

Sustainability Report 2021





Seafood Product Value Enhancement Project

H.T.M.S. Underwater Learning Site Project

Mangrove Forestation Project

The Pilot Recycled Drill Cuttings Road



Baseline study of microplastics in the Gulf of Thailand to promote ocean sustainability

Clean and friendly operation using Autonomous Underwater Vehicles for equipment inspection and maintenance



Explore Value Creation for a Sustainable Future

Over 3 decades of energy exploration on the journey to sustainable development

This reflects our commitment to conducting business with a responsibility for society, the environment, and good governance.

PTTEP is conscious of the responsibility to explore and produce petroleum and to provide a sustainable petroleum supply to Thailand and the countries where we operate. PTTEP aspires to achieve balanced growth and to prepare for Energy Transition.

PTTEP sets out to create long-term values for our stakeholders and thus takes on the mission to protect and care for community, society, and the environment through Net Zero, Circular Model for E&P, and Ocean for Life.

...To achieve balanced growth and a sustainable future.



Relocation of Arthit Asset's wellhead platform topside for reuse to maximize resource efficiency

Explore Value Creation for a Sustainable Future

Ocean Health and Biodiversity Monitoring:
Coral Bleaching Baseline Project

Contents

CEO Message	4	High Performance Organization and Thrive in Lower Carbon Future	19
About This Report	7	<u>Sustainable E&P Business</u>	<u>21</u>
Value Creation	8	<u>Diversification to Beyond E&P Business</u>	<u>26</u>
Achievements	10	<u>Greenhouse Gas Management</u>	<u>28</u>
Sustainability at PTTEP	14	<u>Resources Preparedness</u>	<u>30</u>
<u>Sustainable Development Framework</u>	<u>15</u>		
<u>Sustainable Development Commitment</u>	<u>16</u>		
<u>Materiality Assessment</u>	<u>17</u>		
<u>Sustainable Development Strategy</u>	<u>18</u>		



Sustain Business Integrity Excellence 33

Smart Assurance and GRC in Common Sense 35

Optimize Resource and Create Shared Value 38

Circular Model for E&P 40

Ocean for Life 42

Social Contribution 48



Scan to download
Sustainability Report 2021

CEO Message



Even though PTTEP has been facing numerous business challenges caused by external factors like the ongoing coronavirus outbreak (COVID-19), oil price volatility, disruptive technology and innovation, or even the energy transition in 2021, the Company remains committed to continuous improvement, and adaptation to ensure national energy security while maintaining the right balance of social,

economic, and environmental safeguards as guided by our Sustainable Development Framework. The framework comprises 3 main components, namely: 1) High Performance Organization (HPO) or “Be Smart”, 2) Governance, Risk Management, and Compliance (GRC) or “Be Good”, and 3) Stakeholder Value Creation (SVC) or “Be Responsible”. This is being executed under the strategic direction of

Execute and Expand towards Energy Transition and aligned with the United Nations Sustainable Development Goals (UN SDGs) with the ultimate goal to deliver sustainable values to all stakeholders (From We to World) following its vision of “Energy Partner of Choice”.

Under the challenging circumstances, PTTEP operates its business as a Cautious Diversified Player, emphasizing both petroleum exploration and production business (Core E&P) and diversification to new businesses (Beyond E&P), leveraging the Company’s knowledge and technology, which include power business from natural gas, renewable energy, and future energy. In 2021, PTTEP successfully strengthened its core E&P business by achieving targets in maintaining production plateau and increasing petroleum reserves through its existing projects and projects under the development phase, as well as business expansion in strategic areas to increase future production volumes. Production volumes rose to a record-high at 490,000 barrels of oil equivalent per day as a result of the faster-than-expected production of Malaysia Asset’s Block H together with its successful acquisition of participating interest in Oman’s Block 61 early last year. In addition, PTTEP made additional petroleum discoveries in Malaysia and expanded its investments in strategic locations such as the joint venture in exploration blocks in the United Arab Emirates. In light of PTTEP’s success in new businesses (Beyond E&P) which aim to strengthen the Company’s long-term growth, AI and Robotics Ventures Company Limited (ARV), a subsidiary of PTTEP, established 4 subsidiaries in 2021 to support future business expansion in artificial intelligence and robotics.

Beyond that, PTTEP is conducting a study to formulate a roadmap on climate change in support of Thailand’s goals to achieve carbon neutrality by 2050 and net zero emissions by 2065 as committed at the 26th UN Climate Change Conference (COP26). PTTEP has continued its concrete implementation of “Greenhouse Gas Management Strategy” through technology development projects for greenhouse gas reduction, aiming to further reduce greenhouse gas emissions from operations with key projects such as “Carbon Nanotubes from Flare Gas” Project and

“Carbon Capture and Storage” Project at Arthit Asset. Besides, the Company has accelerated its strategic review to adjust its business portfolio to be ready for the path towards becoming a net zero organization.

Aside from operational targets and strategies, PTTEP has given priority to Safety, Security, Health, and Environment (SSHE) to ensure safe working conditions for employees and contractors. In order to achieve its safety target zero, PTTEP has put the SSHE Management System or SSHE MS in place for strict compliance and continually established SSHE leadership at all levels, resulting in PTTEP’s above-average safety performance level against the average rate of the International Association of Oil and Gas Producers (IOGP). Targeting to continuously improve the overall SSHE performance, all business units have put collective efforts in developing short-term and long-term plans (SSHE Roadmap) as a guideline for effective SSHE implementation.

Also underscored is Governance, Risk Management, and Compliance as PTTEP believes that it will be the Company’s license to operate and support the business mission, while creating public confidence and acceptance from relevant stakeholders. Thus, the Company has driven the Smart Assurance and GRC in Common Sense strategies with aspiration to become a GRC role model among Thai listed companies and raise GRC maturity level to Level 5 or the highest level. In 2021, “#GRC, Good and Cautious” was the key message communicated with employees: “Good” refers to compliance with governance principles and business ethics as well as relevant laws and regulations while “Cautious” concerns risk management and appropriate internal control. PTTEP had put in place the GRC assurance process and ensured that it was deployed to all new projects along with suppliers and contractors to ensure the same standard.

In view of environmental conservation and rehabilitation as well as community and social stewardship, in 2021, PTTEP implemented “Circular Model for E&P” and “Ocean for Life” strategies through key projects, such as Arthit Asset’s Wellhead Platform Topside Relocation, Recycled Drill

Cuttings Road at PTTEP's Rapid Scale-up Center (RASC), Sand to Zeolite for Zawtika Asset, Baseline Study of Microplastics in the Gulf of Thailand, Ocean Health and Biodiversity Monitoring: Coral Bleaching Baseline, Aquatic Animal Hatchery Learning Center, Mangrove Forestation, including several social development projects.

Besides, PTTEP has valued and provided social contribution in several other dimensions, such as donating medical equipment from its innovations jointly developed by PTTEP, ARV, and partners; providing continued financial support and supplies to hospitals in Thailand and other countries, worth more than THB 150 million, to support the fight against coronavirus (COVID-19) since 2020. In addition, the Company supported the Restart Thailand Project as a hiring program to provide a platform for new graduates to develop job skills and put knowledge into practice amid the low season of Thailand's labor market.

Thanks to its continuous commitment on sustainable development, PTTEP received awards and recognitions from various domestic and international institutes, including ASIAN ESG Award for the 9th consecutive year. As well, PTTEP was selected as a member of Dow Jones Sustainability Indices (DJSI) for the 8th consecutive year and FTSE4Good Index Series for the 6th consecutive year. At the national level, PTTEP received Best Sustainability Awards in the category of Sustainability Excellence for the 2nd consecutive year at SET Awards 2021. In addition, PTTEP was included in Thailand Sustainability Investment (THSI) for the 6th year. Also PTTEP received the National Anti-Corruption Commission's NACC Integrity Award and the 2021 Role Model Organization on Human Rights in State Enterprise sector from the Rights

and Liberties Protection Department for the 3rd consecutive year, including a number of international awards on social and environmental programs. These awards reflect the Company's commitment to capability improvement in all dimensions for sustainable development, through collaboration with all stakeholders as guided by its vision of "Energy Partner of Choice".

PTTEP also upholds the United Nations Global Compact (UNGC)'s 10 principles as an Advanced participant and plays a role in driving Thailand's private sector towards sustainability through collaboration with other local organizations such as Global Compact Network Thailand (GCNT), Thailand Business Council for Sustainable Development (TBCSD), and Thai Listed Companies Association's ESG Network.

The journey towards sustainability is not easy, but I'm convinced that with the unity of PTTEP personnel under "One Team One Goal" mindset coupled with strong support from shareholders, business partners, contractors, suppliers, relevant government agencies, communities, and societies to propel our missions under Sustainable Development Framework, we can together achieve our goal and deliver a better future to the next generation.



(Montri Rawanchaikul)
Chief Executive Officer

About This Report

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

PTT Exploration and Production Public Company Limited (PTTEP) prepared Sustainability Report 2021 to publicize the performance of PTTEP operational control activities and material issues in economic, social, and environmental dimensions to stakeholders. The information appearing in this report covers the performance from January 1 through December 31, 2021.

Reporting Approach

(GRI 102-49, GRI 102-54, GRI 102-56)

The information disclosed in this report covers significant issues that caused economic, social, and environmental impacts for PTTEP operational control activities of petroleum exploration and production. This report is completed under the guidelines of Global Reporting Initiative Standards (GRI Standards) in accordance with the core level under Oil and Gas Sector Disclosures (OGSD), and other international sustainability reporting frameworks such as International Petroleum Industry Environmental Conservation Association (IPIECA)'s Oil and Gas Industry Guidance on Voluntary Sustainability, Dow Jones Sustainability Indices (DJSI), AA1000 AccountAbility Principles Standard 2018 (AA1000APS), and Sustainability Accounting Standards Board (SASB)'s Materiality Map™. PTTEP is determined to improve the quality of sustainability reporting to lift the disclosure level in line with Integrating Reporting (IR) Framework which better demonstrates the correlations of sustainable development and financial operations which can shape the organization's future reporting plan.

This report contains material issues and outstanding sustainability performance in 2021, under PTTEP's Sustainable Development Framework and Strategy. Details of the execution and results are posted on PTTEP's website under "Sustainable Development" Section, which is the central information portal for easy online access.

The selected information on safety, occupational health, and environment in this report as well as details of the execution were verified for accuracy and completeness according to AA1000APS principles concerning stakeholders' engagement, the scope of material issues, and responses to stakeholders' expectations. This report received Limited Assurance from KPMG Phoomchai Business Advisory Limited. The assurance statement was shown in "Assurance Statement" Section on PTTEP's website. Meanwhile, the State Audit Office of the Kingdom of Thailand conducted the accounting audit and the auditor's report and financial performance were shown in Annual Report 2021 (56-1 One Report) of PTT Exploration and Production Public Company Limited.

Scope of Reporting

(GRI 102-45, GRI 102-46, GRI 102-49)

The information contained in this report concerns the Company and PTTEP's operational control activities of petroleum exploration and production in Thailand and overseas. The detailed scope of reporting is shown in PTTEP's website under "Sustainability Data Center" Section. There are no significant changes in the reporting scope and material issues of Sustainability Report 2021 compared to

the 2020 issue, as shown in "Approach to Reporting" Section on PTTEP's website. The information on economic performance is the same set as appeared in Annual Report 2021 (56-1 One Report) which covers all projects in exploration and production phases, invested and operated by PTTEP. As a subsidiary of PTT Public Company Limited, PTT's Sustainability Report encompasses PTTEP's information.

Value Creation: From We to World

Input

Financial Capital

- Debt to equity ratio <0.5 times
- Shareholders' equity* = USD 12,428 million
- Interest-bearing liabilities* = USD 4,094 million
- Credit ratings: BBB+ (S&P), Baa1 (Moody's), BBB+ (Fitch), AAA (TRIS)

*Financial position as of December 31, 2021

Production Capital

- 47 projects in 15 countries
- Net procurement value: USD 1,522 million
- Efficiency enhancement and production cost reduction implemented with over 400 initiatives

Human Capital

- 4,564 employees of more than 20 nationalities
- 2,393 suppliers
- Suppliers, dealers, and business partners' skills and experiences
- Average 48 hours per year for employees' development and training

Intellectual Capital

- Technology and innovation development budget: USD 12.5 million
- Executives and the working committee involved with PTTEP's technology and innovation development
- Researchers and employees involved with technology development
- Collaboration with 15 external organizations on technology and innovation development

Social and Relationship Capital

- Expenses for social development projects: USD 13 million
- Employee volunteering: 1,584 hours
- 44 conservation networks in Songkhla, Pattani, Nakhon Si Thammarat, Prachuap Khiri Khan, Surat Thani, Chumphon, Phetchaburi, Samut Songkhram, and Rayong provinces
- Donation of more than THB 150 million in the fight against COVID-19 (2020-2021)

Natural Resources Capital

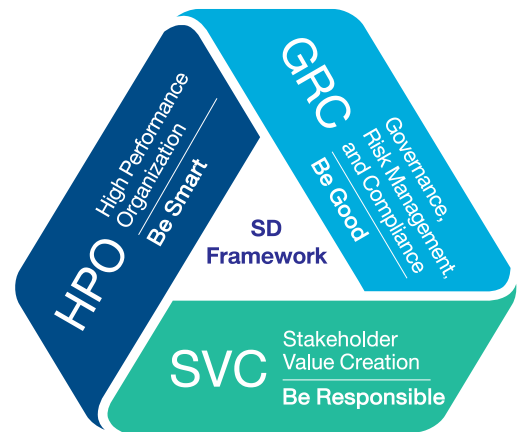
- Natural resources
- Energy consumption: 33.19 million gigajoules
- Water consumption: 0.65 million cubic meters
- Environmental management expenses: USD 17.65 million

Process

Vision



Sustainable Development Framework and Strategy



High Performance Organization and Thrive in Lower Carbon Future

- Sustainable E&P Business
- Diversification to Beyond E&P Business
- Greenhouse Gas Management

Sustain Business Integrity Excellence

- Smart Assurance
- GRC in Common Sense

Optimize Resource and Create Shared Values

- Circular Model for E&P
- Ocean for Life

Output / Value Creation

Stakeholders

Deliver competitive and sustainable returns to shareholders, investors, the government, and business partners

- Total revenue: USD 7,314 million
- Earnings before interest, tax, depreciation, and amortization (EBITDA): USD 4,996 million
- Net profit: USD 1,211 million
- Dividend payout ratio per net income: 50%, and dividend yield: 4.24%
- Unit cost: USD 28.52 per barrel of oil equivalent
- Return on capital employed: 8.15%
- Royalty fee and taxes: USD 1,795 million

Ensure national energy security in response to economic needs

- Natural gas production reached 821 billion cubic feet (133 million barrels of oil equivalent)
- Crude oil, condensate, and LPG production: 48 million barrels of oil equivalent
- Proved reserves: 1,350 million barrels of oil equivalent
- Natural gas accounts for 74% of proved reserves volume

Build employees' capabilities, improve suppliers' capability, and assure all relevant persons of safety

- Lost Time Injury Frequency (LTIF): 0.16 per 1 million hours worked
- Total Recordable Incident Rate (TRIR): 0.74 per 1 million hours worked
- 91% of employees improving capabilities according to individual development plans
- Employees' capability increases 5.45% per year on average

Enhance competitiveness, prepare for future challenges, and develop technologies and innovations for social benefits

- 56 technology projects in the development phase
- 11 projects implemented
- Accumulated intellectual properties: 8 granted patents, 4 registered software copyrights, 42 pending patents applications
- Increased returns from the implementation of in-house technology in E&P in 2021: USD 5.7 million

Grow community economy and build good relationship with community and society

- 145 social development projects in 4 aspects – basic needs, education, environment, and culture
- Achieved net positive impact on ocean biodiversity and ecosystem services (BES) value in domestic offshore operational: 29.5%
- Increased community income of focused communities participating in Aquatic Animal Hatchery Learning Center and Seafood Product Value Enhancement Project: 20.5%
- Earn community's trust and engagement as well as support from the local community

Mitigate environmental impacts caused by the operations, enrich natural resources and ecosystems, and secure community trust and confidence in the operations at all operational sites

- Reduce greenhouse gas emissions by 358,187 tonnes of carbon dioxide equivalent
- Reduce energy consumption and recycle energy by 3.54 million gigajoules
- Waste diverted from disposal (reuse, recycling, and recovery) by 26% of total waste disposal
- Turn waste (drill cuttings) to road construction or pavement materials and convert produced sand waste to zeolite
- Relocation of Arthit wellhead platform topside to new location
- 39% water reused and recycled
- 13 green technology R&D projects



Government
Agencies, Regulators



Vendors,
Suppliers, Contractors



Customers



Employees



Shareholders,
Investment and
Financial Institutions,
and Creditors



Business Partners,
Consortium, and
Joint Ventures



Communities



Independent,
Public Organizations,
NGOs, and
Academics



Press
and Media

Achievements

Sustainable Development



Member of the 2021 Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry for the 8th consecutive year

S&P Global

Member of

**Dow Jones
Sustainability Indices**

Powered by the S&P Global CSA



Gold Class, S&P Global Sustainability Awards in The Sustainability Yearbook 2021

S&P Global

Sustainability Award

Gold Class 2021

S&P Global



Member of the FTSE4Good Index Series for the 6th consecutive year

FTSE Russell



FTSE4Good



| Crab Hatchery Learning Center Project



Best Sustainability Awards in the category of Sustainability Excellence for the 2nd consecutive year

SET Awards 2021

by the Stock Exchange of Thailand (SET) and Money & Banking Magazine





2021 Thailand Sustainability Investment (THSI) for the 6th time


The Stock Exchange of Thailand (SET)

High Performance Organization


HPO

 The Asset Platinum Award
 The Asset Best Initiative in Innovation
 The Asset Best Investor Relations Team Award
 The Asset Best CEO Award
 The Asset Magazine


 Best CEO Award in the resources category
 IAA Awards for Listed Companies 2020
 by Investment Analysts Association
 and the Stock Exchange of Thailand

 Asia's Best CEO for the 4th consecutive year
 Asia's Best CFO for the 8th consecutive year
 Best Investor Relations Company (Thailand)
 for the 9th consecutive year
 Best Investor Relations Professional
 The 11th Asian Excellence Awards 2021
 by Corporate Governance Asia Magazine

 CEO of the Year
 Best Employer Brand Award
 for the 2nd consecutive year
 Award for Excellence in Training
 Thailand Best Employer Brand Awards 2021
 by World HRD Congress, CHRO Asia,
 and Employer Branding Institute


 Best Practice Award in Excellence Level
 from the Initiation of New Way of Working Project
 The 7th International Best Practices Competition
 by Centre for Organisational Excellence Research
 (COER)



 Management Level (B-List) in Climate Change
 Management and Water Management
 CDP







 Global Most Innovative Knowledge Enterprise
 Award 2021 (Global MIKE Award 2021)
 Thailand Most Innovative Knowledge Enterprise
 Award 2021 (MIKE Award 2021) in Gold Level
 Global and Thailand MIKE Award
 Judging Committee 2021

 Best Investor Relations Awards
 SET Awards 2021
 by the Stock Exchange of Thailand (SET)
 and Money & Banking Magazine

Governance, Risk Management, and Compliance

GRC

-  Asia's Icon on Corporate Governance Award for the 9th consecutive year
Asian Corporate Director Recognition Award for the 2nd consecutive year
Being recognized as ESG Influencer
[16th ASIAN ESG Award 2021](#)
by [Corporate Governance Asia Magazine](#)
-  NACC Integrity Awards for the 4th time
[National Anti-Corruption Commission \(NACC\)](#)
-  2021 Role Model Organization on Human Rights in State Enterprise Sector for the 3rd consecutive year
[Rights and Liberties Protection Department, Ministry of Justice](#)
-  Being rated "Excellent" and receiving 5 of the National Corporate Governance Committee's symbols, the highest level, based on the Corporate Governance Report of Thai Listed Companies (CGR) 2021
[Thai Institute of Directors Association \(IOD\)](#)







-  Member of Thai Private Sector Collective Action Against Corruption (CAC) for the 3rd consecutive year
[Thai Private Sector Collective Action Against Corruption \(CAC\)](#)


Stakeholder Value Creation


SVC



-  Golden Peacock Global Award for Corporate Social Responsibility for the 2nd consecutive year
[The Institute of Directors \(IOD\), India](#)
-  Asia's Best CSR for the 2nd consecutive year
[The 11th Asian Excellence Awards 2021](#)
by [Corporate Governance Asia Magazine](#)
-  The Best Initiative in Social Responsibility
[The Asset Magazine](#)
-  Global CSR Awards 2021 (Gold Award) in the category of CSR Leadership, Best Community Programme for Community Health Development Programs, and Best Environmental Excellence for Sea Turtle Conservation Project
[The Global CSR Awards](#)

 Asia's Best CSR Practices Awards 2021 in the category of Best Environment Friendly Project for The Forest Restoration for Eco-learning Project at Sri Nakhon Khuean Khan Park, Community Development for Waste to Energy, and Concern for Health for Community Health Development Programs and Fighting COVID-19
[CMO Asia](#)


 Asia Responsible Enterprise Awards 2021 (AREA 2021) in Health Promotion category for Community Health Development Programs and received Carbon Champion Certificate
[Enterprise Asia](#)

 Communitas Award 2021 for Crab Hatchery Learning Center Project
[Communitas Awards Organization](#)




| The Forest Restoration for Eco-learning Project at Sri Nakhon Khuean Khan Park




 The Asia-Pacific Stevie Awards 2021, Silver Award in the category of Innovation in Community Relations or Public Service Communications for Forest Restoration for Eco-Learning Project at Sri Nakhon Khuean Khan Park, and Bronze Award for Stunting Prevention Program in Indonesia

[Stevie Awards Organization](#)

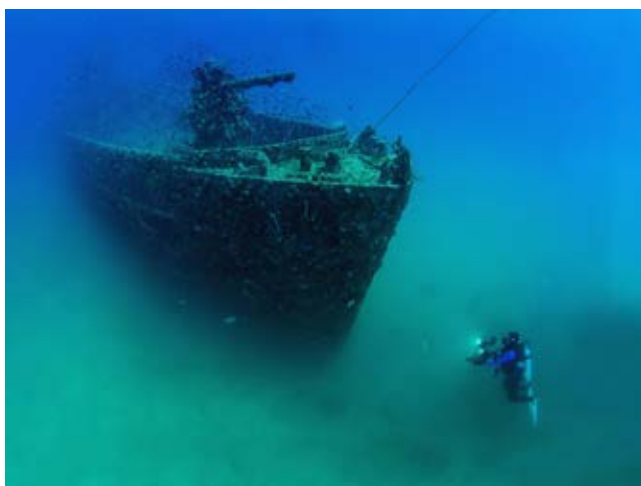
 Gulf Sustainability Awards 2021 in the category of Best Community Development (Silver Award) for H.T.M.S. Underwater Learning Site Project

[Awards International LLC FZ.](#)

 National Innovation Awards 2021 for Social and Environment Contribution (The second runner-up in the private sector category)
[National Innovation Agency \(Public Organization\) and Ministry of Higher Education, Science, Research, and Innovation](#)



| Community Health Development Project



| H.T.M.S. Underwater Learning Site Project



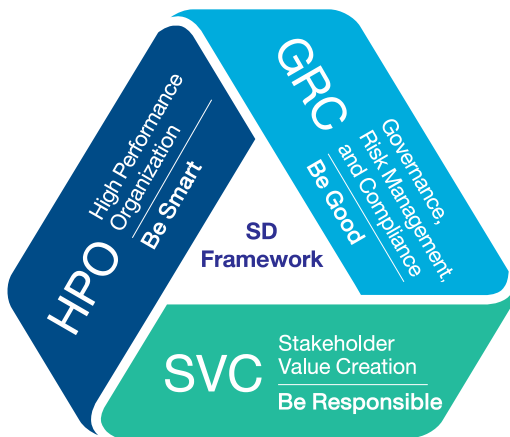
Sustainability at PTTEP

Sustainability at PTTEP

Sustainable Development Framework

With PTTEP's strong belief that the "Right Balance" of business, social, and environmental aspects will contribute to business sustainability, the "Sustainable Development Framework" was formulated. The framework plays a vital role in assuring business continuity to support energy security while safeguarding society and environment. PTTEP strives to build sustainability from within through its operational excellence on a strong business foundation while being committed to delivering long-term values to all stakeholders as the Company believes that this will

ultimately bring sustainability to society (From We to World) and enable PTTEP to achieve its vision of "Energy Partner of Choice". The Sustainable Development Framework emphasizes High Performance Organization (HPO) or "Be Smart", Governance, Risk Management, and Compliance (GRC) or "Be Good", and Stakeholder Value Creation (SVC) or "Be Responsible". The framework and sustainability-related material issues correspond with the United Nations Sustainable Development Goals (UN SDGs): 7, 8, 12, 13, 14, and 16.



High Performance Organization (HPO) "Be Smart"

Emphasizing excellence in all business elements as required by international standards for greater competitiveness and capability to adjust to future changes.



Governance, Risk Management, and Compliance (GRC) "Be Good"

Emphasizing transparent and efficient operations for the organization's stability and sustainability through governance, appropriate risk management, and internal control as well as strict compliance with relevant laws and regulations.



Stakeholder Value Creation (SVC) "Be Responsible"

Emphasizing long-term value creation for all stakeholder groups through responsibility for natural resource conservation, environmental rehabilitation as well as community and social development.

Sustainable Development Commitment

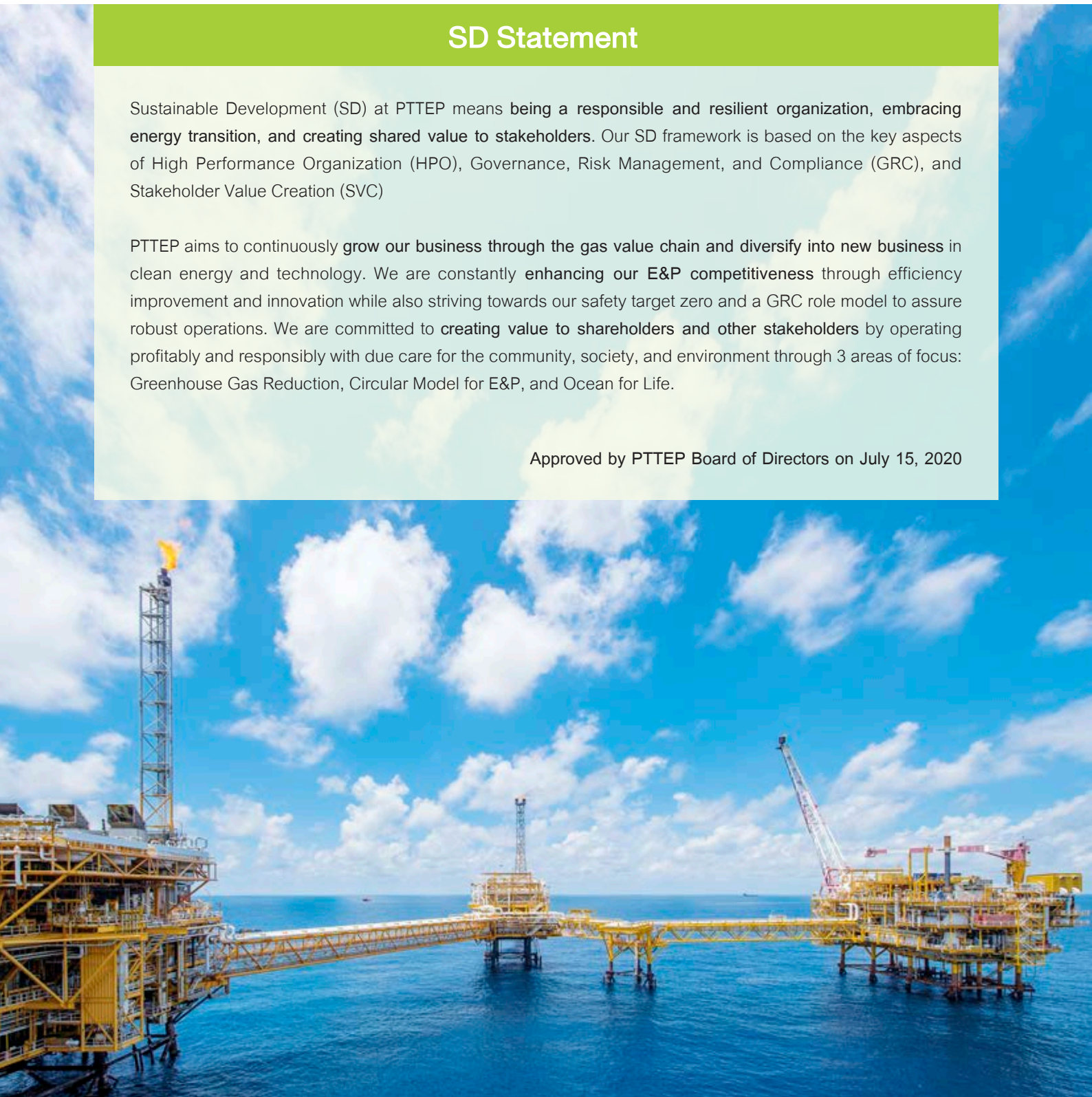
PTTEP announced SD Statement in 2020 to reiterate its commitment to sustainable development. All employees and stakeholders have been informed of the statement for their mutual understanding of expected guidelines on sustainable development. The SD Statement was approved by the Board of Directors who play a vital role in driving sustainable development into concrete actions. PTTEP's Corporate Governance and Sustainable Development Committee is tasked to oversee and support the overall execution for sustainable development with close monitoring on a quarterly basis.

SD Statement

Sustainable Development (SD) at PTTEP means **being a responsible and resilient organization, embracing energy transition, and creating shared value to stakeholders**. Our SD framework is based on the key aspects of High Performance Organization (HPO), Governance, Risk Management, and Compliance (GRC), and Stakeholder Value Creation (SVC)

PTTEP aims to continuously **grow our business through the gas value chain and diversify into new business** in clean energy and technology. We are constantly **enhancing our E&P competitiveness** through efficiency improvement and innovation while also striving towards our safety target zero and a GRC role model to assure robust operations. We are committed to **creating value to shareholders and other stakeholders** by operating profitably and responsibly with due care for the community, society, and environment through 3 areas of focus: Greenhouse Gas Reduction, Circular Model for E&P, and Ocean for Life.

Approved by PTTEP Board of Directors on July 15, 2020

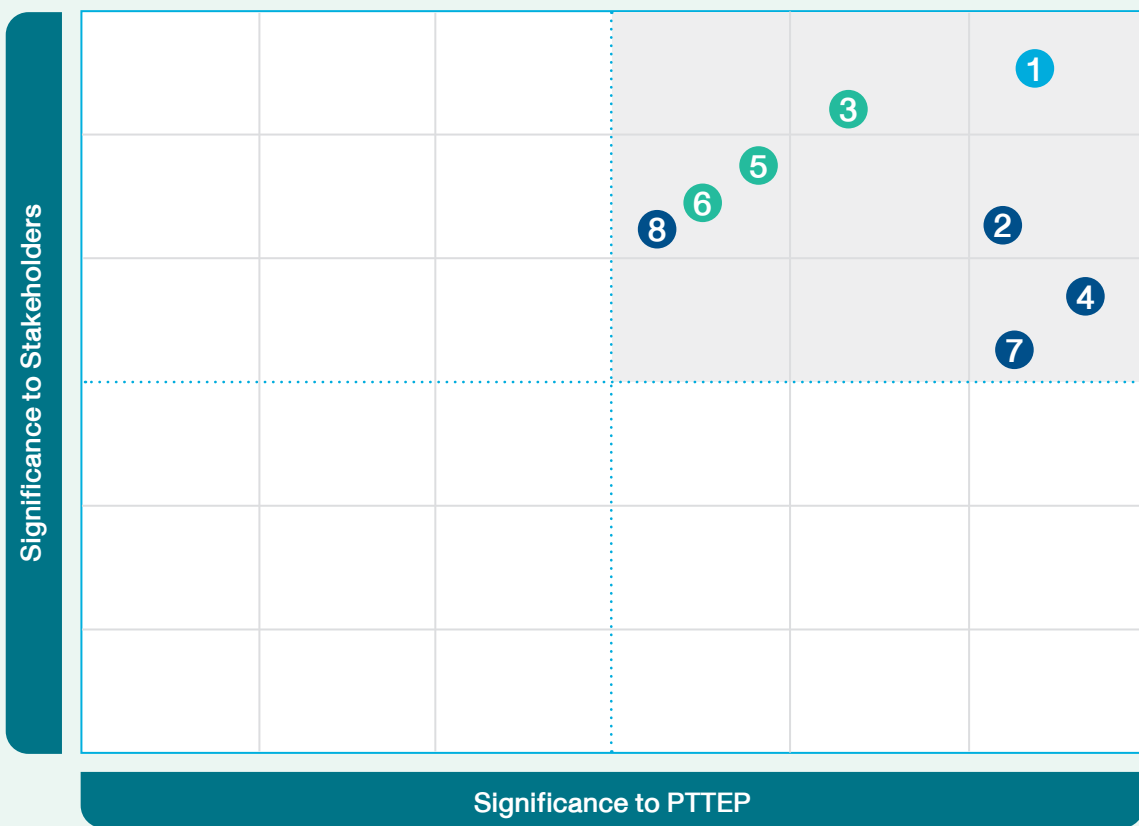


Materiality Assessment

PTTEP reviewed material issues on sustainability in Q1, 2021 through interviews and questionnaires with all stakeholder groups as well as the analysis of the likelihood of opportunities and risks that may affect the operations. The results were prioritized in 2 aspects: material issues of the Company’s operations and stakeholders’ concerns and expectations. Also incorporated are global sustainability trends that are in line with UN SDGs, DJSI’s criteria, and the energy industry’s material issues. The assessment process was conducted in line with GRI Standards.

Material Issues

(GRI 102-47)



- 2 Increasing Petroleum Reserves
- 4 Human Resource Preparation

- 7 Technology and Innovations
- 8 Occupational Health and Safety



- 1 Governance, Risk Management, and Compliance



- 3 Low Carbon Future
- 5 Contribution to Communities and Societies
- 6 Environmental Management









Scan for more details

Sustainable Development Strategy

Guided by the Sustainable Development Framework, PTTEP sets “Execute and Expand towards Energy Transition” as its strategic direction. The sustainable development strategies are developed based on its material issues aiming to address future challenges and continuously create shared values to stakeholders. The Company’s sustainable development strategies and long-term targets (2030) are as follows:

Strategic Direction: Execute and Expand towards Energy Transition

	 High Performance Organization and Thrive in Lower Carbon Future	 Sustain Business Integrity Excellence	 Optimize Resource and Create Shared Value
Strategies	<ul style="list-style-type: none"> • Sustainable E&P Business • Diversification to Beyond E&P Business • Greenhouse Gas Management 	<ul style="list-style-type: none"> • Smart Assurance • GRC in Common Sense 	<ul style="list-style-type: none"> • Circular Model for E&P • Ocean for Life
2030 Targets	<ul style="list-style-type: none"> • 5% CAGR production growth • Maintain proved reserve to production ratio at no less than 5 years • Unit cost in the top quartile among peers • 20% of net income from Beyond E&P Business • Zero work-related accident (SSHE Target Zero) • 25% reduction of greenhouse gas emissions intensity, 2012 base year 	<ul style="list-style-type: none"> • Become GRC role model among Thai listed companies • Increase GRC maturity level to the highest level at level 5 (Continuous Improvement with Automation) 	<ul style="list-style-type: none"> • At least 50% of main structures must be reused with safety awareness and efficient condition • Zero waste to landfill • Achieve net positive impact on ocean biodiversity and ecosystem services (BES) value for all offshore operations by 2030, compared to 2019 base year • 50% increase of income of focused communities and establish 16,000 conservation networks by 2030, compared to baseline data before PTTEP project implementation
	  		 

Aside from sustainable development strategies and long-term targets, PTTEP aims to operate its business in all areas as guided by the Sustainable Development Framework and in alignment with the Company’s strategic directions to ensure sustainability in all dimensions to win acceptance and confidence from stakeholders which will, in turn, allow PTTEP to achieve its vision of “Energy Partner of Choice”.

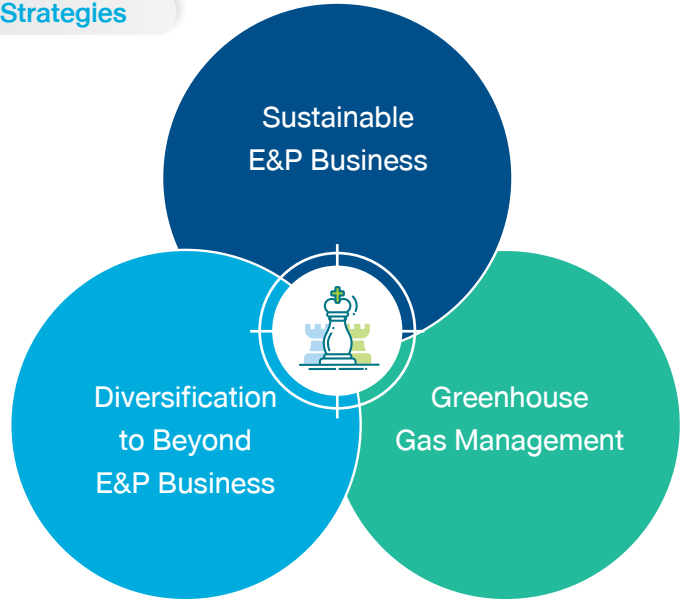


High Performance Organization and Thrive in Lower Carbon Future

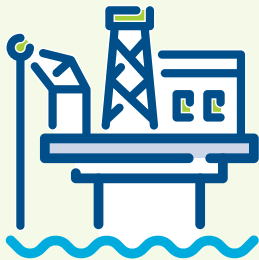
High Performance Organization and Thrive in Lower Carbon Future

PTTEP adapts to challenges that range from oil and gas depletion, oil price volatility, the COVID-19 outbreak, and stringent greenhouse gas emissions reduction measures amid the energy transition to ensure energy security and sustainable values for stakeholders through its strategies namely Sustainable E&P Business, Diversification to Beyond E&P Business, and Greenhouse Gas Management. The execution in 2021 can be summarized below:

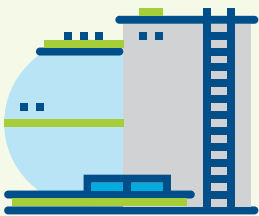
Strategies



Long-term Targets by 2030



5% CAGR production growth

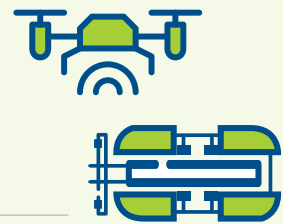


Maintain proved reserve to production ratio at no less than **5 years**



Unit cost in the **Top Quartile** among peers

20% of net income from Beyond E&P Business



Zero work-related accident (SSHE Target Zero)

25% reduction of greenhouse gas emissions intensity, 2012 base year*

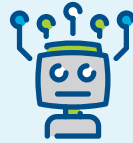


* The target will be revised after PTTEP's net zero target announcement in 2022.

Performance in 2021



Net profit:
USD **1,211** million



Innovation and technology
development: **56** projects



Total revenue:
USD **7,314** million

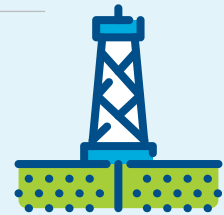


Employees' improved capability
5.45% per year



Dividend yield: **4.24%**

Exploration and Production
activities: **47** projects
in **15** countries



Unit cost:
USD **28.52**

Reduced GHG emissions:
358,187
tonnes of CO₂ equivalent



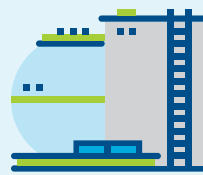
Production growth:
17%



Renewable energy accounting
for **79%** of total energy
consumption of Thai offshore
wellhead platforms

LTIF **0.16**

TRIR **0.74**



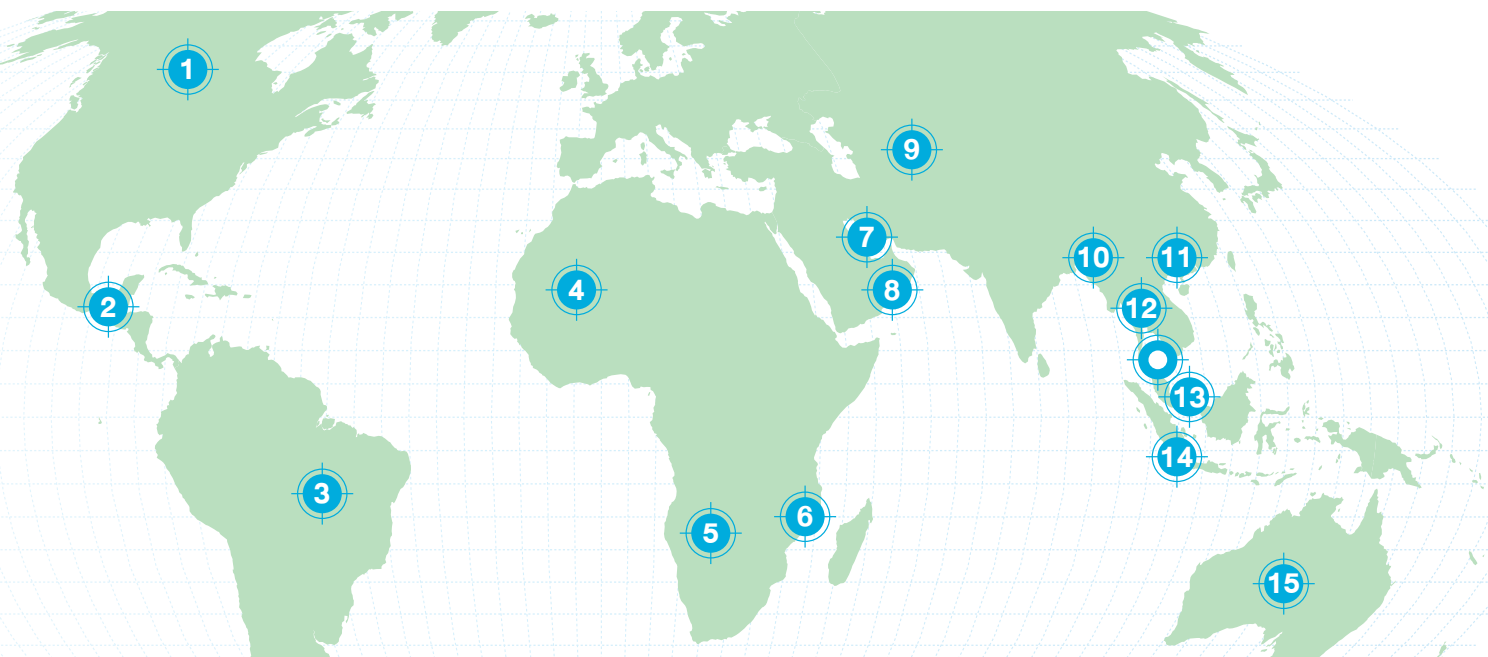
Proved reserve
to production ratio
(R/P Ratio or Reserves Life):
7.5 years

Sustainable E&P Business

PTTEP is committed to operating its business to ensure energy security and nourish sustainability in the exploration and production industry. The Company targets to increase its production capacity from key projects through leveraging its knowledge, expertise, and application of digital technology in exploration process while continuously reducing unit costs for cost competitiveness in order to strengthen PTTEP's core business amid greater volatile environment. Meanwhile, PTTEP explores other investment opportunities in potential locations in collaboration with experienced partners while looking for an opportunity to grow an integrated liquefied natural gas (LNG) business.

Business Overview

PTTEP Group's core business is exploration and production of petroleum in Thailand and foreign countries. As of December 31, 2021, PTTEP Group had 47 petroleum exploration and production projects in 15 countries with details as follows:



- Phase of Exploration
- Phase of Development

- Phase of Production
- Phase of Exploration/Development/Production

1 Canada

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

2 Mexico

- **Mexico Block 12 (2.4) Project**
Participation Interest: 20%
Operator: PC Carigali Mexico
- **Mexico Block 29 (2.4) Project**
Participation Interest: 16.67%
Operator: Repsol Exploración México

3 Brazil¹

- **Barreirinhas AP1 Project**
Participation Interest: 25%
Operator: Shell Brasil

- **Brazil BM-ES-23 Project**
Participation Interest: 20%
Operator: Petrobras

4 Algeria

- **Algeria 433a & 416b Project**
Participation Interest: 35%
Operator: GBRS
- **Algeria Hassi Bir Rekaiz Project²**
Participation Interest: 49%
Operator: PTTEP

5 Angola

- **Block 17/06 Project**
Participation Interest: 2.5%
Operator: TotalEnergies

6 Mozambique

- **Mozambique Area 1 Project**
Participation Interest: 8.5%
Operator: TotalEnergies

7 United Arab Emirates

- **Abu Dhabi Offshore 1 Project**
Participation Interest: 30%
Operator: Eni Abu Dhabi B.V.
- **Abu Dhabi Offshore 2 Project**
Participation Interest: 30%
Operator: Eni Abu Dhabi B.V.
- **Abu Dhabi Offshore 3 Project**
Participation Interest: 30%
Operator: Eni Abu Dhabi B.V.

8 Oman

- **Oman Block 61³**
Participation Interest: 20%
Operator: BP
- **PDO (Block 6) Project**
Participation Interest: 2%
Operator: Petroleum Development Oman
- **Mukhaizna (Block 53) Project**
Participation Interest: 1%
Operator: Occidental Petroleum
- **Oman Onshore Block 12 Project**
Participation Interest: 20%
Operator: TotalEnergies

1 On July 30, 2021, PTTEP Group signed a Sale and Purchase Agreement to sell its 100% interest in Partex Brasil Ltda., which holds 50% participating interest in the Potiguar Project. The transaction was completed and in effect on October 29, 2021.

2 On September 1, 2021, PTTEP Group, with 24.5% participating interests and is the operator of Algeria Hassi Bir Rekaiz Project in People's Democratic Republic of Algeria, received approval from the Government of People's Democratic Republic of Algeria to acquire the 24.5% shareholding interest in the project from CNOOC Limited, a joint partner. The shareholding interest then increased to 49% from such date. SONATRACH, a national oil company of Algeria, is a partner in this project with 51% participating interest.

3 On February 1, 2021, PTTEP Group signed a Sale and Purchase Agreement to acquire the 20% interest in Block 61 from BP Exploration (Epsilon) Limited (BP). The transaction was completed and in effect on March 23, 2021.

9 Kazakhstan

- **Dunga Project**
Participation Interest: 20%
Operator: TotalEnergies

10 Myanmar⁴

- **Zawtika Project**
Participation Interest: 80%
Operator: PTTEP
- **Yadana Project**
Participation Interest: 25.5%
Operator: TotalEnergies
- **Yetagun Project**
Participation Interest: 19.31784%
Operator: Petronas
- **Myanmar M3 Project⁵**
Participation Interest: 100%
Operator: PTTEP
- **Myanmar MD-7 Project⁶**
Participation Interest: 50%
Operator: PTTEP

11 Vietnam

- **Vietnam 9-2 Project**
Participation Interest: 25%
Operator: HV JOC
- **Vietnam 16-1 Project**
Participation Interest: 28.5%
Operator: HL JOC
- **Vietnam B & 48/95 Project**
Participation Interest: 8.5%
Operator: Vietnam Oil and Gas Group
- **Vietnam 52/97 Project**
Participation Interest: 7%
Operator: Vietnam Oil and Gas Group

12 Thailand

- **Bongkot Project**
Participation Interest: 66.6667%
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
- **L22/43 Project**
Participation Interest: 100%
Operator: PTTEP
- **L53/43 & L54/43 Project**
Participation Interest: 100%
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

13 Malaysia

- **Malaysia Project⁷**
Participation Interest: 7.2⁸-80%
Operator: PTTEP

14 Indonesia

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

15 Australia

- **PTTEP Australasia Project⁹**
Participation Interest: 90-100%¹⁰
Operator: PTTEP

Overlapping Area

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

4 PTTEP Group submitted a request to terminate and relinquish 100% of the exploration blocks of Myanmar M11 in September 2019. The official approval from the Government of the Republic of the Union of Myanmar was already obtained on November 22, 2021. PTTEP Group submitted a request to terminate and relinquish 77.5% of the exploration blocks of Myanmar MOGE3 in July 2020. The official approval from the Government of the Republic of the Union of Myanmar was already obtained on November 24, 2021.

5 On September 17, 2021, Mitsui Oil Exploration Company Limited (MOECO), a joint partner of Myanmar M3 Project, withdrew its shareholding interest of 20% according to the Joint Operating Agreement, with effect on October 31, 2021. After such withdrawal, PTTEP Group will hold 100% stake in the project. However, the completion of withdrawal is still pending approval from the Government of the Republic of the Union of Myanmar.

6 PTTEP Group submitted the block relinquishment notification letter for Myanmar MD-7 Project to MOGE in October 2020 after fulfilling the obligations under the Product Sharing Contract. The relinquishment will be effective after the official approval from the Government of the Republic of the Union of Myanmar.

7 PTTEP Group has named investments of all projects in Malaysia under "Malaysia Project", which comprises several petroleum blocks where PTTEP Group is the operator. The participating interests vary from 42-80%, except for one area named Gumusut-Kakap (GK) in Sabah K Block where PTTEP Group is a joint venture partner with participating interest of 7.2%, and Shell is the operator.

8 On March 15, 2021, PTTEP Sabah Oil Limited (PTTEP SBO), a subsidiary of PTTEP Group, obtained approval from the Malaysian Government to increase the interest of GK Block, under Malaysia Block K Project, from 6.366% to 6.555%, with effect from January 1, 2020. Moreover, on December 30, 2021, Sabah Shell Petroleum Company Limited (SSPC), the operator of GK Block, obtained another approval from the Malaysian Government to change the interest of GK Block under the Unitisation and Unit Operating Agreement (UUOA). Therefore, the working interest of PTTEP SBO had increased from 6.555% to 7.1666%.

9 On November 19, 2021, PTTEP Australasia (Ashmore Cartier) Pty Ltd had submitted the request for the relinquishment of AC/L3 Project in Australia, which will be effective after the official approval from the government.

10 PTTEP Australasia Project comprises several petroleum blocks, where the participating interests vary from 90-100%.

Exploration Success and Expansion for Sustainable Growth

With its mission to ensure energy security, PTTEP was bound to explore additional petroleum reserves for the Company's long-term growth. In 2021, PTTEP witnessed great success in the exploration and development in Malaysia, with a series of natural gas and oil discoveries at offshore operations, namely Nangka, Dokong, Lang Lebah, Sirung, and Kulintang. The Company also delivered the first gas production of Sabah H in Malaysia, contributing to the production volume in 2021. The discoveries were made possible by PTTEP's extensive expertise and strong partnership with Petronas. Under the partnership, new oil and gas exploration approaches and techniques were deployed to address future energy demands.

Committed to increasing petroleum reserves and creating long-term growth for the Company, PTTEP put an emphasis on expanding investment in its strategic locations like

the Middle East, a region with low operating costs. In 2021, the Company acquired a 20% participating interest in the Sultanate of Oman's Block 61, a large gas development field, which immediately increased the Company's sales volume, fostered its long-term growth, and opened up new investment opportunities in the Middle East.



"The successful natural gas and oil discoveries and development in Malaysia, a major strategic investment destination of PTTEP, affirm PTTEP's capabilities in terms of human resources and technology. Besides, the current collaboration with Petronas shows our readiness to become an 'Energy Partner of Choice' to create true sustainable growth."

Dr. Terapol Phoonsiri
Country Manager, Malaysia Asset
PTTEP

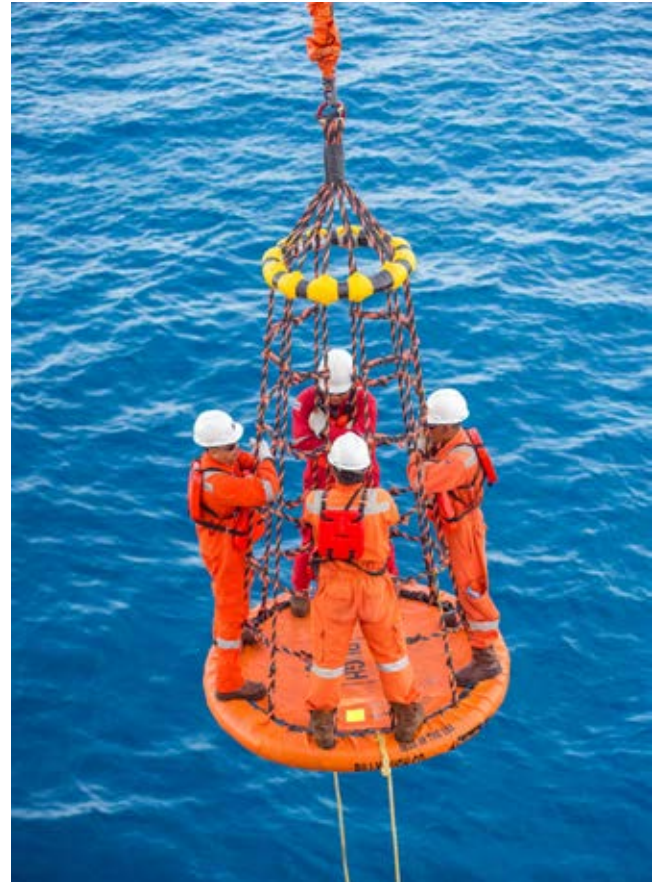
Governance for Transition Project

To ensure continuous and efficient operations of the projects during the asset transition, PTTEP outlined a governance work plan to prepare for operational readiness after a production sharing agreement takes effect. This will allow an uninterrupted and safe gas production and supply after the operatorship is transferred to ensure national energy security. As for the Block G1/61 and G2/61, PTTEP has been closely coordinating with the Department of Mineral Fuels (DMF) for all transitional related activities, including preparation of work program and budget, procurement activities, transferred asset selections, and negotiations of several sales and other required agreements.

Moreover, especially for Block G1/61, PTTEP and DMF jointly worked together and developed the Joint Field Development Plan, the contingency plan reflects the current situation of inability to access site due to prolonged negotiation with existing concessionaire, whilst continuing the joint effort to negotiate. Eventually, the Site Access Agreement was concluded and signed altogether with other two agreements with the existing concessionaire on December 20, 2021, i.e. Asset Retirement Access Agreement (ARAA) and Operation Transfer Agreement (OTA), setting forth collaboration on the remaining period towards the start of the Production Sharing Contract (PSC).

Safety, Security, Health, and Environment (SSHE) Performance

While PTTEP operates its business in alignment with the corporate targets and strategies, the Safety, Security, Health, and Environment (SSHE) value is always underlined. It ensures that safe work conditions for employees and contractors are provided and that stakeholders' expectations are met. To achieve the "Target Zero" goal, PTTEP has put the SSHE Management System (SSHE MS) in place and consistently leveraged SSHE leadership at all levels. In 2021, the overall PTTEP safety performance was above average compared to the International Association of Oil and Gas Producers (IOGP) average performance among the industry peers. However, the Lost Time Injury Frequency (LTIF) and Total Recordable Injury Rate (TRIR) experienced an upward trend, while the Loss of Primary Containment Rate (LOPC) and Oil and Chemical Spill Rate showed a declining trend when compared to last year. Therefore, the short-term and long-term plans (SSHE Roadmap) have been developed and used as guidance for effective SSHE implementation to improve overall SSHE performance. Furthermore, in 2021,



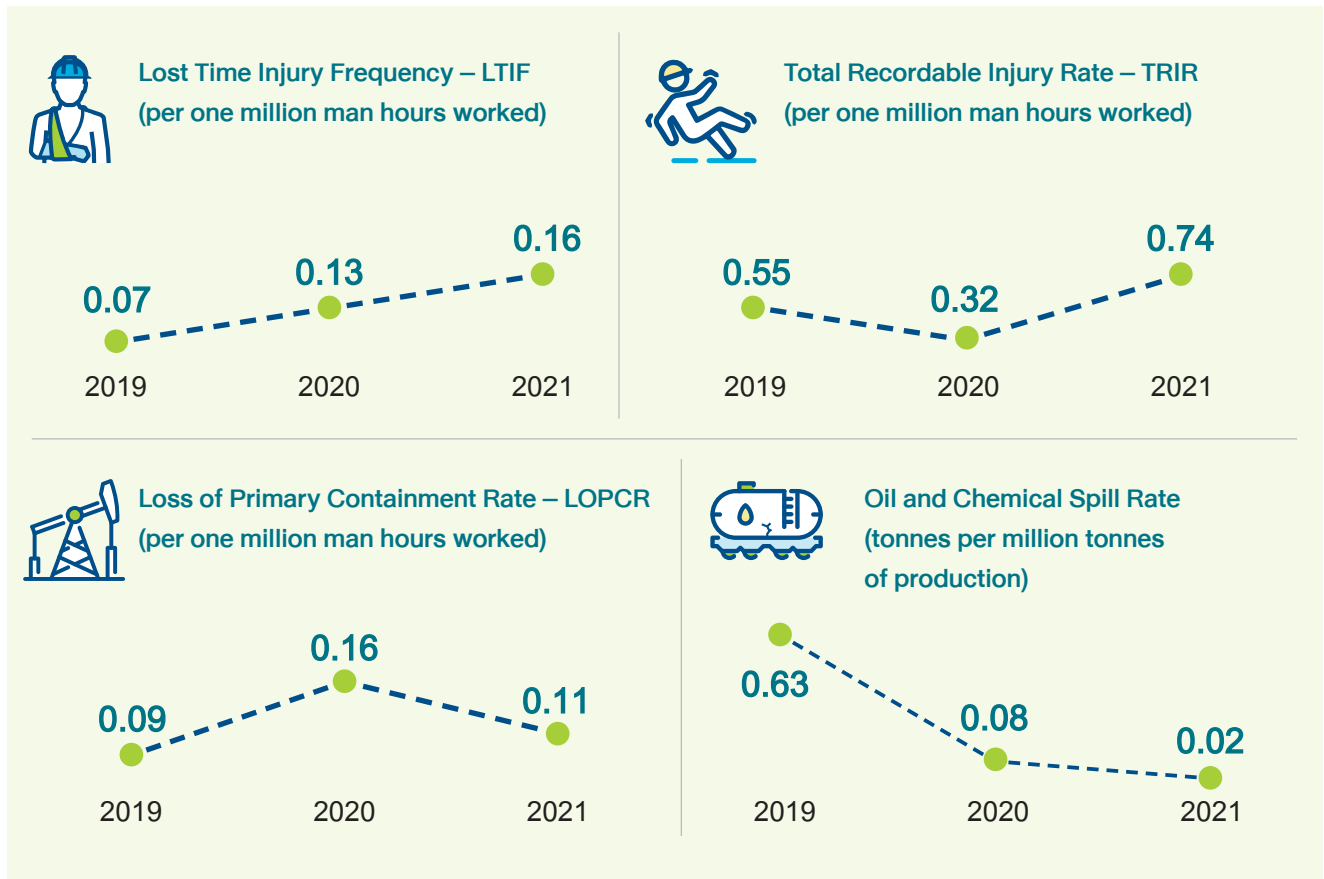
the SSHE Digital Transformation (DT) Initiatives have been implemented covering all areas of concern, including iSSHE, Environmental Portal (Phase 2), e-MOC, and Online Barrier. The key goals of these initiatives are to promote safe and sound SSHE implementation, reduce SSHE risks, minimize unnecessary utilization of resources, reduce errors and redundancy of works, and support users at all locations where PTTEP operates.



Mr. Kamonchai Noochaikaew

Roustabout
CONNECT ENERGY

"I have gained several safety perspectives and examples of safe behavior from PTTEP's safety training that can be applied to my work and my life at home. I can now confidently demonstrate my safety leadership on various occasions. For example, I'm not afraid to express my opinion and stop working when encountering unsafe conditions. PTTEP should keep on providing safety training like this."



Diversification to Beyond E&P Business

In response to changes in energy consumption, PTTEP is exploring investment opportunities beyond the exploration and production business by leveraging its existing knowledge and expertise to develop new technologies which could, in turn, become its future businesses. Examples include artificial intelligence and robotics business, Gas to Power business in the Socialist Republic of Vietnam and the Republic of the Union of Myanmar, investment in Carbon Capture, Utilization, and Storage (CCUS) technology, and future energy.



In-house Technology Commercialization

PTTEP has continued its attempt to develop in-house technologies to ensure efficiency improvement and cost effectiveness for the exploration and production business and minimize operational impacts on the environment with the ambition to commercialize those technologies. Many research and development projects, such as Pipeline and Decommissioning Solution, Carbon Nanotubes from Flare Gas, and Graphene from Crude Oil Sludge, have been executed in collaboration with partners and external organizations.

AI and Robotics Business Scale-Up

Seeing the importance of artificial intelligence and robotics, PTTEP established AI and Robotics Ventures Company Limited (ARV) as a subsidiary in 2018. ARV's mission is to provide AI and robotics solutions in support of petroleum exploration, development, and production activities. With constant business growth, in 2021, ARV registered 4 subsidiaries to accommodate future business expansion, namely Rovula (Thailand) Company Limited (ROVULA), Skyller Solutions Company Limited (SKYLLER), Varuna (Thailand) Company Limited (VARUNA), and Cariva (Thailand) Company Limited (CARIVA).

It's also worth mentioning the success of SKYLLER in joining forces with Aerodyne Group, a Malaysia-based global drone service provider and Digital Creation Company Limited (DC) to set up AeroSky (Thailand) Company Limited (AeroSky) to develop and provide advanced drone solutions to businesses and industries in Thailand. The solutions cover the inspection of infrastructure and equipment located at high level and difficult to reach such as telecom poles, electric poles, flare stacks, and oil tanks. With its agility and precise and high-resolution data provided, it can save time on the inspection and monitoring and reduce the risks of working at heights as we can avoid an inspection using scaffolding and conventional technology. AeroSky will enhance ARV's drone-related business capability as Aerodyne Group is a leading provider of DT3 (Drone Tech, Data Tech, and Digital Transformation) solutions from Malaysia as well as drone technology solutions in the market. Aerodyne is also a pioneer in applying AI for Big Data management, analytics, and work efficiency enhancement.



"It's ARV's great pleasure to partner with internationally recognized and experienced specialists. The set-up of AeroSky marks a major milestone in revolutionizing Thailand's infrastructure inspection services while enhancing customers' business values thanks to our smart drone and its applications, which are ARV's strength, together with our powerful network. This collaboration unlocks a new way of services that address challenges in Thailand's market."

Dr. Thana Slanvetpan

General Manager

AI and Robotics Ventures Company Limited (ARV)

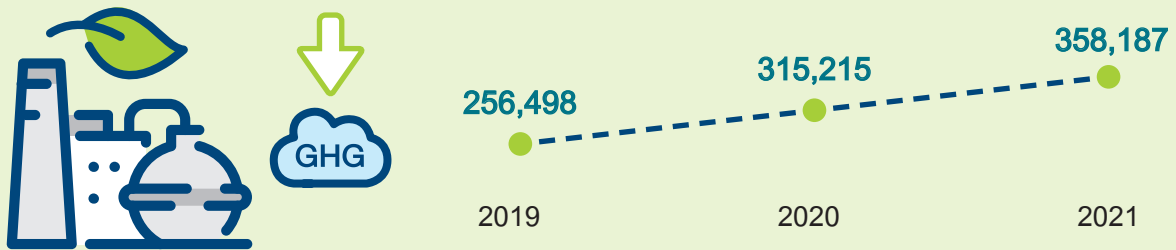
Greenhouse Gas Management

PTTEP has focused its attention on greenhouse gas management to minimize the impacts of global warming and climate change, which are considered as national and global issues that need immediate actions. The Company has set the target to reduce greenhouse gas emissions intensity by at least 25% by 2030 from the 2012 base year through several initiatives like the flare gas recovery and utilization, energy efficiency improvement, production efficiency improvement, reduction of methane leak, adoption of renewable energy in operations and feasibility studies to apply the Carbon Capture, Utilization, and Storage (CCUS) technology for offshore operations, aiming to store and upcycle the captured CO₂ from production process into new products.



In 2021, PTTEP was able to reduce greenhouse gas emissions intensity by 24.1% compared to the 2012 base year or 358,187 tonnes of CO₂ equivalent. From 2012 to present, in accumulation, PTTEP reduced greenhouse gas emissions at 2.34 million tonnes of CO₂ equivalent.

Reduce Greenhouse Gas Emissions from the Production Process in 2021 (tonnes of CO₂ equivalent)



Flare Gas Recovery and Utilization

178,928



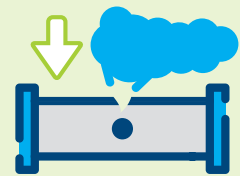
Product Efficiency Improvement

91,555



Energy Efficiency

82,704

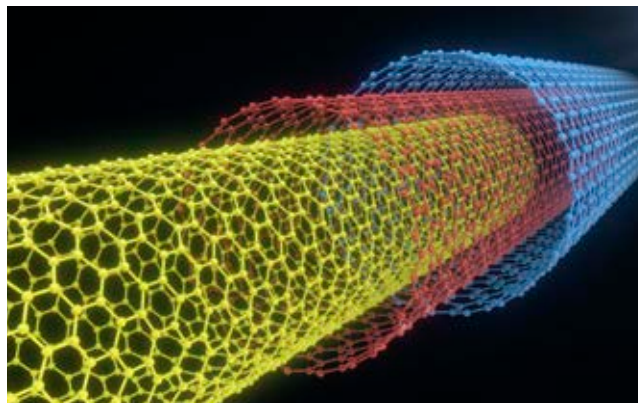


Methane Leakage Control

5,001

Carbon Capture and Utilization (CCU)

As operational greenhouse gas emissions reduction is crucial to achieving our long-term target, PTTEP has initiated feasibility studies on Carbon Capture and Utilization (CCU) technology to convert CO₂ captured from operations into new products. For example, Carbon Nanotubes from Flare Gas Project is initiated to convert flare gas waste into Carbon Nanotubes, which helps reduce greenhouse gas emissions to the atmosphere. Carbon Nanotubes are cylinder-like tubes made of carbon atoms bonded together in a hexagonal mesh, possessing exceptional characteristics due to their strength superior to steel, high electrical conductivity, and electrical insulation which can be manufactured into electronic equipment, battery, vehicle parts, etc. The feasibility study is a collaboration between PTTEP and PTT Innovation Institute. The prototype unit for S1 Project was



completed in August 2021. In the process, 1,000 standard cubic feet per day (scfd) of flare gas waste will be routed to the prototype unit which can produce 0.37 tonnes of nanotubes per annum. The Front-end Engineering Design (FEED) was also conducted for further equipment installation to maximize the production capability of the pilot project to accommodate 100,000 cubic feet of waste flare gas per day, which can produce approximately 30 tonnes of carbon nanotubes per annum. The construction will commence in 2022.

In addition, PTTEP also conducted another feasibility study on Carbon Capture and Utilization (CCU) to convert CO₂ gas from production process into new products such as methanol and propylene carbonate, which can potentially become PTTEP's new business.

Carbon Capture and Storage (CCS)

PTTEP conducted a feasibility study on greenhouse gas reduction in natural gas projects in the Gulf of Thailand through geological and engineering study to determine the possibility for storing CO₂ underground and other areas such as depleted reservoirs, saline aquifers, and crude oil fields to enhance oil recovery, by taking into consideration daily gas compression rate and long-term storage capacity of greenhouse gas with zero possibility of leaking into the atmosphere.

The study outlines the separation of CO₂ from the production process through underground gas sequestration. The process requires the installation of additional equipment to enhance the CO₂ separation efficiency prior to sequestration in order to recover and optimize the remaining natural gas. Compressors were installed to compress the separated CO₂ prior to injecting the gas into storage reservoirs, specifically designed for CO₂.

In 2021, Arthit Project was selected as a pilot project for CCS implementation. With the success of this project in the future, CO₂ emissions will be reduced by more than 500,000 tonnes per year.

Resources Preparedness

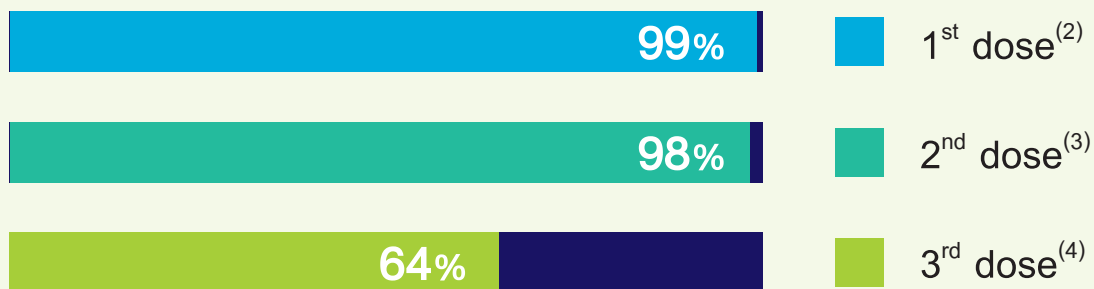
In order to prepare the organization and resources for business transition and enhance employees' readiness to drive the organization towards sustainability while embracing changes and challenges particularly during the energy transition, which also includes the new way of working amid the COVID-19 pandemic, PTTEP puts an emphasis on upskilling and adjusting work process to enhance flexibility for maximum efficiency and effectiveness.

Employee Stewardship Amid COVID-19 Outbreak

As the world and Thailand were struggling with the COVID-19 outbreak, PTTEP set up the "PTTEP Taskforce for COVID-19 Monitoring and Response" to closely monitor the situation, report, and provide consultation to management and employees. Significant issues relating to the outbreak were periodically communicated with employees through LIVE sessions and emails. PTTEP also implemented safety measures for employees to reduce the COVID-19 virus infection and spread. Those include the Work From Home policy to reduce the number of employees at each operation site, a mobile COVID-19 test service for risk groups, a provision of alternative vaccines for employees and their family members as well as contractors working at PTTEP's operation sites, and a preparation of a booster dose for employees. When the infection rate escalated, necessary items such as fabric face masks, Antigen Test Kits (ATK), digital thermometers, and karyiat (Fa Thalai Chon) capsules were delivered to employees' doors to show the Company's care and create awareness for self-protection from the spread.



Ratios of Vaccinated Employees in 2021⁽¹⁾



(1) Thai staff in Thailand and international assets including foreign staff in Thailand (data as of December 31, 2021)

(2) Number not completed 100% due to staff with personal health concern or under doctor supervision

(3) Decreasing number from (2) including staff who got effect from 1st dose of COVID-19 vaccine

(4) Ongoing for COVID-19 booster dose in 2022

In addition, to ease employees' tension, PTTEP adopted a proactive strategy to nurture their psychological health. For example, under Sabaijaidee Project which has been implemented since 2011, psychology experts were hired to provide consultation to employees and their families to ease the pressure from issues related to work, family, legal, and financial matters, etc. Employees can seek consultation around the clock through the provided communication channels or even request a one-on-one session. Besides, throughout 2021, monthly LIVE sessions had been organized, featuring experts in mental health care and stress management.



Club "Fine" Day Project allows our staff in all locations to reduce stress from working during Work From Home and enjoy fun activities and Live Concert by famous artists on a Friday evening of each month. In addition, Fit Firm Fun 2021 activity was held to encourage employees to take care of their physical health during the COVID-19 situation and promote "Responsibility for Society", one of EP SPIRIT values, in terms of sharing to society through workout activity. This activity will convert the accumulated distance, weight loss, and the number of exercise times of all employees participating in the event to donate to medical agencies and charities each month for dealing with COVID-19 situations.

Through the Work From Home model, PTTEP saw a possibility in designing a new way of working, covering a change in work patterns and the ratio of employees working from home and at office. In 2020, the new pattern was studied, planned and experimented, and in 2021, at the end of the experimental phase, the Company launched a survey to gain employees' inputs for further development of a new way of working pattern and policy that will suit all functions.



"The COVID-19 outbreak hits all organizations and all departments. The operation group is not spared. Our work patterns must be adjusted to reduce the risk of pandemic. Thanks to the Company's support in finding us vaccines, face masks, ATK, or even kariyat, the tough times were alleviated. Thank you for taking good care of employees and we'll sail through the crisis together."

Mr. Itsaranawat Jaruphanphitak
Senior Operator, Production
PTTEP



"The new way of working, where personal space is turned to useful common space, requires an adjustment in mindset and user behavior in accordance with changes. We are yet to face many other changes. Being prepared and quick adaptation to changes will push us and the organization forward in a sustainable way."

Miss Sathinee Khummuang
Manager, Building Management
and Security Section
PTTEP

Digital Citizen Bootcamp

PTTEP has established the ENTERPRISE Project along the transformation journey since 2018 to transform PTTEP with key focus on digital technology and innovation. Many initiatives have been implemented across domestic and overseas assets in the core value chain and supporting functions.

PTTEP initiated Digital Citizen Bootcamp in 2021 to prepare its employees for the current rapid changes. The bootcamp was designed to equip employees across the organization with digital knowledge, capabilities to apply the knowledge with their own work and skills to create digital innovations as well as the ability to improve the efficiency and effectiveness of the existing digital initiatives being implemented in their functions. In this endeavor, for Bootcamp #1, PTTEP collaborated with National Institute of Development Administration (NIDA) in designing the “Build Innovation and Digital Capabilities” course and activities, with consultation from Digital Economy Promotion Agency (Depa). Moreover, PTTEP received a collaboration from Microsoft (Thailand) and Google to share their knowledge on technology at Digital Citizen Bootcamp #2 and #3. The bootcamp featured a combination of various training formats covering a lecture by academics or experts from leading organizations, workshops, and group work under the watch of specialized coaches. Joining the bootcamps were the employees from all technical and supporting functions, contributing more than 41 digital initiatives ranging from an initiative on work process automation such as “e-Memo Workflow” which helps save working time so employees can spend the saved time to create more value to the organization. Moreover, several initiatives applied advanced technologies like Machine Learning (ML) and Artificial



Intelligence (AI) in analyzing and processing data, then presenting it in visualization format, making data easier to access while enhancing the decision-making. Take for example, Advanced Petroleum Field Development (APFD) which is a digital platform that connects upstream to downstream systems covering petroleum exploration, well drilling, production platform construction, gas pipeline installation, and production planning. The platform has the ability to make an analysis based on the limitations related to the development of production resources and come up with a highly efficient plan for petroleum field development to ensure maximum benefit. PTTEP has planned to organize the Bootcamp for 3 years with an intention to incubate about 1,000 PTTEP staff to become the Digital Citizens.



Mrs. Phenkae Kongmalai
Vice President, Risk Management Department
PTTEP

“Everybody has learned new thought processes, digital tools, and techniques like Canvas. Now, we know how to succeed with pitching. Our people show their digital mindset by embracing digital technology in their routines and agile project management. It's clear most of that is attributable to Digital Citizen Bootcamp.”



**Sustain Business
Integrity Excellence**

Sustain Business Integrity Excellence

PTTEP upholds business transparency and efficiency with adherence to governance principles, appropriate risk management, and internal control as well as strict compliance with relevant laws and regulations under the foundation of Governance, Risk Management, and Compliance or GRC. PTTEP strives for excellence in business integrity to pave its way towards sustainability with 2 key strategies in place which are “Smart Assurance” and “GRC in Common Sense”. The performance in 2021 can be summarized below:

Strategies



Long-term Targets by 2030



Become **GRC** role model among Thai listed companies

Increase GRC maturity level to the highest level at **Level 5** (Continuous Improvement with Automation)



Performance in 2021



Surveyed the perception of stakeholders on GRC implementations and GRC role model target in order to formulate the Company’s roadmap to achieve the set target.



Assessed the GRC performance level in Malaysia Asset in order to better plan effective and concrete GRC activities.

Enhanced employees’ understanding and knowledge of GRC to enable them to apply GRC in their own work and make important business decisions in order to appropriately meet the stakeholders’ expectations.



Revised Human Rights Policy in alignment with international human rights standards and due diligence.

Smart Assurance and GRC in Common Sense

PTTEP put an emphasis on fostering an integrated, concise, and efficient governance process to govern all functions in Thailand and abroad under the framework of good governance and transparency to ensure a single standard for all business expansion. Also, the Company focused on building awareness, understanding, and acceptance among PTTEP employees, both management and employee levels, as well as relevant stakeholders in order for them to integrate GRC into their daily work and important decision-making process. It also aims to develop GRC best practices in line with its stakeholders' expectations and further replicate the practices in the community and society.

GRC Maturity Assessment for Malaysia Asset

PTTEP integrated GRC (Governance, Risk Management, and Compliance), a component under the Sustainable Development Framework, into its business operations in the belief that it will immunize the organization, support its path towards business goals, and raise confidence and acceptance among relevant stakeholders. To improve its GRC performance and achieve the highest maturity level at 5, in 2018, PTTEP conducted the company-wide GRC Maturity Assessment at the first time with maturity level 3 which defined integration among GRC functions. The assessment was in line with international standards.

PTTEP has continually implemented the GRC process in Malaysia Asset, one of its key international assets, since its investment in the exploration blocks in 2016, and the integration of Murphy Oil Corporation's business in 2019, GRC has continuously been implemented but the GRC Maturity Assessment was yet to be conducted. PTTEP thus expanded the assessment to Malaysia Asset in 2021 in order to identify the GRC maturity level for further setting appropriate targets. The result of assessment was at maturity level 2 and found the Malaysia Asset has consistently implemented GRC in its operations yet still required more integration among the GRC



functions. The asset aims to increase the maturity level up to Organization level. Therefore, the assessment result is expected to help the Company to support the planning of concrete GRC implementation covering integrated GRC activities and the promotion of knowledge and understanding on the linkage between GRC and operations. The said GRC implementation is expected to support Malaysia Asset in improving business operations, which will, at the end, ensure sustainability for both the asset and PTTEP.



"GRC is alive and well in Malaysia Asset. The thing is we need to underscore its focused alignment between functional areas to ensure a seamless integration towards common organizational goals. All levels of employees have to apply a mutually transparent and sustainable realization of GRC principles and their subsequent deliverables as we collectively strive to become the Energy Partner of Choice."

Tengku Saifuzzaman Tengku Ahmad Shahrudin
Head of Assurance, Regulatory, and Public Affairs Section
PTTEP Malaysia Project

GRC Culture Promotion

In 2021, PTTEP initiated a communication campaign for effective GRC awareness building with aim to enhance employees' understanding on GRC so they were capable of integrating GRC into their routine work and important decision-making process, and later on this behavior would eventually become a corporate culture. Under the campaign, the key message of "#GRC Good & Cautious", which was designed to be concise and easy to remember, was communicated to all employees at every operational site. "Good" means compliance with Corporate Governance and Business Ethics (CG&BE) and the relevant law and regulations, while "Cautious" means appropriate risk management and internal control. The key message was communicated through various activities like "GRC Hero" where those who have followed GRC were recognized as role models, "GRC Vlog" where famous YouTubers and GRC



Heroes shared their stories on how to apply GRC in real life, and "GRC Clinic" where questions and confusion concerning the execution of GRC in all functions were clarified by high-level executives.

Other activities organized to stimulate GRC learning were, for example, the sharing of tips in applying GRC in routine work and daily life, a quiz game, "GRC Challenge" involving managements and employees, and "GRC Portal" where frequently asked questions (FAQ) were shared to employees. The activities were organized mostly online in 2021 due to the COVID-19 outbreak and the Work From Home policy.

Employees' understanding, awareness, and ability to apply GRC principles in their routine and important decision-making process will yield a good impact on the organization and stakeholders in a way that will ensure effective and efficient work processes, associated risks can be better managed, and the operations will be transparent and in compliance with relevant laws and regulations. Through good business performance, public acceptance while appropriately meeting stakeholders, PTTEP can eventually achieve sustainable growth.



"GRC is known as one of the 3 pillars of the Sustainable Development Framework. Our job involves petroleum exploration and production in Thailand and abroad. As such, the technical process and the management of risks from all fronts are critical to ensure standardized and optimized results. This year's GRC Activity was good as it bolstered our knowledge and understanding and allowed us to be part of the efforts that pave the sustainable development path for our organization."

Mr. Piti Akrapipatkul

Vice President, Thai Onshore Petroleum Development Department
PTTEP

GRC Perception Survey with Stakeholders

PTTEP conducted a survey to gain stakeholders' perceptions towards its GRC implementation and "GRC Role Model" target in tandem with PTTEP's stakeholder engagement survey on sustainable development through an independent external consultant.

The survey is a tool and channel to reflect stakeholders' opinions and perceptions on PTTEP's GRC implementation and shed light on the strengths and weaknesses of the past execution. The survey results will be used to develop a more effective roadmap and work plans in order to achieve the target of becoming a "GRC Role Model" among Thai listed companies.



"PTTEP demonstrated its commitment to long-term sustainability, with concerns about all stakeholders. PTTEP conducted a perception survey regarding sustainable development and improved the process according to the results. I expect PTTEP to emphasize corporate governance and risk management when considering new investment opportunities."

Miss Kobporn Kulsurakit

Senior Fund Manager

Kasikorn Asset Management

Human Rights



In 2021, PTTEP revised its Human Rights Policy and Management System Guideline to ensure compliance with international human rights standards and integrated its annual human rights risk assessment and impact mitigation process for all projects covering operating assets and non-operated joint ventures as part of the enterprise risk management. In addition, the Company put effort in building shared responsibility and understanding among employees, vendors, suppliers, and business partners through various communication channels, e-learning courses, and participation in human rights panel sessions to share its best practices. Thanks to the efforts, PTTEP received the award for the 2021 Role Model Organization on Human Rights in the State Enterprise sector from the Rights and Liberties Protection Department for the 3rd consecutive year. The recognition derived from the Company's determination to align its human rights due diligence with the National Action Plans on Business and Human Rights in all relevant dimensions.

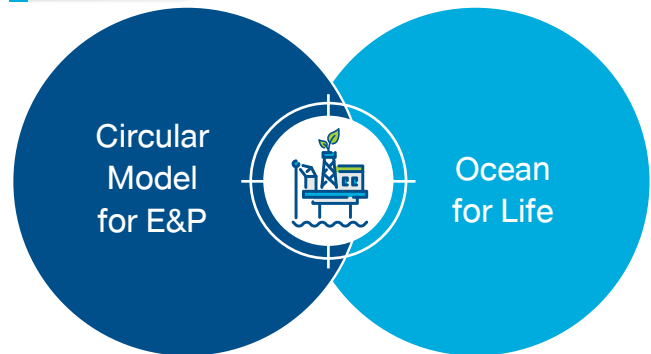


**Optimize Resource
and Create Shared Value**

Optimize Resource and Create Shared Value

PTTEP placed an emphasis on ensuring energy security while delivering sustainable values to its stakeholders through natural resource conservation, environmental rehabilitation, and social development with 2 key strategies which are Circular Model for E&P and Ocean for Life. In 2021, a number of projects under these 2 strategies were executed along with several social development projects to secure long-term value for all stakeholders with key performance in 2021 as shown below:

Strategies



Long-term Targets by 2030

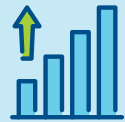


At least **50%** of main structures must be reused with safety awareness and efficient conditions

Zero waste to landfill



Achieve net positive impact on ocean biodiversity & ecosystem services (BES) value for all offshore operations by 2030, compared to 2019 base year



50% increase of income of focused communities and establish 16,000 conservation networks by 2030, compared to baseline data before PTTEP project implementation



Performance in 2021



Relocation of Arthit wellhead platform topside to a new location

Zero waste to landfill



Number of social projects: **145**

Number of conservation networks in Songkhla, Pattani, Nakhon Si Thammarat, Prachuap Khiri Khan, Surat Thani, Chumphon, Phetchaburi, Samut Songkhram, and Rayong provinces:

44



Waste diverted from disposal: **26%** of total waste disposal



Recycled and reused water: **39%**

Employee volunteering hours: **1,584**



Announced commitment on **No Gross Deforestation** for E&P (from 2021 onwards)



Achieved net positive impact on ocean biodiversity and ecosystem services (BES) value in domestic offshore operations: **29.5%**



Increased community income of focused communities participating in Aquatic Animal Hatchery Learning Center and Seafood Product Value Enhancement Project: **20.5%**



Circular Model for E&P

Under the Circular Model for E&P Strategy, PTTEP aims to redesign its work processes to maximize resource efficiency. In 2021, PTTEP implemented 3 key projects: Arthit Asset's Wellhead Platform Topside Relocation, Recycled Drill Cuttings Road at PTTEP's Rapid Scale-up Center (RASC), and Sand to Zeolite for Zawtika Asset. As a result of PTTEP's strong commitment to this strategy, the Company was able to maintain its achievement of zero hazardous waste to landfill sub-target again this year.

Arthit Asset's Wellhead Platform Topside Relocation

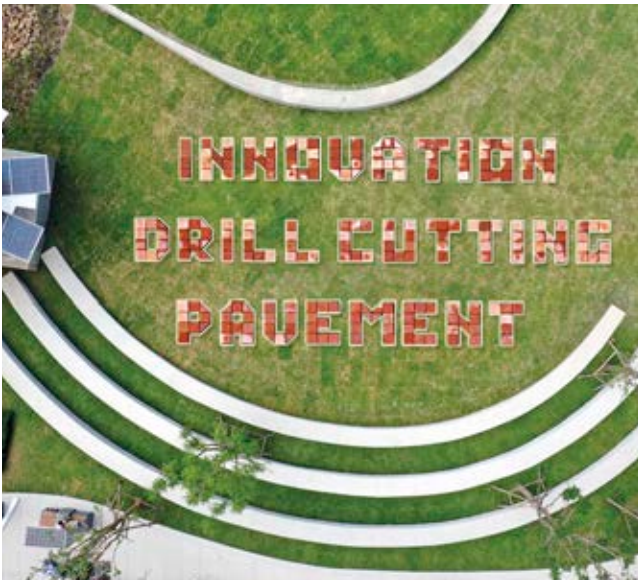
One of PTTEP's key initiatives under Circular Model for E&P Strategy is the relocation of Arthit Asset's wellhead platform topside, which was not in use but still functioning, to a new field for reuse, which was completed for the first time at PTTEP. In order to select the suitable wellhead platform topside, PTTEP conducted a Front-end Engineering Design (FEED) along with a structure and safety inspection to determine the integrity of existing structure and equipment for reuse. Then, the plug and abandonment process was conducted, followed by the flowline and tubing demolition. After cutting the platform legs, the wellhead platform topside was relocated to a new location, 86 kilometers away. As for the leave-in-place platform legs, PTTEP installed the navigation aid platform as a warning system for approaching vessels in the area. The wellhead relocation was successfully installed at a new location on August 20, 2021, for future natural gas production.

PTTEP plans to continuously relocate wellhead platform topside for reuse to optimize resource utilization and reduce operating costs with making safety a priority.



Upcycling to High Value Products

To create added value and optimize resources especially operational wastes, normally disposed or sent to landfills, PTTEP initiated several research and development projects to upcycle operational waste to high value products. In collaboration with Naresuan University and the Department of Rural Roads, PTTEP piloted the use of waste from petroleum drilling activities as an alternative material for road construction. With the Department of Mineral Fuels' approval, drill cuttings from its onshore operations were tested to determine the proper ratio to be used as a component for the asphalt road. On November 9, 2021, the pilot 1.2-km road at PTTEP's Rapid Scale-up Center (RASC) was successfully constructed.



In addition, PTTEP initiated a project to turn sand waste from the petroleum production at Zawtika Project to zeolite, which is a high value substance with several unique properties and high contact surface area, making it suitable for a variety of applications such as adsorbent, membrane, catalyst, ion-exchange, etc. The process begins with cleaning sand waste to remove contaminated hydrocarbon, then synthesizing it into nano silica, which serves as a reactant for further zeolite synthesis. With a success in synthesizing the prototype zeolite, PTTEP plans to develop moisture absorbent for measurement equipment from the aforementioned zeolite, which could potentially become a new business for PTTEP in the future.

Ocean for Life

As most of PTTEP's operations are offshore, oceans are like its second home that the Company is bound to conserve and protect. By using its operational locations and technology capabilities as advantages and with the target to create long-term value to stakeholders, PTTEP strives to take a lead in the conservation and rehabilitation of natural



resources and marine ecosystem and to support the livelihood of coastal communities in 17 provinces in the Gulf of Thailand.

To drive a concrete implementation of this strategy, PTTEP signed an MoU with Kasetsart University to promote ocean sustainability, while implementing various social development projects with related organizations. For example, PTTEP implemented the H.T.M.S. Underwater Learning Site Project in collaboration with various agencies and local communities to lay H.T.M.S. Prab at Koh Ngam Noi, Chumphon Province and H.T.M.S. Sattakut at Koh Tao, Surat Thani Province with the aim to build a new home for corals and marine animals as well as to reduce impacts on the natural coral reefs that are recovering from coral bleaching. Also, it has been considered as one of the popular dive sites to study marine biodiversity. The project not only brings back the abundance of marine life, but also helps in promoting tourism and generating income for local communities. This is a significant milestone for PTTEP in creating sustainable value to the communities and societies wherever PTTEP operates which is in line with its vision to become the "Energy Partner of Choice".

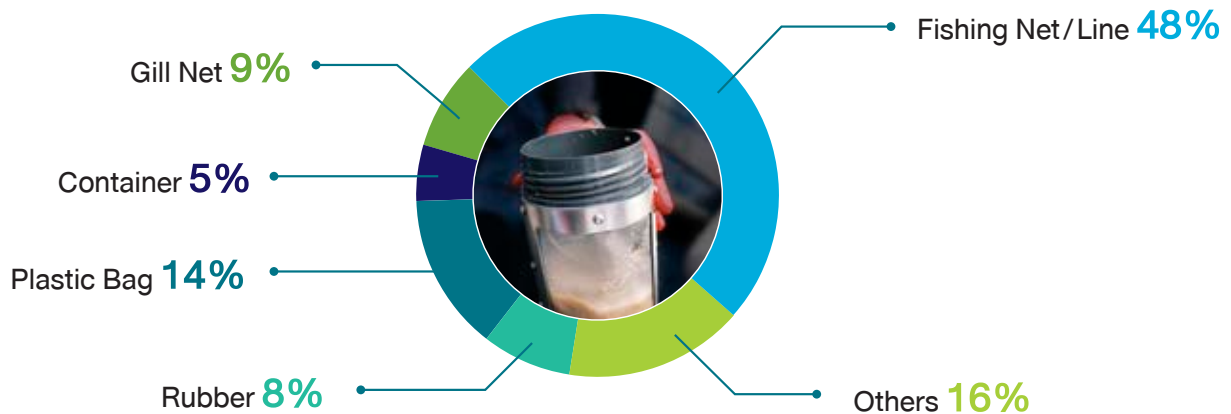
Baseline Study of Microplastics in the Gulf of Thailand

Under the MoU with Kasetsart University to promote ocean sustainability, the Baseline Study of Microplastics in the Gulf of Thailand Project was conducted. The project aims to support the government agencies in formulating measures and plans to minimize microplastics impacts on the Thai seas.

The project was kicked off in October 2020 with study areas covering Bongkot North, Bongkot South, and Arthit assets in the Gulf of Thailand. Apart from these areas, Kasetsart University collected water samples to measure microplastics levels in Koh Losin in Pattani Province, a coastal area in Chumphon Province, and Koh Tao in Surat Thani Province. After a year of study, it showed that the water from the areas contained 0.33-1.26 pieces of mini-microplastics per cubic meter of water or 82,137-314,009 pieces per square kilometer, close to the level found in the Eastern North Pacific. The study also showed that the portion of offshore microplastics from fibers usually found in fishery tools like nets and fishing lines is high when compared to nearshore microplastics.



Microplastics in the Gulf of Thailand



The study marked Thailand's first attempt in conducting a baseline study of microplastics in the Gulf of Thailand and also the world's first attempt to use a petroleum platform as a station to collect ocean waste and microplastic data. PTTEP aims to foster collaboration among academics and private sectors in safeguarding the oceans with the ultimate goal of achieving concrete marine resource conservations.

PTTEP also conducted a research and development project with National Nanotechnology Center (NANOTEC) to develop an in-situ microplastics sensor. With this sensor, it is expected to reduce the time on water sample collection and analysis. The sensor can detect particles with a size of 100-5,000 micrometers. The patent registration is now ongoing.



"We're the first in the world to have production platform staff collect microplastic samples. It immensely cuts down expenses compared to a mission by researchers, through PTTEP's efficient coordination. The project supports the maturity of database in the South China Sea that covers Malaysia and Vietnam. That is our IT innovation. Others will learn from our achievements. And that's what a 'leader' is."

Assistant Professor Thon Thamrongnawasawat, Ph.D.
Deputy Dean, Faculty of Fisheries
Kasetsart University

Ocean Health and Biodiversity Monitoring: Coral Bleaching Baseline

PTTEP conducted the Ocean Health and Biodiversity Monitoring: Coral Bleaching Baseline Project in collaboration with Kasetsart University and AI and Robotics Ventures Company Limited (ARV), PTTEP's subsidiary. The project aims to monitor marine ecosystem and coral reefs in Koh Mannai in Rayong Province and coastal areas near the university's Fisheries Research Station. Drones, equipped with multi-spectrum cameras, are deployed for the first time in Southeast Asia to develop a map for marine ecosystem and coastal resources management through collecting marine ecosystem data and relevant environmental factors. In addition, it can be used for analyzing and improving the mapping system as well as monitoring changes.

Using drone technology for aerial photography and inspection of coral reefs unlocks the challenge from unstable weather as a result of waves and wind including tide levels which become the constraint in operation time. In addition to shorten operation time, the technology delivers precision



and saves manpower and cost when compared to the conventional use of divers.

After a year of drone inspection of coral reefs and marine ecosystem as well as coastal aquaculture areas, a data map, which was converted from images taken by drone technology, was completed and could be used for monitoring the change of coral reefs and bleaching against the next survey.



Coastal Conservation Area and Fish Home Project

The Coastal Conservation Area and Fish Home Project has been carried out under the Ocean for Life MoU between PTTEP and Department of Marine and Coastal Resources, Ministry of Natural Resources and Environment. The objective of this project is to develop a fish home from local wisdom, using natural materials to serve as the habitats and shelters of coastal marine animals in 31 areas in 17 provinces in the Gulf of Thailand. The project also aims to build a coastal conservation area covering 15.5 square kilometers by 2025 and increase the catch rate of aquatic animals around 17 provinces by 20% in 2025 and 30% in 2030, compared to the baseline data before PTTEP project implementation.

PTTEP has worked with Department of Marine and Coastal Resources, Department of Fisheries, local administrative offices, and a network of fishermen in the coastal conservation area, to establish a 500-meter catch-free zone from the 1-km coastline by installing a fish home. The fish home is generally made of local materials like coconut-palm leaf stalks, ropes, wood boxes, or any floating materials, then attached with concrete blocks or sandbags. With the fish home in place, it can increase the abundance of marine animals and expand the coastal conservation area in the location targeted for building the Aquatic Animal Hatchery Learning Center. In 2021, PTTEP successfully placed 14 fish homes in 9 provinces, with the conservation area covering 7.3 square kilometers. It was reported that the crab catch rate in Songkhla and Nakhon Si Thammarat provinces increased by 18.4%, compared to the baseline data before PTTEP project implementation.

The project supports PTTEP's Ocean for Life Strategy by adding value to biodiversity and ecosystem services (BES) in PTTEP's offshore operational sites.



“Khlong Baan Krood Local Fishery Group was created by local fishermen who see the importance of conservation and want to address the depletion of natural resources. Our goal is to lift our community’s quality of life. In 2021, PTTEP supported our group in setting up the Aquatic Animal Hatchery Learning Center and the Coastal Conservation Area that allows us to conduct activities efficiently, have a learning center for the youth and the general public, and nurture the conservation awareness.”

Mr. Pongsak Kumzab

Head of Khlong Baan Krood Local Fishery Group

Mangrove Forestation Project

PTTEP has collaborated with the Department of Marine and Coastal Resources to launch the Mangrove Forestation Project under the Ocean for Life MoU. The project is set to complete 5,000-rai reforestation, accounting for 10% of the national target to rehabilitate 50,000 rai of mangrove forests, as outlined in the 12th National Economic and Social Development Plan (2017-2021). Through the project, it aims to revive the mangrove ecosystem abundance and at the same time rehabilitate degraded forest to be a fertile area for aquatic animal nurseries while promoting the quality of life, local economy, and society of local people in the area. PTTEP also targets to promote community engagement in mangrove forest conservation and extend the conservation networks in its operational areas. The Company plans to collaborate with the Faculty of Forestry, Kasetsart University,

in assessing the ecosystem rehabilitation and CO₂ adsorption performance as a result of this project, ensuring proper growth rate and survival rate of newly-grown trees, biomass storage, and carbon storage as the indicators.

In 2021, PTTEP successfully planted mangrove trees on a 1,000-rai area in Nakhon Si Thammarat Province, equivalent to the CO₂ adsorption of 1,500 tonnes of CO₂ equivalent. The reforestation in the remaining 4,000-rai area in Nakhon Si Thammarat, Chumphon, and Surat Thani provinces is expected to be completed in 2022. At the end of plantation and maintenance period, PTTEP aims to return the reforestation areas to the Department of Marine and Coastal Resources for confirmation of the entire area.



“PTTEP’s aspiration lies in the structural management of the ecosystem, nature, society, and economy. Concerning the ecosystem, that means an increase in the recovery ability of degraded mangrove forests. As trees can grow in a shorter period of time, more CO₂ will be captured and new trees will enhance the biodiversity. On the economic side, once the ecosystem improves with more plants and aquatic animals, coastal fishery will yield profits and the economy will prosper stably and sustainably.”

Assistant Professor Sakhon Teejuntuk, Ph.D.

Professor of Silviculture, Faculty of Forestry
Kasetsart University

Seafood Product Value Enhancement Project

PTTEP initiated the Seafood Product Value Enhancement Project to help tackle social, community, and environmental issues while uplifting the quality of life of local communities in 17 provinces in the Gulf of Thailand. The project aims to enhance the seafood producers' manufacturing capabilities to meet international standards while expanding their distribution channels, so the seafood production in the areas of project implementation can meet the market demands.

In 2021, 5 seafood production and distribution groups were established: 1) Baan Phangsai Seafood Product Group in Songkhla Province 2) Baan Phraek Mueang Seafood Product Group in Nakhon Si Thammarat Province 3) Baan Had Somboon Seafood Product Group in Surat Thani Province 4) Baan Krood Seafood Product Group in Prachuap Khiri Khan Province and 5) Baan Tong Tom Yai Seafood Product Group



in Chumphon Province. The project enhanced the seafood product value, contributing to a higher selling price by 92% for Baan Phangsai in Songkhla Province and by 63% for Baan Phraek Mueang in Nakhon Si Thammarat Province. It was reported that the price increased by 78% on average, compared to the price before their participation in the project. Apart from existing distribution channels, PTTEP supported the communities to start online sales via Shopee and Facebook, allowing community members in Baan Phangsai in Songkhla Province and Baan Phraek Mueang in Nakhon Si Thammarat Province to earn an extra average income of THB 46,000, equivalent to a 49% increase since they joined the project.

In 2022, PTTEP aims to establish 3 more seafood production and distribution groups in Phetchaburi, Samut Songkhram, and Rayong provinces with activities to promote seafood distribution incorporated.



"Baan Phraek Mueang is a fishery community in Na Saton Sub-district, Hua Sai District, Nakhon Si Thammarat Province. We are united to deliver 'delicious seafood' that is safe, fresh, clean, and hygienic. PTTEP helped us create the Baan Phraek Mueang Seafood Product Group and supported our seafood production, which improves our product quality. Our intention is to allocate a part of our revenue to support marine conservation."

Miss Vanitsara Pattarapongphan

Head of Baan Phraek Mueang Seafood Product Group

Social Contribution

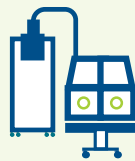
Aside from Circular Model for E&P and Ocean for Life strategies, PTTEP is driven by the determination to create other social value to meet stakeholders' expectations in all dimensions.

PTTEP Fight against COVID-19

PTTEP Supports Thailand in the Fight against COVID-19 (2020-2021)
Donating over THB 144 Million to Hospitals Nationwide



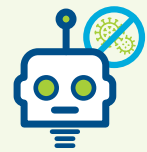
116
negative pressure
patient transfers



92
mobile negative
pressure boxes



6
negative pressure
transfer wheelchairs



3
Xterlizer
UV Disinfection
Robots

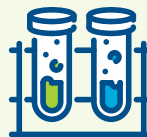


distributed to **89** hospitals across the country valued at
THB 18 million



10
CARA robots deliver
supplies and medicines

THB 29.3 million
for AIRVO 2 humidifiers



THB 30 million
funded Baiya vaccine
a Thai vaccine
against COVID-19



THB 31.5 million
to support medical
operations

THB 5 million
for cold chain monitoring
and alert system for vaccine
storage quality assurance



THB 2 million
to Vidyasirimedhi Institute of Science
and Technology to develop Test Kit Diagnostics



THB 4.05 million
to Thammasat University Hospital
for purchasing an ambulance with a ventilator

PTTEP care box
36,000 boxes



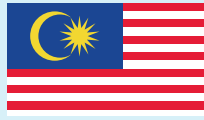
THB 4 million to Chulalongkorn University
to produce Chula COVID-19 Strip Test



PTTEP Supports in the Fight against COVID-19 (2020–2021) Donating THB 10.7 Million Overseas



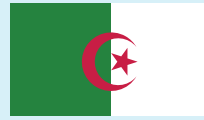
Myanmar



Malaysia



Indonesia



Algeria



Mozambique

PTTEP has joined the national and global efforts in fighting against COVID-19 by using its knowledge and technology in petroleum exploration and production to develop innovations that protect medical professionals and prevent the spread of viruses. The Company has earmarked direct and indirect contributions of over THB 150 million to hospitals, educational institutions, and organizations in Thailand and other countries since 2020.



| Negative pressure patient transfers and wheelchairs



| IoT cold chain monitoring and alert system for COVID-19 vaccine storage



"Elsewhere, the development of Negative Pressure Transport could have taken 5 years. But we spent only 20 days. At our faculty, the transfer equipment is our officer's favorite. Whenever a COVID-19 patient arrives, he would immediately reach out for it, as if to assure himself that he would be safe from infection."

Assistant Professor Anusang Chitsomkasem, M.D.

Deputy Dean, Faculty of Medicine Vajira Hospital
Navamindradhiraj University

The innovations developed through the collaboration of PTTEP, AI and Robotics Ventures Company Limited (ARV), and partners to support hospitals and medical professionals are as follows:



Negative Pressure Patient Transfers and Mobile Negative Pressure Boxes

Additionally equipped with particulate air filter and disinfectant based on a prototype of the Faculty of Medicine Vajira Hospital, Navamindradhiraj University.



“Xterlizer” Robot

Donated Xterlizer UV Disinfection Robot to the Department of Disease Control, Thammasat University Hospital, Piyavate Hospital, and Bangpakok Hospital.



“CARA” Robot

Developed to assist medical personnel in delivering medical and food supplies to reduce risks in contracting the disease from patients and access to risk areas. It can be operated remotely via tablet.

IoT Cold Chain Monitoring and Alert System for COVID-19 Vaccine Storage

Delivered to the Ministry of Public Health.



On top of that, PTTEP provided other medical equipment including high-flow nasal oxygen ventilators and care boxes to public and private organizations.

To establish long-term cooperation and development, PTTEP has provided its budget, knowledge, and technology to support the research and trial of Chula-Baiya vaccine in

cooperation with Baiya Phytopharm Company Limited and CU Enterprise. Its goal is to deliver an international-standard COVID-19 vaccine to strengthen immune system for Thai people and the country. This also reflects PTTEP’s determination to support the country in strengthening Thai research and development for future self-reliance and fighting the crisis.



“The COVID-19 outbreak brought us the hardest time. ARV is proud to be part of the fight against the crisis through our specialized knowledge and capability. Robotic and AI innovations have been developed and allowed frontline medical professionals to complete their tasks conveniently, smoothly, and safely.”

Mr. Pong Kosanunt

Co-founder of Cariva (Thailand) Company Limited
ARV’s Business Unit



Songkhla Hospital Development Project

PTTEP launched a project to support Songkhla Hospital to elevate the healthcare services for people in Songkhla Province, which is the hometown of a majority of its employees. PTTEP initiated the project after learning about the hospital's service limitations caused by inadequate operating rooms. Aside from shortening the surgery queue, the project allows people in Songkhla and nearby provinces to seek timely emergency help as the condition of patients, while waiting for surgery, may worsen, leading to a cause of death or disability.

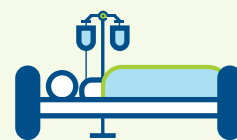
From 2018-2021, the Company allocated an amount of THB 44.18 million to the hospital to finance the construction of operating rooms and 2-bed recovery rooms as well as necessary medical equipment.



1,671
Patients



7
Operating
Rooms



6
Recovery Beds



"Seeing the importance of good health and healthcare services for Songkhla people, PTTEP helped reduce Songkhla Hospital's referrals to other hospitals, hence reducing transfer-related risks for high-risk patients. The financial supports for the improvement of operating rooms and medical equipment procurement have enhanced medical specialists' capacity and encouraged more specialists to return home. The locals enjoy appropriate and thorough healthcare services. The benefits are overwhelming for the locals."

Mr. Pongpot Theeranantachai, M.D.
Director of Songkhla Hospital

Lan Krabue Hospital Development Project

Established in 1981, Lan Krabue Hospital is a community hospital under the Ministry of Public Health, situated in Lan Krabue District, Kamphaeng Phet Province, where Sirikit Oil Field is located. The 30-bed hospital provides services to patients from Lan Krabue and nearby districts like Bang Rakam, Phran Kratai, and Sai Ngam. On average, it treats 265 patients per day or 116,064 times per year, resulting in service inefficiency of medical care.

PTTEP has provided its support to Lan Krabue Hospital since 2013, in its effort to lift the quality of life of local people and elevate the hospital's medical service capacity.

Since then, financial support worth more than THB 26.48 million has been given to the hospital to support the construction of the PTTEP Accident-Emergency Building and an in-patient building named "the 36th Anniversary of PTTEP S1 Building" as well as other projects. The contribution allows the hospital to provide better healthcare service to people in Lan Krabue and nearby districts for routine cases and enhance the efficient management of recovery beds to accommodate patients after being discharged from ICU for further recovery before a hospital discharge. Amid the COVID-19 outbreak, the 36th Anniversary of PTTEP S1 Building is reserved for COVID-19 patients.



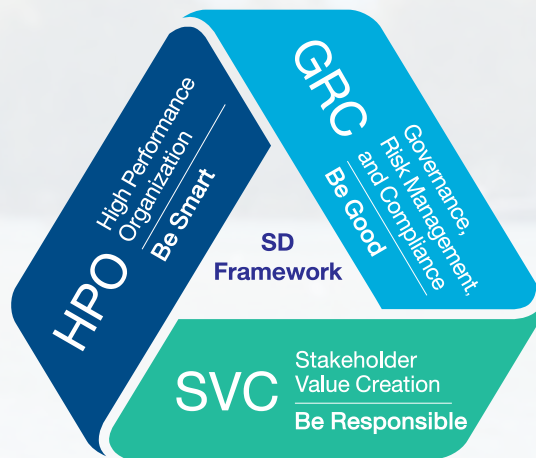
"PTTEP has continually extended support to Lan Krabue Hospital. It raises our capacity in providing services to local people. At the height of the COVID-19 outbreak, in particular, the number of patients was nearly as high as a large district hospital. People in the district and the province have witnessed the benefits while hospital officers are content with their work with greater capacity."

Mr. Teerapong Tancharoensukjit, M.D.
Director of Lan Krabue Hospital

Stunting Prevention Program

PTTEP Indonesia Company Limited, a subsidiary of PTTEP operating in the Republic of Indonesia, has implemented a Stunting Prevention Program for children in cooperation with related agencies in East Nusa Tenggara (NTT). The program sets to upgrade people's quality of life as well as support the national agenda on child stunting prevention. Since 2020, the Company has provided financial support worth USD 608,602 and the program has benefited 2,668 persons. In addition, the program won the 2021 Asia-Pacific Stevie Awards in Innovation in Community Relations or Public Service Communications category (Bronze Level).





Without a doubt, 2021 has been one of the most challenging years for PTTEP. It was a year that the Company remained on guard to be ready for any challenges and risks from global uncertainties including the COVID-19 outbreak. Amid the crisis, PTTEP holds on to its commitment to operating its business under a foundation of the Sustainable Development Framework comprising HPO, GRC, and SVC with the goals to become a responsible and resilient organization, embracing energy transition, and creating shared value to stakeholders in line with the vision of “Energy Partner of Choice”.

The Sustainability Report 2021 showcases PTTEP’s outstanding performance in operating the business for sustainable development in alignment with the UN SDGs. Details of our management approaches and performances are shown on www.pttep.com.



Scan to visit Sustainable Development Section in PTTEP website



Scan to complete survey of readers' opinions



PTTEP

PTT Exploration and Production Public Company Limited

555/1 Energy Complex Building A, Floors 6th, 19th-36th
Vibhavadi Rangsit Rd., Chatuchak, Chatuchak, Bangkok 10900
Tel: 66 (0) 2537-4000
Fax: 66 (0) 2537-4444
www.pttep.com
www.facebook.com/pttepplc



Scan to visit
PTTEP website

This report's cover is made from 100% eco fiber green card paper and printed with soy ink.
The paper inside is made from an environmentally-friendly production process.