PTT Exploration & Production Public Company Limited - Climate Change 2023

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

PTT Exploration and Production Public Company Limited (PTTEP), a Thai national petroleum exploration and production organization, is a publicly listed company on the Thai stock exchange, and a subsidiary of PTT Public Company Limited, Thailand's national petroleum company. PTTEP's mission is to operate globally to provide reliable energy supply and sustainable value to all stakeholders. Therefore, we set our vision to be an energy partner of choice through competitive performance and innovation for long-term value creations.

Operating under the philosophy and concept of sustainable development, PTTEP strives to provide energy security through continuous growth and competitive returns with less impact on environment and society through responsible operations in response to the stakeholder expectations. PTTEP developed the Sustainability Framework as the way of working and strong foundation to support our journey towards sustainability, including to achieve our vision of becoming the "Energy Partner of Choice". The framework comprises of three main components namely: High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC) , and Stakeholder Value Creation (SVC). The framework also corresponds with the United Nations Sustainable Development Goals (SDGs). PTTEP is confident that this strong foundation as well as conscious consideration of all stakeholders' interests will enable us to deliver value and foster sustainability. (From We to World).

PTTEP has worldwide operations of 47 projects in 15 countries as of 31th, December 2022.

The company is engaged in the exploration, extraction, production and development of petroleum products. It produces crude oil, condensate, natural gas and liquefied petroleum gas (LPG). The company is also engaged in petroleum-related businesses, such as jetty, bulk tanks and warehouse management.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.

Reporting year

Start date
January 1 2022

End date
December 31 2022

Indicate if you are providing emissions data for past reporting years
No

Select the number of past reporting years you will be providing Scope 1 emissions data for
<Not Applicable>

Select the number of past reporting years you will be providing Scope 2 emissions data for
<Not Applicable>

Select the number of past reporting years you will be providing Scope 3 emissions data for
<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.
Malaysia
Myanmar
Thailand

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.
USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

C-OG0.7

(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?

Row 1

Oil and gas value chain

Upstream

Other divisions

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	TH0355A10Z04

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual or committee	Responsibilities for climate-related issues
Director on board	Climate related target has been set as corporate KPI and deployed through all employees, where the performance is followed up on monthly basis. CEO is a member of Board of Directors (BoD) who provide direction on company vision, mission, objective and strategy of business development including sustainability. As a representative of BoD, CEO cascades company direction via top managements and relevant management committees including Safety, Security, Health and Environment (SSHE) Council. Moreover, we also have the Corporate Governance and Sustainability (CGS) Committee to oversee the corporate sustainability strategy and framework including climate-related issues in terms of risks and opportunities to PTTEP and provide directions and monitor climate-related implementation including PTTEP's decarbonization and its performance. In addition, Risk Management Committee which is a Board level committee regularly assesses enterprise risks including the Climate related risks.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	Reviewing and guiding annual budgets Overseeing major capital expenditures Overseeing acquisitions, mergers, and divestitures Overseeing and guiding employee incentives Reviewing and guiding strategy Overseeing and guiding the development of a transition plan Monitoring the implementation of a transition plan Overseeing and guiding scenario analysis Overseeing the setting of corporate targets Monitoring progress towards corporate targets Overseeing and guiding public policy engagement Reviewing and guiding the risk management process	<Not Applicable>	In order to move towards our goal of Low-Carbon footprint organization and ensure achievement of GHG reduction target, climate related strategy and relevant policy and plan of actions are oriented by our Board of Directors. The agenda for the meeting includes the climate related issues where by CEO and top management are responsible for updating the BoD on that matters. For example, review and endorse Company's Net Zero Target and Pathway

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	Experienced in oversight and govern on the climate-related risks & opportunities, policy, strategy and management in both organization level and country level.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Position or committee
Chief Executive Officer (CEO)

Climate-related responsibilities of this position
Providing climate-related employee incentives
Developing a climate transition plan
Setting climate-related corporate targets
Monitoring progress against climate-related corporate targets
Managing public policy engagement that may impact the climate
Managing value chain engagement on climate-related issues
Managing climate-related risks and opportunities

Coverage of responsibilities
<Not Applicable>

Reporting line
CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain

Position or committee
Sustainability committee

Climate-related responsibilities of this position
Managing annual budgets for climate mitigation activities
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)
Managing climate-related acquisitions, mergers, and divestitures
Providing climate-related employee incentives
Developing a climate transition plan
Integrating climate-related issues into the strategy
Conducting climate-related scenario analysis
Setting climate-related corporate targets
Monitoring progress against climate-related corporate targets
Managing public policy engagement that may impact the climate
Managing value chain engagement on climate-related issues
Assessing climate-related risks and opportunities
Managing climate-related risks and opportunities

Coverage of responsibilities
<Not Applicable>

Reporting line
CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
CGS committee is a corporate governance and sustainability committee to oversee the corporate sustainability strategy and framework including climate related issues of PTTEP.

Position or committee
Safety, Health, Environment and Quality committee

Climate-related responsibilities of this position
Managing climate-related acquisitions, mergers, and divestitures
Implementing a climate transition plan
Conducting climate-related scenario analysis
Monitoring progress against climate-related corporate targets
Assessing climate-related risks and opportunities
Managing climate-related risks and opportunities

Coverage of responsibilities
<Not Applicable>

Reporting line
CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
SSHE council is a governance committee to oversee the management of safety, security, health and environment including climate related issues of PTTEP under the umbrella of Sustainability Strategy and Roadmap.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive
Chief Executive Officer (CEO)

Type of incentive
Monetary reward

Incentive(s)
Bonus - % of salary
Salary increase

Performance indicator(s)
Achievement of a climate-related target

Incentive plan(s) this incentive is linked to
Both Short-Term and Long-Term Incentive Plan

Further details of incentive(s)
The incentivized climate change related KPI for CEO is GHG intensity reduction target and implementation progress of company roadmap which is aligned with corporate target to achieve the GHG emission intensity reduction and Net Zero Target.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
The achievement of GHG reduction target and roadmap implementation progress each year accounted at 5% of overall CEO KPI weights. This links to salary increasing and bonus consideration of CEO.

Entitled to incentive
All employees

Type of incentive
Monetary reward

Incentive(s)
Other, please specify (Could be any of emission & energy reduction, efficiency improvement, behaviour change, supply chain engagement or company performance and progress of roadmap implementation under the specific scope of their responsibility.)

Performance indicator(s)
Achievement of climate transition plan KPI
Progress towards a climate-related target
Implementation of an emissions reduction initiative
Energy efficiency improvement
Increased share of renewable energy in total energy consumption
Increased investment in low-carbon R&D
Company performance against a climate-related sustainability index (e.g., DJSI, CDP Climate Change score etc.)
Implementation of employee awareness campaign or training program on climate-related issues

Incentive plan(s) this incentive is linked to
Both Short-Term and Long-Term Incentive Plan

Further details of incentive(s)
In addition to emissions reduction target, PTTEP also bestows awards upon those within the company who have achieved excellence in the areas of innovation and performance:
1. Innovation Award - is a contest on innovative concepts or creative new ideas on work process, technology and green practice to support PTTEP business in both technical and non-technical areas.
2. Performance Excellence Award – is an award for employees (as an individual or a team) to increase operational efficiency, excellence, and benefit to business and society by submitting projects for the award competition through each functional group. The criteria include benefits and revenue generated to the company, cost savings, knowledge management and sharing, team collaboration effort across the organization and promotes green practice (low carbon and low environmental impacts).

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
The team winners will receive a monetary award for their achievements. The awards will be granted to the initiatives that could contribute/support the company commitments and/or climate transition plan.

Entitled to incentive
All employees

Type of incentive
Non-monetary reward

Incentive(s)
Internal company award
Internal team/employee of the month/quarter/year recognition
Public recognition

Performance indicator(s)
Achievement of a climate-related target
Implementation of an emissions reduction initiative

Reduction in absolute emissions
Reduction in emissions intensity
Energy efficiency improvement
Increased share of low-carbon energy in total energy consumption
Increased share of renewable energy in total energy consumption
Reduction in total energy consumption
Increased investment in low-carbon R&D
Increased share of revenue from low-carbon products or services in product or service portfolio
Increased engagement with suppliers on climate-related issues
Increased engagement with customers on climate-related issues
Increased supplier compliance with a climate-related requirement
Increased value chain visibility (traceability, mapping, transparency)

Incentive plan(s) this incentive is linked to
Both Short-Term and Long-Term Incentive Plan

Further details of incentive(s)
Technical Forum and Business Forum – are a non-monetary recognition for employees to build, maintain and develop the highest possible standards in the company's technical capabilities and staff competencies.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
Participation as the Technical Forum/Business Forum committee, speaker and/or audience provides all employees the opportunities to share and transferring petroleum industry knowledge, best practices and technical experience, and to function as a capacity-building venue for PTTEP technical professionals to further participate in and gain experience from a world-class petroleum industry technical conferences which incorporated global trend and direction of energy transition and sustainability.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?
Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	5	The short-term time frame is chosen to align with PTTEP's short-term strategy process. In addition, the 0-5 year time frame allows the use of historical time periods and probabilistic studies to forecast the short-term climate risks and opportunities.
Medium-term	6	15	The medium-term time frame draws upon climate modelling data analysis and probabilistic modelling to anticipate climatic changes in this time period.
Long-term	16	30	The long-term analysis involves the use of climate scenario analysis in addition to the modelling data analysis and probabilistic study to understand the range of impacts that can occur over 15 years from now.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

PTTEP applies Corporate Risk Matrix for climate risk assessment in order to ensure consistency in risk management processes. A risk is assigned an impact rating from minor (1) to critical (5) in at least one of the seven following cost categories based on PTTEP's Risk Management Standard: project cost, legal / compliance, property damage, financial, people, environment and reputation. A substantive impact is defined differently across the former cost categories. In particular, substantive impact is based on quantitative limits for the project/schedule, financial, property damage and compliance costs categories, whereas qualitative criteria are set for the legal, people, environment and reputation categories.

The quantifiable measures of substantive impact under a "serious" (4) and "critical" (5) impact rating corresponds to the following:

- project cost + schedule: an impact on cost or schedule over 5% or 10%, respectively

- (legal/) compliance: fines or compensations >USD200k or >USD1 million, respectively -property damage: loss >USD5 million or >USD50 million, respectively

- financial impact: a loss >1% of Net Income (NI)/Net Present Value (NPV) or >10% of NI/NPV, respectively

For the qualitative criteria, a "serious" (4) and "critical" (5) impact rating corresponds to the following:

- legal(/compliance): a (4) corresponds to suspension of stock trading, suspension of licenses and imprisonment for 6-12 months, whereas a (5) corresponds to the dismissal of the board and management, revocation of any licenses, and imprisonment for over 12 months.

- people: a (4) corresponds to multiple lost work day cases, one permanent disability or one fatality, whereas a (5) corresponds to multiple fatalities.

- environment: a (4) corresponds to a >10,000 bbl oil spill that requires regional assistance, whereas a (5) corresponds to a >100,000 bbl oil spill with devastating environmental impacts that requires international assistance.

- reputation: a (4) corresponds to national media coverage and local community protest, whereas a (5) corresponds to international media coverage and a formal complaint by an international authority. Based on the aforementioned definition of substantive impact, climate-related risk constitutes the impact as well as the likelihood (on a scale of 'rare' to 'almost certain') of that risk materialising.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
PTTEP has process to identify and assess climate related risks in which physical and transition risks are assessed individually, for which the Environment Management Department in collaboration with risk management team is responsible on a company level. The results of the risk assessments will be presented to high level management committee e.g. Risk Management Committee, SSHE Council. Through scenario analysis, climate-related risks and opportunities are assessed according to PTTEP's Risk Management Standard, and scored in an enterprise risk matrix based on the frequency and likelihood of risks. Risks identified in the assessment were ranked according to Likelihood (Score 1-5) and Impact which is categorized into 5 levels of impact. This provides PTTEP with a framework for continual review and assessment and allows the cost of potential impacts and management options to be integrated into business planning to determine any potential substantive impact. Climate-related risks and opportunities are monitored on a monthly basis, with a major update planned every five years or when the acquisition of new assets via PTTEP's SAP GRC system under the auspices of the corporate risk management team and risk management committee.

Specifically, for the physical risk assessment process, changes in intensity and frequency in tropical cyclones, heavy precipitation, droughts and heatwaves were reviewed for each of PTTEP's assets for the time periods 2025, 2035 and 2050. Subsequently, the possible impacts on PTTEP assets as a result of the expected changes were quantified in a financial impact assessment. For example, heatwaves were identified as a baseline risk for our onshore S1 & L22/43 assets. In the 2020 Climate Risk Assessment, it was found that the frequency of heatwaves for the respective asset will increase by 340% in 2050. Based on this rate of change in heatwave frequency, the impact to PTTEP is calculated. For example, the impact to PTTEP personnel through potential lost productivity due to heat stress is estimated at approximately $400,000 in 2050.

Specifically, for the transition risk assessment, policy, legal, market, technology and reputation risks were assessed. The approach was structured to review potential changes at asset-level, for market and carbon pricing risks, and at country-level, for the remaining transition risks, for the same time horizons. An example of this was carbon pricing risk, as a subsection of policy risk, which was assessed at asset-level using the IEA SDS scenario. For our onshore S1 asset, for instance, it was found that carbon pricing could result in a 2.2% loss of income in 2050. The impacts arising from the different risks were quantified and management actions based on reported changes were identified.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	This type of risk has been monitored since prior to the publication of the TCFD Recommendations. Regulatory risks are one of the key business areas under climate risk assessment. Current regulatory risk aspects are assessed, including regulations of existing products and services and reporting obligations. Specific examples include regulation of flaring activities, existing carbon markets such as the Thailand Voluntary Emission Reduction Program (T-VER), and an overview of nationally-determined contributions (NDCs) under the Paris Agreement for the relevant countries in which PTTEP operates or invest such as Thailand, Myanmar and Malaysia, etc.
Emerging regulation	Relevant, always included	This type of risk has been monitored since prior to the publication of the TCFD Recommendations. Regulatory risks are one of the key business areas under climate risk assessment as PTTEP expects policies and laws that regulate the O&G sector to develop in line with the Paris Agreement. Emerging regulatory risk aspects are assessed, including regulations of existing products and services, enhanced reporting obligations and increased pricing of GHG emissions. Specific examples include mandates under the 2015-2036 Thailand Oil Plan (to internalize pollution costs, infrastructural damage and other externalities), the Thailand Power Development Plan for 2015-2036, as well as future commitments to the Paris Agreement for the relevant countries in which PTTEP operates or invest such as Thailand, Myanmar and Malaysia, etc.
Technology	Relevant, always included	In the past, technology risk has been integrated with market risk assessments, including an increase in alternative energy technologies, decrease in fossil fuel investment, etc. For the 2020 Climate Change Risk Assessment, technology risk was assessed separately, with particular focus on 1) the risk of renewable and energy efficiency technologies reducing PTTEP's products demand and 2) the risk of low-carbon transportation reducing PTTEP's product demand.
Legal	Relevant, always included	Legal risks have in the past been integrated and merged with the regulatory risk assessment, and has focused on the adoption of carbon pricing penalties in the countries of PTTEP's operations or invest such as Thailand, Myanmar and Malaysia, etc. In addition, for the 2020 Climate Change Risk Assessment, country-level climate litigation risk was considered based on the proliferation of climate-related lawsuits in some countries of PTTEP's operations. An example of considered legal risk is the risk of not disclosing climate change risks in accordance with local regulations.
Market	Relevant, always included	Climate-related market risk has been considered since several years and has focused on the adaptation of the cap and trade regime, technological risks (e.g. alternative energy development), increase in insurance costs and decreases in fossil fuel investment. In addition, for the 2020 Climate Change Risk Assessment, climate-related risk was assessed based on asset retirement obligation costs and stranded asset risk on revenues.
Reputation	Relevant, always included	Reputational risk has been integrated as a cross-sectional "risk of risks" that is inherently linked to other climate-related risk categories. For instance, compliance with low-carbon supply chain initiatives, under the review of market risks, is tied to company reputation. In addition, for the 2020 Climate Change Risk Assessment, PTTEP assessed reputational risk through combining natural language processing methods with an economic event study approach to review the reputational impact on share price. Specifically, potential reputational damage from major industry accidents (oil spills) and climate litigation was assessed.
Acute physical	Relevant, always included	Acute physical risks can have a great impact on our facilities and surrounding environment. Acute physical risks have been monitored since PTTEP was established. Acute physical risks monitored include heatwaves, tropical cyclones, extreme precipitation, and water stress. In the 2020 Climate Change Risk Assessment, PTTEP assessed acute physical risks by analyzing site specific changes in climate indicators. For this, the CMIP5 global climate ensemble was used. PTTEP also quantified the impacts due to the changes in acute physical risks and integrated the results of this assessment in our enterprise risk management process.
Chronic physical	Relevant, always included	The effect of slowly changing physical parameters (increasing) may impact the longer term security of our facilities or surrounding environment. Chronic physical risks monitored include changes in drought patterns and sea level rise. In addition, for the 2020 Climate Change Risk Assessment, PTTEP assessed chronic physical risks by analyzing site specific changes in climate indicators. For this, the CMIP5 global climate ensemble was used. PTTEP also quantified the impacts due to the changes in chronic physical risks and integrated the results of this assessment in our enterprise risk management process.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Heat wave

Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Increasing ambient temperatures have been identified as a principal risk to PTTEP. Our scenario analysis shows that under the IPCC RCP 8.5 scenario the physical manifestations of climate change would be increasingly apparent, presenting financial risks to PTTEP. For example, our Malaysia offshore asset (Sabah & Sarawak) frequency and intensity changes in heatwaves would lead to reducing a worker's capacity to do work. Moderate intensity work at 33–34°C can reduce a worker's capacity by 50%. O&G outdoor work is often physically demanding and requires the use of protective clothing and gear. Impact of excessive heat on O&G workers is expected to be higher. Time taken to perform outdoor operations and preventive/corrective maintenance work may therefore increase to avoid during periods of excessive heat thus, resulting in increased maintenance costs.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
6900000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
the impact of heat waves for Malaysia offshore asset quantified in USD was derived from change of worker productivity due to temperature change, the length of heatwave and its total revenue, which is estimated at USD 6.9 million.

Cost of response to risk
2000000

Description of response and explanation of cost calculation
Response options would be to:
1. Reduce the number of working hours in excessive heat periods
2. Postpone scheduled maintenance during heatwaves
3. Wear lightweight loose-fitting clothing
4. Introduce obligatory drinking breaks

The cost calculation basis is from the estimation on the work hours lost , which is estimated at USD 2 million.

Comment
-

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Cyclone, hurricane, typhoon

Primary potential financial impact
Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Our baseline physical risk assessment showed that our Malaysia, Myanmar and Thailand offshore assets are located in areas where tropical cyclones are apparent. In our risk assessment it became apparent that tropical cyclones have caused production interruptions on these assets. During these production interruptions the flow rate is decreased by 50% on average, and the length of the production interruption is 5 days on average. Our scenario analysis using the IPCC RCP 4.5 shows that the frequency of tropical cyclones is expected to increase for the Malaysia and Thailand offshore assets, presenting increasing financial risk to PTTEP.

Time horizon
Medium-term

Likelihood
Unlikely

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
17500000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The 2020 Climate Change Risk Assessment showed that if a tropical cycle were to hit Thailand, it would impact all 3 Thailand Offshore assets. From historical data on tropical cyclone impacts, the assessment found that the flow rate was reduced by 50% over an average of 5 days. The expected impact is calculated as Production reduction length * Flow rate reduction * Production levels of the respective assets.

Cost of response to risk
10000000

Description of response and explanation of cost calculation
Based on our engineering team's inputs, the management cost is the lump sum of structurally reinforcing the flare booms and communication towers of our offshore assets, which is estimated at USD 10 million.

Comment
-

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
PTTEP considers the impact of carbon taxes and/or cap and trade mechanisms substantial to its operations in Thailand as part of future internal emissions reduction requirements and may also impact our strategy on diversification to low carbon energy technologies. PTTEP already takes part in the Thailand Voluntary Emission Reduction Program (T-VER) but anticipates that carbon pricing could become more stringent in the long-term under the Thailand Greenhouse Gas Management Organization (TGO) in line with the Thailand Climate Change Master Plan 2015-2050 and planned carbon intensity targets relevant to PTTEP under the Thailand Power Development Plan.

Time horizon
Long-term

Likelihood
Unlikely

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
59600205

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
In its 2020 Climate Risk Assessment, PTTEP assumes that our operations in Thailand may be subject to a carbon price as high as USD 179.7/tCO2e based on the IEA SDS carbon price extrapolated to 2050 and our Scope 1+2 emissions which amounts to USD 59,600,205 for PTTEP's assets in Thailand. The figure uses a 5% discount rate.

Cost of response to risk
89680618

Description of response and explanation of cost calculation
In its 2020 Climate Risk Assessment, PTTEP assumed an internal carbon price (ICP) as high as USD 179.7/tCO2e based on the IEA SDS carbon price extrapolated to 2050 across Scope 1+2 emissions which amounts to USD 89,680,618 for all assets in Thailand, Myanmar and Malaysia.

Comment
It was assumed that an integrated ICP would guide investment decisions, simultaneously manage market-related risks such as stranded assets and mitigate climate litigation risk. Therefore, a stringent ICP based on the SDS scenario would function as an overarching risk management measure.

Identifier
Risk 4

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Technology	Transitioning to lower emissions technology

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
In line with SDS Scenario, it is forecast that oil consumption will decline by 61% by 2040, renewables consumption will increase by 215% and natural gas consumption will decline by 4%. As natural gas and liquid account for 71% and 29%, respectively, in terms of value, PTTEP anticipates that this is a significant source of risk. In particular, Thailand already aims to achieve a carbon neutrality target by 2050 and achieve a target of 50% of domestic energy produced by renewables by 2050 according to the Thailand Long-Term GHG Emission Development Strategy.

Time horizon
Medium-term

Likelihood
Unlikely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
10265487611

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact was assessed based on the International Energy Agency's (IEA's) World Energy Outlook 2019 (WEO) demand forecasts. The Stated Policies Scenario (SPS) was considered as a base-case scenario where technology risks have no increased impact and the Sustainable Development Scenario (SDS) as the scenario where technology risks are most significant due to high deployment rates. The impact was derived by estimating foregone revenue due to demand reduction in the SDS scenario compared to SPS scenario. Based on this demand reduction, we estimate the change in demand to our products in a world aligned with the IEA SDS, which is then calculated into a potential financial impact value using our oil and gas price projections. The financial impact is specific to PTTEP's operations in Thailand.

Cost of response to risk
1009629000

Description of response and explanation of cost calculation
The management option for technology risk is to invest in the diversification of PTTEP's business into low-carbon technologies and energy efficiency technologies, including but not limited to renewable energy and emerging low-carbon materials. The goal of these investments is to provide PTTEP with an additional income stream that is not based solely on oil and gas. It is assumed that 15% of PTTEP's revenue is dedicated for managing technological risk as a whole at company-level. An expected IRR of 5-10%.

Comment

Identifier
Risk 5

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Reputation	Increased stakeholder concern or negative stakeholder feedback

Primary potential financial impact
Decreased asset value or asset useful life leading to write-offs, asset impairment or early retirement of existing assets

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
As a "risk of risks", reputational risk is integrated into PTTEP's management framework as an overarching risk. The risk was assesessment based on the PTTEP experienced an oil spill resulting in a share price plunge from THB 180 to 50 (with a total of 3,969,985,400 shares). However, this drop in the share price also included the impact of the global financial crisis which could not be sorted out. PTTEP considers the possibility that this could occur again with considerable financial consequences.

Time horizon
Short-term

Likelihood
Very unlikely

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
5100000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Impact was derived by compiling a database of major industry accidents and using both economic net worth or event study approaches to estimate cumulative abnormal returns, i.e. the reputational damage represents the change in the value of reputation from before to after the incident. The impact estimation could be at approximately 32% of market cap (2019 year end, PTTEP market cap = 494 Billion THB (31 THB = USD 1).

Cost of response to risk
21290000

Description of response and explanation of cost calculation
The cost of management represents PTTEP's budget (660 MMTHB) to improve branding, image and reputation. Under this umbrella, this includes media, advertising, public relations, philanthropy, social investment projects and CSR. The company is committed to continue to ensure the transparency of sustainability performance through our annual and sustainability reports to stakeholders.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Opp1

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Energy source

Primary climate-related opportunity driver
Participation in carbon market

Primary potential financial impact
Other, please specify (Reputational benefits resulting in increased demand for goods/services)

Company-specific description
PTTEP anticipates more stringent carbon trading requirements/increased GHG pricing in the future. Proactive engagement and sustainable leadership through participation in carbon markets is seen for PTTEP as a way to reduce company-level stigmatization associated with the Oil & Gas industry. PTTEP has already been involved in carbon markets and have identified approximately 300,000 tCO2e/yr of GHG reduction that can be certified as carbon credits, which will reduce PTTEP's cost of GHG mitigation projects.

Time horizon
Long-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
9240000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact figure can be recalculated using the latest carbon offset prices from the State of the Voluntary Carbon Markets Report (USD 2.8/tCO2e for energy efficiency / fuel switching projects) for an estimated 300,000 tCO2e worth of GHG reduction unit per year for 11 years (no. of years implementing the GHG reduction initiatives from 2019 until 2030 target year to reduce 25% GHG intensity reduction).

Cost to realize opportunity
13680000

Strategy to realize opportunity and explanation of cost calculation
The strategy to realize reputational and cost saving opportunities is to proactively engage in the carbon trading market and develop our GHG projects that can be certified as carbon credits. Based on an average project development cost of 5.7 USD/tCO2e reduced, the cost to realise opportunity is given as 5.7USD/tCO2e (estimated project development cost) x 300,000 tCO2e/yr (annual GHG reduction) for 8 years, amounting to USD 13,680,000.

Comment
-

Identifier
Opp2

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Development of new products or services through R&D and innovation

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
PTTEP's R&D division investigates multiple innovative projects (e.g. purifying natural gas to liquid hydrogen, CCUS from waste/excess/flare gases, etc.) as part of the company's wider organizational response to the climate change crisis. Out of these investigations, the CO2 conversion to hydrocarbons is identified as the most promising. This opportunity would be mostly for our onshore facilities for now.

Time horizon
Long-term

Likelihood
More likely than not

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
381720000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial impact was calculated by estimated revenue generated from the potential low carbon R&D products and services. However, the exact explanation of how the total number is derived cannot be provided in detail since it is under our research and development phase.

Cost to realize opportunity
47000000

Strategy to realize opportunity and explanation of cost calculation
A new business unit has been established to facilitate business transformation, including technological development. PTTEP's R&D division has studied a number of innovative projects in which green practices have been one of the key themes that have been focused on. For example, CO2 conversion to high valued products, e.g. methanol, carbonate-based products, etc. is one of the on-going projects. To develop and realize these projects, PTTEP has allocated a company budget of at least 3% of annual net profit or 47 MM USD. Note that the costs to realize this opportunity only cover the R&D costs. It does not yet include the costs of machinery for realizing these opportunities, as it is uncertain how much this would be.

Comment
-

Identifier
Opp3

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Shift in consumer preferences

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Natural gas is a key fuel source in the low – carbon transition. In the IEA SDS, the natural gas demand is expected to remain at a significant level, while the oil demand is expected to decrease faster than natural gas. As higher demand on natural gas is expected, this will have a positive impact on revenue for PTTEP who has striven to maintain a natural gas-based portfolio. To maximize the opportunity, PTTEP is focused on maintaining a high natural gas-based portfolio (which is currently 56% by revenue) and diversifying towards energy storage and renewable.

Time horizon
Long-term

Likelihood
More likely than not

Magnitude of impact
High

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
4095840000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
The financial implication is the revenue generated from natural gas sales in 2021.

Cost to realize opportunity
2706017000

Strategy to realize opportunity and explanation of cost calculation
The strategy is to continue to focus on natural gas exploration and production by maintaining a natural gas biased portfolio above 56% by revenue. Furthermore, we will continue to improve operational efficiency in order to minimise natural gas consumption during the production process and hence maximise the amount of natural gas sales. The annual cost is estimated by taking the total operating, exploration and development expenses of operating projects that produce natural gas.

Comment
-

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?

Row 1

Climate transition plan
Yes, we have a climate transition plan which aligns with a 1.5°C world

Publicly available climate transition plan
Yes

Mechanism by which feedback is collected from shareholders on your climate transition plan
We have a different feedback mechanism in place

Description of feedback mechanism
- materiality survey at triannual basis to get information on interests/concerns/recommendations from all stakeholder groups which is including shareholders.
- analyst meeting at quarterly basis to present plan/progress and get recommendation against our business plan (including transition plan)

Our target, strategy and transition plan in response to climate-related issue also has been announced in our Annual General Meetings (AGM).

Frequency of feedback collection
More frequently than annually

Attach any relevant documents which detail your climate transition plan (optional)
Our transition plan has been incorporated in our announcement on the net-zero GHG emission target and disclosed publicly via website: https://www.pttep.com/en/Sustainability/Decarbonization.aspx

Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future
<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: IEA SDS	Company-wide	<Not Applicable>	Five major transition risks were addressed: Policy, legal, market, technology and reputation. The analysis was split into three parts; short-, mid- and long-term transition risks.
Transition scenarios: Customized publicly available transition scenario	Company-wide	1.5ºC	This scenario follows the IPCC's 1.5 degree scenario and guideline. Five major transition risks were addressed: Policy, legal, market, technology and reputation. The analysis was split into three parts; short-, mid- and long-term transition risks.
Physical climate scenarios: RCP 4.5	Company-wide	<Not Applicable>	Five major physical climate change hazards were addressed: heatwaves, extreme precipitation, drought, water stress and tropical cyclones (hurricanes). The analysis was split into three parts; short-, mid- and long-term physical climate risks.
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	Five major physical climate change hazards were addressed: heatwaves, extreme precipitation, drought, water stress and tropical cyclones (hurricanes). The analysis was split into three parts; short-, mid- and long-term physical climate risks.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

What is the PTTEP's exposure to climate change and the impact of climate change on our operations and supply chain and how the future might look if certain trends were to continue or certain conditions were met.

Results of the climate-related scenario analysis with respect to the focal questions

Scenario analysis allows us to see what would happen under different mitigation, warming and socioeconomic scenarios. Scenario analysis also help us to identify and understand on the followings:

1. variety: envision and adapt to a wide range of possible futures.
2. comparability: compare how we are measuring, mitigating and adapting to specific risks.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	There are many socioeconomic scenarios that have been applied to address the impact of specific transition risks (policy, legal, technology, market, and reputation) to our products. The risks and opportunities regarding energy and electricity prices, climate policies, carbon prices, and energy mix, market and technology influenced our strategy in term of integration of the result into the company climate related goal and targets, e.g. our roadmap to become the low-carbon footprint organization, target of GHG emission intensity reduction and net-zero GHG emission target. This directly influenced our business objectives and strategy to explore investment opportunities in potential new business to enhance the company's competitiveness and future sustainable growth. This included a promotion of LNG and natural gas as well as aiming to increase the share of renewable energy in the energy mix.
Supply chain and/or value chain	Yes	Both physical and market risk may impact to company supply chain, e.g. disruption to supply chain (product transportation) from water flooding, storm and drought and/or the market shifts to more environmental stewardship products/services. With this reason, PTTEP has in place the PTTEP Vendor Sustainable Code of Conduct which governs the conduct of vendors on issues relating to their business operations and ethics, human rights, occupational health and safety, as well as environmental expectations. The company also set and acheived the goal to increase the green procurement (for products/services with low carbon and low environmental impacts) to 30% of total spending by 2022. To achieve this goal, we developed the "Green Procurement Criteria" for each of the work categories, which were then certified by the Thailand Environment Institute (TEI), and also developed an approach to evaluate the environmental considerations of procurement practices.
Investment in R&D	Yes	Due to global climate change situation leading to alternative energy adoption, i.e. renewable energy, PTTEP as an oil and gas exploration and production company will be impacted from this transition to low carbon society in case new technologies and new business opportunities are not developed for future trend. With this regard, PTTEP has established Technology Management Division since 2013 with objectives to enhancing core E&P business, minimize environmental impact, explore future energy transition. One of the key objectives of new organization is to explore new business opportunity including low carbon technology e.g. CCU&S and renewable energy.
Operations	Yes	The identified physical risks have potential to impact to PTTEP operations, e.g. heatwaves were the main risks, with potential impacts on all PTTEP's facilities, highest frequency of tropical cyclones in the Gulf of Thailand and the Gulf of Martaban (Myanmar). However, the design basis of existing operations is still valid, with expected climate conditions. In some instances, changes to certain variables by 2035 are within the design threshold. Therefore, the physical risks which may impact our operations in future are under our close monitoring.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues	The world is progressively switching towards more and more ambitious climate policies. In terms of carbon pricing as a policy risk, according to the study of the World Bank, around 57 carbon pricing initiatives have been implemented, or scheduled for implementation, in 46 national and 28 subnational jurisdictions. At least 20% of global emissions (11 GtCO2e) is covered by a carbon price ranging from USD 1 to 127/tCO2e, with 51% of emissions covered prices below USD 10/tCO2e. It is expected that this amount will increase significantly over the years, as a lot of countries are in the process of entering carbon pricing ETS. The international IEA WEO scenarios projected increases in carbon prices, which could put PTTEP under risk. The direct influence of the policy risk in term of an increasing of carbon pricing, for example, is reflected in our 2020-2030 Sustainable Development Plan which target to explore investment opportunities in potential new business to enhance the company's competitiveness and future sustainable growth. With the SD plan, PTTEP aims at least 20% of Net Income from new business. This is included a promotion of LNG and natural gas as well as aiming at increase the share of renewable energy in the energy mix.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	Yes, we identify alignment with our climate transition plan	<Not Applicable>

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's climate transition.

Financial Metric
Other, please specify (Sustainability Budget)

Type of alignment being reported for this financial metric
Alignment with our climate transition plan

Taxonomy under which information is being reported
<Not Applicable>

Objective under which alignment is being reported
<Not Applicable>

Amount of selected financial metric that is aligned in the reporting year (unit currency as selected in C0.4)
23978462

Percentage share of selected financial metric aligned in the reporting year (%)
35

Percentage share of selected financial metric planned to align in 2025 (%)
80

Percentage share of selected financial metric planned to align in 2030 (%)
80

Describe the methodology used to identify spending/revenue that is aligned
Under the challenging circumstances, PTTEP operates its business as a Cautious Diversified Player, emphasizing on 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. Moreover, we also aim to maintain the right balance of social, economic and environmental safeguard as guided by our Sustainability Framework (SF). Therefore, we have accounted the total expenses associated with our SF which is 'aligned with a 1.5°C world'. As part of our net-zero by 2050 commitment, PTTEP has continued the concrete implementation of various greenhouse gas management projects such as flare gas recovery and utilization, energy efficiency improvement, adoption of renewable energy in operations and feasibility studies to apply the Carbon Capture, Utilization and Storage (CCUS) technology for offshore operations as well as greenhouse gas offsetting projects like forestation and carbon credits purchasing to offset the rest of the greenhouse gas emissions. The percentage share provided is calculated based on the expense on those projects against overall sustainability budget set to drive the company in aligned with our SF.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Is this a science-based target?
No, but we anticipate setting one in the next two years

Target ambition
<Not Applicable>

Year target was set
2013

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Location-based

Scope 3 category(ies)
<Not Applicable>

Intensity metric
Other, please specify (tonneCO2e/KtonneProduction)

Base year
2012

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
293.8

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)
0.6

Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
294.4

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
99.8

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure
0.2

% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure
<Not Applicable>

% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure
<Not Applicable>

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure
<Not Applicable>

% of total base year emissions in all selected Scopes covered by this intensity figure
100

Target year
2030

Targeted reduction from base year (%)
25

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]

% change anticipated in absolute Scope 1+2 emissions
8

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)
218.5

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
0.56

Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)
219.1

Does this target cover any land-related emissions?
No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]

Target status in reporting year
Achieved

Please explain target coverage and identify any exclusions
The performance above(which indicated the target acheivment) is based on the basis of "like-with-like" comparisons over time against the base year emissions (same structure, measurement and calculation methodologies, refered to GHG Protocal). However, the public disclosure of our 2022 GHG emissions is based on the recalculation incorporate the changes in structure, measurement and calculation methodologies.

Plan for achieving target, and progress made to the end of the reporting year
<Not Applicable>

List the emissions reduction initiatives which contributed most to achieving this target
This was accomplished through avoidance by portfolio management for lower carbon, cooperation among multi-discipline teams to optimized the operations, and mitigation strategies, such as recovering and utilizing flare/excess gas, enhancing renewable energy consumption, reducing methane leaks, and improving energy and process efficiency. By prioritizing low-carbon assets and incorporating data analytics and digital technologies, the company was able to identify opportunities to reduce emissions and improve energy efficiency, resulting in substantial cost savings.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Net-zero target(s)

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number
NZ1

Target coverage
Company-wide

Absolute/intensity emission target(s) linked to this net-zero target
Abs1
Int1

Target year for achieving net zero
2050

Is this a science-based target?
Yes, we consider this a science-based target, but we have not committed to seek validation of this target by the Science Based Targets initiative within the next two years

Please explain target coverage and identify any exclusions
The target covers both direct emissions (scope 1) and indirect emissions (Scope 2) of the exploration and production business under company's operational control.

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?
Yes

Planned milestones and/or near-term investments for neutralization at target year
We plan for neutralization at target year at not over 10% of the total BAU emissions.

Planned actions to mitigate emissions beyond your value chain (optional)
- Focus on the the nature-based solutions and other carbon removal types i.e. forestration, blue carbon, agricultural and direct air capture (DAC) technology
- Study carbon credit market and explore future and advanced carbon offsetting opportunities

C-OG4.2d

(C-OG4.2d) Indicate which targets reported in C4.1a/b incorporate methane emissions, or if you do not have a methane-specific emissions reduction target for your oil and gas activities, please explain why not and forecast how your methane emissions will change over the next five years.

GHG reduction target are already incorporated the methane emissions. Since 2013 until present, PTTEP has developed and continued our own methane leak detection and repairing program for both onshore and offshore operating assets in Thailand, Myanmar and Malaysia. As of 2022, methane is accounted only 7% of total GHG emission from our operations. This is a result of engineering calculation for incomplete combustion sources as well as our fugitive leak detection and repair program (LDAR) which could reduce our fugitive leaks for over 90%.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.
Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	1500000
To be implemented*	10	2289489
Implementation commenced*	8	27514
Implemented*	35	556984
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes	Other, please specify (A set of 11 initiatives to improve the energy efficiency by waste heat recovery, transportation and process optimization.)

Estimated annual CO2e savings (metric tonnes CO2e)

134882

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
31752759

Investment required (unit currency – as specified in C0.4)
29900000

Payback period
<1 year

Estimated lifetime of the initiative
6-10 years

Comment
Data above contains a combination set of 11 initiatives to improve the energy efficiency which implemented in 2022 consist of 11 projects covering company wide in 4 assets (S1, ART, GBS and Zawtika) which reduced the GHG emissions and are categorized as the energy efficiency improvement by waste heat recovery and process optimization.

Initiative category & Initiative type

Waste reduction and material circularity	Product/component/material reuse

Estimated annual CO2e savings (metric tonnes CO2e)
304117

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
31976954

Investment required (unit currency – as specified in C0.4)
1880000

Payback period
4-10 years

Estimated lifetime of the initiative
11-15 years

Comment
Data above contains a combination set of 15 initiatives to recovery the gases which otherwise will be flared/vent which implemeted in 2022 covering company wide in 4 assets (S1, ART, GBS and Zawtika) which reduced the GHG emissions and are categorized as the energy efficiency improvement by waste heat recovery and process optimization.

Initiative category & Initiative type

Fugitive emissions reductions	Oil/natural gas methane leak capture/prevention

Estimated annual CO2e savings (metric tonnes CO2e)
5000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
527215

Investment required (unit currency – as specified in C0.4)
140000

Payback period
1-3 years

Estimated lifetime of the initiative
6-10 years

Comment
To minimize methane leak in the operation process, company has conducted fugitive leak detection and repair program (LDAR) which could help company tracking and reducing the methane leak from operations.

Initiative category & Initiative type

Low-carbon energy consumption	Other, please specify (Wind-Solar Hybrid Turbine)

Estimated annual CO2e savings (metric tonnes CO2e)
40

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
3699

Investment required (unit currency – as specified in C0.4)
300000

Payback period
>25 years

Estimated lifetime of the initiative
6-10 years

Comment

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for low-carbon product R&D	In order to achieve our vision of being an energy partner of choice through competitive performance and innovation for long-term value creation, this target has been included in the long term business strategy, and dedicated budgets for energy efficiency are included in our budget. We have also publicly disclosed our intentions of reducing and offsetting our GHG emissions in which this serves as a long term public commitment which drives initial investments into projects that can reduce and offset GHG. In addition, development of low carbon products is in PTTEP research & development plan.
Other (Employee Engagement)	In order to achieve our vision of being an energy partner of choice through competitive performance and innovation for long-term value creation , this target has been included in the long term business strategy. The company wide target as well as the key performance indicators are set. The company KPIs are then cascaded down to each individual employee, where monetary incentives such as bonuses, monetary recognitions and awards are given to employees with the best GHG emissions reduction project implementations and results.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?
Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon
Other, please specify (GHG protocol and IOGP environmental performance report)

Type of product(s) or service(s)

Other	Other, please specify (Low energy consumption products)

Description of product(s) or service(s)
As PTTEP is an upstream business, low carbon product has been considered from the production of assets which consume energy and emit GHG lower than the IOGP average.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Estimating and Reporting the Comparative Emissions Impacts of Products (WRI)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Use stage

Functional unit used
energy consumption intensity in operating assets vs. average IOGP energy consumption intensity for oil and gas sector.

Reference product/service or baseline scenario used
average IOGP energy consumption.

Life cycle stage(s) covered for the reference product/service or baseline scenario
Use stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
137419

Explain your calculation of avoided emissions, including any assumptions
Avoided emission was calculated by differentiation between asset emission and average IOPG emission. Revenue was calculated by counted assets revenue from low carbon product divided by PTTEP total revenue.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
12.88

C-OG4.6

(C-OG4.6) Describe your organization's efforts to reduce methane emissions from your activities.

Since 2013, PTTEP has developed and continued our own methane leak detection and repairing program for both onshore and offshore operating assets in Thailand, Myanmar and Malaysia. The result from this program support us on reporting the fugitive by approach of direct measurement at leak point. In 2021, PTTEP developed methane emission reduction roadmap with target to achieve 1st quartile of IOGP.

In 2022, we completed the methane survey in 7 operation assets, 183 wellhead platforms/wellsites with 1,163 leak points detected and leak reduction of approximately 25,107 tonneCO2e/year after fixed.

C-OG4.7

(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?
Yes

C-OG4.7a

(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.

Since 2013, PTTEP has developed and continued our own methane leak detection and repairing program for both onshore and offshore operating assets in Thailand, Myanmar and Malaysia. The methane leak mitigation and action plan is developed for each assets to reduce methane emission. In 2017, PTTEP developed the methane survey guideline to support the operations on methane self-monitoring and emission reduction. The methane survey approach is under the Loss of Primary Containment (LOPC) Reporting and Reduction which is an integral part of PTTEP SSHE and Process Safety management system. It has been developed based on the United States Environmental Protection Agency (US EPA) Method 21 and US EPA Leak Detection and Repair (LDAR) program (EPA-305-D-07-001, Leak Detection and Repair – A Best Practices Guide, United States Environmental Protection Agency (US EPA), October 2007).

The guideline was initially applied in 2018 at our offshore operations and has been continued annually. Since 2013 the methane surveys have been conducted at all operation assets. From 7 operation assets, 183 wellhead platforms/wellsites were surveyed with 1,163 leak points detected and leak reduction of approximately 25,107 tonneCO2e/year after fixed. . The surveys were internally conducted by PTTEP staffs and aimed to improve our fugitive emission reporting and reduce the methane emissions.

Outcomes from the survey allow the unintentional leaks to be detected and fixed, which subsequently enhances process safety, increases productions from the recovered gases, and ultimately enables to evaluate the current status of PTTEP GHG emissions and comes up with any means of mitigation accordingly. This approach applies to all projects under PTTEP operational control. To ensure that the emission reduction performance is maintained, it is suggested that the leak survey should be conducted regularly. The more frequent the survey conducted, the better the reduction performance is ensured. Normally, the survey frequency should be conducted at least, but not limited to, as follows: For routine maintenance by assets:

• After there is any significant change made to the equipment/component

• After major/minor shutdown or maintenance activities

• As per site's requirement or maintenance programs

For re-monitoring the GHG reduction:

• At the interval of three years for each location

• If the survey for routine maintenance and for re-monitoring the GHG reduction performance are scheduled for the same period, the survey can be combined together to avoid overconsuming both manpower and resources.

C-OG4.8

(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization's efforts to reduce flaring, including any flaring reduction targets.

PTTEP GHG medium term target was set 25% emission intensity reduction by 2030 from 2012 base year covering all operating assets under PTTEP operational control. GHG emission performance included in the target covers all sources of GHG emission, i.e. flaring, fuel combustion, and fugitives and process vents. GHG reduction initiatives has been voluntarily developed and implemented for achieving the target as planned.

As flare is a major contribution on PTTEP scope 1+2 GHG emission (approximately 55%), the GHG reduction target on a yearly basis which focus on flaring reduction as follows:

• Flash Gas Recovery Unit (FGRU) at Greater Bongkot South: The project was implemented since 2013. In 2022, target to reduce GHG from this project is 97,000 tonneCO2e while actual is about 125,487 tCO2e per year

• Purge Gas Reduction at Greater Bongkot South: The project was implemented since 2018. In 2022, target to reduce GHG from this project is 6,500 tonneCO2e while actual is about 6,500 tCO2e per year

• Flare Gas Utilisation at Sirikit Oil Field: The project was implemented since 2013. The excess gas from the petroleum production process was utilized by selling to UAC Global Public Co., Ltd. for electricity production. In 2022, target to reduce GHG from this project is 46,500 tonneCO2e while actual is about 31,068 tCO2e per year.

• Trunk Flow Lines from remote station of Sirikit Oil Field: Trunk flow line projects aim to reduce flaring at remote stations of Sirikit Oil field by transporting excess gas through pipelines to be consolidated and processed at the main production facilities. The project started to operatesince 2016 then added up in 2018 and 2022. In 2022, target to reduce GHG from the projects is 66,700 tonneCO2e and estimated flare reduction was at 82,694 tCO2e per year.

• LP Flare Recovery at Sirikit Oil Field: The low pressure excess gas from the petroleum production process was recovered by gas ejector to return gas which otherwise be flared at low pressure flare to production process. The project started to operate since 2018. In 2022, target to reduce GHG from this project is 2,839 tonneCO2e while actual is about 4,122 tCO2e per year.

• Purge Gas Reduction at Greater Bongkot North: The project was just implemented since 2021. In 2022, target to reduce GHG from this project is 8,200 tonneCO2e while actual is about 13,135 tCO2e per year

• Stripping Gas Reduction at Greater Bongkot North: The project was just implemented since 2021. In 2022, target to reduce GHG from this project is 280 tonneCO2e while actual is about 288 tCO2e per year

• Flash Gas Recovery Unit (FGRU) at Greater Bongkot North: The project was implemented since 2017. In 2022, target to reduce GHG from this project is 48,000 tonneCO2e while actual is about 73,166 tCO2e per year

• Stripping Gas Usage Optimization at Zawtika: The project was implemented since 2022. In 2022, target to reduce GHG from this project is 0 tonneCO2e while actual is about 955 tCO2e per year

• Flare Optimization at Block H: The project was implemented since 2022. In 2022, target to reduce GHG from this project is 800 tonneCO2e while actual is about 122 tCO2e per year

Apart from yearly flaring reduction targets in our existing assets above, we also set longer-term target for zero routine flare by 2030 which is aligned with "**Zero Routine Flaring by 2030" initiative** introduced by the World Bank.

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

No

Name of organization(s) acquired, divested from, or merged with

<Not Applicable>

Details of structural change(s), including completion dates

<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
5773825

Comment

Scope 2 (location-based)

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
10935

Comment
No change in scope 2 emission in base year.

Scope 2 (market-based)

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
10935

Comment
No change in scope 2 emission in base year

Scope 3 category 1: Purchased goods and services

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 2: Capital goods

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 4: Upstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 5: Waste generated in operations

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 6: Business travel

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 7: Employee commuting

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 10: Processing of sold products

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
4036416

Comment
Natural gas is major PTTEP's product (approx 67% by volume) and was sold directly to PTT Gas Separation Plant (GSP) which is our sole customer. Therefore, GHG emissions from processing of PTTEP's natural gas sold is equal to scope 1&2 GHG emissions of PTT GSP (10,921,040 tonneCO2e). However, natural gas from PTTEP is approx. 42% of total PTT GSP feedstock, and 12% of total gas feed will be a feedstock for petrochemical product which considered as non-combustible product. Therefore, only 88% will be combusted and turn into GHG emission thus, the scope 3- processing of sold product accounted equal to 0.42* 0.88*10,921,040 = 4,036,416 tonneCO2e

Scope 3 category 11: Use of sold products

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
30222561

Comment
Emissions from natural gas combustion by the end user were calculated under the assumption that all natural gas sold in 2012 with volume of 605,601 MMSCF from our purchase orders was combusted in 2012. GHG emissions from processing of sold product is deducted. Emissions from crude oil are not relevant because it is not combusted directly and must be processed into other products before being used. Emission factor used is referred to IPCC AR4 (IPCC 2006, vol.2, ch.2, p.2.16)

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009
IPCC Guidelines for National Greenhouse Gas Inventories, 2006
IPIECA's Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011
ISO 14064-1
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
5354425

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
14919

Scope 2, market-based (if applicable)
14919

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?
No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
1

Please explain
Accounting for the goods and services provided during the PTTEP Annual General Meeting of Shareholders event, including emission from cooking, electricity consumption, transportation of equipment and attendees, accommodation, distribution materials, and waste. which was offset by PTTEP and considered a carbon-neutral event. For other events e.g. 2022 SSHE Forum and KM Week, PTTEP changed to online events and was considered a "low carbon emission" events and not included in the assurance scope and public disclosure.

Capital goods

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Considering this category insignificant and not included in the public disclosure.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
930

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Accounting for transmission and distribution loss which is derived from the electricity consumption in scope 2 and % transmission and distribution loss (from https://data.worldbank.org/indicator/eg.elc.loss.zs)

Upstream transportation and distribution

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Referring to "Overview of methodologies: Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions" of IPIECA and API, the category emissions comparison also requires considering volume, for example, if the amount of fuel used in a category is smaller than the amount of that fuel sold by the company included in Category 11 (Use of sold products), the company may assume that accounting for fuel emissions in both Category 11 and the other category may be double counting. Categories for which it may be straightforward to avoid the double counting of Category 11 (Use of sold products) emissions include Category 4 (upstream transport and distribution), Category 6 (business travel), and Category 7 (employee commuting). Accordingly, PTTEP considered that the emissions from fuel that the company sold (use of sold product) covered the emissions from the fuel used in Category 4 (upstream transport and distribution) and Category 7 and we choose to disclose under Category 11 (Use of sold products) emissions.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
9194

Emissions calculation methodology
Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Apart from reuse and recycle methods, PTTEP's waste is mainly disposed in two ways: incineration (which is alternatively burning in cement kiln) and landfill (mostly are domestic non-hazardous waste). By using emission factor for industrial waste for these two disposal methods, we estimated the Scope 3 emissions from waste generation.

The GHG emission factor from incineration = 1.0 tonneCO2e output/tonne waste (referred: Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, IPCC). In 2022, waste disposed by incineration = 8,939 tonne, thus generated GHG = 8,939 tCO2e.

The GHG emission factor from landfill = 0.8 tonneCO2e output/tonne waste (referred: https://www.anamai.moph.go.th). In 2022, waste disposed by landfill= 319 tonne, thus generated GHG = 255 tCO2e.

Therefore, total GHG emission from waste generated in operations= 9,194 tCO2e.

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
12219

Emissions calculation methodology
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Vehicle mileage (segregated by vehicle type and fuel type) and fuel use data separated by fuel type were used. In addition, the emission factors in the PTT Group standard & API Compendium 2009 are used. This category is included in the assurance scope and public disclosure.

Employee commuting

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Referring "Overview of methodologies: Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions" of IPIECA and API, the category emissions comparison also requires considering volume, for example if the amount of fuel used in a category is smaller than the amount of that fuel sold by the company included in Category 11 (Use of sold products), the company may assume that accounting for fuel emissions in both Category 11 and the other category may be double counting. Categories for which it may be straightforward to avoid the double counting of Category 11 (Use of sold products) emissions include Category 4 (upstream transport and distribution), Category 6 (business travel) and Category 7 (employee commuting). Accordingly, PTTEP considered that the emissions from fuel that company sold (use of sold product) covered the emissions from the fuel used in Category 4 (upstream transport and distribution) and Category 7 and we choose to disclose under Category 11 (Use of sold products) emissions.

Upstream leased assets

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
289823

Emissions calculation methodology
Hybrid method
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Applying methodology is a spend-based method by accounting for the total electricity & fuel consumption of the rental head office multiplied by % space occupied by PTTEP

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
5609

Emissions calculation methodology
Fuel-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Applying methodologies are a combination of a fuel-based method and distance-based method by tracking on vehicle mileage (segregated by vehicle type and fuel type) and fuel use data separated by fuel type, then applying the emission factors. This category is included in the assurance scope and public disclosure

Processing of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
5294060

Emissions calculation methodology
Site-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
73

Please explain
Natural gas is major PTTEP's product (73% by volume) and was sold directly to PTT Gas Separation Plant (GSP) which is our sole customer. Therefore, GHG emissions from processing of PTTEP's natural gas sold is equal to scope 1&2 GHG emissions of PTT GSP (9,988,792 tonCO2e). However, natural gas from PTTEP is approx. 53% of total PTT GSP feedstock. This category is not included in the assurance scope and public disclosure.

Use of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
40281178

Emissions calculation methodology
Fuel-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Emissions from natural gas combustion by the end user were calculated under the assumption that all natural gas sold in 2022 with the volume of 807,156 MMSCF from our purchase orders was combusted in 2022. GHG emissions from the processing of sold products are deducted. Emissions from crude oil are not relevant because it is not combusted directly and must be processed into other products before being used. The emission factor used is referred to IPCC AR4 (IPCC 2006, vol.2, ch.2, p.2.16). This category is not included in the assurance scope and public disclosure.

End of life treatment of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
PTTEP's products are crude oil, natural gas and condensate as business to business nature. We do not sell our product to the mass consumers. These products generally do not end up as waste since they are fuels or are used to produce fuels, therefore there is no end of life treatment for our products.
[max. 1000 chars]

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
PTTEP does not have any downstream leased assets.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
PTTEP engages in only exploration and production without downstream business. PTTEP therefore does not have any franchises as defined in the GHG Scope 3 Accounting and Reporting Standard.

Investments

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
PTTEP engages in only exploration and production (upstream) without midstream and downstream business and does not provide any financial services. Therefore, this issue is not applicable to our current business model.

Other (upstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
All relevant scope 3 emissions had been identified in each category above.

Other (downstream)

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
All relevant scope 3 emissions had been identified in each category above.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	3334	

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
0.00059

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
5725573

Metric denominator
unit total revenue

Metric denominator: Unit total
9660000000

Scope 2 figure used
Location-based

% change from previous year
16.05

Direction of change
Decreased

Reason(s) for change
Other emissions reduction activities
Acquisitions
Mergers
Change in revenue
Change in boundary
Other, please specify

Please explain
The main reasons for the changes:
1. Change from M&A + Change in boundary: Company's operating results were achieved as planned and unit cost was maintained at USD 28.36 per barrel of oil equivalent (BOE). The average petroleum sales volume improved due to a 12 percent rise in production in comparison to 2021. This significant increase was primarily from petroleum production in overseas projects including Oman Block 61 and Malaysia Block H, as well as from domestic project, G1/61.
2. Change in revenue: The average selling price was adjusted upward due to the global crude oil price escalation.
3. Change from emission reduction activities: The total emission reduction from our operation was estimated at 583,185 tonneCO2e which considered the highest compared with previous years.

C-OG6.12

(C-OG6.12) Provide the intensity figures for Scope 1 emissions (metric tons CO2e) per unit of hydrocarbon category.

Unit of hydrocarbon category (denominator)
Other, please specify (Thousand tons of Gas/Crude Oil/Condensate Production)

Metric tons CO2e from hydrocarbon category per unit specified
219.1

% change from previous year
5

Direction of change
Decreased

Reason for change
The main reasons for the changes:
1. Change from emission reduction activities: The total emission reduction from our operation was estimated at 583,185 tonneCO2e which considered the highest compared with previous years.
2. Change from production increasing

Comment
In 2022, our base year emissions was recalculated to incorporate changes from calculation method, improvement of incorrect data. Those changes result in 2021 intensity revised from 223.1 to 231.3.

C-OG6.13

(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.

Oil and gas business division
Upstream

Estimated total methane emitted expressed as % of natural gas production or throughput at given division
0.065

Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division
0.081

Details of methodology
As an upstream oil and gas business company, our methane emission is mainly from incomplete combustion of flaring, fuel combustion, and process & vent.
Note: % above expressed in terms of % tonne CH4 per tonne Natural Gas Production or Hydrocarbon Production.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?
Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	4950505	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	400125	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	8471	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Mixture of HFC,PFC,CFC)	2074	IPCC Fourth Assessment Report (AR4 - 100 year)

C-OG7.1b

(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.

Emissions category
Combustion (excluding flaring)

Value chain
Upstream

Product
Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)
2064082

Gross Scope 1 methane emissions (metric tons CH4)
18

Total gross Scope 1 emissions (metric tons CO2e)
3057919

Comment
There are not just only CO2 and CH4 from combustion, but are also N2O. Thus, the total gross Scope 1 emissions above included N2O. However, this considered as low portion (4,230 tonsCO2e or 14 tons N2O).

Emissions category
Flaring

Value chain
Upstream

Product
Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)
2844225

Gross Scope 1 methane emissions (metric tons CH4)
8547

Total gross Scope 1 emissions (metric tons CO2e)
2844225

Comment

Emissions category
Venting

Value chain
Upstream

Product
Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)
47

Gross Scope 1 methane emissions (metric tons CH4)
1509

Total gross Scope 1 emissions (metric tons CO2e)
37782

Comment

Emissions category
Fugitives

Value chain
Upstream

Product
Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)
42150

Gross Scope 1 methane emissions (metric tons CH4)
5913

Total gross Scope 1 emissions (metric tons CO2e)
189967

Comment
There are not just only CO2 and CH4 from fugitive but are also mixture of HFC,PFC,CFC. Thus, the total gross Scope 1 emissions above included mixture of HFC,PFC,CFC. However, this considered as low portion (2,074 tonsCO2e).

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/area/region.

Country/area/region	Scope 1 emissions (metric tons CO2e)
Thailand	4056368
Myanmar	198019
Malaysia	1100038

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility
By activity

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
GBN	741311	7.89501	102.4656
G2S	2042661	7.65743	102.680852
ART	785728	8.24169	102.47739
S1 & L22/43	436085	16.80199	99.95117
Suphanburi	1970	14.33893	99.97073
Sinphuhorm (SPH)	48540	16.677019	102.771435
PSB	60	7.23497	100.56158
RSB	13	10.030612	98.633312
Zawtika	198019	14.190867	96.045583
Malaysia	1100038	3.267361	113.077972

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Flare	3057919
Stationary Combustion	1810201
Mobile Combustion	258557
Process and Vent Emission	37782
Fugitive Emission from Facilities	189967
Fugitive of SF6,HFC,PFC,Mixture	2074

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	5354425	<Not Applicable>	
Oil and gas production activities (midstream)	0	<Not Applicable>	
Oil and gas production activities (downstream)	0	<Not Applicable>	
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/area/region.

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Thailand	8259	8259
Myanmar	60	60
Malaysia	6599	6599

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

By activity

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
S1 & L 22/43	4643	4643
Suphanburi	2187	2187
SPH	835	835
PSB	491	491
RSB	103	103
ART	0	0
GBN	0	0
GBS	0	0
Malaysia	6599	6599
Zawtika	60	60

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Electricity Purchased	14919	14919
Stream Purchased	0	0

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

Not relevant as we do not have any subsidiaries

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	14919	14919	
Oil and gas production activities (midstream)	0	0	
Oil and gas production activities (downstream)	0	0	
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	136	Decreased	0.003	We have implemented the renewable energy e.g. solar roof top for petroleum support base, wind-solar power for offshore wellhead platform.
Other emissions reduction activities	224980	Decreased	4.359	In 2022, we achieved the GHG reduction volume more than planned and also have additional implementation of emissions reduction activities see more details of the projects in C4.3b.
Divestment	0	No change	0	No divestment in 2022.
Acquisitions	0	No change	0	No acquisition in 2022
Mergers	0	No change	0	No merger in 2022
Change in output	335908	Decreased	6.509	In 2022, the production significantly increased. If without the success in GHG reduction, the GHG emissions would be expected to increase significantly.
Change in methodology	11768	Increased	0.218	In 2022, we improved the methodology and recal for more data accuracy.
Change in boundary	0	No change	0	No changed in boundary.
Change in physical operating conditions	0	Please select	0	No change in physical operating conditions
Unidentified	0	No change	0	Reasons of all changes had been identified.
Other	758373	Increased	14.695	This is a result of our production increased from asset without further gas processing under our operational control and from assets with lower intensity.

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	13216	10038239	10051455
Consumption of purchased or acquired electricity	<Not Applicable>	3207	36289	39496
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	16423	10074528	10090951

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
13216

MWh fuel consumed for self-generation of electricity
13216

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
0

Other biomass

Heating value
Please select

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

Comment

Coal

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

Comment

Oil

Heating value
LHV

Total fuel MWh consumed by the organization
1294713

MWh fuel consumed for self-generation of electricity
1294713

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
Most of oil consumed by the organization is mainly diesel/biodiesel for marine vessel transportation and some is for diesel generators/compressors.

Gas

Heating value
LHV

Total fuel MWh consumed by the organization
8743526

MWh fuel consumed for self-generation of electricity
8743526

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment
The fuel gases consumed by the organization mostly reported as LHV, except for Malaysia asset that consumed at 1,834,692 MWh which is reported as HHV.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
LHV

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment

Total fuel

Heating value
LHV

Total fuel MWh consumed by the organization
10090951

MWh fuel consumed for self-generation of electricity
10090951

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
0

Comment

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	10090951	10090951	16423	10074528
Heat	0	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

C8.2g

(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.

Country/area
Thailand

Consumption of purchased electricity (MWh)
7237

Consumption of self-generated electricity (MWh)
6648567

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]

Country/area
Malaysia

Consumption of purchased electricity (MWh)
7522

Consumption of self-generated electricity (MWh)
2341011

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]

Country/area
Myanmar

Consumption of purchased electricity (MWh)
7574

Consumption of self-generated electricity (MWh)
1061878

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
0

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]

Country/area
Please select

Consumption of purchased electricity (MWh)

Consumption of self-generated electricity (MWh)

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

Consumption of self-generated heat, steam, and cooling (MWh)

Total non-fuel energy consumption (MWh) [Auto-calculated]
<Calculated field>

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description
Waste

Metric value
2

Metric numerator
no. of main structures reused

Metric denominator (intensity metric only)
total no. of main structures that can be reused.

% change from previous year
0

Direction of change
No change

Please explain
PTTEP set the target to reuse the main structures at least 50% by 2030. With this reuse, we can reduce the fuel consumption in scope 1, and scope 3 GHG emissions.

C-OG9.2a

(C-OG9.2a) Disclose your net liquid and gas hydrocarbon production (total of subsidiaries and equity-accounted entities).

	In-year net production	Comment
Crude oil and condensate, million barrels	39.01	-
Natural gas liquids, million barrels	0	No natural gas liquids production.
Oil sands, million barrels (includes bitumen and synthetic crude)	0	No oil sands production
Natural gas, billion cubic feet	807.15	

C-OG9.2b

(C-OG9.2b) Explain which listing requirements or other methodologies you use to report reserves data. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries/areas, please explain this.

PTTEP defines Proved Reserves are those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations. Practically, Proved Reserves mean the petroleum in reservoirs which can be commercially produced based on supporting data gathered during the well testing process. The Company's Proved Reserves are reviewed annually by our earth scientists and reservoir engineers to ensure the industry's rigorous professional standards.

Moreover, PTTEP defines Probable Reserves are those additional quantities of petroleum obtained from an analysis of geoscience and/or engineering data similar to that used in the estimation of Proved Reserved but with less production possibility.

Due to the company policy, PTTEP publicly reports only Proved and Probable reserves.

C-OG9.2c

(C-OG9.2c) Disclose your estimated total net reserves and resource base (million boe), including the total associated with subsidiaries and equity-accounted entities.

	Estimated total net proved + probable reserves (2P) (million BOE)	Estimated total net proved + probable + possible reserves (3P) (million BOE)	Estimated net total resource base (million BOE)	Comment
Row 1	2286		2286	Estimated net total resource base is just from P1 = 1442 MMBOE, P2 = 844 MMBOE (we did not disclose on P3)

C-OG9.2d

(C-OG9.2d) Provide an indicative percentage split for 2P, 3P reserves, and total resource base by hydrocarbon categories.

	Net proved + probable reserves (2P) (%)	Net proved + probable + possible reserves (3P) (%)	Net total resource base (%)	Comment
Crude oil/ condensate/ natural gas liquids	28		28	Due to the company policy, PTTEP publicly discloses only Proved (P1) and Probable(P2) reserves.
Natural gas	72		72	Due to the company policy, PTTEP publicly discloses only Proved (P1) and Probable(P2) reserves.
Oil sands (includes bitumen and synthetic crude)	0		0	Due to the company policy, PTTEP publicly discloses only Proved (P1) and Probable(P2) reserves.

C-OG9.2e

(C-OG9.2e) Provide an indicative percentage split for production, 1P, 2P, 3P reserves, and total resource base by development types.

Development type
Onshore

In-year net production (%)
23

Net proved reserves (1P) (%)
27

Net proved + probable reserves (2P) (%)
30

Net proved + probable + possible reserves (3P) (%)

Net total resource base (%)

Comment
Due to the company policy, PTTEP publicly discloses only Proved (P1) and Probable(P2) reserves.

Development type
Shallow-water

In-year net production (%)
77

Net proved reserves (1P) (%)
73

Net proved + probable reserves (2P) (%)
70

Net proved + probable + possible reserves (3P) (%)

Net total resource base (%)

Comment
Due to the company policy, PTTEP publicly discloses only Proved (P1) and Probable(P2) reserves.

C-OG9.5a/C-CO9.5a

(C-OG9.5a/C-CO9.5a) Break down, by fossil fuel expansion activity, your organization's CAPEX in the reporting year and CAPEX planned over the next 5 years.

	CAPEX in the reporting year for this expansion activity (unit currency as selected in C0.4)	CAPEX in the reporting year for this expansion activity as % of total CAPEX in the reporting year	CAPEX planned over the next 5 years for this expansion activity as % of total CAPEX planned over the next 5 years	Explain your CAPEX calculations, including any assumptions
Exploration of new oil fields	0	0	0	
Exploration of new natural gas fields	0	0	0	
Expansion of existing oil fields	542400000	47	36	
Expansion of existing natural gas fields	601043000	53	64	
Development of new coal mines	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Expansion of existing coal mines	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-CO9.6a/C-EU9.6a/C-OG9.6a

(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)	Average % of total R&D investment planned over the next 5 years	Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan
Carbon capture, utilization, and storage (CCUS)	Applied research and development	28.5	4200000	60	PTTEP has set up the technology development strategy to support company sustainable development strategy for being low carbon organization. The strategy focused in 3 areas: enhance core E&P business, minimize environmental impact and explore future energy transition. To support our medium term target and ultimate goal for net zero GHG emission in long term, PTTEP is developing technologies to create high value products from flare or associated gas as well as setting the plan to deploy the CCS technologies in our operations and services. The project stage is under ongoing at Arthit, Thailand and oversea asset.

C-OG9.7

(C-OG9.7) Disclose the breakeven price (US$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.

28.32

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2023-03-27-Assurance-Statement-EN.pdf

Page/ section reference
PDF page 1-2
(source: https://www.pttep.com/en/Sustainability/Disclosure/Assurance-Statement/download.aspx?Content=4808)

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2023-03-27-Assurance-Statement-EN.pdf

Page/ section reference
PDF page 1-2
(source: https://www.pttep.com/en/Sustainability/Disclosure/Assurance-Statement/download.aspx?Content=4808)

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Business travel

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
2023-03-27-Assurance-Statement-EN.pdf

Page/section reference
PDF page 1-2

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Downstream transportation and distribution

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement

Page/section reference
PDF page 1-2

Relevant standard
ISAE 3410

Proportion of reported emissions verified (%)
100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C8. Energy	Energy consumption	Our assurance was conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and ISAE 3410 Assurance on Greenhouse Gas Statements.	We have also conducted our assurance in accordance with the Accountability Assurance Standard of Sustainability AA1000AS (2008) at moderate level that corresponds to a limited assurance as per ISAE 3000 with a Type 2 engagement, which covers not only the nature and extent of the organisation's adherence to the AA1000APS (2018), but also evaluates the reliability of Subject Matters. 2023-03-27-Assurance-Statement-EN.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

With reference to Petronas Exploration & Production Minimum Environmental Specifications (MES), it is required all Petroleum Arrangement Contractors operating in Malaysia managing their environmental aspects with regards to upstream petroleum operations and activities to ensure that they are carried out prudently and effectively in line with the best practices currently prevalent in the oil and gas industry. It is clearly stated in MES that carbon price of USD 20/ tCO2e shall be considered in project decision-making for all development projects in Malaysia. This is an approach Malaysia government bodies implemented to ensure its achievement of net zero emissions in target year of 2050. It is anticipated that the regulatory carbon pricing system will be escalated and implemented in near future. PTTEP, as one of Petroleum Arrangement Contractors in Malaysia, has considered this as a climate related risk and has set up the strategy by incorporating Malaysian CO2 reduction aspiration into our project design and investment analysis. Consequently, CCS is under our project designfor CO2 sequestration.

C11.2

(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Type of internal carbon price
Shadow price

How the price is determined
Cost of required measures to achieve emissions reduction targets
Benchmarking against peers
Price with material impact on business decisions

Objective(s) for implementing this internal carbon price
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Identify and seize low-carbon opportunities
Stress test investments
Set a carbon offset budget

Scope(s) covered
Scope 1
Scope 2

Pricing approach used – spatial variance
Uniform

Pricing approach used – temporal variance
Evolutionary

Indicate how you expect the price to change over time
We shall monitor and review the results from ICP applications closely and seek to expand the scope of ICP implementation to be more comprehensive or challenging, such as expanding the scope of the ICP mechanism and setting more challenging greenhouse gas reduction targets.

Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)
35

Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)
60

Business decision-making processes this internal carbon price is applied to
Risk management
Value chain engagement

Mandatory enforcement of this internal carbon price within these business decision-making processes
Yes, for all decision-making processes

Explain how this internal carbon price has contributed to the implementation of your organization's climate commitments and/or climate transition plan
The identification of ICP to align with E&P business and define risks and opportunity of ICP implementation and economic evaluation to achieve the company's target.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our suppliers
Yes, our customers/clients

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement
Engagement & incentivization (changing supplier behavior)

Details of engagement
Climate change performance is featured in supplier awards scheme
Other, please specify (Included climate-related management in supplier selection / management mechanism)

% of suppliers by number
7.6

% total procurement spend (direct and indirect)
30

% of supplier-related Scope 3 emissions as reported in C6.5
99

Rationale for the coverage of your engagement
Since 2017, PTTEP has developed and implemented the Green Procurement Criteria Manual covered the goods and services that still not being included in Thai Green Label Products list and PTTEP has significant proportion of spent on that goods or services. PTTEP's green procurement toolkit is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmentally friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. This manual focuses on how to integrate green criteria into procurement and contract processes which can be applied to all related functions in corporate and Thailand assets.

In 2022, 7.6% of suppliers (engaged with suppliers in priority with spent volume) applied the manual and it could enhance PTTEP consumption in green products or services supply.

Impact of engagement, including measures of success
PTTEP has set target 30% of total spent on office supplies to be green products and services by 2022. Up to 2021, we achieved 45% of total procurement spend under 13 work categories. This target has been annually monitored by responsible party and reported to relevant top management. In additional the achievement of the engagement measures in term of number of suppliers implemented the manual and % of total procurement spend in green products/services.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Collaboration & innovation	Other, please specify (Taskforce establishment in collaboration with customer to develop climate change related policy & strategy)

% of customers by number
100

% of customer - related Scope 3 emissions as reported in C6.5
100

Please explain the rationale for selecting this group of customers and scope of engagement
All company products were sold directly to PTT Gas Separation Plant (GSP) (over 70% of PTTEP product is natural gas sent to GSP) and others companies in PTT group. The processing of our sold products by the GSP is contributed as a significant stage of GHG scope 3 emission. The engagement with our customers is implemented via an establishment of the Environmental taskforce in collaboration with customers to develop climate change related policy & strategy.

Impact of engagement, including measures of success
With the systematic engagement i.e quarterly meeting, carbon pricing policy development and as a result of the collaboration on policy and strategy, PTT Gas Separation Plant (GSP) as a PTT subsidiary set the target of 27% GHG intensity reduction. This target was quarterly monitored. In 2021, PTT GSP has set new target to reduce GHG emissions at least 15% by 2030 from 2020 baseline. The measures of success is tracked quaterly basis through the PTTG environmental taskforce and PTTG management committee.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?
Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement
Implementation of emissions reduction initiatives

Description of this climate related requirement
PTTEP's green procurement guideline is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmentally friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. This guideline focuses on how to integrate green criteria into procurement and contract processes which can be applied to all related functions in corporate and Thailand assets. This could enhance PTTEP consumption in green products or services supply.

% suppliers by procurement spend that have to comply with this climate-related requirement
0

% suppliers by procurement spend in compliance with this climate-related requirement
30

Mechanisms for monitoring compliance with this climate-related requirement
Supplier self-assessment
Supplier scorecard or rating

Response to supplier non-compliance with this climate-related requirement
Other, please specify (There is a feedback mechanism to allow the contractor or supplier to improve their performance over the contractual period)

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
Yes, we engage directly with policy makers

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?
Yes

Attach commitment or position statement(s)
1. https://www.newsdirectory3.com/pttep-joins-onep-to-work-on-climate-change-pptvhd36/
2. https://www.energyvoice.com/renewables-energy-transition/417477/pttep-to-start-thailands-first-ccs-project-in-2026/
3. https://www.pttep.com/en/Newsandnmedia/Mediacorner/Pressreleases/Pttep-Initiates-Thailand-First-Ccs-Project-Pushing-Towards-Net-Zero-Green-House-Gas-Emissions.aspx, Bangkok, June 6, 2022

"Our knowledge and expertise in geoscience and petroleum engineering represent advantageous foundation for CCS development, leading us towards our carbon emissions reduction target. Apart from Thailand's first CCS initiative at the Arthit gas field, PTTEP has collaborated with partners who have experience in CCS technology in Japan to evaluate the potential of CCS development in other parts of Thailand that will eventually provide support to other domestic industries in decarbonization. Moreover, we have recently joined forces with companies in PTT Group to apply CCS under the concept of CCS Hub Model to reduce GHG emissions from PTT Group's operations and other industries in the adjacent operational areas. These ongoing projects are expected to effectively support the country's road to net zero GHG reduction goal. However, several key factors including CCS policy and regulations, investment promotion mechanisms, as well as cultivation of knowledge and understanding among the public are needed for the successful execution of the CCS project in Thailand. These will require collective support from government agencies and relevant parties in driving and promoting CCS technology adoption in Thailand in order to ensure that we can truly achieve our emissions reduction goals," said Mr. Montri.

(Statement above and attached file have been disclosed in PTTEP website.)
C12.3_PTTEP News.pdf

Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan
The in-place process to ensure that our engagement activities are consistent with our overall climate change strategy is to:
- conducted the climate-risk assessment to understand both physical and transition risk in short-, medium- and long-term.
- conduct the materiality assessment through interviews and questionnaires with all stakeholder groups (policy makers is being one of stakeholders)

The results of above then were integrated into the Corporate climate change strategy as public statement on Net Zero GHG target below (ref: https://www.pttep.com/en/Sustainabledevelopment/Net-Zero-Ghg-Emissions.aspx) :

"With the spirit and determination towards sustainable growth, PTTEP operates with consideration to create the right balance of business, social and environmental aspects as well as shared values for stakeholders. PTTEP therefore takes part in managing greenhouse gas and solving global warming issues. The effort is in line with the global action on climate change and Thailand's commitment to the UN Climate Change Conference of the Parties (COP26) in Glasgow, where Thailand agreed to reach carbon neutrality in 2050 and Net Zero Greenhouse Gas Emissions in 2065.

We set forth to reach Net Zero Greenhouse Gas Emissions by 2050 with our EP Net Zero 2050 concept. This goal covers both direct emissions (scope 1) and indirect emissions (Scope 2) of the exploration and production business under PTTEP's operational control. PTTEP also has set interim targets to reduce greenhouse gas emission intensity by at least 30% within 2030 and 50% within 2040 (from base year 2020) and achieve net zero greenhouse gas emissions in 2050.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Specify the policy, law, or regulation on which your organization is engaging with policy makers
Petronas Exploration & Production Minimum Environmental Specifications (MES) , Malaysia Petroleum Management.

Category of policy, law, or regulation that may impact the climate
Carbon pricing, taxes, and subsidies

Focus area of policy, law, or regulation that may impact the climate
Subsidies for low-carbon, non-renewable energy projects

Policy, law, or regulation geographic coverage
Regional

Country/area/region the policy, law, or regulation applies to
Malaysia
Thailand

Your organization's position on the policy, law, or regulation
Support with major exceptions

Description of engagement with policy makers
Collaborate with industry associations, advocacy groups, and other stakeholders to amplify our message and build a collective voice. Participation in the public participation process to emphasizing their importance for driving investment, innovation, and market transformation towards a low carbon economy.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation
PTTEP expects to execute CCS technology at Arthit Project in 2026, which will reduce emissions from the petroleum production process by approximately 700,000 - 1,000,000 tonnes of CO2 per annum. The CCS project study is concurrently taking place at Lang Lebah field, in Malaysia SK410B Project, a huge gas field discovered by PTTEP in Malaysia. However, PTTEP also endeavors to garner support from policymakers through measures such as incentives, tax holidays, subsidies or carbon credits, which contribute to the economic viability of these projects.

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?
Subsidy policies create financial incentives for businesses and investors to pursue low carbon projects. By providing financial support, such as grants, tax incentives, or subsidies, these policies encourage investment in renewable energy, energy efficiency, and other low carbon initiatives such as CCUS. This stimulates private sector involvement and mobilizes capital towards projects that align with climate transition goals.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication
In voluntary sustainability report

Status
Complete

Attach the document
2022 PTTEP SD Report--EN 090523.pdf

Page/Section reference
2022 PTTEP SD Report, PDF page 2, 4, 15-21

Content elements
Governance
Strategy
Risks & opportunities
Emission targets
Other metrics

Comment

Publication
In mainstream reports

Status
Complete

Attach the document
2022-12-31-Environmental-Performance-Data-EN (2).pdf

Page/Section reference
PDF page 1

Content elements
Emissions figures

Comment

Publication
In mainstream reports, incorporating the TCFD recommendations

Status
Complete

Attach the document
PTTEP 2023 TCFD Disclosure Report.pdf

Page/Section reference
TCFD link https://www.pttep.com/en/Sustainability/Environmental-Stewardship/Climate-Change-Management/download.aspx?Content=5168

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics
Other, please specify

Comment

C12.5

(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	Task Force on Climate-related Financial Disclosures (TCFD) UN Global Compact World Business Council for Sustainable Development (WBCSD)	- As a member of the Thailand UN Global Compact, we commits to the ten principles of the initiative, aligning its operations with international norms in areas such as human rights, labor, environment, and anti-corruption. PTTEP implements sustainable practices, reports its progress through an annual Communication on Progress (COP) report, collaborates with other members, and advocates for sustainable development. - As a member of the TCFD, we contributes to enhancing the understanding of climate-related financial risks and opportunities, facilitating more informed decision-making by investors, lenders, and other stakeholders. Our commitment to TCFD principles supports the transition to a more sustainable and resilient economy. - As a member of the WBCSD, we actively participates in the council's initiatives, frameworks, and commitments to drive sustainable development practices. This includes collaborating with other member companies, sharing best practices, and working towards common goals.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, both board-level oversight and executive management-level responsibility	Our corporate targets on biodiversity of BES value and No Gross Deforestation were oversight by the BoD, and we have sub board namely Corporate Governance and Sustainable Development Committee to review the performance of sustainability issues including biodiversity as quarterly basis.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments and publicly endorsed initiatives related to biodiversity	Commitment to Net Positive Gain Commitment to No Net Loss Adoption of the mitigation hierarchy approach Commitment to not explore or develop in legally designated protected areas Other, please specify (No gross deforestation)	Please select

C15.3

(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?

Impacts on biodiversity

Indicate whether your organization undertakes this type of assessment
Yes

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Portfolio activity
<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity
Other, please specify (IInternational Finance Corporation (IFC) and IPIECA's "A Guide to Developing Biodiversity Action Plans for the Oil and Gas Sector)

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)
PTTEP manages biodiversity and ecosystem service risks by integrating them into a company-wide risk management process. PTTEP developed the Biodiversity and Ecosystem Services (BES) Management Guideline in line with International Finance Corporation (IFC)'s Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources and IPIECA's "A Guide to Developing Biodiversity Action Plans for the Oil and Gas Sector" .
The Biodiversity and Ecosystem Services Risk Assessment, implemented since 2017, showed that no project possessed high biodiversity risks. The assessment was based on location-specific approach with project activities, e.g. operation located in close proximity to the critical biodiversity.

PTTEP screens all of its existing operations and adjacent areas globally through the Biodiversity and Ecosystem Services Risk Assessment to determine operations sites in close proximity to critical biodiversity. The assessment was conducted in 2017 and reviewed in 2021. The assessment process is location-specific and integrated into a company-wide risk management process.
From the assessment, PTTEP has identified two operations that are in close proximity to critical biodiversity from a total of eleven sites used for operational activities globally. The first is Sinphuhorm Project, an onshore natural gas field located in Udon Thani and Khon Kaen provinces in Thailand. The second, Zawtika Onshore Gas Transportation Project, located in Dawei, Myanmar. PTTEP conducts further assessment on the two operations. The assessment includes ecosystem service assessment, natural habitat and modified habitat assessment, critical habitat assessment and no-net loss/net gain assessment. The assessment outcomes are used for determination of “Biodiversity Offset Management Plan” to achieve no-net-loss/net-gain of natural habitats in the operating area and significantly improve conservation outcomes for numerous native species, including those with special conservation status.

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment
Yes

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Portfolio activity
<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity
Other, please specify (WWF’s Water and Biodiversity Risk Filter.)

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)
PTTEP uses the WWF Water Risk Filter and Biodiversity Risk Filter to assess dependency and impact of the two operations with biodiversity identified risk. The assessment cover sensitivity analysis (e.g. water scarcity). The results show Sinphuhorm is at risk of water scarcity, however this does not mean it has high dependency on water due to PTTEP’s business operations. Both sites are vulnerable to natural hazards such as extreme heat, tropical cyclones, and drought, while Sinphuhorm is also at risk of floods. Both sites have high pressure on biodiversity, specifically on pollution and deforestation, while Sinphuhorm also is at risk of land and freshwater use change

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?
Yes

C15.4a

(C15.4a) Provide details of your organization's activities in the reporting year located in or near to biodiversity -sensitive areas.

Classification of biodiversity -sensitive area
Natura 2000 network of protected areas

Country/area
Myanmar

Name of the biodiversity-sensitive area
Tanintharyi Nature Reserve

Proximity
Overlap

Briefly describe your organization's activities in the reporting year located in or near to the selected area
A section of the natural gas pipeline (approximately 32 km) and gas metering station have been laid within the area of Tanintharyi Nature Reserve. Right of Way (ROW) being 20 m in width, of the project, it could be able to calculate the total area of the gas pipeline and gas metering station located within the Tanintharyi Nature Reserve approximately 77 ha.

Indicate whether any of your organization's activities located in or near to the selected area could negatively affect biodiversity
Yes, but mitigation measures have been implemented

Mitigation measures implemented within the selected area
Site selection
Project design
Scheduling
Physical controls
Operational controls
Abatement controls
Restoration
Biodiversity offsets

Explain how your organization's activities located in or near to the selected area could negatively affect biodiversity, how this was assessed, and describe any mitigation measures implemented
As Thanintharyi Natural Reserve Area of Myanmar has some endangered species, entering into the area may disturb the endangered species. Thus, mitigation measures according to the project BES management plan have been implemented, for exmamples:
- PTTEP and Thanintharyi National Reserved Project have monitored a number of endangered species found in forest and within the project site by using camera traps and staff mobile phones as one of the strategic actions of the BAPs of the project. The endangered species found near the project site have been recorded and kept to ensure that there is no net loss of BES in the area.
- Continually conducts BES management training for all PTTEP staff who work in protected areas to build up awareness and knowledge of BES management.
- Manage biodiversity risks in accordance with the mitigation hierarchy (Avoidance, Minimizing, Restoration and - Offsetting)

Classification of biodiversity -sensitive area
Other biodiversity sensitive area, please specify (Local protected area)

Country/area
Thailand

Name of the biodiversity-sensitive area
Watershed Area and Phan Don and Pakho Reserved Forest

Proximity
Adjacent

Briefly describe your organization's activities in the reporting year located in or near to the selected area
The Sinphuhorm onshore facilities, consists of a 64 km long onshore gas transportation pipeline and four (4) connected well pads, which are located in the Phan Don and Pakho Reserved Forest.

Indicate whether any of your organization's activities located in or near to the selected area could negatively affect biodiversity
Yes, but mitigation measures have been implemented

Mitigation measures implemented within the selected area
Site selection
Project design
Scheduling
Physical controls
Operational controls
Abatement controls
Restoration
Biodiversity offsets

Explain how your organization's activities located in or near to the selected area could negatively affect biodiversity, how this was assessed, and describe any mitigation measures implemented
Conduct Biodiversity offset strategy and Biodiversity offset management program have been identified and implementing, for examples:
- Manage biodiversity risks in accordance with the mitigation hierarchy (Avoidance, Minimizing, Restoration and - Offsetting)
- Ecological restoration and securing of degraded forest habitats proximate to locations where project development
- Fire control programs by supporting and optimisation of existing community fire control programs to identify any potential sources of fire and raise public awareness related to fire prevention.

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water management Species management Education & awareness Law & policy Livelihood, economic & other incentives

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	State and benefit indicators Pressure indicators Response indicators

C15.7

(C15.7) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Impacts on biodiversity Details on biodiversity indicators Influence on public policy and lobbying Risks and opportunities Biodiversity strategy	Document link: https://www.pttep.com/en/Sustainability/Environmental-Stewardship/Biodiversity-And-Ecosystem-Services-Management/download.aspx?Content=5509 Biodiversity and Ecosystem Services Risk Assessment & Progress Report.pdf

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Executive Officer	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms