

Sustainability Report 2020





From our first day,

PTTEP, as a national petroleum exploration and production company, has strived to learn, practice, and accumulate experience to be able to provide a sustainable petroleum supply to Thailand and the countries we operate in. Today, we have expanded operations to 15 countries across the globe with our continued commitment to contribute to the sustainable development of society under the vision of “Energy Partner of Choice”.



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From We to World

PTTEP has established a Sustainable Development Framework as a way of working. The framework comprises 3 main components of High Performance Organization, Governance, Risk Management and Compliance, and Stakeholder Value Creation. We believe that performance excellence in these three areas, together with a conscious consideration of all stakeholders' interests will lead to a sustainable society.



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CEO Message



PTT Exploration and Production Public Company Limited (PTTEP) has vowed to operate the petroleum exploration and production business in a sustainable manner since taking up its mission to ensure national energy security. While supporting economic and social development, PTTEP takes into consideration environmental impacts as well as the shared value and mutual prosperity of the Company and stakeholders under our vision to be Energy Partner of Choice. PTTEP witnessed huge challenges in 2020, especially the outbreak of new coronavirus (COVID-19) which remains

a global issue. In response to the outbreak, we launched a New Normal Transformation work plan which involves, for instance, a new way of working, efficiency enhancement for information technology necessary to support full-scale online meetings and trainings, and LIVE broadcast of internal communications for the latest updates and releases of important messages. All are to ensure employees that we all would ride through this crisis. As a result, we successfully carried on our business activities and achieved 2020 key milestones. PTTEP also stayed beside all Thais in fighting



the disease by integrating our knowledge and technology, we created negative pressure patient transfers and mobile negative pressure boxes that helped save medical personnel and reduce the spread of the virus. Aside, we allocated more than THB 44 million as direct and indirect donations to hospitals, educational institutions and government agencies in Thailand and abroad.

Another grave challenge in 2020 concerned oil prices which plunged below USD 20 per barrel and oil futures recorded negative prices for the first time. The situation prompted the Company to find ways to reduce expenses and increase revenue as well as work efficiency during the oil price volatility crisis, greater competitiveness and sustainable growth. The other challenges, like energy transition, growth trend of renewable energy, rapid technological changes, global warming and climate change, remain points of concern and the organization has continually considered those as part of our strategic planning.

Amid these challenges, PTTEP adheres to the Sustainable Development Framework which comprises 3 main components namely: 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 strategies and targets under each component to be achieved in 2030 are clearly stated, corresponding with the United Nations Sustainable Development Goals (UN SDGs). The Board of Directors also endorsed the SD Statement in 2020 to communicate with all PTTEP personnel and our stakeholders and be committed towards sustainability.

PTTEP is growing business through the Execute and Expand strategy, mainly to enhance competitiveness, support sustainable growth and prepare for future challenges in the energy industry. In 2020, PTTEP achieved its business plans for instance, cost of production per unit was continually brought down to a competitive level thanks to

digital technology and enhanced work efficiency; through collaboration with business partners, PTTEP won the bid for Offshore Block 3, off the coast of the United Arab Emirates and signed Exploration and Production Sharing Agreement (EPSA) with Oman’s Ministry of Oil and Gas (MOG) for exploration and production rights of Block 12; PTTEP received the Myanmar government’s approval for its Gas to Power Project. For business sustainability, PTTEP also proceeded with its expansion into AI and Robotics and conducted a feasibility study on electricity generation and alternative energy investment in Southeast Asia.

Aside from operational targets and strategies, PTTEP gives importance to Safety, Security, Health and Environment (SSHE) to ensure employees, contractors and stakeholders of the Company’s safety standards under Target Zero, or zero work-related accidents. PTTEP has run a regular survey on the organization’s safety culture. The level, according to the 2020 survey, went up to 4.36 from a score of 5, showing employees’ understanding in operational safety. It also corresponded with a decline in Total Recordable Injury Rate (TRIR) including oil and chemical spillage both of which are in the leading position when measured against the overall performance of the International Association of Oil and Gas Producers (IOGP).

On Governance, Risk Management and Compliance, PTTEP pushes forward its “Smart Assurance and GRC in Common Sense” scheme, setting sight to be a role model on GRC for listed companies in Thailand and raise GRC maturity level to 5, or top of the scale. In 2020, PTTEP put in place the GRC assurance process and ensured that all new projects, suppliers and contractors exercise under the same GRC standards.

For sustainable growth in all dimensions, PTTEP emphasizes the creation of long-term values for stakeholders through 3 main strategies, namely Greenhouse Gas Reduction,



Circular Model for E&P and Ocean for Life. All have clear long-term targets (2030) to cultivate a work culture that promotes natural resources conservation, environmental rehabilitation, as well as community and social development. In 2020, several activities/initiatives have been launched to support the 3 strategies: for example, a study on and implementation of new technologies to reduce greenhouse gas intensity; zero hazardous waste to landfill; collaboration with government agencies, educational institutions and private organizations in pushing forward resources and marine ecosystem conservation and rehabilitation.

Thanks to our continuous commitment on sustainable development, in 2020, PTTEP was selected as a member of the Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry for the seventh consecutive year and FTSE4Good Index Series for the fifth consecutive year. At the national level, PTTEP was included in the Stock Exchange of Thailand's Thailand Sustainability Investment Index (THSI) for the fifth consecutive year and was awarded the National Anti-Corruption Commission's NACC Integrity Award for the second consecutive year. Additionally, PTTEP has been granted 21 social development awards from various platforms both domestically and internationally. These achievements reflect the Company's commitment towards sustainable development through collaboration with all partners as guided by our Energy Partner of Choice vision.

PTTEP also upholds the United Nations Global Compact (UNGC)'s 10 principles as an Advanced participant and it plays a part 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 Thailand Responsible Business Network (TRBN).

Though several parts of our operations experienced challenges in 2020, I'm confident that our capabilities, ability to appropriately adapt to these challenges and commitment to sustainability in all dimensions will lead us through this crisis. Lastly, I would like to thank shareholders, business partners, contractors and suppliers, relevant government agencies, community and society as well as the Board of Directors, management and employees for their continuous confidence, support and participation in PTTEP's endeavor to achieve sustainability.



(Phongthorn Thavisin)
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 2020 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 covered performance from January 1 to December 31, 2020.

Reporting Approach

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

The information disclosed in this report covers PTTEP operational control activities and significant issues that caused economic, social and environmental impacts. This report is completed under the guidelines of Global Reporting Initiative Reporting 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 SASB Materiality Map™. PTTEP strives to improve the quality of sustainability reporting to enhance disclosures, in line with Integrated Reporting (IR) Framework which better demonstrates the correlations of sustainable development and financial operations, and to shape the organization's future reporting plan.

This report contained key topics and outstanding performance on sustainable development in 2020, 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 will be the central information portal for easy online access.

The selected information on safety, occupational health and environment in this report was verified for accuracy and completeness. The information as well as details of the execution are in accordance with AA1000APS principles concerning stakeholders' engagement, the scope of material issues, and responses to stakeholders' expectations 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 the Annual Report 2020.

Scope of Reporting

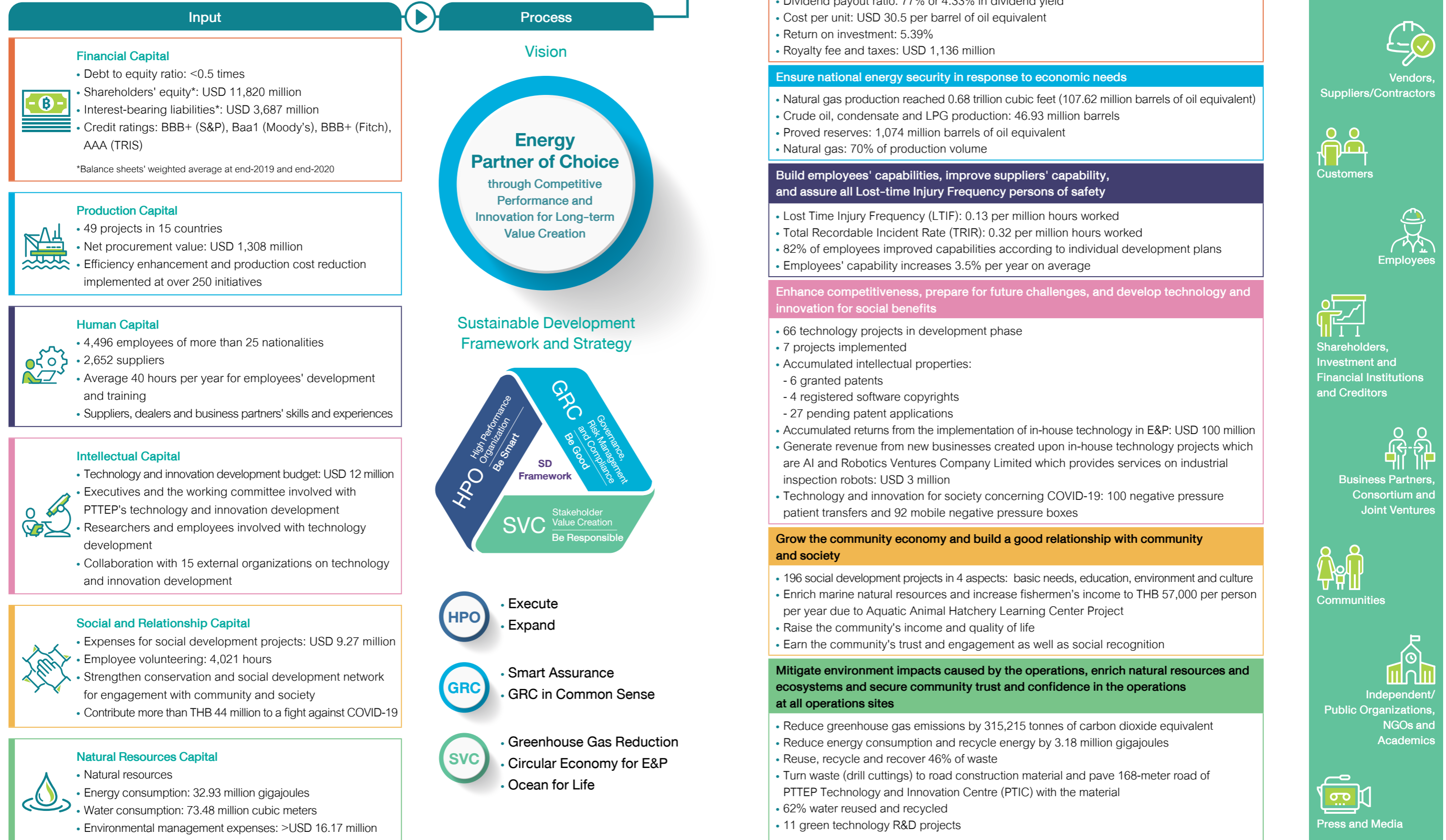
(GRI 102-45, GRI 102-46, GRI 102-49)

The information contained in this report concerned the Company and PTTEP's operation control activities in Thailand and overseas. The detailed scope of reporting is shown in [sustainable development performance section](#). There were no significant changes in the reporting scope and material issues of the 2020 Sustainability Report compared to the

2019 issue, as shown in [approach to reporting section](#) on PTTEP's website. The information on economic performance covered all projects in exploration and production phases which are invested and operated by PTTEP. As a subsidiary of PTT Public Company Limited, PTT's Sustainability Report contains PTTEP's information.



Value Creation: From We to World



Achievements



Sustainable Development (SD)

Member of
**Dow Jones
Sustainability Indices**
Powered by the S&P Global CSA

Member of the 2020 Dow Jones Sustainability Indices (DJSI) in the World Oil and Gas Upstream & Integrated Industry for the seventh consecutive year
S&P Global

Member of the FTSE4Good Index Series for the fifth consecutive year
FTSE Russell



FTSE4Good

SAM
**Sustainability Award
Gold Class 2020**

Gold Class, SAM Sustainability Award in The Sustainability Yearbook 2020, the highest sustainability ranking and Industry Leader in Oil and Gas Upstream & Integrated Industry
SAM

2020 Thailand Sustainability Investment (THSI) for the fifth 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


CEO of the Year Award
Thailand's Best Employer Brand Award for the second consecutive year
Award for Excellence in Training
World HRD Congress, CHRO Asia and Employee Branding Institute

Asia's Best CEO for the third consecutive year
Asia's Best CFO for the seventh consecutive year
Best Investor Relations Company (Thailand) for the eighth consecutive year
The 10th Asian Excellence Awards 2020
by Corporate Governance Asia Magazine

ADIPEC Awards 2020
Breakthrough Technological Project of the Year
The Abu Dhabi International Exhibition and Conference





-  Best Investor Event
Best Use of Multimedia for IR for the second consecutive year
IR Magazine Forum & Awards South East Asia 2020 by IR Magazine



-  Best Innovative Company Awards from the "Nautilus" Project
Outstanding Investor Relations Awards for the fourth consecutive year
SET Awards 2020 by the Stock Exchange of Thailand and Money & Banking Magazine

-  National Innovation Awards 2020 in the Innovative Organization
National Innovation Agency or NIA (Public Organization), Ministry of Higher Education, Science, Research and Innovation



-  ISO 22301:2012 Business Continuity Management System Certification for S1 Project
British Standards Institution (BSI)
-  Certificate of Honor in Zero Accident Campaign 2020 – Silver Level
Thailand Institute of Occupational Safety and Health (Public Organization)



GRC

Governance, Risk Management and Compliance (GRC)



- ASEAN Top 20 PLCs
- ASEAN Asset Class PLCs resulting from the 2019 ASEAN CG Scorecard
- ASEAN Capital Markets Forum (ACMF) and Asian Development Bank (ADB)

- Asia's Icon on Corporate Governance Award for the eighth consecutive year
- Asian Corporate Director Recognition Award
- "ESG Influencer" Award
- The 15th ASIAN ESG Award 2019 by Corporate Governance Asia Magazine



- NACC Integrity Awards for the second consecutive year and the third time in total
- National Anti-Corruption Commission (NACC)

- 2020 Role Model Organization on Human Rights in State Enterprise Sector for the second consecutive year
- Rights and Liberties Protection Department, Ministry of Justice

- Being rated "Excellent" and receiving five of the National Corporate Governance Committee's symbols, the highest level, based on the Corporate Governance Report of Thai Listed Companies (CGR) 2020
- Thai Institute of Directors Association (IOD)

SVC


Stakeholder Value Creation (SVC)

- Leadership Level (A-List) in Climate Change Management for the seventh consecutive year
- CDP


- Global CSR award at Platinum Winner
- H.T.M.S. Underwater Learning Center Project
- Energy and Environment Foundation Global CSR Awards 2020

- Asia's Best CSR Awards
- The 10th Asian Excellence Awards 2020 by Corporate Governance Asia Magazine




 Golden Peacock Global Awards for Corporate Social Responsibility 2019

The IOD's 14th International Conference on Corporate Social Responsibility


 3G Best Social Empowerment Award

Crab Hatchery Learning Center Project for the second consecutive year

Global Good Governance (3G) Awards 2020 by Cambridge IFA Analytica

 The Asia-Pacific Stevie Awards 2020 in Innovation in Community Relations or Public Service Communications category (Silver Class)


Stevie Awards Organization

 Asia's Best CSR Practices Awards in Community Development Category

Asia's Oil & Gas Excellence Awards in Corporate Social Responsibility Category
Crab Hatchery Learning Center Project


CMO Asia



 Asia Responsible Enterprise Awards 2020 (AREA 2020) in Green Leadership

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

Enterprise Asia

 Global CSR Awards (Silver Class) in

- Best Country Award Thailand Overall CSR Excellence
- Best Environmental Excellence Forest Restoration Project for Eco-learning at Sri Nakhon Khuean Khan Park (Khung Bang Kachao)
- Best Community Program Waste to Energy Project and Sobis Pammase Project in Indonesia

The Global CSR Awards


 Golden Globe Tigers Awards in

- Oil & Gas Leadership CSR Project of the Year and Excellence & Leadership in CSR Community Development Crab Hatchery Learning Center Project

- Best Environment Friendly Award Forest Restoration Project for Eco-learning at Sri Nakhon Khuean Khan Park (Khung Bang Kachao)


- Concern for Health Award Free Clinic Project in Indonesia and 100 Smiles Project in Myanmar

The Golden Globe Tigers Awards 2020

 Golden Rank Awards in Social Impact and Sustainability Categories

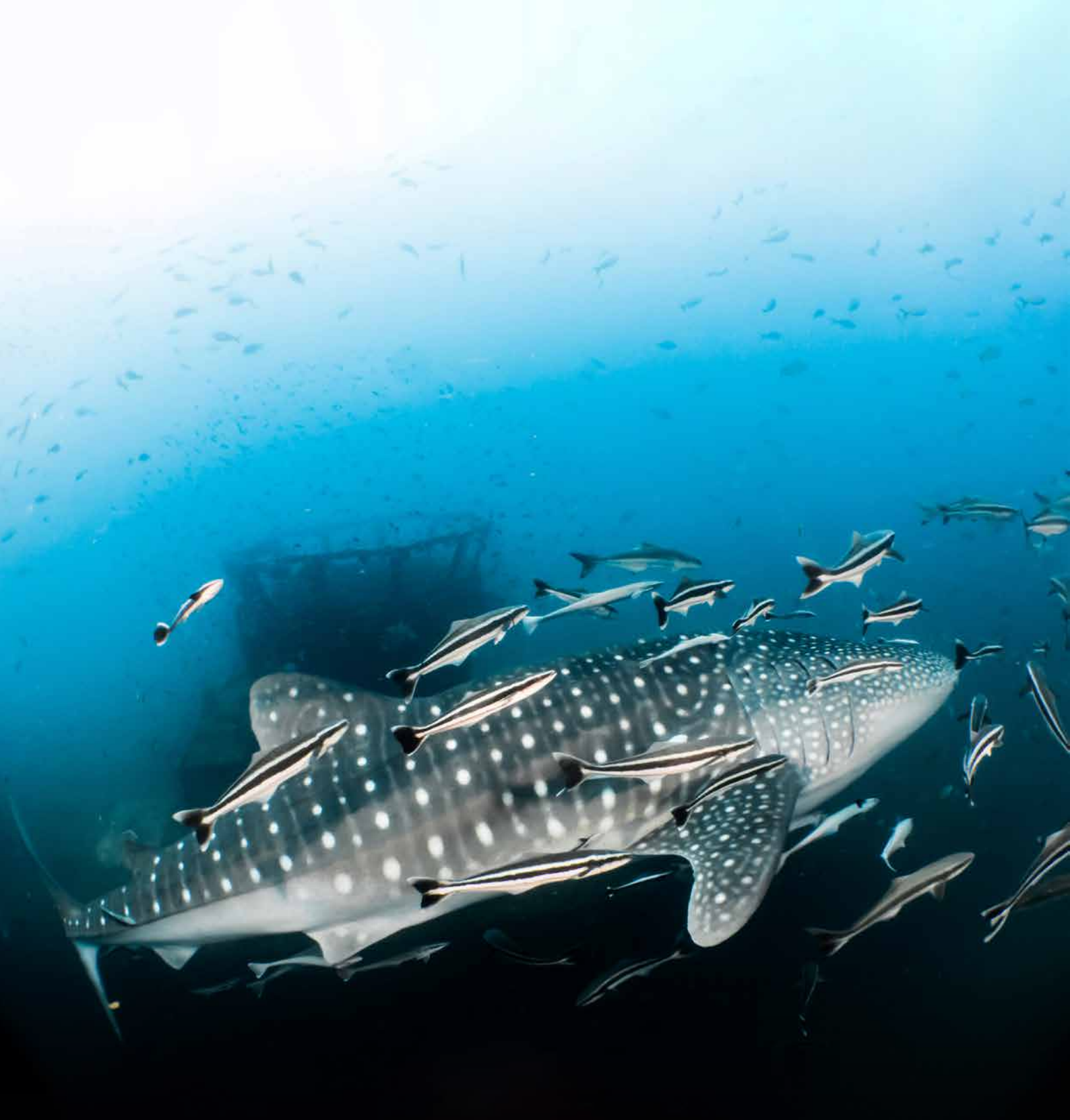
Forest Restoration Project for Eco-learning at Sri Nakhon Khuean Khan Park

The International Business Excellence Awards 2020

 LESS (Low Emission Support Scheme) Award Letter of Recognition for the fourth consecutive year

Ministry of Natural Resources and Environment





**PTTEP
and Sustainable
Development**

Sustainable Development Journey

PTTEP has set a target to become a sustainable organization since its inception in 1985. The journey started with a goal to be a green organization where environmental stewardship and management was a priority. The sustainable development concept that involves Environmental, Social and Governance elements was subsequently applied and

in 2011, PTTEP participated in the United Nations Global Compact (UNGC), demonstrating our commitment to uphold the UNGC 10 principles that highlight 4 main aspects – human rights, labor, environment and anti-corruption. Later in 2015, PTTEP, adhering to all advanced criteria, was named at Advanced Participant level of the UNGC.



1985 – 2000 Green Organization

- Emphasis on environmental stewardship and management
- Participate in Thailand Business Council for Sustainable Development (TBCSD) since 1993



2001 – 2011 ESG Principles

- Apply ESG principles across the organization
- Participate in the United Nations Global Compact (UNGC) since 2011



2012 – 2018 Outside In

- Apply international sustainability assessment criteria
- Selected as a member of Dow Jones Sustainability Indices (DJSI) in the DJSI World Oil and Gas Upstream & Integrated Industry for the first time in 2014



2019 – Present Inside Out

- Develop Sustainable Development Framework and Strategy
- Change PTTEP vision to Energy Partner of Choice
- Announce PTTEP SD Statement as our commitment to conduct our business to ensure sustainability



“Global Compact Network Thailand thanks PTTEP for its continuous supports to the GCNT. As an organization that plays an important role in Thailand's energy sector, PTTEP must be prepared to tackle challenges induced by climate change, and to enhance science and technology capabilities in order to support the country's sustainable economic development.”

Mr. Netithorn Praditsan

Deputy Secretary

Global Compact Network Thailand (GCNT)



Moreover, PTTEP has adopted several international sustainability assessment criteria, like the Dow Jones Sustainability Indices (DJSI), in formulating the organization's Sustainable Development Framework. PTTEP has been a member of DJSI World Oil and Gas Upstream & Integrated Industry for seven consecutive years since 2014 and was named the Industry Leader in this category in 2016 and 2019.

In 2019, PTTEP formulated a Sustainable Development Framework and Strategy, and set clear long-term targets (2030). Under the inside-out approach, PTTEP strived for impressive performance on a strong business foundation, to deliver sustainable values to society (From We to World).

In 2020, the Board of Directors made an important step in driving the organization's sustainable development towards concrete implementation. It approved the sustainability strategy with long-term targets and SD Statement, to ensure common understanding among employees and other stakeholders. The Corporate Governance Committee's scope of responsibilities was extended to cover the formulation, supervision and promoting of overall sustainable development policy and activities which are closely monitored on a quarterly basis. The Committee was renamed to the Corporate Governance and Sustainable Development Committee, following the shareholders' resolution at the 2020 annual meeting.



Admiral Tanarat Ubol
Chairman of the Corporate
Governance and Sustainable
Development Committee
PTTEP

“The Board of Directors gives immense importance to sustainable development and stands ready to turn strategies to tangible results, particularly Stakeholder Value Creation (SVC) strategy that involves Greenhouse Gas Reduction, Circular Model for E&P and Ocean for Life. The ultimate goal is to transform the organization to embody the Energy Partner of Choice, which is Smart, Good and Responsible and attractive enough to draw cooperation from partners at the national and international level.”

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



Sustainable Development Framework and Strategy

Sustainable Development Framework

PTTEP developed the “Sustainable Development Framework” as a foundation for the organization’s long-term strengths and as a tool to achieve the vision to be the “Energy Partner of Choice”. The framework emphasizes the balance of “Be Smart” (High Performance Organization – HPO), “Be Good”

(Governance, Risk Management and Compliance – GRC), and “Be Responsible” (Stakeholder Value Creation – SVC). PTTEP’s Sustainable Development Framework and sustainability-related material issues correspond with the United Nations Sustainable Development Goals: Goals 7, 8, 12, 13, 14 and 16.



HPO

High Performance Organization (HPO) or “Be Smart”

Emphasizing excellence in all business elements that meet international standards, for greater competitiveness and capability to adjust to future changes.

GRC

Governance, Risk Management and Compliance (GRC) or “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.

SVC

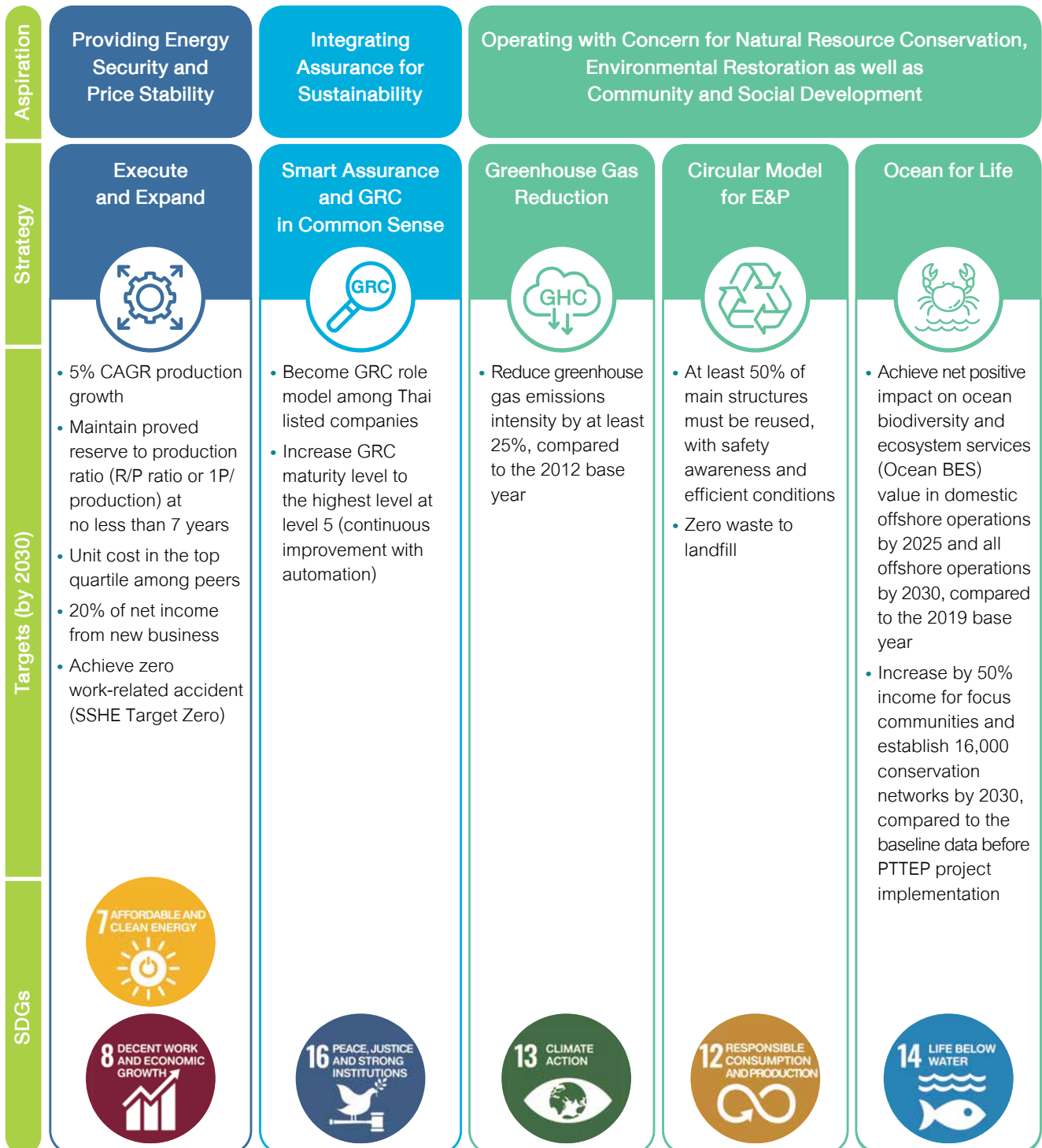
Stakeholder Value Creation (SVC) or “Be Responsible”

Committing to the creation of long-term values for all stakeholder groups, through responsibility for natural resource conservation, environmental rehabilitation, as well as community and social development.

Under the framework, PTTEP believes that with operations based on strong foundation of stakeholders’ interests, we will deliver values and sustainable development to society as a whole (From We to World).

Sustainable Development Strategy

Guided by the Sustainable Development Framework, PTTEP developed a Sustainable Development Strategy based on the assessment of material issues on sustainability. The strategy aims to prepare PTTEP for future challenges that include Energy Transition and ensure continued value for stakeholders. The strategy and long-term goals (2030) are as follows:



Aside from a Sustainable Development Strategy and long-term targets, PTTEP actively proceeds with projects and initiatives to materialize the Sustainable Development Framework's 3 components to achieve sustainability in all dimensions which will ensure stakeholders' trust and confidence and eventually make PTTEP the Energy Partner of Choice.



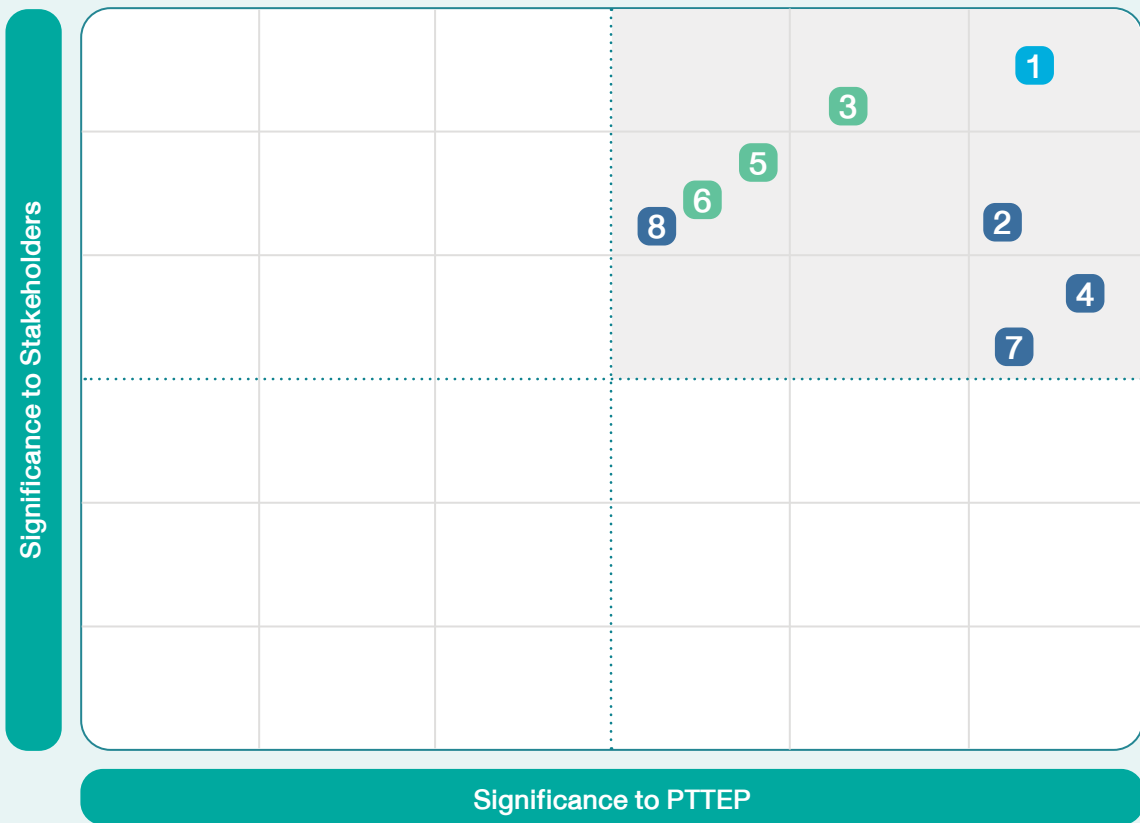
Materiality Assessment

In 2020, PTTEP reviewed material topics on sustainability through interviews and questionnaires with all stakeholders as well as the analysis of the likelihood of opportunities and risks that may affect the Company. The results were classified into 2 groups: material issues of the Company's

operations and stakeholders' concerns and expectations. Also incorporated were global sustainability trends and direction in line with UN SDGs and DJSI as well as the energy industry's material issues. The assessment process was completed in line with GRI Standards.

Materiality Matrix

(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 Society
- 6 Environmental Management



Scan for more details on Materiality Assessment





HPO

High Performance Organization (HPO)

High Performance Organization (HPO) Performance in 2020



Net profit:
USD **720** million



Operating revenues:
USD **5,357** million



EBITDA:
USD **3,512** million



Dividend yield:
4.33%



Cost per unit:
USD **30.5**



Natural gas:
0.68 trillion cubic feet



Crude oil, condensate and LPG:
46.93 million barrels



Proved reserves:
1,074 million barrels
of oil equivalent

LTIF
0.13

TRIR
0.32



Innovation and technology
development:
66 projects



Employee improved capability:
3.5% per year



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



Driven by our mission to operate globally to provide reliable energy supply and sustainable value to all stakeholders, PTTEP operates its business under 2 main strategies – Execute and Expand. The strategies are aimed at fostering growth and preparing the organization for the various

challenges to business like the COVID-19 outbreak, oil price volatility and Energy Transition. Amid these challenges, PTTEP in 2020 mapped out the following long-term business targets as guided by the HPO strategy and framework:

Targets (by 2030)



5% Compound Annual Growth Rate (CAGR) production growth



Maintain proved reserve to production ratio (R/P ratio) at no less than 7 years



Unit cost in the top quartile among peers



20% of net income from new business



Achieve zero work-related accident (SSHE Target Zero)



“To achieve sustainability, PTTEP needs to focus on the development of exploration and production technology to ensure Thailand's energy security and expand business abroad as much as possible while ensuring governance, human resource development and environmental and social stewardship.”

Mr. Somboon Vachalachaisurapol

Deputy Director General
Department of Mineral Fuels



“As PTTEP's main business is exploration and production, it means we must achieve maximum strength and efficiency as well as continuous growth, while addressing concerns about environmental, social, and governance through the use of technology and innovation. Aside from oil and gas exploration and production, we must explore new types of energy and push for new investments and expansion of our collaboration network, for our organization's sustainable growth.”

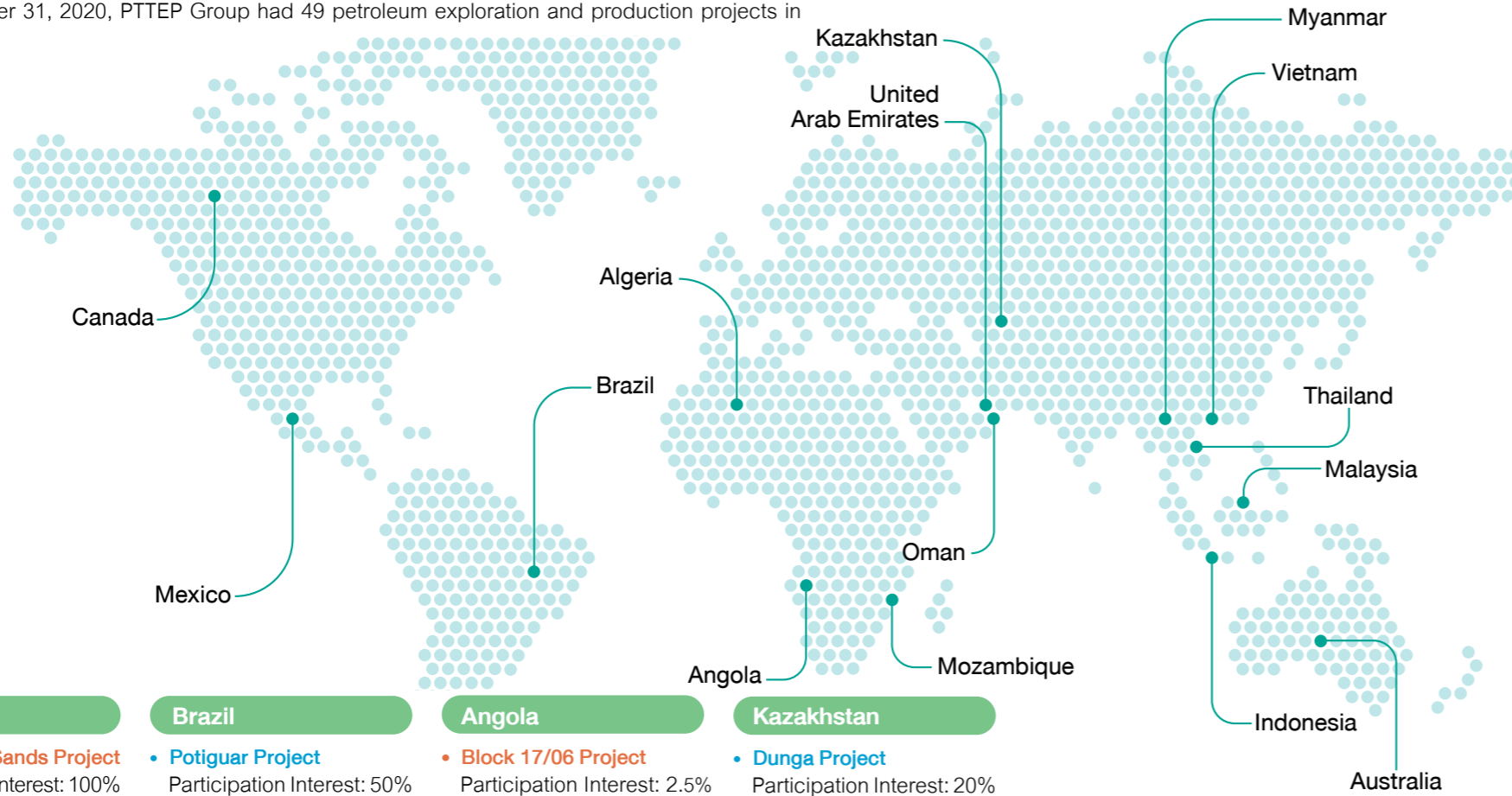
Mr. Montri Rawanchaikul

President
PTTEP



Business Overview

PTTEP's core business is petroleum exploration and production in Thailand and foreign countries. As of December 31, 2020, PTTEP Group had 49 petroleum exploration and production projects in 15 countries.



Canada

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

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

Brazil

- **Potiguar Project**
Participation Interest: 50%
Operator: PTTEP
- **Barreirinhas AP1 Project**
Participation Interest: 25%
Operator: Shell Brasil
- **Brazil BM-ES-23 Project**
Participation Interest: 20%
Operator: Petrobras

Algeria

- **Algeria 433a & 416b Project**
Participation Interest: 35%
Operator: GBRS
- **Algeria Hassi Bir Rekaiz Project**
Participation Interest: 24.5%¹
Operator: PTTEP

Angola

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

Oman

- **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**²
Participation Interest: 20%
Operator: Total

Kazakhstan

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

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**³
Participation Interest: 30%
Operator: Eni Abu Dhabi B.V.

Mozambique

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

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

Myanmar

- **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
- **Sinphuhorm Project**
Participation Interest: 55%
Operator: PTTEP
- **B8/32 & 9A Project**
Participation Interest: 25.001%
Operator: Chevron
- **G4/48 Project**
Participation Interest: 5%
Operator: Chevron
- **G1/61 Project**
Participation Interest: 60%
Operator: PTTEP
- **G2/61 Project**
Participation Interest: 100%
Operator: PTTEP

Myanmar

- **Zawtika Project**
Participation Interest: 80%
Operator: PTTEP
- **Yadana Project**
Participation Interest: 25.5%
Operator: Total
- **Yetagun Project**
Participation Interest: 19.31784%
Operator: Petronas
- **Myanmar M3 Project**
Participation Interest: 80%
Operator: PTTEP
- **Myanmar M11 Project**⁴
Participation Interest: 100%
Operator: PTTEP
- **Myanmar MD-7 Project**⁵
Participation Interest: 50%
Operator: PTTEP
- **Myanmar MOGE 3 Project**⁶
Participation Interest: 77.5%
Operator: PTTEP

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: Petrovietnam
- **Vietnam 52/97 Project**
Participation Interest: 7%
Operator: Petrovietnam

Malaysia

- **Malaysia Project**⁷
Participation Interest: 6.4-80%⁸
Operator: PTTEP
- **Natuna Sea A Project**
Participation Interest: 11.5%
Operator: Premier Oil

Australia

- **PTTEP Australasia Project**⁹
Participation Interest: 90-100%¹⁰
Operator: PTTEP
- **Overlapping Area**
- **MTJDA Project**
Participation Interest: 50%
Operator: CPOC
- **G9/43 Project**
Participation Interest: 100%
Operator: PTTEP

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

1 In March 2020, the Company entered into an Asset Sale and Purchase Agreement to acquire an additional 24.5% investment in the project from CNOOC, a co-investor in the project. The acquisition will be completed when it has been officially confirmed and announced by the Algerian government. After the purchase, the Company will have an increased participation interest from 24.5% to 49%, with SONATRACH, Algeria's national oil company, is the main investor with the participation interest of 51%.
2 PTTEP and Total E&P Oman Block 12 B.V., a wholly-owned subsidiary of Total S.A. signed Exploration and Production Sharing Agreement (EPSA) with Oman's Ministry of Oil and Gas (MOG) for exploration and production rights of Block 12 on February 19, 2020.

3 PTTEP was selected as the successful bidders for the exploration and production, named Offshore 3 and signed the Concession Agreement with Abu Dhabi National Oil Company on December 21, 2020.
4 The project submitted the block relinquishment notification letter to MOGE in September 2019. Currently, the project is waiting for MOGE's approval on block termination.
5 The project submitted the block relinquishment notification letter to MOGE in October 2020 after fulfilling the obligations under the Production Sharing Contract. The termination will be effective after receiving the official approval from the Government of the Republic of the Union of Myanmar.

6 The project submitted the block relinquishment notification letter to MOGE in July 2020 by submitting a request to terminate and return 77.5% of the exploration block of Myanmar MOGE 3 Project after fulfilling the obligations under the Production Sharing Contract. The termination will be effective after receiving the official approval from the Government of the Republic of the Union of Myanmar.
7 PTTEP has named investments of all projects in Malaysia under "Malaysia Project".
8 Malaysia Project holds many petroleum blocks where PTTEP as operator has various participation interests from 42-80%, except one area named Gumusut-Kakap (GK) in Sabah K Block where PTTEP is a joint venture partner with participation interest of 6.4%, and Shell is the operator.

9 The project requested to terminate and return 100% of the exploration blocks of AC/RL5 Project in Tenacious Field, which is a part of PTTEP Australasia Project, to the Government of the Commonwealth of Australia on March 13, 2020, after fulfilling the obligations under the concession agreement. The termination was effective from June 15, 2020.
10 PTTEP Australasia Project holds many petroleum blocks which have varying participation interests ranging from 90-100%.

Execute Strategy

PTTEP strives for maximum operational efficiency in all dimensions, through proactive actions to transform the organization and create work processes that address future business challenges. Digital technology has been applied in work processes to create added value, increase key projects' production volume, enhance competitiveness, ensure business continuity and introduce a new way of working under the New Normal Transformation.

PTTEP Seismic Processing Center (PSPC)

In exploration and production, a key element of this business is the visualization of subsurface geology, for accurate and precise planning of drilling and production activities.

Driven by this realization, PTTEP Seismic Processing Center (PSPC) has been set up in 2020. The process of visualization is assisted by a supercomputer which processes data 10 times more efficiently than the previous model, advanced imaging software for subsurface geology visualization and an expert team of local and foreign geophysicists. High-quality images are produced rapidly in response to increasing demand from the Company's global exploration and production operations. The PSPC helps the Company in reducing cost while imaging efficiency increases.



Advanced Production Excellence (APEX)

Advanced Production Excellence (APEX) introduces digital technology to natural gas production in the Gulf of Thailand. The project's key objectives are to enhance efficiency, reduce expenses and increase petroleum reserves. It also helps reduce greenhouse gas emissions from the production process. Under APEX, the main initiatives have supported operations like drilling operation and subsurface initiatives. Moreover, several small-scale initiatives have facilitated operations and contributed to PTTEP's sustainability in different dimensions, including Digital Logging System: Tablet/Mobile, which replaces note-taking papers with tablets, CO₂ Membrane Optimization, which reduces greenhouse gas emissions and Platform Robotic Operator, which offers platform robots, developed in collaboration with PTTEP's subsidiary, AI and Robotics Ventures Company Limited. APEX generates annual returns of USD 10-15 million. More initiatives will be launched subsequently, such as Condensate Management Portal and the adoption of digital technology for other production processes.



“For successful implementation of digital technology in work processes, it demands personnel's capability development and preparedness for changes, open-mindedness and adaptation to new technologies. Those are the requisites in using novel tools, technology and innovations to enhance work efficiency.”

Mr. Supha-Kitti Dhadachaipathompong

Senior Engineer, Production Operations
(APEX Project Manager)
PTTEP

New Way of Working

In the wake of COVID-19 outbreak, the whole world has had to adjust to a new way of life. A New Way of Working task force was set up, consisting of representatives from various functions. The task force is assigned to study, analyze and design a new way of working that corresponds with changes, under the goal to achieve operational continuity, flexibility and maximum efficiency. The new way of working also increases office space management efficiency, allowing PTTEP to accommodate more employees.

Work-life integration defines PTTEP's new way of working, to ensure employees' good health and workplace environment. Work patterns have been modified and considered based on assignments, requirements of

office equipment and tools, data security, necessity of communications and the ratio of office-based and home-based employees (Work from Home).

Continuous communications with employees were established during the trial period in 2020 and they warmly embraced the initiative. PTTEP also found the new way of working, resulted in work efficiency, the Company's business continuity and achievement of target.

The new way of working not only helped the Company and employees adjust to the new normal in light of the COVID-19 outbreak. It also increased efficiency in resource management and improved employees' work-life balance.



"The past year went by very quickly and there were many abrupt changes. Adjusting to the new way of working is just the beginning of the many changes and preparations we have to make in the future to ensure the sustainability of our way of life and the organization."

Mr. Pongtai Wilaireungsuan

Manager, Competency and Career
Development System Section
PTTEP



"Amid changes, adjusting our mindset is essential for our survival. When the social norm has changed, we can't avoid changes and we must live with them."

Miss Thidarat Chatchaiyadej

Officer, Strategy and Planning Support
PTTEP



Reduce the Spread
of Covid-19 and
Infection Probability



Increase Efficiency
of Office Space
Management



Lower Expenditure
on Office and
Parking Space



Reduce CO₂
Emissions Arising
from Employees'
Travel



Improve
Employee's
Work-life Balance



Limitless Learning

Online Training



**Virtual classroom,
i-learning and
other digital platforms**

**More Than 50 Online
Training Courses**



Technical training
concerning engineering
and E&P, etc.



General skills
such as soft skill, business skill,
future skill, etc.

**Increase
Overall Employee
Capability**



Considering human resources as an essential part in driving the organization towards its goals, PTTEP places emphasis on continuous capability development. Driven by circumstantial and technological changes as well as self-learning, today's learning enters a new arena. PTTEP consequently adjusted its training and capability building activities to replace classroom-based activities with more Digital Learning. Online training also corresponds with the Company's new way of working.

Online training is designed to establish a learning culture and eventually transforms PTTEP to a learning organization. It also creates more learning opportunities for employees. More online training courses will be continually introduced in the future to offer employees unlimited learning opportunities.



“Learning is not restricted to the classroom. We can learn and improve ourselves anywhere, any time. We just need to be open for new learning and never stop improving ourselves. Then, learning opportunities will reach all.”

Miss Sunantha Kitisarasak

Manager, Learning and Development Section
PTTEP

Corporate SSHE Culture

PTTEP has conducted Safety, Security, Health and Environment (SSHE) Culture Survey since 2011, which is conducted every 3 years, to measure corporate SSHE culture to ensure maximum safety for both employees and contractors and reflect the organization's efficiency on safety management.

The survey form has been continually improved to cover different dimensions of safety, from personal safety to process safety. The latest improvement took place in

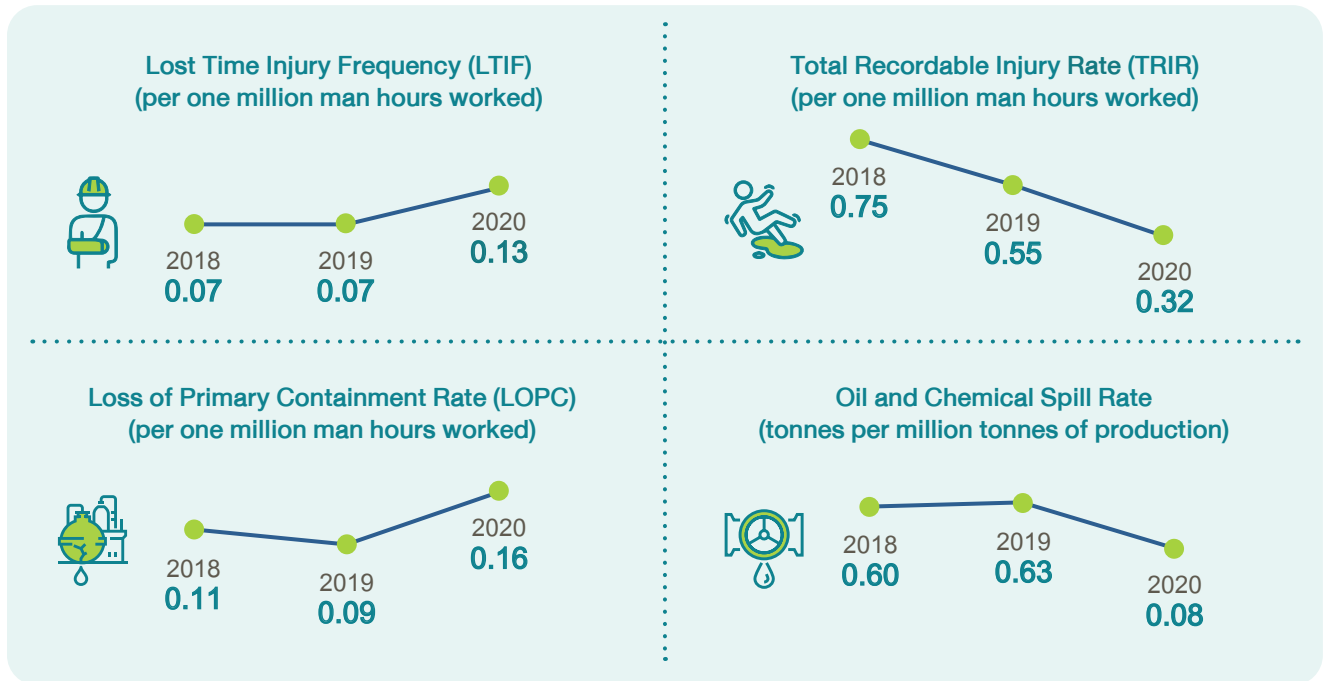
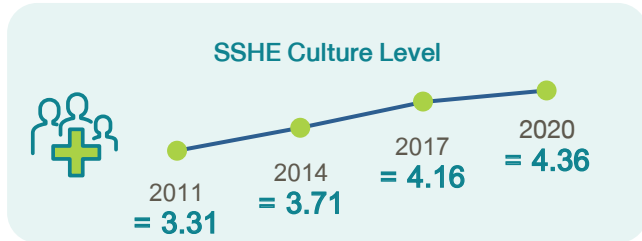
2020 when environmental management was included. The survey results were analyzed and used in the formulation of the 3-Year SSHE Culture Improvement Plan for implementation by all functions.

In 2020, the survey was conducted online in line with the new way of working, engaging more than 4,000 employees. It was also the first time that the survey covered contractors. More than 1,400 contractors participated in the survey. The results showed that PTTEP's corporate

SSHE culture level was 4.36 out of 5 score which is the highest level (Generative Level). The scores have continually increased, reflecting better understanding in operational SSHE awareness and practice. PTTEP sets a goal to achieve SSHE Target Zero.

With efficient SSHE management, PTTEP's safety performance has been among the leading world-class exploration and production companies which are members of the International Association of Oil & Gas Producers (IOGP).

Despite improvement in the overall Total Recordable Injury Rate (TRIR) and Oil and Chemical Spill Rate, challenges lie ahead on the Lost Time Injury Frequency (LTIF) and Loss of Primary Containment Rate (LOPC), which were contributed from new operating assets acquired in 2019. PTTEP analyzed root causes of the incidents and strengthened safety oversight of these assets including accelerating the closing of SSHE improvement gaps to prevent reoccurrence of such incidents.



“Safety Leadership is essential in preventing work-related accidents. PTTEP evidently places importance on safety by promoting safety awareness and leadership among all contractors to ensure operational safety.”

Miss Ruthairat Khamprommee

SSHE Specialist

Schlumberger Oversea S.A.



Expand Strategy

PTTEP's Expand Strategy primarily focuses on strategic locations – Thailand, Southeast Asia and the Middle East, while seeking investment opportunities in other potential locations in collaboration with experienced partners. PTTEP also explores opportunities in the integrated liquefied natural gas business and new businesses including alternative energy in Southeast Asia as well as robotics and artificial intelligence.



Expansion for Sustainable Growth

PTTEP was on an investment spree in 2020, especially in the Middle East. In cooperation with Total E&P Limited, a long-time business partner, PTTEP signed Exploration and Production Sharing Agreement (EPSA) with Oman's Ministry of Oil and Gas (MOG) for exploration and production rights of Oman Onshore Block 12, a 10,000 square kilometer onshore natural gas field in the middle of Oman. PTTEP together with Eni, an Italian oil company, won the bid for

Block Offshore 3 Field, off the coast of the United Arab Emirates, which encompasses 11,000 square kilometers and is one of the areas with the highest petroleum potential in the world.



"PTTEP and Total have had a strategic alliance that closely follows PTTEP's vision of 'Energy Partner of Choice'. We look forward to continuing our joint business development and building an efficient skilled workforce to enhance sustainability in the energy industry throughout ASEAN and the Middle East."

Mr. Pascal Laroche

General Manager

Total E&P Thailand

Expansion in the two countries is another business milestone for PTTEP's investment in the Middle East. It not only supports the corporate strategy and target in increasing proved reserves and production volume, but also tightens PTTEP's collaboration with business partners in line with the "Energy Partner of Choice" vision.

Aside from investment in the main business, PTTEP expanded investment in new businesses as planned. It secured the Republic of the Union of Myanmar Government's endorsement for an integrated domestic gas to power project. Under the project, a 600-megawatt cogeneration power plant will be constructed and powered by natural gas from Zawtika and M3 projects in the Republic of the Union of Myanmar (Myanmar) to produce reasonably-priced electricity for domestic consumption. The project involves the construction of a natural gas pipeline and electricity transmission grid. It will not only grow PTTEP's business but also ensure Myanmar's energy security.



"PTTEP executes a national mission in growing revenue and ensuring energy security in the long term, by exploring oil and gas in Thailand and overseas. PTTEP demonstrates efficient management and transparency in every step. It cares for and nurtures long-term relationship with customers, with a commitment to reduce its environmental impact."

Mrs. Tanunporn Tangpithakkul

Manager, Crude Oil Trading Department

PTT



Scale Up Robotics and AI Business

Nautilus:

The World's First Subsea Pipeline Inspection, Repair and Maintenance Robot

One of PTTEP's priorities is to improve knowledge related to technology especially artificial intelligence and robotics. In 2018, AI and Robotics Ventures Company Limited (ARV) was established to provide AI and robotics-related services in support of activities in petroleum exploration and production and other sectors with focus on 4 areas: Subsea, Aerial Inspection, Agriculture and Med Tech to enhance PTTEP's competitiveness.

In 2019, ARV and Norway-based Kongsberg Ferrotech developed "Nautilus", the world's first subsea pipeline maintenance robot. Nautilus reduces maintenance risks and operating cost. The robot combines PTTEP and ARV's engineering knowledge involving underwater pipeline maintenance with Kongsberg Ferrotech's subsea robotics. Nautilus won the Award for Breakthrough Technological Project of the Year at the Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) Awards 2020.

Nautilus was developed under the supervision of all relevant parties with plans to be deployed in the Gulf of Thailand in 2021. It is expected to reduce maintenance expenses by more than 40%, while preserving international standards of efficiency and reducing work-related risks. The anticipated benefits of the Nautilus can be extended into commercial services to other petroleum exploration and production companies worldwide.



"As a subsidiary of PTTEP, ARV has learnt and followed through PTTEP's sustainable development principles. We have been a smart, good and responsible citizen and we have set our sights to develop a new business which is a key milestone for digital transformation, to create business opportunities and to ensure continuity amid the wave of Technology Disruption."

Mr. Thana Slanvetpan

General Manager

AI and Robotics Ventures Company Limited (ARV)





GRC

Governance,
Risk Management
and Compliance
(GRC)

Governance, Risk Management and Compliance (GRC) Performance in 2020

Applied GRC

with new transition projects



PTTEP emphasizes transparency and efficiency for the organization's stability and sustainability. PTTEP adheres to governance best practices, ensures appropriate risk management and internal control, and strictly complies with relevant laws and regulations. Two major strategies – Smart Assurance and GRC in Common Sense – are executed to achieve the targets which are to become a GRC role model for Thai listed companies and to raise GRC maturity level to level 5, the maximum level. Notable GRC-related activities in 2020 are as follows:

The Whistleblowing System expanded to the Company's subsidiaries and overseas projects



Implement online

web-based risk register system



Targets (by 2030)

<p>Become GRC role model among Thai listed companies</p>	<p>Increase GRC maturity level to the highest level at level 5 (continuous improvement with automation)</p>
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Mr. Khairul Mizan Zakaria
Compliance Manager
PTTEP Malaysia

"I'm proud to be part of the PTTEP Group which has a strong commitment to good corporate governance and business ethics. Tone at the top sets forth the Company's ethical environment and values. We're grateful to get full support from our Board of Directors and Management on the implementation of business ethics and anti-corruption programs for Malaysia Assets. In addition, PTTEP Group has comprehensive GRC policies and adequate procedures to ensure sustainability and continuous improvement."

Smart Assurance

Smart Assurance focuses on integrated, concise and efficient corporate governance. Best practices are applied at all PTTEP operations in Thailand and abroad to ensure a single standard in support of business expansion.

Governance for Asset Transition



PTTEP expanded existing businesses and completed several acquisition deals in 2020, prompting the Company to outline the GRC-based system and apply it with all new projects. This is to ensure efficient operations of the new projects.

For maximum smooth and efficient operations, PTTEP has conducted a study of each project's GRC system, identified gaps and map a suitable development plan. This was executed simultaneously with communication on the importance of GRC and best practices to the new projects' executives and staff, to ensure uniform understanding and implementation according to PTTEP's way. PTTEP also delegated a unit to take responsibility for new projects' GRC. The unit was included in the organization structure, with a clear scope of responsibility. Action plan's progress is routinely reported to corporate to ensure appropriate internal control. Performance data was gathered and included in the Company's Knowledge Management Portal.

PTTEP uses digital technology in developing the GRC process, which was extended to cover more domestic and overseas operations. For example, the Whistleblowing System currently supports subsidiaries and overseas projects, including Myanmar Asset and Malaysia Asset, allowing the projects' responsible persons to directly handle complaints within their territories. The Web-based Risk Register System is now online. It promises complete and fast risk identification and analysis as well as thorough communications. Aside from that, relevant persons can monitor risk management in a convenient and quick manner.

The GRC-based control system not only ensures an efficient and standard GRC approach for implementation at all projects and all operating areas, it also helps the Company prevent possible fraudulent or corruption-related risks that may affect the organization's reputation and image. On top of that, best GRC practices will create confidence among shareholders, investors and relevant stakeholders and align with the organization's Sustainable Development Framework.



GRC in Common Sense

Aside from an efficient assurance system, PTTEP expects employees and relevant stakeholders' understanding and acknowledgement of the GRC approach, for integration into their routines and important decision-making process. Meanwhile, best practices will be communicated to the wider community and society.

Talk on GRC

PTTEP, as a founding member of the Global Compact Network Thailand (GCNT), vows to take a leading role in pushing forward corporate governance and anti-corruption. Its representative sits on a sub-committee on the issues. Affirming this vow, PTTEP joined a seminar on governance and anti-corruption which was a part of "GCNT FORUM 2020: Thailand Business Leadership for SDGs". Knowledge and experiences relating to GRC implementation were shared in support of GCNT's effort to build awareness in the business sector so that they join the movement to lead Thailand towards UN SDGs.

PTTEP is also a committee member of the Risk Management and the Internal Control Club of the Thai Listed Company Association, which provides a venue where PTTEP is able to exchange knowledge and experiences with other listed companies at various activities including talks on risk management, business continuity management and internal control and to participate in workshops. Through the activities, PTTEP and other listed companies are able to learn and exchange experience from each other on implementation, issues of concern and obstacles. This information and input are very beneficial for companies to internally improve their GRC performance.





“PTTEP has shown impressive performance. The application of technology and innovations will further strengthen the organization in order to tackle risks like uncertainty in oil consumption and an increase in renewable energy consumption. As such, PTTEP should define its energy transition path to address future challenges.”

Miss Pensri Sutirasan

Director

Thai Listed Companies Association

Human Rights

PTTEP contracted an external advisor for a thorough assessment on its human rights-related risks and impacts in 2020, including bolstering the knowledge and understanding of all personnel involved in the assessment and advised them on risk management. While the assessment was aimed at attaining international human rights standards, it offered a review on the process and pinpointed potential risks. The assessment also shed light on possible areas for improvement on human rights in countries where PTTEP recently expanded its presence and also countries in its future investment plans.

Due to our commitment and the impressive performance in this aspect, PTTEP received the award for the 2020 Role Model Organization on Human Rights in State Enterprise sector from the Rights and Liberties Protection Department, Ministry of Justice for the second consecutive year.



“PTTEP has operated business consistent with international human rights standards and has encouraged its suppliers and stakeholders to follow human rights principles. This strongly supports the government’s policy in preventing human rights violation.”

Miss Aimon Siangyai

Deputy Director General

Rights and Liberties Protection Department





**Stakeholder
Value Creation
(SVC)**

Stakeholder Value Creation (SVC) Performance in 2020



Reduced greenhouse gas emissions:
315,215
tonnes of CO₂ equivalent



Reused, recycled and recovered waste:
46%



Recycled and reused water:
62%



Social development projects:
196



Renewable energy accounts for **77%** total energy consumption of Thai offshore production platforms



Increased target community's annual income per person: **>10** times compared to the baseline data before Aquatic Animal Hatchery Learning Center implementation



Numbers of conservation networks in Songkhla Province: **34**



Employee volunteering hours: **4,021**

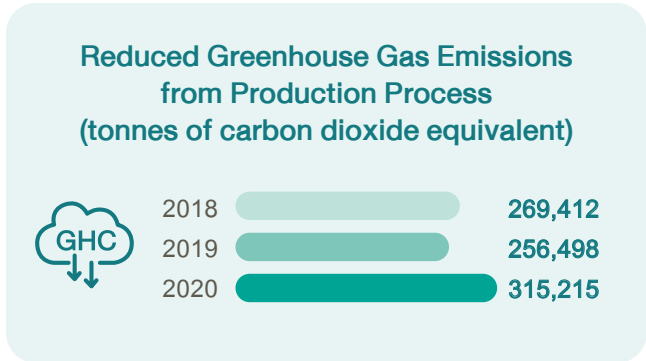
PTTEP's operations are geared towards ensuring national energy security, natural resources conservation, environmental rehabilitation and community and social development. Three main strategies – Greenhouse Gas Reduction, Circular Model for E&P and Ocean for Life – are in place to achieve the goals. In 2020, actions under the strategies as well as other activities created long-term shared values to stakeholders.



Greenhouse Gas Reduction Strategy

Global warming and climate change has been a significant and urgent issue at the national and global levels. It is a material issue on sustainability due to the impacts on the environment, livelihood and business operations. PTTEP is aware of the impacts and has drawn up the Greenhouse Gas Reduction Strategy to mitigate possible impacts from its operations. The target under this strategy is clearly defined: to reduce the emissions intensity by at least 25% by 2030 from the base year 2012.

In 2020, the intensity was reduced by 13% as greenhouse gas emissions dropped by 315,215 tonnes of carbon dioxide equivalent. A number of projects contributing to the success include: flare gas recovery and utilization, energy efficiency



improvement, production efficiency improvement, Methane gas leakage reduction, application of renewable energy in operations including the feasibility study of Carbon Capture Utilization and Storage (CCUS).

Target (by 2030)

Reduce greenhouse gas emissions intensity by at least **25%**, compared to the 2012 base year

	Reduced Greenhouse Gas Emissions (tonnes of CO ₂ equivalent)
 Flare Gas Recovery and Utilization	164,297
 Product Efficiency Improvement	88,248
 Energy Efficiency	57,670
 Curb on Methane Leakage	5,000

Flare Gas Recovery and Utilization

PTTEP has undertaken Flare Gas Utilization to reduce greenhouse gas emissions from the production process. By installing a Flare Gas Recovery Unit (FGRU), the excess gas is recovered from condensate production and used as fuel for the machinery e.g. power generators on accommodation and central processing platform.

This project helps the Company to reduce GHG emissions by 164,297 tonnes of CO₂ equivalent. PTTEP is dedicated to further improvement of FGRU efficiency and exploration of new technology to recover and utilize more excess gas which will help mitigate climate change impacts.





Renewable Energy

Renewable energy has increased in usage in many countries as a substitute for fossil fuels in electricity generation, which can mitigate environmental impacts. PTTEP's pilot renewable energy project was implemented at an unmanned wellhead platform. Solar panels were installed to feed electricity to the wellhead platform, which reduced the need of gas for electricity generation. The project was replicated at other wellhead platforms and solar panel efficiency has been simultaneously improved to replace more gas for electric power generation. Aside, PTTEP conducted a study on

a solar and wind turbine hybrid system. In 2020, the first hybrid system installation at one of the wellhead platforms at Arthit Project was completed and the project will later encompass other platforms. Renewable energy currently accounts for 77% of total energy consumption of offshore platforms in our Thailand operations. PTTEP expects to have new wellhead platforms 100% electrified by renewable energy in the future. Solar energy partially powers some office buildings like Petroleum Development Support Base in Songkhla and Ranong provinces as well as S1 Project's office.



"Our ultimate goal is not to gain profit for the Company from the excess gas recovery. Rather, we don't want to burn off the gas and cause pollution. The effectiveness may not be evident today but we will see it in the future. This will definitely foster PTTEP's sustainable growth and benefit society and the environment."

Mrs. Junjira Lawrattanachaiyong

Supervisor SSHE
PTTEP



"Our solar energy initiative slightly reduces the operating cost. But this marks a small beginning of our courage to step out of the comfort zone, to learn and explore renewable energy innovations that can reduce the Company's cost and further mitigate social and environmental impacts."

Mr. Warawath Thubthimsang

Manager, Power Plant Section
PTTEP



PTTEP discloses the performance on climate change actions in Annual Report and Sustainability Report, published on the Company website. Since 2007, it has disclosed environmental and climate change actions to CDP. In 2020, PTTEP is ranked at “Leadership Level” for the seventh consecutive year, reflecting relative stewardship compared to companies in the same industry.

PTTEP has signed up to the United Nations Global Compact (UNGC)’s Guide for Responsible Corporate Engagement in Climate Policy and explored opportunities to reduce or offset carbon emissions. Actions implemented so far include the purchase of carbon credit in support of Thailand Greenhouse Gas Management Organization (Public Organization) or TGO’s carbon credit market, reforestation to create natural carbon sinks, participation in TGO’s Low Emission Support Scheme (LESS) which involves renewable energy consumption and energy efficiency enhancement and natural resource efficiency enhancement.



“Being a smart and socially-responsible citizen to win community trust reflects the vision of PTTEP’s top management. Results have been mirrored by a decrease in greenhouse gas emissions. PTTEP’s goal to become lower carbon organization will make its actions to tackle global warming more evident.”

Mr. Kiatchai Maitriwong

Executive Director

Thailand Greenhouse Gas Management Organization

Circular Model for E&P Strategy

Targets (by 2030)



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



Zero waste to landfill

Under the Circular Model for E&P Strategy, PTTEP redesigned work processes and resource management for more reuse and recycling of resources. The Company’s two main targets under this strategy are clearly defined.

In 2020, PTTEP achieved zero hazardous waste to landfill and successfully used drill cuttings for road construction and maintenance materials. In addition, the Company has made preparations for topside reuse at Arthit Project.

The Pilot Recycled Drill Cuttings Road

Onshore drilling generates massive rocks and soil (drill cuttings) which have been so far used as raw materials for cement production. To create added value and optimize resources, PTTEP teamed up with the Department of Rural Roads, the Department of Mineral Fuels at the Ministry of Energy and the Thailand Institute of Scientific and Technological Research for an experimental project called Pilot Recycled Drill Cuttings Road. The project used drill cuttings as an alternative material for road construction and maintenance.



The study confirmed the drill cuttings' quality and safety as a road construction material. In August 2020, PTTEP paved a 168-meter road inside PTTEP Technology and Innovation Centre (PTIC) and found that the quality of drill cuttings-based material is relatively comparable to standard road construction materials.

PTTEP plans more experiments at PTTEP Rapid Scale-up Center (RASC) and S1 Project in 2021. It also considers launching road construction and maintenance projects for communities surrounding its operating sites, to create long-term values for stakeholders through the organization's knowledge and innovations.

Management of Hazardous Waste to Landfill

Under the zero waste to landfill target within 2030, PTTEP sets sub-targets for different types of waste. Actions have been continually implemented to achieve the target.



PTTEP manages waste systematically and aligned with the international standards. In 2020, PTTEP achieved a sub-target with zero hazardous waste to landfill, by the applying of a waste hierarchy for resource optimization. In its management process, PTTEP emphasizes reduce, reuse, recycle and recover concept, respectively.

A one-stop service center was created for offshore waste to define appropriate waste management practices in line with the waste hierarchy. To standardize the waste management of the Company, the same concept was also applied for wastes from onshore activities. Monitoring and auditing

on waste vendors has been continuously implemented to ensure their compliance with laws, regulations and company requirements. This also includes collaborations to find ways to enhance the process efficiency.

Moreover, PTTEP successfully conducted studies to handle specific wastes (such as petroleum rubber hoses, steel pipes and plastic caps) by enhancing the recovery of valuable materials from waste. With this improvement, it helps minimizing impact to the environment from the traditional waste to landfill method and has been applied widely to the existing waste management.



Ocean for Life Strategy

 **Targets (by 2030)**



Achieve net positive impact
on ocean biodiversity and ecosystem services
(BES) value in domestic offshore operations
by 2025 and all offshore operations
by 2030, compared to the 2019 base year



Increase **50%** of community income
of focused communities and achieve
16,000 conservation networks by 2030,
compared to the baseline data
before PTTEP project implementation

Under the Ocean for Life Strategy, PTTEP strives to take a lead in the conservation of natural resources and marine ecosystem in support of economic growth and livelihood of coastal communities. Vast offshore operating areas are PTTEP's advantage in creating long-term values to stakeholders. Two long-term targets (by 2030) under the strategy are clearly set.

PTTEP has formed partnerships with external organizations to implement this strategy. In 2020, a Memorandum of Understanding (MoU) on Ocean for Life was signed with the Department of Marine and Coastal Resources, chiefly to increase biodiversity and abundance. The MoU covers activities like ocean waste management, mangrove reforestation and rehabilitation, hatchery learning centers to preserve sustainable coastal livelihoods, conservation of rare species, and support for research on ocean health and biodiversity.





“PTTEP’s business involves mainly marine resource utilization. As such, marine resource and environment conservation is essential and deserves greater emphasis. This includes a center that promotes public awareness of the value of Thai waters.”

Mr. Sopon Thongdee

Director General

Department of Marine and Coastal Resources



“PTTEP is Thailand’s oldest petroleum exploration and production company while Kasetsart University’s Faculty of Fisheries is the country’s oldest center on marine knowledge. Our synergy is necessary to push the country forward, through the creation of a marine ecosystem network and the improvement of marine resources and coastal communities with support from technology and innovations.”

Asst. Prof. Thon Thamrongnawasawat, Ph.D.

Associate Dean for Special Affairs

Department of Marine Science

Faculty of Fisheries, Kasetsart University

PTTEP also signed another MoU with Kasetsart University, Thailand’s oldest and largest marine research center, to promote ocean sustainability. The two organizations will together launch activities and develop knowledge in relation to Ocean Health Index for optimal environmental benefits and the sustainability of marine ecosystem.

The collaboration is just the beginning. Under the vision to become “Energy Partner of Choice”, PTTEP will seek further cooperation from other relevant organizations to jointly create sustainable values to community and society.

Baseline Study of Microplastics in the Gulf of Thailand’s Offshore

The Baseline Study of Microplastics in the Gulf of Thailand’s Offshore Project is one of the initiatives included in the MoU with Kasetsart University. In 2020, the first sampling of microplastics was conducted at Bongkot and Arthit fields. To cover the most parts of the Gulf as much as possible, the study and sampling areas were extended to cover Koh Losin in Pattani Province, Koh Tao in Surat Thani Province and a coastal area in Chumphon Province. The samplings are under lab analysis. The study and sampling will continue in 2021 to ensure the most accurate research results to assist formulation of plans at a national level to tackle and manage ocean waste.



Green Buoy Project

PTTEP, in collaboration with the Department of Marine and Coastal Resources, Kasetsart University's Sri Racha Campus, and independent innovators, developed Green Buoys in 2020 to monitor ocean health and biodiversity. Providing data support on Thailand's oceanography, the buoys will lift Thailand's ocean scientific research capacity and reduce dependence on foreign technology. Maintained by wave and solar energy, the buoys monitor ocean temperature and pH scale. They are equipped with microplastic sensors and a system for data transmission to the onshore server for online data processing.

PTTEP and partners witnessed lab-scale success in buoy development and testing as well as the development of wave generated energy system. The test results showed the buoys can capture energy from surface waves. The construction of the prototype buoy is underway, and it will be tested at Koh Mannai, Rayong Province in 2021. The buoys are expected to be in service in 2022.

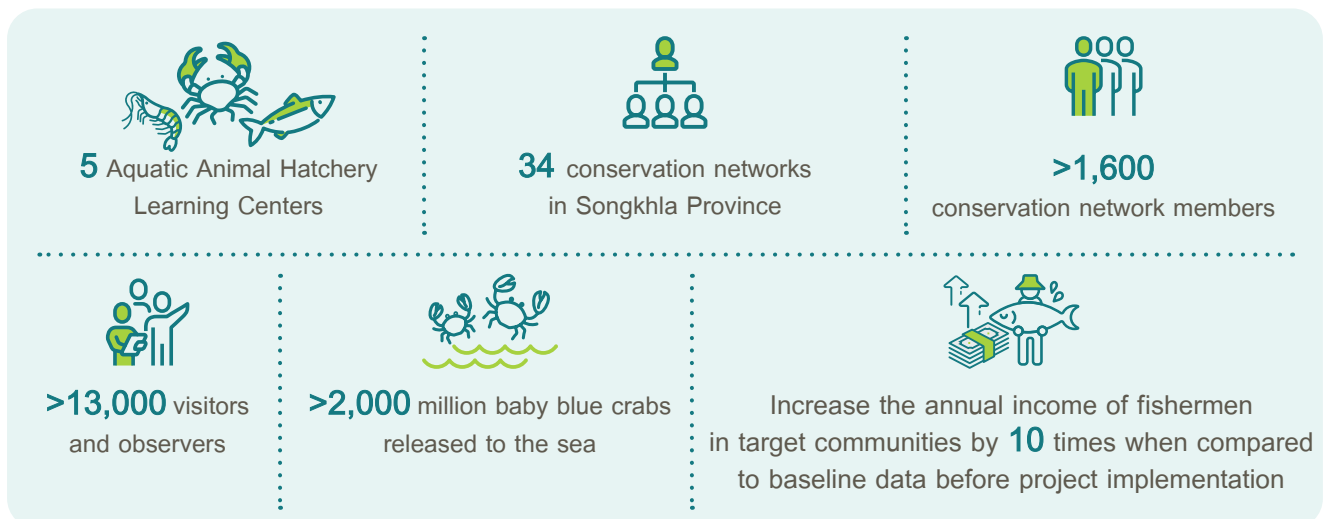


Aquatic Animal Hatchery Learning Center

Aquatic Animal Hatchery Learning Center is implemented under the MoU with the Department of Marine and Coastal Resources to build a marine resource conservation network, to support sustainable fishing in 17 provinces along the Gulf of Thailand coastline to increase marine life abundance and enhance relationship with government agencies and local fishermen networks. PTTEP contributes technological expertise in building systematic and standard hatchery

knowledge as well as support hatchery learning centers with its energy technology.

PTTEP established the first Aquatic Animal Hatchery Learning Center in 2013. To date, there are 5 learning centers: 3 in Songkhla Province, and 1 each in Pattani Province and Nakhon Si Thammarat Province.





“PTTEP puts an importance on the livelihood of local people. The Company has offered support, including assistance to turn a crab bank in Phangkhem Community to a hatchery of crabs and other marine lives. PTTEP helped us with hatchery knowledge to increase output, resulting in higher income and awareness in marine life conservation.”

Mr. Yongyut Rodboonmee

Chairman of Phangkhem Community

Crab Hatchery Learning Center, Songkhla Province

Biodiversity and Environmental Quality Survey

Driven by intense dedication for marine resource conservation, PTTEP launched a biodiversity and environmental quality survey in collaboration with the Department of Marine and Coastal Resources, Prince of Songkla University, Kasetsart University, Rajabhat Phuket University and Walailak University. The project was implemented at Koh Losin in Pattani Province, which is the largest habitat of hard corals in the Gulf of Thailand and plays an important role as Thailand's maritime territory.

The project surveyed seawater quality, current direction and speed as well as the volume of microplastic in seawater and silt. It is also associated with a volunteering activity by PTTEP employees to collect waste at the seabed and fishing nets on coral reefs. The first survey initially discovered more than 10 new fish species never seen before in Thailand and at least 4 new hard coral species on top of 76 known coral species. Official survey results are being analyzed. PTTEP and partners are committed to conducting more surveys for the most comprehensive results which will support Thailand's marine resource and ecosystem conservation efforts.



Values Creation for Society

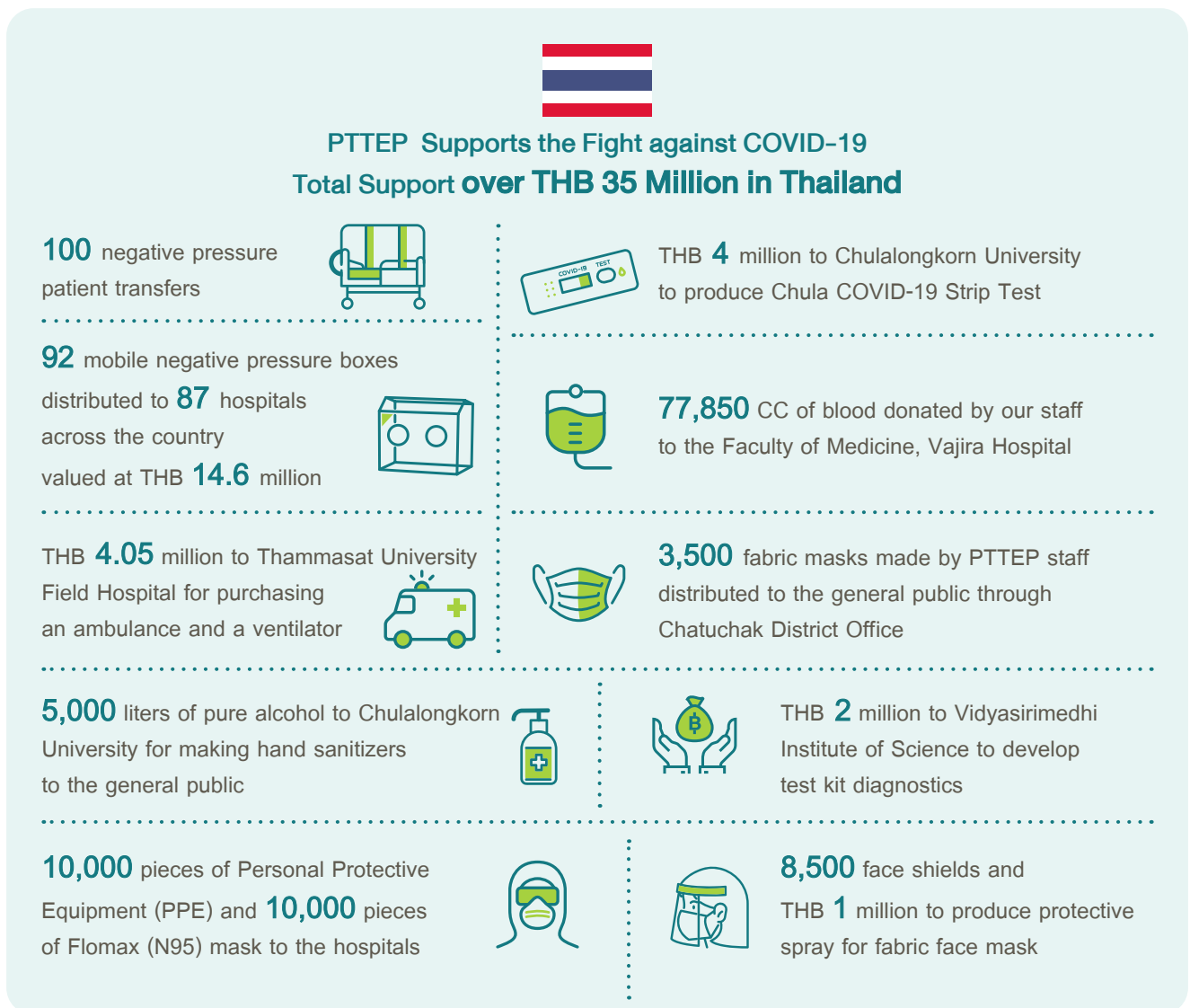
Aside from programs implemented under the strategies of Stakeholder Value Creation (SVC), PTTEP has launched several more actions to create value for society in several dimensions to address their expectations and ensure thorough benefits to the Company's stakeholders.

Supporting Fight against COVID-19

Amid the outbreak of COVID-19 in Thailand and the rest of the world, PTTEP utilized its knowledge and technology in energy 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 44 million to hospitals, educational institutions and organizations in Thailand and other countries. PTTEP joined this fight by utilizing engineering knowledge

and technology in the development of negative pressure patient transfers and negative pressure boxes.

PTTEP and its subsidiary, AI and Robotics Ventures Company Limited, joined up with A.I. Technology Co., Ltd., to develop a prototype negative pressure patient transfer bed originally created by Navamindradhiraj University's Faculty of Medicine Vajira Hospital. It can capture small particles and kill the virus.



PTTEP Supports the Fight against COVID-19 Donating THB 8.8 Million Overseas



Myanmar



Indonesia



Malaysia



Algeria



Mozambique



Asst. Prof. Anusang Chitsomkasem, M.D.

Deputy Dean of the Faculty of Medicine
Navamindradhiraj University

“PTTEP has a wealth of talented personnel. It efficiently utilizes innovations and ably pushes society forward through transparency and sustainability. As a society and community representative, I expect PTTEP to be a leader in innovations that answer all challenges, not just for exploration and production activities.”

Smart Village Project

Smart Village was jointly developed by PTTEP and AI and Robotics Ventures Company Limited, in support of smart farming. The project is designed to lift Thai farmers' quality of life, create community-level jobs, ease labor shortages as Thailand becomes an aging society, reduce energy consumption and greenhouse gas emissions and support Thailand's agricultural leadership at the international level.



Technology supports the project in 2 fronts:

1) The agriculture drone reduces time taken on surveys, reduces chemical contact and cuts water and energy consumption. Drone pilots are also trained to offer services in their areas.

2) Application to collect data from agricultural fields, which is analyzed and used in the planning to raise output and quality.

In 2020, the project was implemented at a pilot rice field in Suphanburi Province, in cooperation with various public and private organizations. Rice cultivation started in September for harvesting in December. Instead of human labor, a drone sprayed fertilizer and took photos of the field for crop health checks from planting to harvesting. Data analytics helped to identify the areas to troubleshoot and increase the yield.



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

PTTEP kicked off the Forest Restoration for Eco-learning at Sri Nakhon Khuean Khan Park in 2013. The project continues today under joint implementation with several agencies – the Royal Forest Department, Kasetsart University and Chaipattana Foundation. The city forest is turned into an eco-learning center or a “natural classroom” through 40-rai forest restoration, the restoration of landscape in the 108-rai park area, signage and facilities for all types of visitors including a nature trail for visitors in wheelchairs in accordance with universal design. The community is encouraged to take part in conserving the city forest while a community business is launched, supported by local resources.

In 2020, PTTEP entered into the second phase of MoU (2020-2025) with the Royal Forest Department and Kasetsart University to proceed with the project.

The Forest Restoration for Eco-learning at Sri Nakhon Khuean Khan Park is open to community members, visitors and natural classroom enthusiasts. It also serves as a center for learning and environmental activities of public and private organizations, which helps create jobs and income for the community. As a side project, “Youth Guide Training” was launched, whereby elementary-level students in Bang Kachao are trained to be tour guides.



- **305,262** visitors and natural classroom enthusiasts
- **362** youth volunteers



Mr. Saman Sateainbutre
Vice Chairman
Khung Bang Kachao Community

“PTTEP shows its sincerity and determination in developing Sri Nakhon Khuean Khan green area. It provides knowledge on sustainable tree plantation, which reduces the community's environmental problems. A vivid example is the embankment that keeps trees from falling. PTTEP also delivers new ideas and knowledge to the community and students, allowing them to build things on this project. Thank you, PTTEP, for your continuous support and may you be with us forever.”



Café Amazon for Chance Project

Café Amazon for Chance has been launched to create jobs for the underprivileged, under the supervision of Sarn Palung Social Enterprise Company Ltd. (SPSE), a business unit of PTT Group. In 2019, SPSE and PTTEP forged a 50:50 investment to open the Café Amazon for Chance at the Royal Thai Marine Corps., in Sattahip District, Chonburi Province. Opening in January 2020, the branch is staffed by veterans discharged because of injuries and their families who have been trained as barista and staff in the shop. PTTEP plans to contribute the profit to fund the conservation of rare marine species, such as the activities at Sea Turtle Conservation Center, Royal Thai Navy in Sattahip District, Chonburi Province.



Sobis Pammase Project

PTTEP's social contribution is extended to communities in foreign countries where the Company operates. One of the projects is Sobis Pammase which promotes social enterprises in West Sulawesi, Indonesia. PTTEP has extended support to local farmers involved in shrimp, duck, chicken and bee farming since 2018, to help them make a living and lift the quality of life. The project involves 500 farmers and succeeds in producing highly-demanded products for local markets. A variety of new products is being developed including organic vegetables. With clear benefits

to community, the project won the "Best Community Program Award" from the 12th Global CSR Award event.

Sobis Pammase project has allocated partial profits to fund the Stimulation, Intervention, Optimization of Services for Children (SIOLA) Project, initiated by PTTEP with the objective to support the development of pre-school children in terms of nutrition, health and child protection. At present, there are 15 SIOLA Centers in Indonesia.



"I'm delighted to be part of Sobis Pammase. I earn a living by raising chicken at home. At first, I had no knowledge in chicken farming, but the project's manager was very helpful. Moreover, I don't need to worry about buyers as the project finds me buyers who give me fair prices. This is my second participation in the project and I will keep this going on."

Mr. Jalaludin

A chicken farmer
Sobis Pammase Project



"I didn't hesitate to join this project as soon as I learnt that partial profits would go to SIOLA. I had never known any social business like this and all team members have been extremely helpful to project participants. I'm so proud to be part of it and I'd love to continue working with them."

Mr. Bapak Ruhul

A duck farmer
Sobis Pammase Project



Despite challenges in 2020 and adjustments in response to the challenges, PTTEP is confident that amid the crisis, there are great opportunities. We worked diligently to achieve the mission in ensuring energy security and creating shared values to society and the environment. Aside from activities with outstanding performance detailed in this report, the remaining projects implemented for sustainability and their management approaches are shown on www.pttep.com.

PTTEP remains committed to creating sustainable growth in all dimensions under the 3 components of the Sustainable Development Framework – HPO, GRC and SVC. We stand ready to partner with all parties in creating value to all stakeholder groups, to achieve the Company's vision as the “Energy Partner of Choice”.



Scan to visit sustainable development section in PTTEP website



Scan to complete survey of readers' opinions



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Cover Photo:

Ocean for Life is one of PTTEP's sustainable development strategies.
We strive to conserve natural marine resources and ecosystem to increase biodiversity.
Sea turtles are indicators of the abundance of marine ecosystems.
Conservation of sea turtles is a tangible way to express our love for nature and our world.

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

Scan to visit
PTTEP website



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