
DROPS: Onsite Coaching	2	53
SSHE Leadership for Frontline Supervisors	4	63

* Total Contractors

Furthermore, the company has developed the SSHE for Frontline Supervisors Handbook, the Logistics Safety Manual, and provided training for employees and contractors in order to prevent accidents or damages that may result from land transportation.

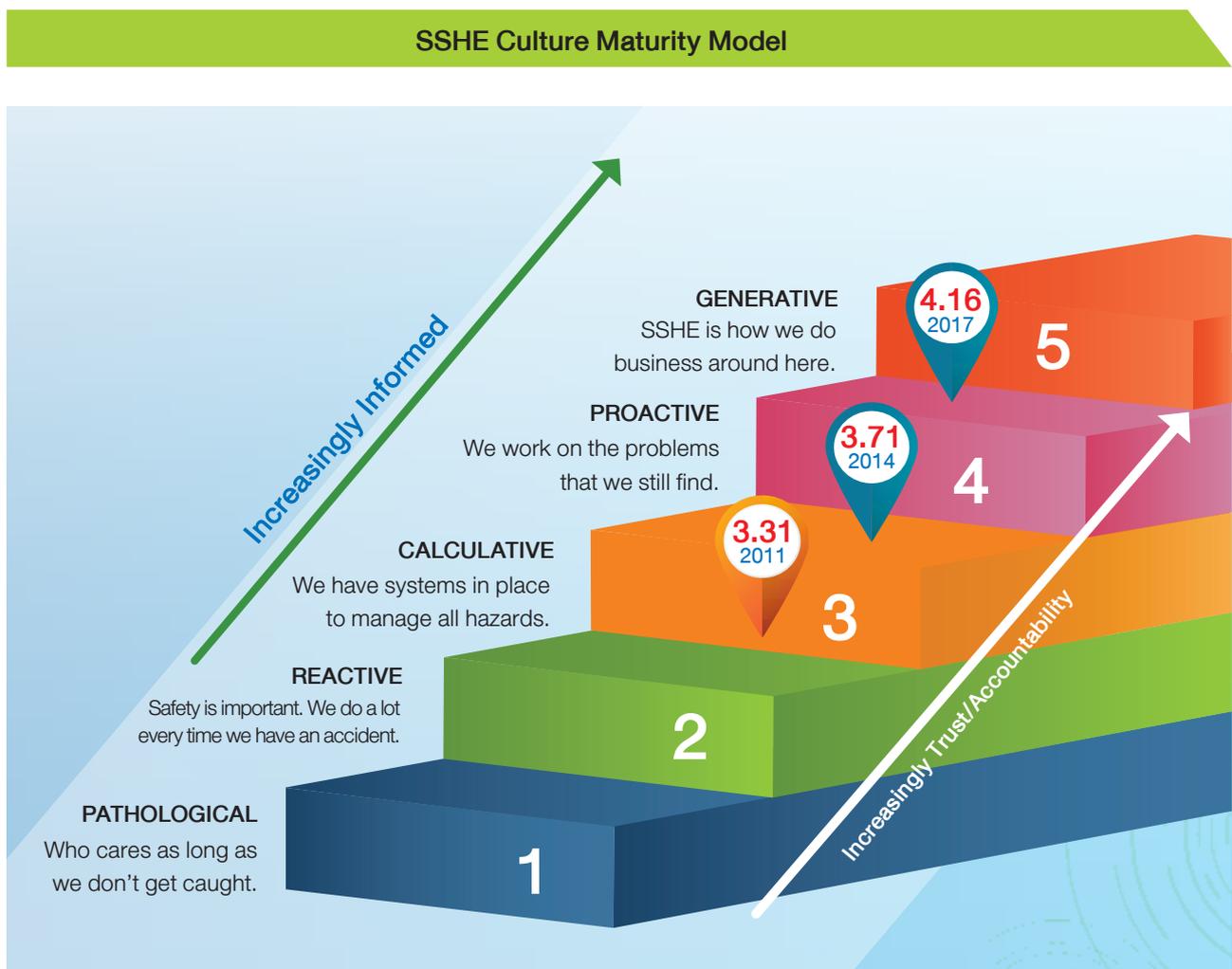
In 2018, the company received a report on the fatal injury of one contractor, who had been undergoing treatment following an accident involving electrical work 8 months ago. Following this incident, the company strengthened our safety oversight in operations, communicated closely with contractors, organized trainings, and enforced strict measures to prevent the reoccurrence of such a tragic incident.

Since 2011, PTTEP has been working to foster a culture of safety, security, health and environment throughout the organization. The company employs a safety model that aligns with the model developed by the International Association of Oil and Gas Producers (IOGP), the SSHE

Culture Maturity Model, to monitor our progress and performance on safety issues. The company has established the goal of achieving a “SSHE Culture Level 5”, the highest level possible, in order to embed safety as an ingrained behavior amongst employees by 2020.

Over the past 8 years, we regularly revised and updated our management approach and organized various events and activities, as appropriate for each operational area, to create safety awareness amongst our employees. This has resulted in the consistent improvement in the SSHE culture of the organization. Indeed, based on the latest survey in 2017, the result of SSHE Culture Survey was 4.16 out of 5, based on the participation of over 98% of employees.

The company also prepared the Three-Year Safety Plan (2018 - 2020) to elevate the quality of our SSHE culture prior to the next survey in 2020, e.g. improving the quality of safety observation data, encourages SSHE communication, etc.





Safety, Security, Health and Environment of Suppliers and Contractors

PTTEP’s contractors have always demonstrated their commitment to the safety policy of the company. In order to create mutual understanding on this important issue, PTTEP also partnered with our suppliers and contractors to organize the 2018 SSHE Contractor Forum under the theme, “Safety, Security, Health and Environment (SSHE) Leadership in All Levels.” The Forum was designed to foster knowledge and understanding of SSHE performance standards and to encourage employees at all levels to prioritize SSHE in all of their work processes.



“

I participated in PTTEP’s training courses to make sure that we are equipped with the sufficient readiness and capability to do our work safely and efficiently, according to the regulations and requirements on safety, security, health and environment. We also have a safety analysis process that specifies detailed safety measures. Not only that, PTTEP also facilitates our convenience and ability to work together on their operations, and so I feel like it has become another home for me.

”

Mr. Tanurat Reangporahom
Scaffolder, DSL Thailand Limited



“

PTTEP has in place various working requirements and regulations that everyone should adhere to for their own safety, and that also includes providing us with high quality personal protection equipment. This gives us the confidence in our work and is one way in which PTTEP will be able to achieve its zero accident target.

”

Mr. Piraphan Pengtham
Mechanical Technician,
CR Asia (Thailand) Co., Ltd.

Occupational Health



In addition to safety, the company cares for and monitors the occupational health of all our employees and related stakeholders. In 2018, there were no occupational illnesses recorded for employees, and the company achieved the Total Recordable Occupational Illness Rate (TROIR) target of zero cases per million hours worked.

Moreover, in 2018 the company increased testing for employees who are assessed to be at risk of exposure to benzene, mercury and arsenic through the Health Risk Assessment. Should employees be found to have levels of these substances that are higher than the industry’s limits, the employee will receive appropriate treatment, and the company will investigate the causes of exposure and conduct regular testing on the affected employees until their health returns to normal.

Emergency and Crisis Management



PTTEP has a robust and clearly delineated crisis management plan in place to prepare for any incidents that may affect our safety, security, health, the environment or have impacts on our stakeholders. The company regularly conducts crisis management response drills. In addition, we revised our oil and chemical spill response plan across all of our operational areas to ensure that it remains efficient and aligns with international standards. These measures, in addition to our top quality safety management system, resulted in zero security breaches in 2018, in line with our set target.



“

PTTEP's 'TARGET ZERO' sets a clear vision and highlights the importance of safety, leading us to the implementation of 'SAFE WORKING PLACE.' The Improvement of SAFETY PRACTICES is visibly seen through decreasing numbers of Incidents/ Accidents.

Mr. Aung Kyaw Htoo
Managing Director, Dare Co., Ltd.



“

SSHE culture makes our commitment stronger in SSHE. Improving standards in line with the best HSE practices of PTTEPI. Obviously, we achieve a safe and fun workplace at our all operations with PTTEPI. I can measure the benefits through a dedicated KPI for every project for direct observation of conditions and of people's behavior.

Mrs. Yadana Su Hlaing
Managing Director,
SMART Technical Services Co., Ltd.



“

I gained a lot of safety and health knowledge from PTTEP that I can apply not only in the workplace but also in my home. Management commitment and visible leadership in safety at PTTEP make me more confident to work. Here I can assist others by participating in PTTEP's Behavior Based Safety (BBS) program like SOC and HRC reporting and applying Stop Work Authority. PTTEP shared a lot of SSHE knowledge that everyone everywhere can apply to do their job safely. Management Leadership and commitment in SSHE for achieving Target Zero make me feel confident to work. Applying Stop Work Authority and promoting BBS will maintain and care for each other and to achieve Target Zero.

Mr. Thant Zin
Deck Crew, SMART Co., Ltd.



“

Emphasizing our services with PTTEPI, I realize that the improvement in SSHE culture enriches qualitative safety services and adheres to international safety standards. Hence, enhancing skill that allows us to undertake a greater variety of risk-bearing services with target zero.

Mr. U Ag Ye Moe
Director, Shwe Sandar Co., Ltd.

”



▶▶ Human Capital and Organizational Culture are Investments for Sustainable Growth



PTTEP is committed to treating all employees equally, promoting decent and a safe work environment, as well as inspiring and motivating employees to maximize their competency and performance in order to drive the company towards achieving its business objectives so that as our business grows so do our employees' capabilities and their careers advance.

Inspire, Attract and Retain Capable and Ethical Employees

PTTEP recognizes the emerging trend in the labor market of the increasing proportion of Generation Y and Generation Z employees. Therefore, the company has reviewed and improved its human resource management strategies to adapt to this changing trend.

Improving recruitment methodology to attract new generations through various social media platforms such as LinkedIn and Facebook. Besides this, the company has initiated plans to develop an online application for potential applicants to learn about PTTEP's business. The application will also provide a function for potential applicants to test their personality for job fit and value and culture fit before applying for a job with the company. These online initiatives not only better facilitate the job application process, but also place PTTEP at the forefront as an organization that embraces digital innovations.

Increasing proportion of the new generation in the labor market




Gen Y Gen Z





Scan here to go to PTTEP Career





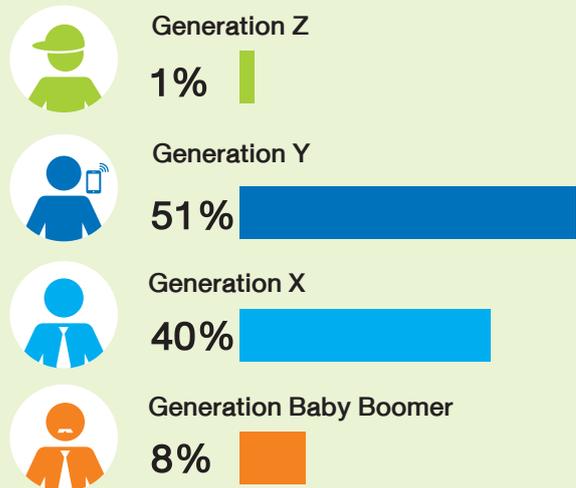
Scan here to go to PTTEP



Adjusting work environments to fit the new generation, by allowing flexible working hours, casual Fridays, as well as establishing a cozy, innovative and digital workplace called the “Innovation Playground” or “iPlay”; a modern and innovative common area for co-working, hot-desk (mobile office), relaxation and recreation activities. The area is also used to promote innovation activities such as Design Thinking Workshops and idea exchange event – “Kla (Share) Dee”. The company also set up additional Discovery club and E-Sport club, a total of 25 clubs to respond to global trends in the digital innovation.

Applying chatbot technology to assist human resource management. With this technology, employees can directly access human resource services including welfare, benefits and leave requests on their personal computers, tablets and smartphones. In addition, PTTEP has conducted a study to develop “Flexible Benefits” packages to meet individual lifestyle needs of each group of employees.

In 2018, PTTEP's workforce consisted of



In 2018, **68%** of applicants who have been selected to work with PTTEP are candidates sourced through **LinkedIn**, **20%** higher than the previous year.



Human Capital Development

In 2018, PTTEP restructured its organization to prepare for future growth in both existing E&P and new businesses by combining functions with similar roles and responsibilities in order to streamline end-to-end processes with appropriate level of authorities and promoting organizational culture that encourages trust and empowerment, enhances accountability and places a strong focus on team spirit (One Team, One Goal). To support the successful business and organization transformation, PTTEP started developing employees' capabilities by reviewing soft skills and leadership competencies and setting up the Digital Academy to equip employees with digital literacy and agile way of working.

Maintaining Business Continuity through Organizational Leadership

PTTEP developed a succession plan for management positions and a capability development plan for high-potential employees to equip them to be ready to take any vacant management positions in times of need in order to ensure the company's business continuity. PTTEP aimed at ensuring the 1.5:1 ratio of immediate successors to management positions and reviewed a list of potential successors on an annual basis to mitigate risk and potential impact from management retirement and resignation. In addition, PTTEP implemented a talent management program to enhance competencies of potential successors. In 2018, we organized the following activities:



▶ EP-LEAD Program

aims to develop capabilities of the next generation of leaders by providing them necessary knowledge and skills in business management and leadership and strengthen their network. Since 2013, the program has contributed to strengthening the organization and motivating high-potential employees to pursue their career advancement. 73 employees had participated in the program to date.

In 2018, the EP-LEAD I, II and III programs were organized to prepare high-potential employees for their future roles as Managers, Vice Presidents, and Senior Vice Presidents respectively.

▶ Leader in Me Program

is an extension of EP-LEAD I Program. The training coaches employees on self-understanding (Connect with Myself), and building meaningful relationships and adjust oneself to others (Connecting with Others). The program has also introduced new aspects of leadership while building positive attitudes towards their future roles as a leader ("Grow the Leader in Me) which are the foundations of good leadership and the basis for employees' success, confidence, and sustainable long-term happiness throughout their careers.

PTTEP also enhances executives' competencies and skills through various development programs such as Executive Coach, On-the-Job Assignment on significant projects and Constructive Feedback sessions, etc.



EP-LEAD Program Participants

during 2013 - 2017

94
persons

in 2018

73
persons



Continual Development of Organizational Leaders

organizing regular training to enhance leadership capabilities yearly to drive the organization’s visions, missions, values and organizational cultures. Activities organized in 2018 include



Power in Me*

- ▶ Building visionary leadership targeting self-development. The rationale of the project is to reflect that an individual has choices and can train oneself to adopt new behaviors that influence sustainable success. The individual can also act as a role model and support other team members in order to strengthen work relationships and trust within the team.

Program Participants **2018**
163



Human Resource Management
 for Executives (HR How-To)

- ▶ Providing knowledge on human resource management policy and practices through case studies, group discussions, exchanges of experience and best practices from human resources executives. The training aims to promote information sharing and create mutual understanding on the interpretations of regulations and practices in compliance with the relevant laws and regulations.

Program Participants **2017** | **2018**
243 | **79**



PTT Group Leadership
 Development Program - GLDP)
 and Government’s Executive
 Development Programs

- ▶ Nominating leaders to rotate among PTT Group flagship companies and participate in the PTT Group Leadership Development Program and government’s executive development programs such as Thailand Energy Academy, Capital Market Academy and CGD courses.



Adaptive Leadership

- ▶ Reviewing competencies required for leaders in order to successfully transform the business and the organization. The company shall start developing leadership competencies in accordance with the new “Adaptive Leadership” model in 2019.

* To develop this program, PTTEP analyzed feedback from employee engagement surveys and the evaluation of 360 performance appraisal.



Human Capital Development

- ▶ Developing employee's competencies to enhance PTTEP's competitiveness or support business expansion in the future

In 2018, PTTEP has continued to enhance employee's competencies in three core areas to support the company's competitiveness and business expansions in the future. These areas are

- ◆ Exploration Success
- ◆ Joint Venture Management and
- ◆ Merger and Acquisition – (M&A).

In addition, the company has continued developing capacities of local employees in Myanmar a strategic investment location for the company. The initiative aims to build their competencies and expertise and to equip them to be ready to replace expatriates in key positions in Myanmar in the near future. Besides, PTTEP also seeks to recruit external experts to support work which requires expertise in areas that PTTEP presently lacks.

- ▶ Overall competency development

PTTEP implemented the Individual Competency Development Plan (ICDP) using 70-20-10 development model which is a proportion of learning and development through On-the-Job Assignment (OJA), coaching and mentoring, and formal training, respectively.

- ▶ Competency Review to Support Business and Organization Transformation

PTTEP has reviewed leadership and employees' soft skills competencies required to support business and organization transformation. In addition, the "Digital Academy" was established in order to equip employees with digital literacy and knowledge and skills related to the agile way of working. In 2018, employees are provided with training programs such as Design Thinking Working and Agile Coach.



1,650 employees
developed according to the ICDPs
or **80%**
of those having ICDPs in place



5% increase in
overall competency
higher than the target set at 3%



4% increase in competency
of technical job function
higher than the target set at 2%



The total expense for training and employee development was **5,970,885 USD**



Average training and development per employee **55 hours/year**



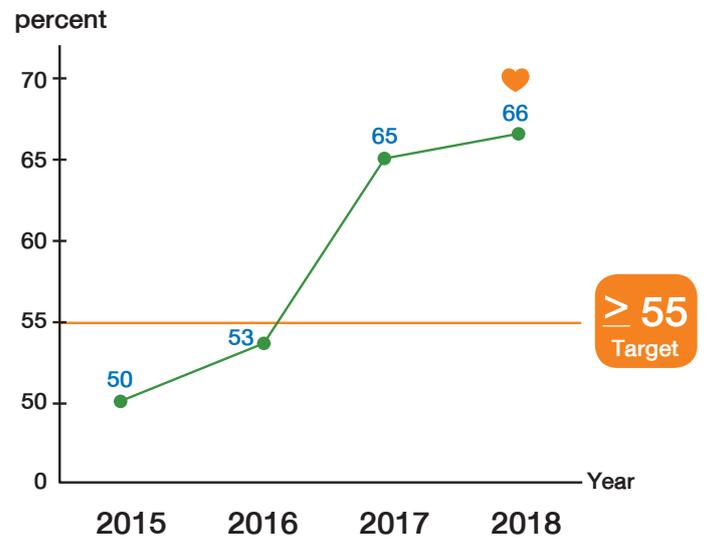
30 scholarships, with a value of **853,310 USD** for high-potential individuals in Thailand and overseas

Strengthening Organizational Culture

PTTEP organized various programs to increase employees' engagement and strengthen the EP SPIRIT culture in everyday life. More than 230 employees from 60 business units were nominated as EP SPIRIT Transformers to promote and drive the EP SPIRIT values in their own functions through various communication channels and activities, with the main objective to build a good and collaborative work environment in the organization. These activities have been strongly supported by PTTEP management at all levels.

In 2018, the company organized the "Best Company Visits" for EP SPIRIT Transformer to take a tour of various leading companies well-known for their successful transformation with strong and supporting organizational culture with an aim that the EP SPIRIT Transformers will apply their learning in building up the core values in PTTEP. Furthermore, PTTEP has organized a monthly activity "Kla (Share) Dee" to enhance corporate values through exchanges of ideas/experiences among employees.

Employee engagement



Interview



“

What I like about working here are the opportunities to learn and to grow in my career path. I had the opportunity to fully utilize my capabilities and the company offered a good remuneration in return. I also learned a lot of new ideas and ways of working from colleagues from different business units who are the ones driving PTTEP forward. We all see challenges as opportunities for self-development. And I believe that these are what the next generations are looking for in a career path.

Kasama Ittisawadipant
 Engineer, Reservoir Engineering

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“

I have been working with PTTEP for 19 years. When I first started most of our operations were in Thailand. Today, our operations have expanded to more than 12 countries worldwide. Over time, we have faced challenges and unpredictable hurdles in our business operations. But with clear goals and our highly competent employees, the company has achieved and are ready to build on our achievements in increasing exploration successes, in line with the company's mission and vision.

Passakorn Suwanruji
 Vice President, Malaysia Exploration Project

”



Apart from the support and care we have for our employees, PTTEP also respects and enforces equal employment practices in accordance with the company's human rights policy. In 2018, the company has provided grants to support projects for the employment of **38 disabled employees** to work with communities or social enterprise. The company also adheres to the equal pay for equal work for all employees.

The proportion of women employees

Management positions

22%



Total employees

33%



Proportion of females in management positions is higher than Energy industry average.



Operating Responsibly and Contributing to Society

From the construction of our very first production platform to today at 40 E&P projects, PTTEP has expanded our operations in Thailand and overseas. We continue to uphold our commitment to caring for communities, society, and the environment in every one of our operational areas. Underlining all of this is our recognition of the value of the livelihoods, local wisdoms and natural resources – all of which depend upon and interact with one another as the “capital” behind economic and social growth.

PTTEP is committed to environmental management in line with international standards, driven by our objective to create net zero impacts on communities

and the environment. The company is guided in this endeavor by our strategy to reduce carbon and ecological footprints and continue to engage in proactive engagements with our stakeholders. It is our belief that achieving mutually beneficial growth relies upon building trust and mutual respect in the rights and dignity of all stakeholders. We believe that by listening to the voices and opinions of local stakeholders and working with them to promote community developments that suit local needs, we can maximize value creation and benefits to the communities. PTTEP trusts that where we operate the company has become a part of the community, and effectively supports social development in ways that are truly sustainable.

▶▶ Environmental Stewardship



PTTEP places high importance on the environment and aims to reduce our carbon footprint and ecological footprint in all our operational areas both domestically and internationally.



Target

PTTEP set a target to be a low carbon footprint and low ecological footprint organization.



Target to reduce greenhouse gas emissions intensity by at least **25%** by 2030



ZERO oil and chemical spills



Avoid operations in areas at risk from water scarcity and ensure no impact to water users and communities.



No-net Loss for biodiversity as defined by IUCN and no operations in World Heritage sites.

Reducing Our Carbon Footprint for Climate Change Management

One of PTTEP's important climate change indicators is the reduction of greenhouse gas emissions. The company has set a medium-term target to reduce greenhouse gas emissions intensity by at least 25% by 2030, compared to the base year 2012. This target aligns with Thailand's commitment to supporting global climate change efforts under the agreement made at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21).

The company is committed to improving our production process, introducing innovative or new approaches or technologies that can reduce greenhouse gas emissions in line with our established target. From 2013 to 2018, the company was able to reduce 1,410,000 tonnes of CO₂ equivalent from our production process and reduced our greenhouse gas emissions intensity by 7.2% when compared to the base year 2012.

Reduction of 269,412 tonnes of CO₂ equivalent from Greenhouse Gas Reduction program in 2018



Reusing excess gases and gases that would otherwise be flared or putting them back into the production process

This approach has reduced **212,221** tonnes of CO₂ equivalent.

Reducing methane leakages

As methane is a highly potent greenhouse gas, the company closely inspects leakages both in our onshore and offshore operations. The inspections focus on methane gas detection and maintenance of equipment used during the production process and during petroleum transport*.



Energy efficiency

Including: using heat from excess gas to produce electricity; minimizing the use of the water pump in the cooling system without interrupting system efficiency; and implementing a system to control and monitor ship transportation to ensure maximum efficiency and reduce fuel consumption. Greenhouse gas emissions were reduced by

57,192 tonnes of CO₂ equivalent.



Reduced greenhouse gas emissions intensity by **7.2%** when compared to the base year in 2012

1,410,000 tonnes of CO₂ equivalent reduction from 2013 to 2018.

Reduction of greenhouse gas emissions (tonnes of CO₂ equivalent)



239,400
2016

308,080
2017

269,412
2018

≥ 220,500
Vs 2018 Target

*Small Volume



Smart Marine Logistics

In 2018, PTTEP began monitoring and controlling through a marine fleet system at the Zawtika Project in Myanmar. In doing so, fuel consumption was reduced by 1,400,000 liters and greenhouse gas emissions reduced by approximately 5,000 tonnes of CO₂ equivalent.

The company offsets carbon dioxide emissions from our internal events and activities by purchasing carbon credits – either from governmental agencies or communities – in order to support the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)'s carbon credit market. On 26 October, PTTEP offset greenhouse gas emissions from the PTTEP Transformation Event by purchasing carbon credits from the University of Phayao's Campus Power Project.

Furthermore, the company works to reduce our greenhouse gas emissions through the use of renewable energy, increasing energy efficiency, and waste management. These initiatives are either undertaken by PTTEP or through communities participating in TGO's Low Emission Support Scheme (LESS), resulting in the latter's contribution to the reduction of 414 tonnes of CO₂ equivalent in 2018.

PTTEP also provides financial support to a 105,000-rai reforestation project to prevent global warming; in 2019, the project will undertake research to determine the forest's carbon capture capacity.



PTTEP has been disclosing environmental data to CDP since 2010, demonstrating a commitment to transparency and accountability. CDP, formerly known as Carbon Disclosure Project, is the only global environmental disclosure system that collects data from companies, cities, states, and regions about how they are measuring and managing their environmental impact. This data is used by investors and purchasers to better inform investment and procurement decisions, with the goal of a smooth transition to a low carbon economy. PTTEP answers our questions about both climate- and water-related risks and opportunities.

In 2017, PTTEP was the only company in Southeast Asia and one of 74 companies worldwide to score an 'A' in its approach to water security, demonstrating leading stewardship of freshwater resources. Given Thailand's vulnerability to both climate and water stress, it is imperative that companies operating in the country recognize, understand, and manage their environmental risks and opportunities. We hope that companies like PTTEP continue to lead the way in order to ensure a climate and water secure future.



Ms. Suzin Ahn
Associate Director of CDP
Hong Kong



In 2018, The Zawtika Project in Myanmar has been certified according to ISO 14001:2015 standards by AJA Registrars under the United Kingdom Accreditation Service (UKAS), meaning that all of PTTEP's operational areas in the production phase in Thailand, Australia and Myanmar are now certified to the latest version of ISO 14001.

Managing Our Ecological Footprint

Managing the company’s ecological footprint involves examining issues related to

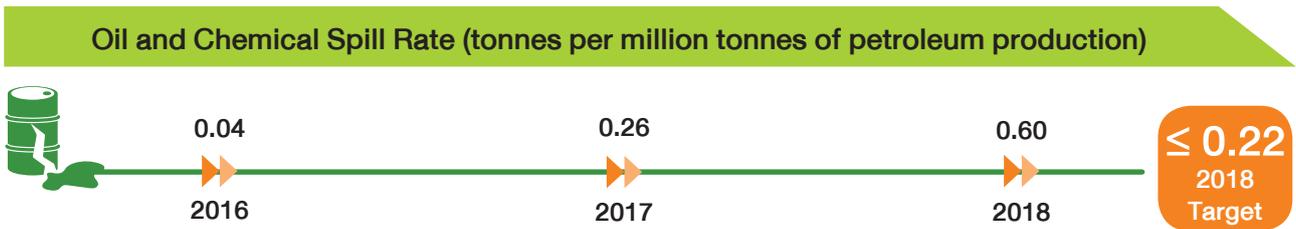


Spill Prevention

PTTEP has a dedicated approach for spill prevention and is committed to achieving the ultimate target of zero spills – an important target of our overall goal to reduce our ecological footprint. In 2018, we revised our Spill Management Plan to include more details about the roles and responsibilities of each relevant department, and to prepare appropriate measures and management approaches for spills occurring in our own operational areas. This includes developing a Spill Contingency Plan and revising our oil and chemical spill response specific to each operational area. Such measures will help to increase the efficiency of these plans in accordance with widely accepted standards for crisis and emergency response, both within the company and internationally.

Moreover, in working towards our zero-spill target, PTTEP also conducted a “Capability Assessment for Oil Spills Response” on onshore and offshore operations (located within Thailand’s territory), a “Loss of Primary Containment” (LOPC) Survey, and continued to adhere to the 4Ls* Safety Program on oil and chemical spills.

* Maintaining High Safety Standards



Waste Management

PTTEP has committed to a target of zero hazardous waste to landfill by 2020. Given this, the company conducts extensive research to identify ways of improving our waste disposal methods in line with the circular economy model – wherein waste is put back into the production process or reused, and thereby promotes resource maximization. In 2018, the company successfully changed our method of disposing of rubber hoses, pipe spools, and plastic tubing protectors. Instead of disposing 300 tonnes of these materials, they were put through a decontamination process and subsequently through a pyrolysis furnace, a blast furnace or cement furnace to be transformed into valuable products or reused as fuel or raw materials in other industries. This method allows the company to reduce the costs associated with disposal and storage, and further decreases the risks of hazardous waste impacting the environment. Moreover, it can be applied to manage waste from decommissioning processes or on other similar types of waste.



Decommissioning and Pipeline Decontamination Project

In January 2018, PTTEP set up a decommissioning planning department to oversee the decommissioning of our petroleum operations. This new department is responsible for monitoring the progress of decommissioning plans, reporting on their status, studying impacts, and developing approaches as well as applying decommissioning guidelines, as appropriate in each operational area. Through its work, the department will help to enhance the efficiency of the company’s decommissioning processes and significantly reduce our future costs.

In addition, to reuse waste from our decommissioned operations, PTTEP, in collaboration with the NSTDA and Dacon Inspection Services Co., Ltd., developed the Subsea Pipeline Decontamination Project to test the environmental impacts of subsea pipeline decommissioning operations and ensure safety throughout the process. The project has thus far achieved success in its pilot phase and will be fully implemented in the near future.

Water Resources Management

Water is significant for exploration and production activities. PTTEP assesses water-related risks in all operational areas in order to prevent problems concerning water quality and water shortages, which have impacts on surrounding communities. Our risk assessment system integrates data from both on-site operations and internationally-recognized forecasting tools, including IPIECA Global Water Tool for Oil and Gas, WRI Aqueduct, and WWF Water Risk Filter. Results from the water-related risk assessment reveal that our operational sites have a medium to low risk concerning water resources management. The site identified as ‘medium risk’ is our Songkhla operational support base, which supplies water to our offshore production sites located in the Gulf of Thailand.

PTTEP’s operations in areas with water stress risks, in accordance with the criteria of IPIECA Global Water Tool, include S1 project (along with L22/43 project) and PTTEP1 project (along with L53/43 and L54/43 projects). For the continuity of business, PTTEP has conducted the Study of Water Use and Water Conservation Program Development and adopted an action plan to manage and control water use. PTTEP ensures that the operations with water stress risks have engaged stakeholders to garner recommendations and concerns, while ensure that water management plans have been clearly communicated to relevant suppliers and contractors. Moreover, PTTEP has closely monitored the amount of water withdrawal, water consumption and water discharge through the company’s environmental performance reporting system, and developed the Water Management Guideline at all operational sites. As there are no PTTEP’s operation sites with “High” water risk, the company focuses instead on maintaining the balance of the company’s water consumption with the needs of surrounding communities and the environment.

On water discharge management, PTTEP has re-injected produced water into underground petroleum reservoirs. In 2018, a total of 94% of produced water was re-injected, while 6% of produced water was treated and discharged. The quality of treated water is in compliance with the relevant standards and regulations.

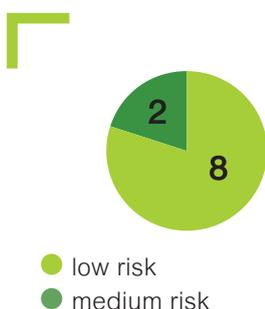
Air Pollution Reduction

PTTEP is committed to reducing air pollutant emissions such as nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOC) etc. by continuously improving the efficiency of the flare system from the petroleum production process, and machinery and equipment in the production process. In addition, the company strives to reduce flaring by using gas from the production process instead of it being flared.

Biodiversity

PTTEP is committed to integrating biodiversity into our business decision making processes in order to avoid and reduce the risk of potential impacts on biodiversity, and instead support the creation of net positive biodiversity impacts. The company has a target of “No-net Loss” for its operations located in natural reserve areas as defined by the International Union for Conservation of Nature (IUCN), and does not carry out operations in World Heritage sites.

In 2018, the company partnered with the Biodiversity-based Economy Development Office (BEDO) to conduct a “Business and Biodiversity Check” on a pilot project in Suphan Buri province: the PTTEP 1 Project. The Project was assessed against the objectives of the Convention on Biological Diversity using a tool developed by the Global Nature Fund (GNF).



From PTTEP’s 10 operational areas, all of which constitute a total area of 2,659,954 hectares including Zawtika project in Myanmar and Sinphuhorm project. To ensure the achievement of the No-net loss of biodiversity goal, PTTEP developed a Biodiversity Action Plans for 2 operational areas with medium levels of biodiversity risk.



▶▶ Creating Shared Value with Stakeholders



By its nature petroleum exploration and production operations usually take place in distant and rural locations far from public infrastructure with limited access to public services, PTTEP has continued to engage with these communities in the areas surrounding our operation bases, whether in Thailand or overseas, and contribute to their development. Supporting social development and creating sustainable value for all stakeholders remain key challenges for PTTEP; therefore, we developed a long-term Corporate Social Responsibility strategy which focuses on the development of communities surrounding our operational areas.

PTTEP’s Corporate Social Responsibility Policy and Its Contributions to Achieving the Sustainable Development Goals (SDGs)

PTTEP has in place a clear CSR Policy that supports communities, social development and environmental conservation in all our operational areas. Specifically, the Policy focuses on livelihood development by supporting the provision of basic needs, education, environment and culture, while applying PTTEP’s expertise to support such developments at both the local and national levels. Such efforts fall in line with the company’s policy to instill a mindset for volunteerism amongst management, employees, and suppliers so that everyone can have a part in social development.



Basic Needs



Education



Environment



Culture

It is through our social projects that PTTEP can contribute to achieving the United Nations' Sustainable Development Goals.

Good Health and Well-being



PTTEP is committed to promoting health and sanitation among low-income individuals living in densely populated communities where we operate, or those communities lacking access to medical services, to promote good health and well-being for people of all ages. We have provided services in responses to basic needs of communities through social projects such as the SIOLA Preschool Development Project, the Parasite-Free School Project in Myanmar, the PTTEP Mobile Health Project in the S1 Project area, and the PTTEP Community Nurse Project in the Nam Phong and Ubolratana districts of Khon Kaen province.

Quality Education



PTTEP supports equal access to education. The company provides scholarships at the higher education level with an opportunity for talented individuals to work with the company. PTTEP also implements projects with a focus on educational opportunities for youths in communities surrounding our operational areas, and projects that promote lifelong learning, quality education, and vocational training. These include the Pracharath School Project in Thailand, and the Higher Education Assistance for Development (HEAD) Project, the High Vocational Diploma Scholarship Project, and the Technical Capacity Building and Development Project which supports technical skills training for communities in the Republic of the Union of Myanmar.

Affordable and Clean Energy



PTTEP promotes access to modern and sustainable energy sources, with a specific focus on renewable energy, among communities in our operational areas. For example, the Waste to Energy project generates energy from household waste and significantly reduces costs of household energy consumption for communities in Nong Saeng district, Udon Thani province.



Total contribution to communities and society

12.62
million USD



1,776
employees volunteered for

9,280 hours



135

community development projects
 100% of community engagement and consultation

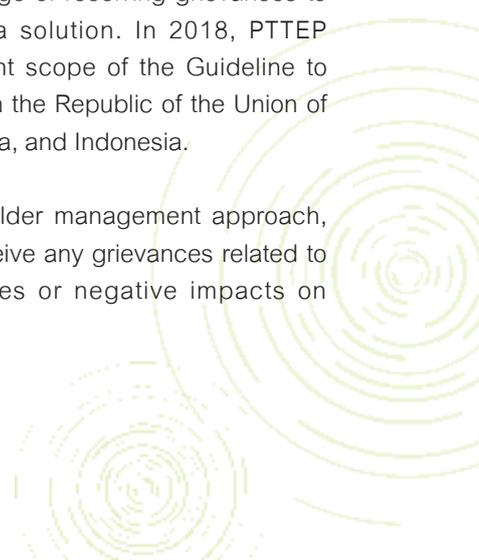


Management Approach for Social Development Projects

Social development projects constitute one of the important means by which PTTEP manages our stakeholders to ensure value creation for societies and avoid negative impacts on stakeholders in all our areas of operations.

PTTEP uses the Stakeholder Management System (ISMS) as a tool for impact assessment and to initiate development of social projects. A grievance Handling Guideline is also implemented to all operational areas and all business units are required to comply with the Guideline to ensure that responses and grievance handling are efficiently and comprehensively dealt with to the same exact standard, from the first stage of receiving grievances to the eventual finding of a solution. In 2018, PTTEP expanded the enforcement scope of the Guideline to cover our operation sites in the Republic of the Union of Myanmar, Australia, Canada, and Indonesia.

As a result of our stakeholder management approach, in 2018 PTTEP did not receive any grievances related to conflicts with communities or negative impacts on stakeholders.





Creating Values to Communities and Fostering Local Development

In our petroleum production sites overseas, we found that poor health and sanitation are the key problems, as the communities are usually situated far from public infrastructure and have limited access to public health services. To address these challenges, PTTEP has initiated projects focused on health development and promoting awareness on hygienic living conditions. An example is the “Parasite-Free School Project in Myanmar” in the Zawtika Project area, which was discovered that a large proportion of students suffered parasitic diseases. The aim of the project was to promote schools as the focal point for treatment of parasitic diseases for students, and extend the service and awareness on good hygiene practices to cover risk groups in the community. Phase 1, from 2010, of the project expanded its coverage to 35 schools with 6,000 beneficiary students along the Zawtika pipeline and reduced the proportion of students suffering from parasitic diseases from 41.5% to 15.4%. In 2018, 3,471 students participated and parasite diseases have been reduced by 4%. Furthermore, more than 1,500 teachers, family members, and government officials in the areas covered by the project have also been engaged in hygiene awareness promotion.

Another example of a PTTEP community health development project is the Free Clinic Project, or Layan Kesehatan Cuma-Cuma Project, implemented in Indonesia since 2015. The project has worked in collaboration with a local NGO to provide medical services and promote health awareness among the impoverished. By 2018, more than 100,000 people have received treatment and participated in health promotion activities. With a big portion of participants outside of PTTEP’s operational areas, this project reflects a

statement of our commitment to creating value for the wider society.

Petroleum exploration and production sites are usually situated in rural areas where the local communities lack the professional skill set required by the petroleum exploration and production operations. As a result, local employment opportunities are usually limited. PTTEP has been aware of this gap and has launched projects to develop skills that would contribute towards supporting self-sufficient communities, for example, vocational training projects in the Republic of the Union of Myanmar to train electricians, welders, and air-conditioning mechanics and installers. In our operation sites, 961 individuals have participated in the vocational training since 2015. Of this number, 300 have successfully passed skill standard tests, which officially certified that they have actual skills required for future employment.

In Thailand, in addition to the conditional higher education scholarships we offer to high-potential students, PTTEP has also provided 2,798 scholarships to students across our areas of operation. These scholarships are offered to students as young as elementary school level. Within this number, there are 80 vocational education scholarships and 121 bachelor’s degree scholarships. In addition, since 2008, PTTEP has offered nursing scholarship grants to high-potential high school students in the Ubolratana and Nam Phong districts nearby Sinphuhorm Project. The objective is to build the healthcare capacity of high-potential students and encourage them to return to work in the community. To date, 23 students have been awarded the scholarship and, in 2018, 19 of the students have completed their education and assumed nursing positions in the area.





Case Study: SIOLA Preschool Development Project Early Childhood Development Center



“

Through the SIOLA program, PTTEP have contributed significantly to the development of early childhood education in Polewali Mandar and West Sulawesi in general.

”

Andi Ibrahim
Head of Regency, Polewali Mandar
Masdar, Bupati Polewali Mandar

In response to the basic needs of communities in remote areas of Sulawesi, Indonesia, PTTEP has taken the opportunity to participate in a project for early childhood development and their families. The company sees the significance of these groups of beneficiaries, as children are our future and their families represent a fundamental unit of society. In 2013, the Stimulation, Intervention, Optimization of Services Children Project, or SIOLA, was initiated with the objective to support childhood health and help create household environments that foster childhood development. The project has provided nutrition, healthcare, childcare support and family services, such as family counseling and training on household financial management. The project has been implemented in collaboration with the government of West Sulawesi province, UNICEF, local women groups, and the local private sector.

In 2018, the SIOLA project established 2 new SIOLA centers, bringing the number to 15 centers across West Sulawesi province. The project has also built the capacity of

more than 30 local teachers, trained them as trainers, and encouraged experience sharing with teachers from other centers. This year, the project also organized activities to promote social enterprises, in cooperation with the local organization “sobis pammase,” to promote shrimp, duck, chicken, and bee farming. A portion of profits from farming activities will be used to support SIOLA centers’ operations to ensure their sustainability.

Furthermore, PTTEP organized a campaign to raise health awareness among pre-school children and their families, in collaboration with local hospitals and UNICEF, to promote good hygiene practices, disease prevention, nutrition, and to provide family counseling services in various areas. Since the project’s inception 5 years ago, SIOLA has provided quality support on early childhood development to 3,754 children at the 15 SIOLA centers. The participating children have shown improvements in their health, self-confidence, creativity, and their academic performances.



3,754

Schoolchildren and parents who have participated in SIOLA center activities

Social Return on Investment – SROI

1:2.87

Platinum award for Best Community Program from the 10th Annual Global CSR Summit and the Global Good Governance Awards 2018



Creating Values for Thailand

PTTEP carries out a diverse range of projects focusing on the conservation of natural resources in natural World Heritage sites – in the forest complexes of Thungyai Naresuan-Huai Kha Khaeng and Dong Phrayayen-Khao Yai – in collaboration with the Department of National Parks, Wildlife and Plant Conservation, Ministry of Natural Resources and Environment. PTTEP has supported activities researching and developing communications systems that enable visitors to understand the importance of forest complexes and their conservation. PTTEP has also assisted on improving the solar power system which is the main power generator for the exhibition hall at the Huai Kha Khaeng Wildlife Sanctuary.

Apart from natural heritage sites, PTTEP also supports the conservation of green spaces in Bangkok through the Forest Restoration for Eco-learning at Sri Nakhon Khuean Khan Park Project in partnership with the Forestry Department of the Ministry of Natural Resources and Environment, and Kasetsart University. The objectives

of the project are to improve the biodiversity in an area of 148 rai and to renovate spaces for Eco-learning. These activities are in line with the 8-year master plan for the conservation and sustainable development of Khung Bang Kachao launched in 2013. As of 2018, the project has completed activities focused on forest rehabilitation and biodiversity data collection at Sri Nakhon Khuean Khan Park. The project also built a network of 120 students who participated in the “Young Guide Course” to raise awareness on nature conservation. PTTEP has also planned the renovation of the Thai-style building complex in Sri Nakhon Khuean Khan Park and ecosystem demonstration learning room, in collaboration with the Fine Arts Department, to be used as the space for the Bang Kachao exhibition to preserve Thai cultural heritage for the next generations. At present, a total of 308,715 people have visited the Sri Nakhon Khuean Khan Park. Of that number, 36,922 were from overseas and included 140 wheelchair bound visitors.



148 Rai

Area reforested at
Sri Nakhon Khuean Khan



> 308,715

Visitors



36,922

Visitors from overseas



140

Wheelchair
bound visitors



Case Study: Crab Hatchery Learning Center, Songkhla

The Crab Hatchery Learning Center Project was initiated with the aim to increase incomes for local communities surrounding the Petroleum Support Base in Singhanakhon district, Songkhla province. Since its inception, the project has expanded and benefited neighboring areas, as well as created a significant set of knowledge on marine resources conservation in Thailand. Since the project was launched 2013, it established the Crab Hatchery Learning Center to nurse juvenile crabs, both for brackish water crabs and saltwater crabs; installed a renewable energy generator for crab hatching; and systematically collected data on crab hatching for further research and development. The project has significantly changed the community at Ban Hua Khao, as conservation efforts have resulted in a steady increase of the crab population, which has increased the length of the fishing seasons for local fishermen.



In 2018, the project supports a network of 32 marine and coastal resources conservation groups, with a total of 1,539 members. The learning centers have also

been expanded to Ban Phang Sai in Songkhla province and Panare in Pattani province. The project also contributed to the establishment of eight conservation belts, covering a total area of 6 square kilometers, and continues to provide knowledge on crab hatchery. Currently, PTTEP implements this project in collaboration with public sector and academic institutions, including the Department of Fisheries, the Department of Marine and Coastal Resources, as well as local administrative organizations, to work towards the goal of comprehensive conservation of marine resources for the future, and continue to sustainably create value for the communities.



200 – 400 million
 juvenile crabs released back to nature each year



Income from crab sales by fishermen increased by ~ **60,000** baht per household per year



Number of local fishermen/ business owners who participated in the project and received benefits, as well as members of the network **1,539 participants**



Number of visitors



Social Return on Investment – SROI

1:2.29

“

With the support from PTTEP, this building has been developed to be a learning center with the main purpose to widely provide the knowledge about crab hatchery, covering the eggs stirring, hatching, and the sea crab life cycle as well as marine resources preservation.

Mr. Anan Manil
 (Chairman of P. Sap-anan Traditional Fishermen Group)
 Crab Hatchery Learning Center Project

”





Stakeholder Commitments and Social License to Operate

To ensure that PTTEP’s social projects have delivered positive impacts to our stakeholders, and to collect recommendations and suggestions from stakeholders across our operational areas, PTTEP conducted Stakeholder Commitment Surveys interviewing stakeholders in operational areas where key social development projects are implemented. The survey analyzes and categorizes stakeholder commitment levels into four levels; awareness, understanding, engaged, and support.

The results of the survey conducted in 2018 from three project locations – Sinphuhorm project, the Zawtika Project in the Republic of the Union of Myanmar, and the Free Clinic Project in Indonesia – found that on average, stakeholders from the Sinphuhorm and Zawtika projects are at the level of “awareness”, while the beneficiaries of Free Clinic Project are at the “engaged” level. More than 50% of communities in these three project areas held the view that PTTEP’s social development projects aligned with their needs and have been beneficial to their community developments. The survey result reflects that PTTEP’s CSR initiatives have responded directly to the real needs of our local stakeholders.

Aside from commitment levels, the company also measures returns on investment from social development projects. Every year, PTTEP has conducted “Social Return on Investment (SROI)” assessments for various CSR projects implemented in Thailand. In 2018, PTTEP assessed SROI of 5 CSR projects¹ [for projects implemented in the Petroleum Development Support Base (PSB) area in Songkhla province, the S1 Project area in Kamphaeng Phet, Sukhothai and Phitsanulok provinces, and corporate-level CSR projects]. The results of the assessments

show that 4 projects have delivered social returns at the value of more than 2 times of the value invested in the projects, and 1 project delivered social return values of 1.5 times of the initial investment. The results of the SROI assessments similarly confirmed that PTTEP’s projects deliver actual social values to stakeholders across our operational areas.



These aforementioned project evaluations and stakeholder commitment surveys are very important processes for PTTEP, as they are a vital part in the collection of feedback and recommendations. PTTEP proactively works on these recommendations to improve and develop our social projects that would most benefit and respond to our stakeholders’ needs. By 2018, PTTEP has completed stakeholder commitment surveys across all of our production projects. For the next year, we plan to repeatedly conduct the survey in the S1 Project, the Suphan Buri Project, and the Petroleum Development Support Base (PSB) in Songkhla, in order to adjust our plan towards elevating the stakeholder commitment level to “support” level by 2020, as specified in our CSR strategy.



¹ These are the School-Based Integrated Rural Development Project (School BIRD), the Lan Krabue Hospital Development Project, the Sea Turtle Conservation Project, the Sailor Athlete Development Project, and the Labor Capacity Development Project.



▶▶ The Sailor Athlete Development Project



▶▶ The Labor Capacity Development Project



▶▶ The Sea Turtle Conservation Project



▶▶ The School-Based Integrated Rural Development Project (School BIRD)



▶▶ Awards and Recognition



Sustainability Performances

- ▶ **Member of the 2018 Dow Jones Sustainability Indices (DJSI) in the World Oil and Gas Upstream & Integrated Industry for a fifth consecutive year**
RobecoSAM
- ▶ **Silver Class, the SAM Sustainability Award in the Sustainability Yearbook 2019**
RobecoSAM
- ▶ **Member of the FTSE4Good Index Series for a third consecutive year**
FTSE Russell
- ▶ **The Best Initiative in Innovation Award**
The Asset Magazine
- ▶ **Thailand Sustainability Investment Award 2018**
The Stock Exchange of Thailand (SET)
- ▶ **Outstanding Category, the SET Sustainability Awards 2018**
The Stock Exchange of Thailand (SET)
- ▶ **Listed as 1 of 100 Thai Listed Companies that are outstanding performers in terms of Environmental, Social and Governance (ESG100)**
Thaipat Institute
- ▶ **Excellence Category in the Sustainability Report Award 2018**
Thai Listed Companies Association (TLCA)

Corporate Governance

- ▶ **Asia's Best CEO (Investor Relations) Award**
Corporate Governance Asia Magazine
- ▶ **Asia's Best CFO (Investor Relations) Award for the fifth consecutive year**
Corporate Governance Asia Magazine
- ▶ **Asia's Icon on Corporate Governance Award for the sixth consecutive year**
Corporate Governance Asia Magazine
- ▶ **The Platinum Corporate Award**
The Asset Magazine
- ▶ **Top Fifty ASEAN PLCs (Top Ten Ranking) for the ASEAN CG Scorecard for a second consecutive year**
Asian Development Bank
- ▶ **Thailand's Top Three Domestic PLCs for the ASEAN CG Scorecard for a second consecutive year**
Asian Development Bank
- ▶ **Certified as a member of Thailand's Private Sector Collective Action Coalition against Corruption (CAC) for a second consecutive term**
Thailand's Private Sector Collective Action Coalition Against Corruption (CAC)





Corporate Social Responsibility

▶ **CSR Programme of the Year Award for the Crab Hatchery Learning Center Project**

Petroleum Economist Magazine

▶ **The Best Initiative in Social Responsibility Award for the Crab Hatchery Learning Center Project**

The Asset Magazine

▶ **Platinum Award in Best Community Programme for the SIOLA (Stimulation, Intervention, and Optimization of Services for Children) in Indonesia**

The 10th Annual Global CSR Summit and Awards and the Global Good Governance Awards 2018

▶ **Gold Award in Best Environmental Excellence for H.T.M.S. Underwater Learning Site Project**

The 10th Annual Global CSR Summit and Awards and the Global Good Governance Awards 2018

▶ **Gold Award in Best Environmental Excellence for the Crab Hatchery Learning Center Project**

The 10th Annual Global CSR Summit and Awards and the Global Good Governance Awards 2018

▶ **CECT Sustainability Awards 2018 in Health and Wellbeing for PTTEP Free Clinic Project in Indonesia**

Center for Entrepreneurship, Change, and Third Sector (CECT), Trisakti University

▶ **Silver Stevie Award in the Innovation in Community Relations Category for PTTEP Free Clinic Project in Indonesia**

The Asia-Pacific Stevie Awards

▶ **Silver Stevie Award in the Innovation in Community Relations Category for the Waste to Energy Project**

The Asia-Pacific Stevie Awards

▶ **Green Leadership Category for H.T.M.S. Underwater Learning Site Project, the Asia Responsible Enterprise Awards 2018**

Enterprise Asia

▶ **Health Promotion Category for PTTEP Free Clinic Project in Indonesia, the Asia Responsible Enterprise Awards 2018**

Enterprise Asia

▶ **Top CSR Advocates of the Asia Corporate Excellence & Sustainability Awards 2018**

MORS Group



Achievements and Excellence in Investor Relations



▶ **The Best Investor Relations Team Award**

The Asset Magazine

▶ **Best Investor Relations Company award for the sixth consecutive year**

Corporate Governance Asia Magazine

▶ **Best Investor Relations Awards**

The Stock Exchange of Thailand (SET)

Environment

▶ **The Excellent Level (G-Gold) the Green Office Award 2017**

Minister of Natural Resources and Environment

▶ **The Best Initiatives in Environmental Stewardship Award**

The Asset Magazine

▶ **Green Procurement Certificate 2018**

Thailand Environment Institute (TEI)

▶ **LESS (Low Emission Support Scheme) Award Letter of Recognition for the second consecutive year**

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

▶ **Re-certification for Green Meetings Certificate and Green Meetings Plus Certificate for PTTEP Headquarters**

Thailand Business Council for Sustainable Development (TBCSD)

▶ **Green Meetings Certificate for PTTEP Petroleum Development Support Base (PSB)**

RobecoSAM



Sustainable Development Performance Summary

Scope of Reporting	Operational Control																												
	Domestic										International																		
	Exploration	Production					Support				Exploration Phase					Production Phase													
	G9/43	Arthit	B6/27	Bongkot	L22/43	L53/43 and L54/43	PTTEP 1	S1	Sinphuhorm	Headquarters	Petroleum Development Support Base	Algeria Hassi Bir Rekaiz	PTTEP Australasia	Mariana Oil Sands	Sarawak SK410B	Sarawak SK417	Sarawak SK438	Myanmar M11	Myanmar M3	Myanmar MD-7	Myanmar MOGE3	Indonesia Malunda***	Algeria 433a and 416b**	Vietnam 16-1**	Vietnam 9-2**	Zawtika	PTTEP Australasia		
Country	Thailand										Algeria	Australia	Canada	Malaysia	Myanmar	Indonesia	Algeria	Vietnam	Myanmar	Australia									
Environment*																													
Hydrocarbon production	○	●	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Energy consumption	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Greenhouse gas emissions	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Flare	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Emissions (NOx, SOx, VOC)	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Spills	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Water withdrawal	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Water discharge	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Waste generation	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Waste disposal	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Biodiversity and ecosystem services	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Environmental compliance	○	●	●	●	●	●	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Health and Safety																													
Fatality - Workforce	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Fatality - Contractors	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Occupational health and safety - Workforce	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Occupational health and safety - Contractors	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Process safety	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Loss of primary containment	○	●	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Corporate Social Responsibility																													
Volunteer	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
In-kind giving	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Management overhead	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Remarks:

- * Scope of reporting for environmental data covers only projects that are in production phase and support.
- ** Joint operator
- *** Project was official relinquished with approval on 10 April 2018
- Not relevant and excluded from scope of reporting
- Included in reporting scope

Economics⁽¹⁾

GRI	Required Data	Unit	Data Collection Period			
			2015	2016	2017	2018
GRI:201	Direct Economic Value Generated					
201-1	Total revenue	Million USD	5,614	4,339	4,523	5,459
GRI:201	Economic Value Distributed					
201-1	Salary, wages and employees' benefits	Million USD	139.19	138.61	178.62	195.32
201-1	Operating expense	Million USD	685	582	652	645
GRI:201	Payment to Provider of Capital					
201-1	Payment to government ⁽²⁾	Million USD	1,398	950	826	1,331
201-1	Dividend payment	Million USD	298	310	459	556
201-1	Interest payment	Million USD	253	200	186	186

Remarks:

- (1) Scope of reporting Economics performance is in alignment with PTTEP Annual Report 2018.
(2) Payment to government covers petroleum royalties and tax payment.

Corporate Social Responsibility

GRI	Required Data	Unit	Data Collection Period			
			2015	2016	2017	2018
GRI:201	Total Contribution					
201-1	Total contribution	Million USD	26.46	11.23	11.59	12.62
-	Volunteer	Hours	6,438	4,806	18,807	9,280
-	In-kind giving	Million USD	1.02	1.00	0.99	1.03
-	Management overhead	Million USD	0.95	1.13 ⁽¹⁾	3.40	3.35

Remarks:

- (1) Rectify cost of Management overhead due to typo (from 12.36 Million USD to 1.13 Million USD).



Environment ⁽¹⁾

GRI	Required Data	Unit	Data Collection Period						
			2015	2016 ⁽²⁾		2017 ⁽³⁾		2018	
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national
-	Hydrocarbon Production								
-	Production from operating asset	BOE	136,408,299	102,888,543	25,116,412	98,043,001	22,343,237	91,292,879	22,492,872
-		Tonnes	19,015,762	15,112,236	3,339,866	14,936,612	2,855,571	14,040,323	2,574,323
GRI:302	Energy Consumption								
302-1	Total direct energy consumption	GJ	26,116,608	20,909,807	5,301,953	20,096,714	4,555,825	19,585,720	4,757,786
302-1	Total indirect energy consumption by primary energy source (electricity purchased)	GJ	81,510	106,908	6,828	141,785 ⁽⁴⁾	2,578 ⁽⁴⁾	149,390	1,955
302-3	Total energy intensity	GJ/tonne production	1.38	1.39	1.59	1.35	1.60	1.41	1.85
GRI:305	Greenhouse Gas Emissions (GHGs) ^{(5) (6) (7)}								
305-1	Direct total GHGs	Tonne CO ₂ equivalent	4,885,952	4,048,528	582,963	4,083,327	561,541	3,660,334	467,283
305-2	Indirect total GHGs	Tonne CO ₂ equivalent	4,228	5,283	383	5,239	532	5,406	229
305-3	Other relevant indirect GHG emissions ⁽⁸⁾	Tonne CO ₂ equivalent	57,910	17,181	41,649	16,534	20,658	19,421	13,434
305-4	GHG intensity	Tonne CO ₂ equivalent/ thousand tonne production	260	269	187	275	204	262.47	186.82
OGSS	Flare								
OG6	Total flaring	MMscf	48,285	40,152	3,283	42,854	2,911	36,458	2,106
OG6	Hydrocarbon flaring	Tonnes	1,096,671	982,161	77,194	1,043,084	68,809	886,178	49,613
OG6	Hydrocarbon flaring intensity	Tonnes/ thousand BOE	8.04	9.55	3.07	10.64	3.08	9.71	2.21
GRI:305	Emissions								
305-7	Volatile organic compounds (VOCs)	Tonne VOC	16,620	14,865	1,198	15,755	1,049	13,385	776
-	VOC intensity	Tonne VOC/ thousand tonne production	0.874	0.984	0.359	1.055	0.367	0.953	0.302

GRI	Required Data	Unit	Data Collection Period						
			2015	2016 ⁽²⁾		2017 ⁽³⁾		2018	
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national
GRI:305 Emissions									
305-7	Nitrogen oxides (NOx)	Tonne NO ₂	11,043	8,746	2,115	7,868	1,253	7,122	1,655
-	NOx intensity	Tonne NO ₂ /thousand tonne production	0.581	0.579	0.633	0.527	0.439	0.507	0.643
305-7	Sulfur oxides (SOx)	Tonne SO ₂	598	460	150	374	44	298.41896	118.492529
-	SOx intensity	Tonne SO ₂ /thousand tonne production	0.031	0.030	0.045	0.025	0.015	0.021	0.046
305-6	Ozone-depleting substances (Hydrochloro-fluorocarbon: HCFC) ⁽⁹⁾	kg of CFC11 equivalent	8.5	3.7	NA	12.9	NA	6.8	16.8
GRI:306 Spills									
306-3	Spills	Cases	17	9	7	9	4	8	1
		Tonnes	17.14	0.51	0.23	4.29	0.36	9.70	0.29
306-3	Hydrocarbons	Cases	15	9	7	8	3	8	1
		Tonnes	16.59	0.51	0.23	4.29	0.36	9.77	0.29
306-3	Non-hydrocarbons	Cases	2	0	0	1	1	0	0
		Tonnes	0.55	0.00	0.00	0.00	0.00	0.00	0.00
GRI:303 (2018) Water Withdrawal									
303-3	Total water withdrawal from all areas	Cubic meters	51,295,665	50,420,020	362,098	47,921,070	350,924	49,675,463	52,062
	▶ Freshwater ⁽¹⁰⁾	Cubic meters	NA ⁽¹¹⁾	NA	NA	NA	NA	523,421	33,745
	▶ Freshwater from areas with water stressed ⁽¹²⁾	Cubic meters	NA	NA	NA	NA	NA	441,936	0
303-3	▶ Surface water	Cubic meters	NA	NA	NA	NA	NA	0	0
	▶ Ground-water	Cubic meters	NA	NA	NA	NA	NA	425,022	0
	▶ Municipal water supply	Cubic meters	NA	NA	NA	NA	NA	16,914	0
303-3	▶ Water withdrawal excluding once through cooling water	Cubic meters	2,630,453	1,944,573	362,098	2,492,540	350,924	2,550,562	52,062



GRI	Required Data	Unit	Data Collection Period						
			2015	2016 ⁽²⁾		2017 ⁽³⁾		2018	
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national
GRI:303 (2018) Water Discharge ^{(13) (14)}									
303-4	Total water discharge to all areas	Cubic meters	7,668,987	7,281,782	939,108	7,813,693	1,057,173	7,927,061	500,526
303-4	▶ Produced water	Cubic meters	7,668,987	7,281,782	939,108	7,760,171	1,057,173	7,892,085	500,526
	▶ Injection	Cubic meters	7,013,451	7,276,263	0	7,755,653	0	7,885,638	0
	▶ Disposed by evaporation	Cubic meters	279,930	4,823	103,679	2,601	0	2,915	0
	▶ Treated and discharged	Cubic meters	374,451	0	835,429	0	1,057,173	0	500,526
	▶ Disposed by waste processor	Cubic meters	1,155	696	0	1,917	0	3,532	0
303-4	▶ Process wastewater	Cubic meters	NA	NA	NA	53,522	0	34,976	0
	▶ Injection	Cubic meters	NA	NA	NA	53,522	0	34,944	0
	▶ Disposed by waste processor	Cubic meters	NA	NA	NA	0	0	32	0
	▶ Treated and discharged	Cubic meters	NA	NA	NA	0	0	0	0
GRI:306 Waste Generation ^{(15) (16)}									
306-2	Hazardous waste	Tonnes	42,566	28,243	499	38,477	451	57,558	267
306-2	Non-hazardous waste	Tonnes	175,750	149,018	220	104,251	3,361	80,680	42,275
GRI:306, OGS D Waste Disposal ^{(16) (17)}									
-	Hazardous waste	Tonnes	42,366	27,668	541	39,517	555	58,971	261
OG7	▶ Drilling mud and cutting waste	Tonnes	40,286	25,348	0	36,571	0	54,811	0
306-2	▶ Other hazardous waste	Tonnes	2,080	2,320	541	2,946	555	4,159	261
-	Non-hazardous waste	Tonnes	175,506	148,953	199	104,253	3,361	80,599	42,275
OG7	▶ Drilling mud and cutting waste	Tonnes	171,911	143,139	0	100,871	2,809	78,859	41,859
306-2	▶ Other non-hazardous waste	Tonnes	3,595	5,814	199	3,382	552	1,741	416
306-4	Exported hazardous waste under the Basel Convention	Tonnes	0	0	0	1,169	0	1,055	0

GRI	Required Data	Unit	Data Collection Period							
			2015	2016 ⁽²⁾		2017 ⁽³⁾		2018		
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national	
GRI:304, OGSB Biodiversity and Ecosystem Services										
OG4	Significant operating sites where biodiversity risks have been assessed	Number of sites	NA	8	3	8	2	8	2	
		%	NA	100	100	100	100	100	100	
304-1	Significant operating sites exposed to significant biodiversity risks	Number of sites	NA	0	0	0	0	0	0	
		%	NA	0	0	0	0	0	0	
- Environmental Management										
-	Investing in managing environmental impacts	Million USD	12.77	39.56	0.98	38.016	1.36	21.30 ⁽¹⁸⁾	1.89	
-	▶ Treatment and disposal expenses	Million USD	6.42	4.85	0.69	10.22	0.28	4.75 ⁽¹⁸⁾	0.10	
-	▶ Protection, management and investments	Million USD	6.36	34.71	0.29	27.80	1.08	16.55 ⁽¹⁸⁾	1.80	
-	Percentage of prevention cost in total environment expense	%	50	88	30	73	79	78	95	
GRI:307 Legal Compliance										
307-1	Significant fines, penalties and settlements	Cases	0	0	0	0	0	0	0	
		Million USD	0	0	0	0	0	0	0	

Remarks:

- (1) PTTEP revised the category for environmental data of Thailand and international from 2016 onwards.
- (2) International column includes Australia, Myanmar and Oman assets in 2016.
- (3) Since 2017, international column includes Australia and Myanmar assets as PTTEP completed sales agreement of Oman asset.
- (4) Revised 2017 data due to consistency of calculation methodology.
- (5) Total direct GHG emissions (Scope 1) based on equity basis is not included in this report.
- (6) GHG emissions from well service venting is not included.
- (7) In 2018, methane (CH₄) emission is equivalent to 9,710 and 3,126 tonnes CH₄ for Thailand and international assets respectively.
- (8) Other relevant indirect GHG emissions (Scope 3) is comprised of transportation and air travel.
- (9) Ozone-depleting substances (ODS) include Hydrochlorofluorocarbon (HCFC) only.
- (10) Refer to PTT Group procedure, total dissolved solid < 2,000 mg/L
- (11) NA (not available)
- (12) Water stress area classified by IPIECA Global Water Tool
- (13) In 2018, hydrocarbon discharged within produced water is equal to 0 and 11.93 tonnes for Thailand and international assets respectively.
- (14) Since 2017, injected process wastewater was reported under water discharge.
- (15) In 2018, hazardous and non-hazardous waste disposal subtracted by reuse/recycling/recovery are 4,204 and 122,394 tonnes respectively.
- (16) Waste generation and disposal included both production and drilling activities.
- (17) The difference between waste generation and disposal amount is accounted for on-site storage.
- (18) Refer to 2017 environmental management expenses for S1



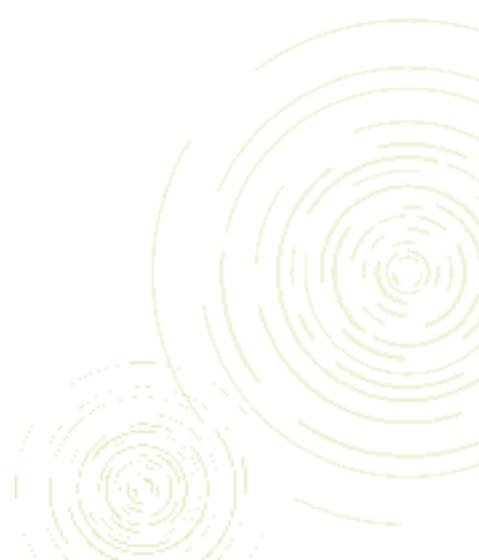
Health and Safety ⁽¹⁾

GRI	Required Data	Unit	Data Collection Period							
			2015	2016		2017		2018		PTTEP Global
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national	
GRI:403 (2018) Fatalities										
403-9	Total number	Cases	0	0	0	0	0	1	0	1
	▶ Workforce ⁽²⁾	Cases	0	0	0	0	0	0	0	0
	▶ Contractors ⁽³⁾	Cases	0	0	0	0	0	1	0	1
403-9	Fatal accident rate (FAR) - Workforce	Cases per million hours worked	0	0	0	0	0	0	0	0
403-9	Fatal accident rate (FAR) - Contractors	Cases per million hours worked	0.00	0.00	0.00	0.00	0.00	0.06	0	0.05
GRI:403 (2018) Occupational Health and Safety										
403-9	Total recordable incident rate (TRIR) - Workforce	Cases	9	1	4	5	1	2	3	5
		Cases per million hours worked	1.02	0.13	2.76	0.69	0.77	0.28	2.17	0.59
403-9	Total recordable incident rate (TRIR) - Contractors	Cases	25	16	5	4	12	12	4	16
		Cases per million hours worked	1.14	1.00	1.04	0.24	2.54	0.74	1.22	0.82
403-9	Lost time injury frequency (LTIF) - Workforce	Cases	2	0	0	1	0	0	0	0
		Cases per million hours worked	0.23	0.00	0.00	0.14	0.00	0.00	0.00	0.00
403-9	Lost time injury frequency (LTIF) - Contractors	Cases	2	2	1	0	2	2	0	2
		Cases per million hours worked	0.09	0.13	0.21	0.00	0.42	0.12	0.00	0.10
-	Severity of lost work day cases - Workforce	Average days lost per LWDC	3.16	0.00	0.00	25.02	0.00	0.00	0.00	0.00
-	Severity of lost work day cases - Contractor	Average days lost per LWDC	2.52	0.84	0.21	0.00	25.71	3.68	0.00	3.07
-	Severity of restricted work day cases - Workforce	Average days lost per RWDC	10.16	0.43	33.36	1.81	7.39	1.13	59.34	10.62
-	Severity of restricted work day cases - Contractor	Average days lost per RWDC	11.26	5.49	0.00	2.81	18.21	2.39	24.43	6.08
403-9	Near Miss - Workforce	Cases	44	21	28	9	14	10	17	27
403-9	Near Miss - Contractors	Cases	34	14	7	16	15	22	15	37

GRI	Required Data	Unit	Data Collection Period							
			2015	2016		2017		2018		PTTEP Global
				Thailand	Inter-national	Thailand	Inter-national	Thailand	Inter-national	
GRI:403 (2018) Illness										
403-10	Total recordable occupational illness frequency (TROIF) - Workforce	Cases per million hours worked	0.03	0.00	2.53	0.00	0.00	0.00	0.00	0.00
403-10	Total recordable occupational illness frequency (TROIF) - Contractors	Cases per million hours worked	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OGSD Process Safety										
OG13	Number of Tier 1 process safety events	Cases	1	0	0	1	0	1	0	1
OG13	Number of Tier 2 process safety events	Cases	5	1	0	0	0	1	0	1
OGSD Loss of Primary Containment (LOPC)										
OG13	Loss of primary containment (LOPC)	Number of incidents per million work hours of drilling and production	0.21	0.06	0.00	0.06	0.00	0.12	0.00	0.11

Remarks:

- (1) International column includes Algeria (Hassi Bir Rekaiz), Canada, Myanmar, Australia, Malaysia and Indonesia in 2018.
- (2) Workforce means employees and supervised workers of PTTEP and PTTEP Services Limited.
- (3) Contractor means an individual or a company carrying out work under the supervision, instructions and SSHE Management System of PTTEP or subsidiaries within the reporting boundary.





Labor Practices

GRI	Required Data	Unit	Data Collection Period							
			2015		2016		2017		2018	
			Male	Female	Male	Female	Male	Female	Male	Female
GRI:102, 405	Workforce									
102-8	Total workforce ⁽¹⁾	Persons	4,297		3,794		3,774		3,861	
	▶ Staff by gender	Persons	2,904	1,393	2,540	1,254	2,509	1,265	2,582	1,279
102-8	Staff by region									
	▶ Thailand	Persons	2,270	1,189	2,043	1,071	1,991 ⁽²⁾	1,070 ⁽²⁾	1,986	1,062
	▶ Australia	Persons	154	35	107	30	100 ⁽²⁾	30 ⁽²⁾	114	23
	▶ Myanmar	Persons	244	98	272	102	310 ⁽²⁾	118 ⁽²⁾	371	138
	▶ Others	Persons	236	71	118	51	108 ⁽²⁾	47 ⁽²⁾	111	56
405-1	Staff by age									
	▶ <30 years	Persons	660	351	408	222	361	187	343	182
	▶ 30 - 50 years	Persons	1,826	955	1,760	941	1,793	976	1,842	986
	▶ >50 years	Persons	418	87	372	91	355	102	397	111
102-8	Staff by employment type									
	▶ Permanent ⁽³⁾	Persons	1,700	862	1,541	975	1,484	794	1,562	799
	▶ Temporary ⁽⁴⁾	Persons	1,204	531	999	459	1,025	471	1,020	480
405-1	Staff by employee category									
	▶ Executives	Persons	33	8	26	8	30	12	28	11
	▶ Middle management	Persons	77	29	83	23	89	22	86	22
	▶ Senior	Persons	619	237	912	276	835	292	814	230
	▶ Employee	Persons	2,175	1,119	1,519	947	1,555	939	1,654	1,016
GRI:404	Training and Development									
404-1	Average all employees	Hours/ person/ year	39	44	32	20	55	39	60	44
-	Employee Satisfaction									
-	Employee satisfaction	%	50		53		65		66	
GRI:405	Composition of Governance Bodies									
405-1	Board of directors	Persons	15	0	14	1	14	1	12	2
405-1	Executives	Persons	33	8	26	8	30	12	28	11
405-1	Middle management	Persons	77	29	83	23	89	22	86	22
405-1	Senior	Persons	619	237	912	276	835	292	814	230
405-1	Employee	Persons	2,175	1,119	1,519	947	1,555	939	1,654	1,016
GRI:401	New Employee Hired by Age Group									
401-1	<30 years	Persons	62	39	27	23	48	43	81	48
401-1	30 - 50 years	Persons	85	25	41	15	51	35	58	33
401-1	>50 years	Persons	11	1	11	1	14	4	24	3
401-1	Total	Persons	158	65	79	39	113	82	163	84
401-1	New hire rate	% of total employees	3.7	1.5	2.1	1.0	3.0	2.2	4.2	2.2

GRI	Required Data	Unit	Data Collection Period								
			2015		2016		2017		2018		
			Male	Female	Male	Female	Male	Female	Male	Female	
GRI:401	Turnover by Age Group										
401-1	<30 years	Persons	46	43	29	29	18	28	12	15	
401-1	30 - 50 years	Persons	66	67	98	94	81	42	50	46	
401-1	>50 years	Persons	37	7	31	9	56	7	52	12	
401-1	Total	Persons	149	117	158	132	155	77	114	73	
401-1	Turnover rate	% of total employees	3.5	2.7	4.2	3.5	4.1	2.0	3.0	1.9	
GRI:401	Turnover by Type										
401-1	Voluntary resignation	Persons	139	115	111	124	128	72	61	57	
401-1	Dismissal	Persons	0	0	30	5	8	2	29	8	
401-1	Retirement	Persons	7	1	16	3	17	2	20	8	
401-1	Death - not related to work	Persons	3	1	1	0	2	1	4	0	
GRI:401	Parental Leave										
401-3	Employee taken parental leave	Persons	61	46	35	39	37	45	34	44	
401-3	Employee returned to work after parental leave	%	98.4	97.8	100.0	97.4	97.3	100.0	100.0	97.4	
GRI:412	Integrity										
412-2	Training hours concerning human rights, anti-bribery, and corruption	Hours	675	891	502	339	1,199	846	1,223	1,702	
GRI:405	Gender Diversity and Equal Remuneration										
405-2	Ratio basic salary women/men	Ratio		0.66		0.73		0.78		0.78	
GRI:405	Gender Diversity and Equal Remuneration										
405-1	Women in workforce	Persons		1,393		1,254		1,265		1,279	
		%		32		33		34		33	
405-1	Women in professional positions	Persons		1,119		947		939		1,016	
		%		34		38		38		38	
405-1	Women in management positions	Persons		237		276		292		230	
		%		28		23		26		22	
405-1	Women in senior leadership positions	Persons		37		31		34		33	
		%		25		22		26		22	

Remarks:

- (1) Total workforce is the total number of employees involved in core activities of PTTEP's and subsidiaries'. This does not include workers and supervised workers performing non-core activities in the company, e.g. maids, gardeners, drivers, etc.
- (2) Restatement is made to 2017 number of staff by region due to edition of calculation methodology from grouping by work unit to grouping by work location.
- (3) Permanent means employment contracts with an indeterminate period made with PTTEP or its subsidiaries excluding PTTEP Services which is manpower agency of PTTEP.
- (4) Temporary means employment contract with or without a specific employment period made through manpower agencies, e.g. PTTEP Services, etc.

Statement of External Assurance



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Independent limited assurance report

To the Directors of PTT Exploration and Production Public Company Limited (“PTTEP”)

Conclusion

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

Our Responsibilities

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

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

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

Subject Matters

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

- GRI 302-1 Energy consumption within organization (2016 version)
- GRI 303-3 Water withdrawal (2018 version)
- GRI 303-4 Water discharge (2018 version)
- GRI 305-1 Direct (Scope 1) GHG emissions (2016 version)
- GRI 305-2 Energy indirect (Scope 2) GHG emissions (2016 version)
- GRI 305-3 Other indirect (Scope 3) GHG emissions (2016 version)
- GRI 305-6 Emissions of ozone-depleting substances (ODS) (2016 version)
- GRI 305-7 Nitrogen oxides (NOx), Sulfur oxides (SOx), and other significant air emissions (2016 version)
- GRI 306-2 Waste by type and disposal method (2016 version)
- GRI 306-3 Significant spills (2016 version)
- GRI 403-9 Work-related injuries (2018 version)
- GRI 403-10 Work-related ill health (2018 version)
- OGSD – OG4 Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored
- OGSD – OG5 Volume and disposal of formation or produced water



- OGSD – OG7 Amount of Drilling Waste (Drill mud and cuttings) and Strategies for treatment and disposal

Criteria

The Subject Matters were assessed according to the following criteria:

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

Director’s and management’s responsibilities

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

Procedure performed

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

- Interviews with senior management and relevant staff at corporate and operating sites;
- Inquiries about the design and implementation of the systems and methods used to collect and process the information reported, including the aggregation of source data into the Subject Matters;
- Inquiries about managements practices and procedures related to identifying stakeholders and their expectations, determining material sustainability matters and implementing sustainability policies and guidelines;
- Visits to 2 sites; Greater Bongkot North project and Zawtika project, selected on the basis of risk analysis including the consideration of both quantitative and qualitative criteria;
- Agreeing the Subject Matters to relevant underlying sources on a sample basis to determine whether all the relevant information has been included in the Subject Matters and prepared in accordance with the Criteria.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less

in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

Inherent limitations

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

Restriction of use of our report

Our report should not be regarded as suitable to be used or relied on by any party wishing to acquire rights against us other than PTTEP, for any purpose or in any other context. Any party other than PTTEP 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 PTTEP for our work, for this independent limited assurance report, or for the conclusions we have reached.



KPMG Phoomchai Business Advisory Ltd.

Bangkok

1 March 2019

▶▶ Content Index and UNGC Communication on Progress

GLOBAL REPORTING INITIATIVE (GRI) AND UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (UN SDGs)

GRI G4 Indicator		GRI G4 OGSS Indicator		<input checked="" type="radio"/> YES <input type="radio"/> NO
GRI STANDARD		Reference/Remarks		External Assurance
Organizational Profile				
102-1	Name of the organization	SR2018, Page 8 URL: https://www.pttep.com/en/Aboutpttep/Pttepgroup/Pttepheadquarters.aspx		<input type="radio"/>
102-2	Activities, brands, products, and services	SR2018, Page 16-17		<input type="radio"/>
102-3	Location of headquarters	SR2018, Back Cover URL: https://www.pttep.com/en/Aboutpttep/Pttepgroup/Pttepheadquarters.aspx		<input type="radio"/>
102-4	Location of operations	SR2018, Page 16-17		<input type="radio"/>
102-5	Ownership and legal form	URL: https://www.pttep.com/en/InvestorRelations/ShareholderInformation/Top10Shareholders.aspx https://www.pttep.com/en/Aboutpttep/Corporategovernance/Bylaws.aspx (Affidavit)		<input type="radio"/>
102-6	Markets served	SR2018, Page 16-17		<input type="radio"/>
102-7	Scale of the organization	SR2018, Page 16-17, 29, 85, 92 URL: https://www.pttep.com/en/InvestorRelations/FinancialPerformance/FinancialHighlight.aspx		<input type="radio"/>
102-8	Information on employees and other workers	SR2018, Page 92 Remark: No significant variation in employment numbers and changes in 2018 Relation to SDGs Targets: 8.5, 10.3		<input type="radio"/>
102-9	Supply chain	SR2018, Page 50		<input type="radio"/>
102-10	Significant changes to the organization and its supply chain	Remark: No significant changes during the reporting year		<input type="radio"/>
102-11	Precautionary principle or approach	SR2018, Page 46		<input type="radio"/>
102-12	External Initiatives	SR2018, Page 18, 44, 63, 69, 71, 74-77, 80-83		<input type="radio"/>
102-13	Membership of associations	SR2018, Page 22-23, 80-83		<input type="radio"/>
Strategy				
102-14	Statement from senior decision-maker	SR2018, Page 6-7		<input type="radio"/>
102-15	Key impacts, risk, opportunities	SR2018, Page 18, 46		<input type="radio"/>
Ethics and Integrity				
102-16	Values, principles, standards, and norms of behavior	SR2018, Page 15, 19 URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/CgandbusinessEthics.aspx Relation to SDGs Targets: 16.3		<input type="radio"/>
102-17	Mechanisms for advice and concerns about ethics	SR2018, Page 45 URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/Reportingandwhistleblowingregulations.aspx Relation to SDGs Targets: 16.3		<input type="radio"/>

GRI STANDARD		Reference/Remarks	External Assurance
Governance			
102-18	Governance Structure	URL: https://www.pttep.com/en/AboutPTTEP/Publications/PTTEPOrganizationStructure.aspx	○
102-19	Delegating authority	URL: https://www.pttep.com/en/Sustainabledevelopment/Sustainabilityatpttep/SDGovernanceStructure.aspx	○
102-20	Executive-level responsibility for economic, environmental, and social topics	SR2018, Page 10 URL: https://www.pttep.com/en/Sustainabledevelopment/Sustainabilityatpttep/SDGovernanceStructure.aspx	○
102-21	Consulting stakeholders on economic, environmental, and social topics	SR2018, Page 8-10 Relation to SDGs Targets: 16.7	○
102-22	Composition of the highest governance body and its committees	URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/Thecommittee.aspx Relation to SDGs Targets: 5.5, 16.7	○
102-23	Chair of the highest governance body	URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/Thecommittee.aspx Relation to SDGs Targets: 16.6	○
102-24	Nominating and selecting the highest governance body	URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/CgandbusinessEthics.aspx (6.2 Selection of Directors and Chief Executive Officer) Relation to SDGs Targets: 5.5, 16.7	○
102-25	Conflicts of interest	URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/CgandbusinessEthics.aspx (6.3 Roles of the Board of Directors and Management, Conflict of Interest Prevention) Relation to SDGs Targets: 16.6	○
102-26	Role of highest governance body in setting purpose, values, and strategy	URL: https://www.pttep.com/en/Sustainabledevelopment/Sustainabilityatpttep/SDGovernanceStructure.aspx	○
102-27	Collective knowledge of highest governance body	URL: https://www.pttep.com/en/Aboutpttep/Corporategovernance/Cgreport.aspx (Training of Directors)	○
102-28	Evaluating the highest governance body's performance	AR2018, Page 104-106	○
102-32	Highest governance body's role in sustainability reporting	SR2018, Page 10	○
102-33	Communicating critical concerns	AR2018, Page 106-108	○
102-34	Nature and total number of critical concerns	AR2018, Page 106-108	○
102-35	Remuneration policies	AR2018, Page 115-118	○
102-36	Process for determining remuneration	AR2018, Page 115-118	○
102-37	Stakeholders' involvement in remuneration	AR2018, Page 115-117 Relation to SDGs Targets: 16.7	○
Stakeholder Engagement			
102-40	List of stakeholder groups	SR2018, Page 9	○
102-41	Collective bargaining agreements	All employees are covered by collective bargaining agreement. Relation to SDGs Targets: 8.8	○
102-42	Identifying and selecting stakeholders	SR2018, Page 8-9	○
102-43	Approach to stakeholder engagement	SR2018, Page 9	○
102-44	Key topics and concerns raised	SR2018, Page 10	○



GRI STANDARD		Reference/Remarks	External Assurance
Reporting Practice			
102-45	Entities included in the consolidated financial statements	SR2018, Page 8	○
102-46	Defining report content and topic boundaries	SR2018, Page 8, 10, 12-13	○
102-47	List of material topics	SR2018, Page 11-13	○
102-48	Restatements of information	SR2018, Page 89, 91, 93	○
102-49	Changes in reporting	Remark: No significant changes from previous reporting periods in the scopes and aspect boundaries	○
102-50	Reporting period	SR2018, Page 8	○
102-51	Date of most recent report	Remark: Most recent previous report is 2017 PTTEP Sustainability Report.	○
102-52	Reporting cycle	Remark: PTTEP publishes Sustainability Report annually.	○
102-53	Contact point for questions regarding the report	SR2018, Back Cover	○
102-54	Claims of reporting in accordance with the GRI Standards	SR2018, Page 8	○
102-55	GRI content index	SR2018, Page 96-103	○
102-56	External assurance	SR2018, Page 94-95	○
Material Topics			
ECONOMICS			
GRI 201: Economic Performance 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 19-21	○
103-2	The management approach and its components	SR2018, Page 19-20, 43-44	○
GRI 201: Economic Performance			
201-1	Direct economic value generated and distributed	SR2018, Page 85 Relation to SDGs Targets: 8.1, 8.2, 9.1, 9.4, 9.5	○
201-2	Financial implications and other risks and opportunities for the organization's activities due to climate change	SR2018, Page 18-19, 68-69 Relation to SDGs Targets: 13.1	○
GRI 203: Indirect Economic Impacts 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 26, 72, 74	○
103-2	The management approach and its components	SR2018, Page 72-79	○
103-3	Evaluation of the management approach	SR2018, Page 73-79	○
GRI 203: Indirect Economic Impacts			
203-1	Development and impact of infrastructure investments and services supported	SR2018, Page 72-79 Relation to SDGs Targets: 5.4, 9.1, 9.4, 11.2	○
203-2	Significant indirect economic impacts, including the extent of impacts	SR2018, Page 72-79 Relation to SDGs Targets: 1.2, 8.2, 8.3, 8.5	○

GRI STANDARD		Reference/Remarks	External Assurance
GRI 204: Procurement Practices 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 47, 51, 53-54	○
103-2	The management approach and its components	SR2018, Page 47-48	○
103-3	Evaluation of the management approach	SR2018, Page 27, 47-48, 50, 52, 53	○
GRI 204: Procurement Practices			
204-1	Proportion of spending on local suppliers	SR2018, Page 48 Relation to SDGs Targets: 8.3	○
ENVIRONMENT			
GRI 302: Energy 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 66-70	○
103-2	The management approach and its components	SR2018, Page 66-71	○
103-3	Evaluation of the management approach	SR2018, Page 27, 67-68, 70-71	○
GRI 302: Energy			
302-1	Energy consumption within the organization	SR2018, Page 86 Relation to SDGs Targets: 7.2, 7.3, 8.4, 12.2, 13.1	●
302-3	Energy Intensity	SR2018, Page 86 Relation to SDGs Targets: 7.3, 8.4, 12.2, 13.1	○
GRI 303: Water and Effluents 2018			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 71	○
103-2	The management approach and its components	SR2018, Page 71	○
GRI 303: Water and Effluents			
303-1	Interactions with water as a shared resource	SR2018, Page 71	○
303-2	Management of water discharge-related impacts	SR2018, Page 71	○
303-3	Water withdrawal	SR2018, Page 87 Relation to SDGs Targets: 6.3, 6.4, 8.4, 12.2	●
303-4	Water discharge	SR2018, Page 88 Omission: Information unavailable for GRI 303-4 (b, c and d), PTTEP will improve the data collection in the next reporting cycle. Relation to SDGs Targets: 3.9, 6.3, 6.4, 6.6, 12.4, 14.1	●
GRI 304: Biodiversity 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 71	○
103-2	The management approach and its components	SR2018, Page 71	○
GRI 304: Biodiversity			
304-1	Operational sites owned, leased managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	SR2018, Page 89	○



GRI STANDARD		Reference/Remarks	External Assurance
GRI 305: Emissions 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 67-68	○
103-2	The management approach and its components	SR2018, Page 67-69	○
103-3	Evaluation of the management approach	SR2018, Page 26, 67-69	○
GRI 305: Emissions			
305-1	Direct Greenhouse Gas (GHG) Emissions (Scope 1)	SR2018, Page 86 Relation to SDGs Targets: 3.9, 12.4, 13.1, 14.3, 15.2	●
305-2	Energy Indirect Greenhouse Gas (GHG) Emissions (Scope 2)	SR2018, Page 86 Relation to SDGs Targets: 3.9, 12.4, 13.1, 14.3, 15.2	●
305-3	Other Indirect Greenhouse Gas (GHG) Emissions (Scope 3)	SR2018, Page 86 Relation to SDGs Targets: 3.9, 12.4, 13.1, 14.3, 15.2	●
305-4	Greenhouse Gas (GHG) Emissions Intensity	SR2018, Page 86 Relation to SDGs Targets: 13.1, 14.3, 15.2	○
305-5	Reduction of Greenhouse Gas (GHG) Emissions	SR2018, Page 68 Relation to SDGs Targets: 13.1, 14.3, 15.2	○
305-6	Emissions of ozone-depleting substances (ODS)	SR2018, Page 87 Relation to SDGs Targets: 3.9, 12.4	●
305-7	NOx, SOx, and other significant air emissions	SR2018, Page 86-87 Relation to SDGs Targets: 3.9, 12.4, 14.3, 15.2	●
GRI 308: Supplier Environmental Assessment 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 47-48	○
103-2	The management approach and its components	SR2018, Page 47-48	○
103-3	Evaluation of the management approach	SR2018, Page 27, 47-54	○
GRI 308: Supplier Environmental Assessment			
308-1	New suppliers that were screened using environmental criteria	SR2018, Page 52	○
GRI 306: Effluent and Waste 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 27, 70	○
103-2	The management approach and its components	SR2018, Page 70	○
103-3	Evaluation of the management approach	SR2018, Page 27, 70	○
GRI 306: Effluent and Waste			
306-1	Water discharge by quality and destination	SR2018, Page 88 Relation to SDGs Targets: 3.9, 6.3, 6.4, 6.6, 12.4, 14.1	○
306-2	Waste by type and disposal method	SR2018, Page 88 Relation to SDGs Targets: 3.9, 6.3, 12.4, 12.5	●

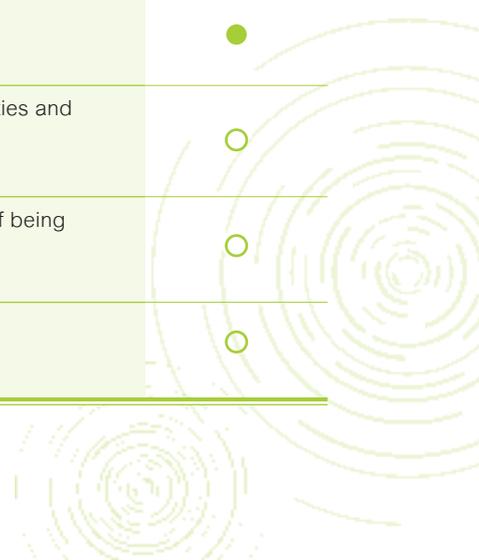
GRI STANDARD		Reference/Remarks	External Assurance
GRI 306: Effluent and Waste			
306-3	Significant Spills	AR2018, Page 65 SR2018, Page 87 Remark: Refer to Annual Report for updates of the legal disputes on the environmental impacts of the Montara Oil Spills Relation to SDGs Targets: 3.9, 6.3, 6.6, 12.4, 14.1, 15.1	●
306-4	Transport of hazardous waste	SR2018, Page 88 Relation to SDGs Targets: 12.4	○
GRI 307: Environmental Compliance 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 66-71	○
103-2	The management approach and its components	SR2018, Page 66-71	○
103-3	Evaluation of the management approach	SR2018, Page 27, 66-71	○
GRI 307: Environmental Compliance			
307-1	Non-compliance with environmental laws and regulations	SR2018, Page 89 Relation to SDGs Targets: 16.3	○
LABOR PRACTICES AND DECENT WORK			
GRI 401: Employment 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 60	○
103-2	The management approach and its components	SR2018, Page 60-61	○
103-3	Evaluation of the management approach	SR2018, Page 25, 60	○
GRI 401: Employment			
401-1	New employee hires and employee turnover	SR2018, Page 92-93 Relation to SDGs Targets: 5.1, 8.5, 8.6, 10.3	○
401-3	Parental leave	SR2018, Page 93 Relation to SDGs Targets: 5.1, 5.4, 8.5	○
GRI 403: Occupational Health and Safety 2018			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 55-56, 58	○
103-2	The management approach and its components	SR2018, Page 55-56, 58	○
103-3	Evaluation of the management approach	SR2018, Page 25, 56-59	○
GRI 403: Occupational Health and Safety			
403-5	Worker training on occupational health and safety	SR2018, Page 56-57 Relation to SDGs Targets: 3.3, 3.9, 8.8	○
403-9	Work-related injuries	SR2018, Page 90 Relation to SDGs Targets: 3.3, 3.9, 8.8	●
403-10	Work-related ill health	SR2018, Page 91 URL: https://www.pttep.com/en/SustainableDevelopment/Safetysecurityhealthandenvironment/Ssheinpttep.aspx (Medical and Occupational Health)	●





GRI STANDARD		Reference/Remarks	External Assurance
GRI 404: Training and Education 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 25, 62	○
103-2	The management approach and its components	SR2018, Page 62	○
103-3	Evaluation of the management approach	SR2018, Page 25, 62-64	○
GRI 404: Training and Education			
404-1	Average hours of training per year per employee	SR2018, Page 92 Relation to SDGs Targets: 4.3, 4.4, 4.5, 5.1, 8.2, 8.5, 10.3	○
404-2	Programs for upgrading employee skills and transition assistance programs	SR2018, Page 62-64 Relation to SDGs Targets: 8.2, 8.5	○
404-3	Percentage of employees receiving regular performance and career development reviews	SR2018, Page 64 Relation to SDGs Targets: 5.1, 8.5, 10.3	○
GRI 405: Diversity and Equal Opportunity 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 25, 65	○
103-2	The management approach and its components	SR2018, Page 65	○
103-3	Evaluation of the management approach	SR2018, Page 65	○
GRI 405: Diversity and Equal Opportunity			
405-1	Diversity of governance bodies and employees	SR2018, Page 65, 92-93 Relation to SDGs Targets: 5.1, 5.5, 8.5	○
405-2	Ratio of basic salary and remuneration of women to men	SR2018, Page 93 Relation to SDGs Targets: 5.1, 8.5, 10.3	○
GRI 414: Supplier Social Assessment 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 47-54	○
103-2	The management approach and its components	SR2018, Page 42, 47-54	○
103-3	Evaluation of the management approach	SR2018, Page 27, 47-54	○
GRI 414: Supplier Social Assessment			
414-1	New suppliers that were screened using social criteria	SR2018, Page 52 Relation to SDGs Targets: 5.2, 8.8, 16.1	○
SOCIETY			
GRI 413: Local Communities 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 72	○
103-2	The management approach and its components	SR2018, Page 72-79	○
103-3	Evaluation of the management approach	SR2018, Page 26, 73, 75-79	○
GRI 413: Local Communities			
413-1	Operations with local community engagement, impact assessments, and development programs	SR2018, Page 73	○

GRI STANDARD		Reference/Remarks	External Assurance
GRI 205: Anti-Corruption 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 24, 45	○
103-2	The management approach and its components	SR2018, Page 45	○
103-3	Evaluation of the management approach	SR2018, Page 24, 45	○
GRI 205: Anti-Corruption			
205-2	Communication and training about anti-corruption policies and procedures	SR2018, Page 45 Relation to SDGs Targets: 16.5	○
205-3	Confirmed incidents of corruption and actions taken	SR2018, Page 45 Relation to SDGs Targets: 16.5	○
GRI 419: Compliance 2016			
GRI 103: Management Approach			
103-1	Explanation of the material topic and its boundaries	SR2018, Page 24, 42-44	○
103-2	The management approach and its components	SR2018, Page 42-44	○
103-3	Evaluation of the management approach	SR2018, Page 42-44	○
GRI 419: Socioeconomic Compliance			
419-1	Non-compliance with laws and regulations in the social and economic area	Remark: No cases of non-compliance with the laws and regulations Relation to SDGs Targets: 16.3	○
GRI Oil and Gas Sector Disclosure			
G4-OG1	Volume and type of estimated proved reserves and production	SR2018, Page 19	○
G4-OG2	Total amount invested in renewable energy	Remark: Not applicable to PTTEP business.	○
G4-OG3	Total amount of renewable energy generated by source	Remark: Not applicable to PTTEP business.	○
G4-OG4	Number and percentage of significant operating sites in which biodiversity risk has been assessed and monitored	SR2018, Page 89	●
G4-OG5	Volume and disposal of formation or produced water	SR2018, Page 88	●
G4-OG6	Volume of flared and vented hydrocarbon	SR2018, Page 86	○
G4-OG7	Amount of drilling waste (drill mud and cuttings) and strategies for treatment and disposal	SR2018, Page 88	●
G4-OG10	Number and description of significant disputes with local communities and indigenous peoples	Remark: No disputes with local communities and indigenous people	○
G4-OG11	Number of sites that have been decommissioned and sites that are in the process of being decommissioned	Remark: No projects are in the process of being decommissioned.	○
G4-OG13	Number of process safety events, by business activity	SR2018, Page 91	○





INTEGRATED REPORTING <IR>

Capital	Description	Page
Financial Capital	The pool of funds that is available to an organization for use in the production of goods or the provision of services obtained through financing such as debt, equity or grants or generated through operations or investments.	SR2018, Page 28, 64, 73, 85
Manufactured Capital	Manufactured physical objects that are available to an organization for use in the production of goods or the provision of services (e.g. buildings, production, equipment and infrastructure).	SR2018, Page 16-17, 19, 28, 50
Intellectual Capital	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).	SR2018, Page 21, 26, 28, 38-41
Human Capital	People's competencies, capabilities and experience, and their motivations to innovate.	SR2018, Page 25, 28, 55-57, 62-65
Social and Relationship Capital	The institutions and relationships established within and between each community, group of stakeholders and other networks and an 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).	SR2018, Page 9, 18, 26, 28, 44, 73-78
Natural Capital	All renewable and non-renewable environmental stocks that provide goods and services that support the current and future prosperity of an organization (e.g. air, water, land, minerals and forests biodiversity and eco-system health).	SR2018, Page 19, 27, 28-29, 67-71, 86-89

UNITED NATIONS GLOBAL COMPACT (UNGC) COMMUNICATION ON PROGRESS – ADVANCED LEVEL

 United Nations Global Compact	Criteria of UNGC COP for the advanced level	Page
STRATEGY, GOVERNANCE AND ENGAGEMENT		
Scope: Implementing the Ten Principles into Strategies & Operations	1. Mainstreaming into corporate functions and business units	SR2018, Page 24-27
	2. Value chain implementation	SR2018, Page 47-54
HUMAN RIGHTS		
Principle 1: Support and respect the protection of internationally proclaimed human rights	3. Robust commitments, strategies or policies in the area of human rights	SR2018, Page 48, 72-73 URL: https://www.pttep.com/en/ Sustainabledevelopment/Business/ Labourpractices.aspx
Principle 2: Not complicit in human rights abuses	4. Effective management systems to integrate the human rights principles	URL: https://www.pttep.com/en/ Sustainabledevelopment/Business/ Labourpractices.aspx
	5. Effective monitoring and evaluation mechanisms of human rights integration	SR2018, Page 52 URL: https://www.pttep.com/en/ Sustainabledevelopment/Business/ Labourpractices.aspx
LABOR		
Principle 3: Uphold the freedom of association and the effective recognition of the right to collective bargaining	6. Robust commitments, strategies or policies in the area of labor	SR2018, Page 47-54, 55-58, 60-65
Principle 4: Uphold the elimination of all forms of forced and compulsory labor	7. Effective management systems to integrate the labor principles	SR2018, Page 47-54, 55-58, 60-65
Principle 5: Uphold the effective abolition of child labor		
Principle 6: Uphold the elimination of discrimination in respect of employment and occupation	8. Effective monitoring and evaluation mechanisms of labor principles integration	SR2018, Page 47-54, 55-58, 60-65





ENVIRONMENT		
Principle 7: Support a precautionary approach to environmental challenges	9. Robust commitments, strategies or policies in the area of environmental stewardship	SR2018, Page 21, 66-71
Principle 8: Undertake initiatives to promote greater environmental responsibility	10. Effective management systems to integrate the environmental principles	SR2018, Page 66-71
Principle 9: Encourage the development and diffusion of environmentally friendly technologies	11. Effective monitoring and evaluation mechanisms for environmental stewardship	SR2018, Page 36-37, 41, 66-71
ANTI-CORRUPTION		
Principle 10: Work against corruption in all its forms, including extortion and bribery	12. Robust commitments, strategies or policies in the area of anti-corruption	SR2018, Page 42-45, 47, 51
	13. Effective management systems to integrate the anti-corruption principle	SR2018, Page 42-45, 47, 51
	14. Effective monitoring and evaluation mechanisms for the integration of anti-corruption	SR2018, Page 42-45
UN GOALS AND ISSUES		
Scope: Taking action in support of broader UN goals and issues	15. Core business contributions to UN goals and issues	SR2018, Page 24-27
	16. Strategic social investments and philanthropy	SR2018, Page 72-79
	17. Advocacy and public policy engagement	SR2018, Page 18, 44, 69, 71, 74-77
	18. Partnerships and collective action	SR2018, Page 18, 44, 63, 69, 71, 74-77, 80-83
GOVERNANCE		
Scope: Corporate sustainability governance and leadership	19. CEO commitment and leadership	SR2018, Page 6-7
	20. Board adoption and oversight	SR2018, Page 43-46
	21. Stakeholder engagement	SR2018, Page 8-10



▶ Survey of Readers' Opinions

Your suggestions will be valuable input for the improvement of future PTTEP Sustainability Report.

1. Does the report provide you with an understanding of PTTEP sustainability?

- Yes, fully Yes, partially Not at all

2. Please rate your suggestion of PTTEP Sustainability Report 2018.

- | | | | | |
|----------------------|-------------------------------|---------------------------------|------------------------------|---------------------------------------|
| Completeness | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Dissatisfied |
| Topics | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Dissatisfied |
| Ease to understand | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Dissatisfied |
| Report design | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Dissatisfied |
| Overall satisfaction | <input type="checkbox"/> High | <input type="checkbox"/> Medium | <input type="checkbox"/> Low | <input type="checkbox"/> Dissatisfied |

3. Please choose top three materiality issues which influence PTTEP business operation.

- | | |
|--|--|
| <input type="checkbox"/> Governance, Risk Management, and Compliance (GRC) | <input type="checkbox"/> Spills |
| <input type="checkbox"/> Increasing Petroleum Reserves | <input type="checkbox"/> Climate Change |
| <input type="checkbox"/> Technology and Innovation | <input type="checkbox"/> Environmental Management |
| <input type="checkbox"/> Supply Chain Management | <input type="checkbox"/> Human Capital Development |
| <input type="checkbox"/> Occupational Health and Safety | <input type="checkbox"/> Social Development |

4. Please provide further comments and/or suggestions (if any).

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.....
.....

5. Which best describes you as a stakeholder?

- | | | |
|--|--|--|
| <input type="checkbox"/> Shareholder / Investor | <input type="checkbox"/> Government Agency | <input type="checkbox"/> Media |
| <input type="checkbox"/> Supplier | <input type="checkbox"/> Employee | <input type="checkbox"/> Research / Academic Institute |
| <input type="checkbox"/> Student | <input type="checkbox"/> NGO | <input type="checkbox"/> Communities surrounding PTTEP operation areas |
| <input type="checkbox"/> Others (please specify) | | |

PTTEP appreciates your valuable input.



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