ISSB Climate Related Disclosure

15 August 2025

The better the question. The better the answer. The better the world works.

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Agenda

1

ภาพรวมและหลักการสำคัญของการเปิดเผยข้อมูลด้านสภาพภูมิอากาศ

2

แนวทางการเปิดเผย:

การกำกับดูแล

3

แนวทางการเปิดเผย:

กลยุทธ์ ความเสี่ยง โอกาสด้านสภาพภูมิอากาศ

4

แนวทางการเปิดเผย:

การบริหารจัดการความเสี่ยง

5

แนวทางการเปิดเผย:

เป้าหมายและตัวชี้วัด

Chapter 1

ภาพรวมและหลักการสำคัญของการเปิดเผยข้อมูลด้านสภาพภูมิอากาศ

The core content of IFRS S2 applies TCFD structure focusing on climate related as details outlined below:

1	Governance		
2	Strategy		▪ Climate-related risks and opportunities ▪ Business model and value chain ▪ Strategy and decision-making ▸ Financial position, financial performance and cash flows ▸ Climate resilience
3	Risk management		
4	Metrics and targets		▪ Climate-related metrics (incl. GHG emission) — Transition relief ▪ Climate-related targets

Proportionality mechanisms

Overview: Element of IFRS S1 that applies to IFRS S2

The requirements of IFRS S1 are fundamental for all sustainability disclosures in compliance with ISSB Standards. Therefore, when an entity reports solely on climate, it must still adhere to the related principles of IFRS S1.

1	Objective	
2	Scope	
3	Conceptual foundations	▪ Fair presentation ▪ Materiality ▪ Reporting entity ▪ Connected information
4	Core content	▪ Value chain concepts
5	General requirements	▪ Location of disclosures ▪ Timing of reporting ▪ Comparative information ▪ Statement of compliance
6	Judgements, uncertainties and errors	▪ Judgements ▪ Measurement uncertainty ▪ Errors

Transition relief

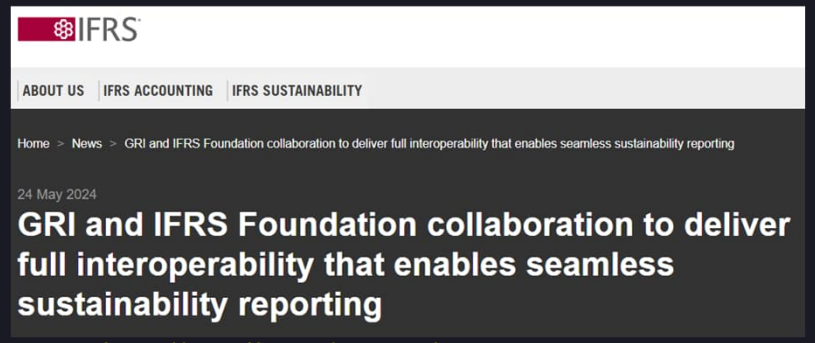
Overview: Transition relief

To facilitate the initial application of IFRS S1 and IFRS S2, SEC has proposed temporary transition reliefs for the application of specified requirements

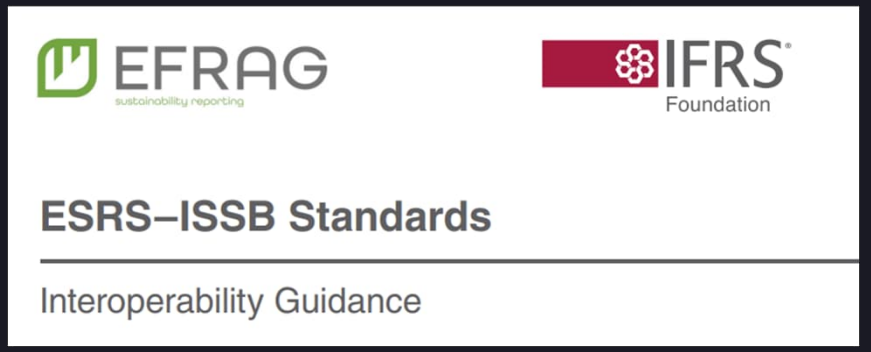
1. Comparative reporting	2. Climate-first reporting	3. Timing of reporting	4. GHG Protocol	5. Scope 3 GHG emissions
Comparative information is not required to be disclosed in the first annual reporting period in which an entity applies IFRS S1 and IFRS S2	During the 5-year period of the transition relief, the reporting entity is eligible to disclose only climate-related information of IFRS S1 and the entirety of IFRS S2 (the remaining of sustainability-related information e.g., social aspect, shall continue to be disclosed on the current 'comply or explain' mechanism). When the transition relief expires, the reporting entity shall uplift their disclosure by following the entirety of the ISSB Standards IFRS S1 and IFRS S2.	During the 5-year period of this transition relief, the reporting entity is eligible to report its annual sustainability-related financial disclosure at a different time period from its financial statements. For a reporting entity that choose to apply this transition relief, such entity will be eligible to disclose the sustainability-related financial information in 56-1 One Report as specified by the current reporting period (within 3 months after the end of its accounting period). When the transition relief expires, the reporting entity shall report the aforesaid information and submits the 56-1 One Report along with its financial statements and the submission period shall be the same as financial positions and operating results depending on circumstances (2 or 3 months after the end of its accounting period)	For the first five years during the transition relief period, the reporting entity is allowed to use either GHG Protocol 2004 or other international standards and its equivalent. When the transition relief expires, depends on reporting entity's category, the reporting entity shall disclose the GHG emission information by applying GHG Protocol 2004.	For the first five reporting year, the reporting entity is eligible to omit the disclosure of Scope 3 GHG emissions (disclose only scope 1 and 2 GHG emissions). When the transition relief expires, the reporting entity shall disclose all scopes (1, 2, and 3) of GHG emissions.

Source: SEC Public Consultation Aor Sor Yor. 50 /2567

Connectivity of ISSB and other sustainability frameworks



Source: https://www.ifrs.org/news-and-events/news/2024/05/gri-and-ifrs-foundation-collaboration-to-deliver-full-interoperability/



Source: https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/ESRS-ISSB%20Standards%20Interoperability%20Guidance.pdf

Source: https://efrag.sharefile.com/share/view/s459956b01c6841298f78e5031759ca6e/fo8ed338-4c5e-4502-823b-88009818b85a

Chapter 2

แนวทางการเปิดเผย: การกำกับดูแล

Governance: Key disclosures

What the company needs to have

1. Climate-related board / committee
2. Climate-related management / responsible unit / department
3. Climate-related risks and opportunities meeting, KPI setting
4. Climate performance-based compensation

Key disclosures

1. Governance structure
2. Management roles and responsibilities
3. Governance process
4. Monitoring and compensation

Climate-related governance can be part of overall risk or sustainability governance of the company.

Governance: Example

Governance

Board Oversight:

Our Board of Directors (the Board) oversees Environmental, Social and Governance (ESG) matters for the Company, including its environmental sustainability practices, through its committees and as a whole. Our Executive Team (ET) and senior management are responsible for reviewing, refining, and implementing our long-term sustainability strategy.

Our ET updates the Board on our long-term sustainability strategy and performance through discussions both as a full Board as well as through Committee discussions on specific topics. For example, the Board's Governance Committee, which monitors and assists the Board in its oversight of environmental sustainability practices, ensures relevant issues are subject to review by Board Committees with relevant areas of competency. The Governance Committee also receives regular updates on Environmental, Health and Safety matters.

Board's roles and responsibilities

Management's roles and responsibilities

Health: Merck & Co., Inc.

MERCK discloses climate-related governance structure as part of the sustainability governance.

Management Oversight:

The groups below are responsible for directing the day-to-day supervision of our environmental sustainability strategy and driving performance:

Our Environmental, Health and Safety (EHS) Council is a cross-functional body, chaired by our General Counsel, with leadership representation from each area of our business and is responsible for overseeing our environmental sustainability strategy, policy, and risk mitigation controls. It monitors performance against our targets and increases transparency on environmental matters within the Company, the ET, and the Board. The EHS Council meets on a quarterly basis.

The Global Safety and Environment (GSE) vice president communicates progress on environmental sustainability goals, objectives and other material issues to the Board, ET and EHS Council. The GSE vice president is also a part of the Strategic Policy & Sustainability Council (SPSC). Additionally, the head of the Environmental Sustainability Center of Excellence (CoE) is a member of the ESG Strategy Management Team (ESMT).

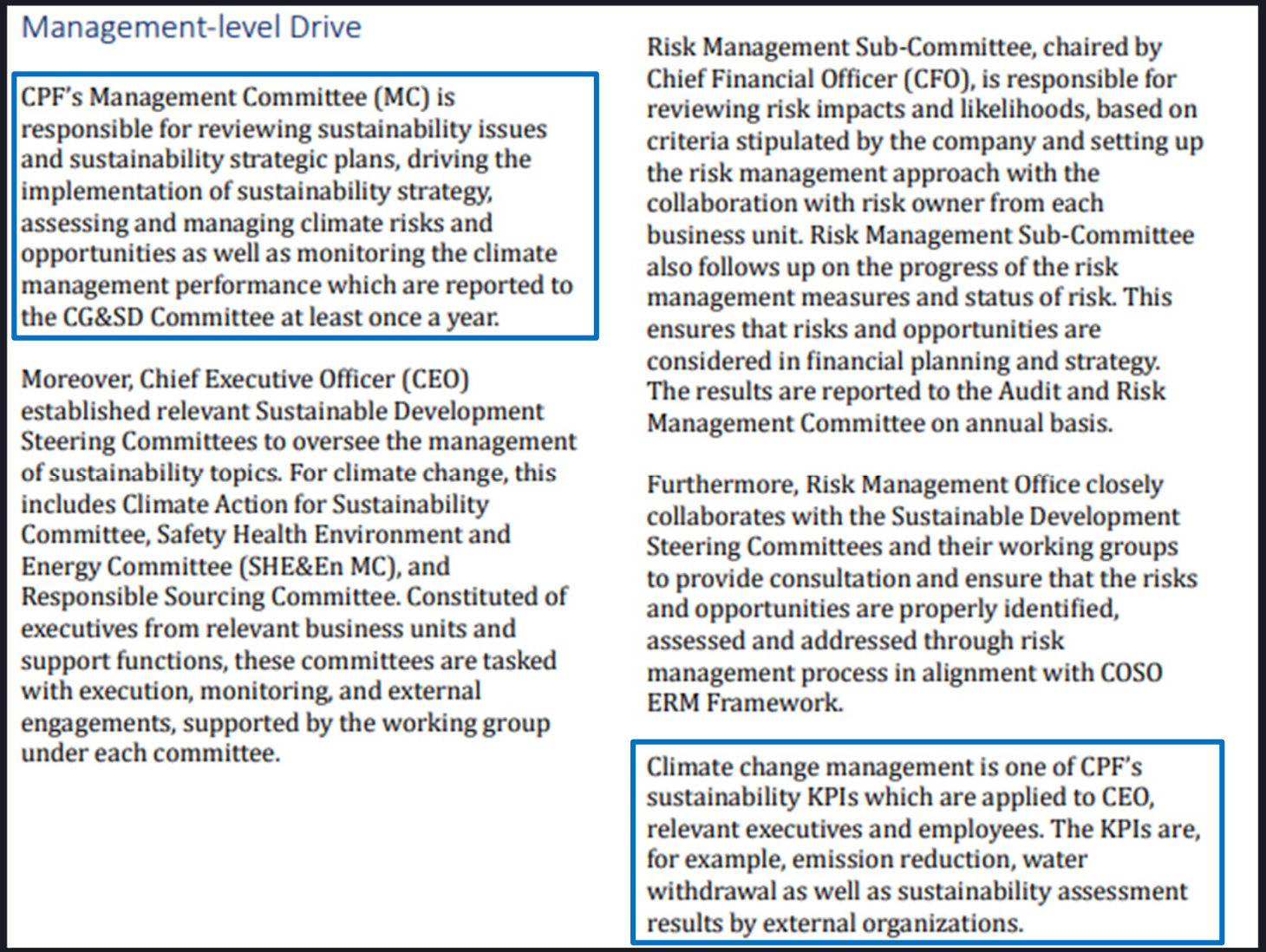
Our cross-functional Environmental Sustainability Implementation Steering Committee was designated by the EHS Council to oversee the progress of initiatives that support the achievement of our public targets and provide guidance on resourcing of our environmental sustainability strategy.

Source: *Merck & Co., Inc., Task Force on Climate Related Financial Disclosure (TCFD) Report December 2024*

Governance: Example

Food: CPF

For management's responsibilities, CPF explains that the Management Committee (MC) is responsible for reviewing sustainability strategy and driving the implementation of such strategy. Furthermore, the sustainability-related KPIs are applies to the CEO and relevant executives and employees.



Management-level Drive

CPF's Management Committee (MC) is responsible for reviewing sustainability issues and sustainability strategic plans, driving the implementation of sustainability strategy, assessing and managing climate risks and opportunities as well as monitoring the climate management performance which are reported to the CG&SD Committee at least once a year.

Moreover, Chief Executive Officer (CEO) established relevant Sustainable Development Steering Committees to oversee the management of sustainability topics. For climate change, this includes Climate Action for Sustainability Committee, Safety Health Environment and Energy Committee (SHE&En MC), and Responsible Sourcing Committee. Constituted of executives from relevant business units and support functions, these committees are tasked with execution, monitoring, and external engagements, supported by the working group under each committee.

Risk Management Sub-Committee, chaired by Chief Financial Officer (CFO), is responsible for reviewing risk impacts and likelihoods, based on criteria stipulated by the company and setting up the risk management approach with the collaboration with risk owner from each business unit. Risk Management Sub-Committee also follows up on the progress of the risk management measures and status of risk. This ensures that risks and opportunities are considered in financial planning and strategy. The results are reported to the Audit and Risk Management Committee on annual basis.

Furthermore, Risk Management Office closely collaborates with the Sustainable Development Steering Committees and their working groups to provide consultation and ensure that the risks and opportunities are properly identified, assessed and addressed through risk management process in alignment with COSO ERM Framework.

Climate change management is one of CPF's sustainability KPIs which are applied to CEO, relevant executives and employees. The KPIs are, for example, emission reduction, water withdrawal as well as sustainability assessment results by external organizations.

Source: Charoen Pokphand Foods Public Company Limited, TCFD Report 2024

Chapter 3

แนวการเปิดเผย: กลยุทธ์ ความเสี่ยงและโอกาสด้านสภาพภูมิอากาศ

Strategy : Key disclosures

What the company needs to have

Strategy

1. Identification of climate-related risks and opportunities (along the business model and value chain)
2. Climate-related risks and opportunities strategy
   - Transition plan
3. Impact of the risks and opportunity on the financials (short, medium, and long term)
4. Scenario analysis

Key disclosures

Strategy

1. Climate-related risks and opportunities
2. Strategy and decision making
3. Current and anticipated financial effects
4. Climate resilience

Overall process of climate-related risk assessment and financial impact

3.1. Climate-related hazards screening and risks identification

Screening process to identify significant climate hazards drivers and analyzing to identify key climate-related risk indicators by using climate model

Physical Risk
- Acute Risk
- Chronic Risk

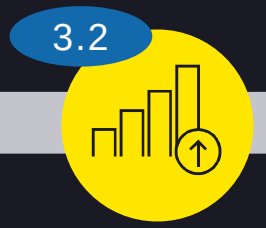
Transition Risk
- Policy & Legal Risk
- Technology Risk
- Market Risk
- Reputation Risk

Climate Model

Physical Risk
- EY CAP
- Climate Impact Explorer,
- IPCC WGI Interactive Atlas tool, Aqueduct

Transition Risk
- International Energy Agency (IEA) scenarios

3.2. Risks assessment and Scenario Analysis



Evaluate and assess risks over climate related scenario

Scenario analysis

Physical risk:

Shared Socioeconomic Pathways (SSPs):
- SSP1-2.6 (low-emission scenario)
- SSP2-4.5 (intermediate scenario, limiting warming to ~2.5°C)
- SSP5-8.5 (high-emission scenario)

Transition risk:

International Energy Agency (IEA) scenarios
- Stated Policies Scenario (STEPS) – Reflecting current policy commitments.
- Announced Pledges Scenario (APS)
- Net Zero Emissions by 2050 Scenario (NZE) – Pathway to net-zero emissions.

3.3. Financial impact assessment

Conduct a qualitative / quantitative analysis to estimate the financial impacts of each scenario and timeframe

Direct Impact
- Livability and workability
- Physical impact to assets
- Infrastructure services
- Natural capital

Indirect Impact
- Impact on business disruption
- Impact on connected sectors and regions
- Impact on upstream and downstream parts of supply chains
- Destabilizing impacts such as regulatory step change, financial market impacts, migration, social unrest

3.4. Financial impact disclosures and recognition

Determine incurred/anticipated financial impacts and consider disclose in Climate/Sustainability report, and determine anticipated financial impacts and consider recognition/disclosure in FS

Financial Statements

Incurred
- Change in Useful life
- Write-off
- Cost of repair
- Revenue (decrease)

Anticipated
- Impairment
- Planned cost of mitigation, adaptation (e.g., Insurance, investment diversification, planned expense,)

Climate/Sustain report

Current
- Incurred cost of write-off
- Impact of change in useful life
- Incurred cost or expense
- Decrease in revenue

Anticipated
- Cost of investment for adaptation /mitigation
- Higher insurance cost

This is for illustrative only. The impacts are not exhaustive, and the entity shall justify the materiality for disclosure.

Chapter 3.1

แนวทางการระบุความเสี่ยงและโอกาส

Climate-related risk categories

ความเสี่ยงทางกายภาพ (Physical)

เฉียบพลัน (Acute)	เกิดขึ้นระยะยาว (Chronic)
น้ำท่วม	คลื่นความร้อนและภัยแล้งที่ยาวนานและทวีคูณความรุนแรงขึ้น
พายุ	ความเครียดจากน้ำ (Water stress) เนื่องจากการเปลี่ยนแปลงของรูปแบบปริมาณน้ำฝนตามฤดูกาล
ไฟป่า	ระดับน้ำทะเลที่เพิ่มสูงขึ้น

ความเสี่ยงจากการเปลี่ยนผ่าน (Transition)

ตลาด (Markets)

การเปลี่ยนแปลงของอุปสงค์และอุปทานสำหรับสินค้า ผลิตภัณฑ์ และบริการบางประเภท

เทคโนโลยี (Technology)

การเปลี่ยนแปลงของนวัตกรรมทางเทคโนโลยีที่สนับสนุนการเปลี่ยนผ่านไปสู่การประหยัดพลังงานและระบบเศรษฐกิจคาร์บอนต่ำ

นโยบายและกฎหมาย (Policy and legal)

นโยบายหรือกฎหมายหรือกฎระเบียบที่จำกัดการดำเนินการอันมีส่วนทำให้เกิดผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ

การดำเนินการตามนโยบายของนักลงทุนที่ต้องการเห็นการปรับตัวให้เข้ากับการเปลี่ยนแปลงสภาพภูมิอากาศ

ชื่อเสียง (Reputation)

การเปลี่ยนแปลงแง่ทัศนคติของลูกค้าหรือชุมชนเกี่ยวกับการมีส่วนร่วมขององค์กรว่าด้วยการเปลี่ยนแปลงไปสู่เศรษฐกิจคาร์บอนต่ำ

Climate-related opportunities

โอกาส (Opportunities)

การลดต้นทุนจากการใช้ทรัพยากรอย่างมีประสิทธิภาพ	การประหยัดต้นทุนจากแหล่งพลังงานสีเขียวที่มีแนวโน้มต้นทุนที่ลดลง	สินค้าและบริการ	ตลาด	ความยืดหยุ่น
การทำให้มีการใช้ทรัพยากรอย่างมีประสิทธิภาพมากที่สุดเท่าที่จะเป็นไปได้ เช่น การจัดการพลังงานอัจฉริยะ ลดการใช้น้ำและการบริโภค และการรีไซเคิล	การเปลี่ยนผ่านไปสู่สังคมคาร์บอนต่ำ ทำให้เกิดการพัฒนาทางเทคโนโลยีและต้นทุนที่ลดลงในอนาคต	การเพิ่มโอกาสในการแข่งขันจากการออกแบบผลิตภัณฑ์ที่คำนึงถึงสิ่งแวดล้อมและรองรับการปรับตัวด้านสิ่งแวดล้อมของธุรกิจ	การเข้าถึงตลาดใหม่เพื่อสร้างความหลากหลายในธุรกิจ การทำธุรกิจใหม่ เช่น รถ EV	เพิ่มความยืดหยุ่นในการดำเนินการทางธุรกิจไม่ให้กระจุกตัวอยู่เพียงธุรกิจใดธุรกิจหนึ่ง โดยผ่านการใช้กลยุทธ์การดำเนินธุรกิจอย่างยั่งยืน

Screening climate hazards

Source: *Risk – United Nations Environment – Finance Initiative*

Using the **UNDP Financial Initiative (FI)** involves assessing potential climate-related risks specific to various sectors. This process helps organizations identify vulnerabilities in their operations and investments due to climate change impacts.

The screening typically includes evaluating physical risks (such as extreme weather events), transition risks (related to policy changes and market shifts), and liability risks (from legal actions).

By utilizing **sector-specific guidelines**, organizations can tailor their risk assessments to address unique challenges and opportunities within their industry, ultimately enhancing resilience and sustainability in their strategic planning and decision-making processes.

Example of climate risk: Heatmap Matrix

Physical Risk Screening *(Illustrative purpose)*

Risk Driver	Asset	Potential Business Impact	Impact	Likelihood	Risk Score
Tropical Cyclone 	• A • B	• Increased operational disruptions and infrastructure damage, leading to higher maintenance costs and production delays.	Moderate	Likely	Medium
Heavy Precipitation 	• A • B • C	• Flooding risks at extraction sites, causing delays, equipment damage, and higher insurance costs..	Serious	Likely	High
Heatwave 	• A • B • C	• Increased cooling requirements for machinery	Serious	Likely	Low
Water Stress 	• A • C	• Limited water availability for drilling and processing, increasing operational costs and regulatory risks..	Serious	Likely	Medium

Transition Risk Screening *(Illustrative purpose)*

Risk Driver	Asset	Potential Business Impact	Impact	Likelihood	Risk Score
Carbon Pricing Mechanisms 	• A • B	• Higher compliance costs and potential stranded assets due to increased carbon taxes and emissions regulations.	Serious	Likely	High
Technology Transition 	• A • B	• Market competitiveness threatened by the shift to low-carbon alternatives, requiring investment in cleaner technologies.	Serious	Likely	Medium
Change Customer Behavior 	• A • B	• Declining demand for fossil fuels as consumers and industries shift toward renewable energy, impacting long-term revenue.	Serious	Likely	Medium

Source: EY tool

Chapter 3.2

ทำความรู้จักกับการวิเคราะห์ Scenario Analysis และการประเมิน Physical and Transition Risks

Climate R&O Assessment and Climate Resilience

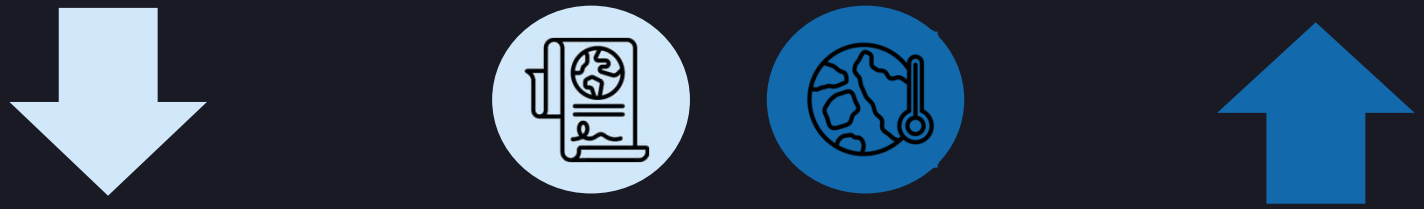
IFRS S2 includes application guidance on how to apply scenario analysis, building on TCFD materials, which requires:

- A method of climate-related scenario analysis commensurate with an entity's circumstance
- The use of all reasonable and supportable information that is available to an entity at the reporting date without undue cost of effort

Lowering average temperature change through low carbon economy

Transition risks arise from adjustment to a low carbon economy influenced by the change through stakeholder behavior & mindset responding to climate change

No Climate policy
4 °C +



Paris ambition
1.5 °C

Physical climate risks arise from the increased frequency and severity of climate- and weather-related events that damage infrastructure, property, disrupt trade and put at risk human health and even lives.

Increasing average temperature change due to the lack of climate actions

Scenario Analysis

Representative Concentration Pathways (RCP)

RCP2.6 | RCP4.5 | RCP6.0 | RCP8.5

Shared Socioeconomic Pathways (SSPs)

SSP1 | SSP2 | SSP3 | SSP4 | SSP5

Network for Greening the Financial System (NGFS)

NGFS net-zero 2050 | NGFS fragmented world

NGFS Nationally Determined Contributions

NGFS below 2 degree | NGFS current policies

NGFS delayed transition | NGFS low demand

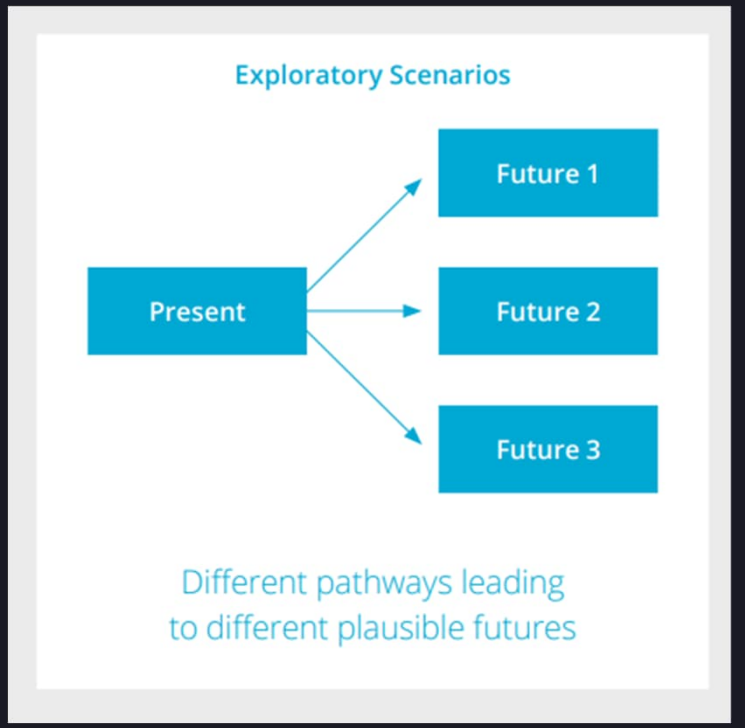
What is Climate Scenario Analysis?

Imagine you're a business owner and you want to prepare for the future.
You know that climate change is a big deal, but it's hard to predict exactly what will happen.
Will there be more flood?
Will new carbon tax make it more expensive to use fossil fuels?

This is where “Climate Scenario Analysis” comes in.

You can't predict the future, but you can imagine different possible futures. This is the core idea. Instead of trying to guess what will happen, you create several “Scenarios" or stories about how the world might change.

“Exploratory scenarios describe a diverse set of plausible future states. These scenarios are then used to assess potential climate-related risks and uncertainties, and test the resiliency of various strategies to a wide range of future conditions.”
TCFD



Scenario Analysis – A development process

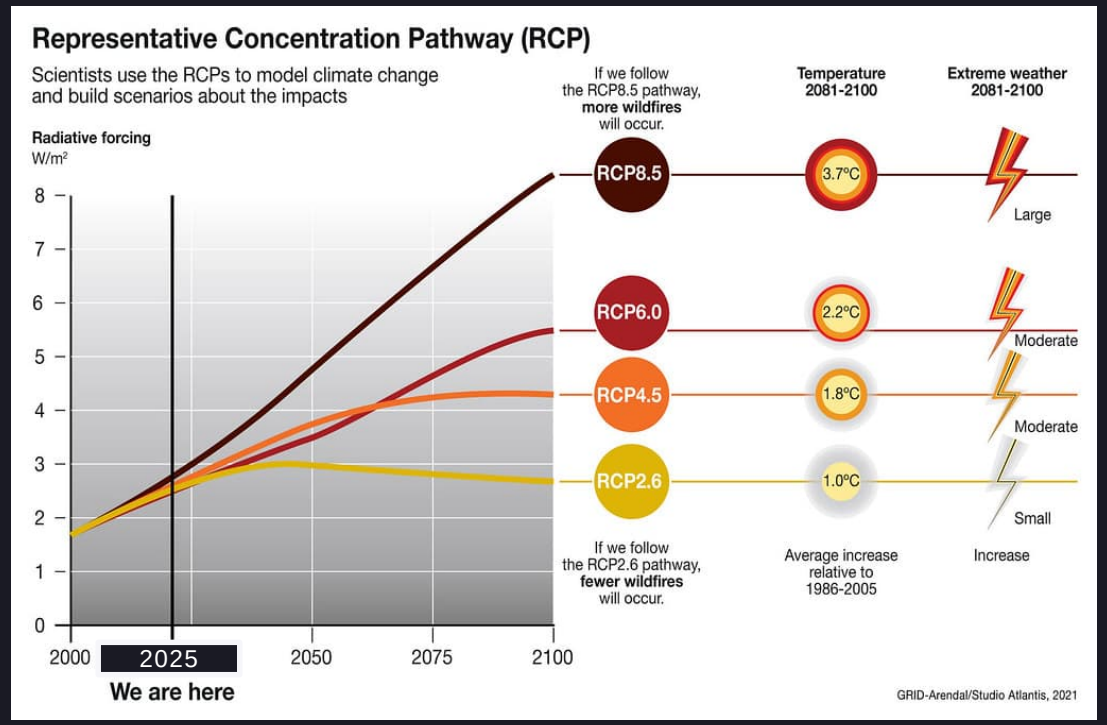
An entity might use a simpler approach to climate-related scenario analysis, such as qualitative scenario narratives, if such an approach is appropriate to the entity's circumstances. For example, if an entity does not currently have the skills, capabilities or resources to carry out quantitative climate-related scenario analysis but has a high degree of exposure to climate-related risk, the entity might initially use a simpler approach to climate-related scenario analysis, but would build its capabilities through experience and, therefore, would apply a more advanced quantitative approach to climate-related scenario analysis over time. An entity with a high degree of exposure to climate-related risks and opportunities, and with access to the necessary skills, capabilities or resources, is required to apply a more advanced quantitative approach to climate-related scenario analysis.

Just starting	Gaining experience	Advanced experience
May start with qualitative scenario narratives or storylines to help management explore the potential range of climate change implications	Can use quantitative information to illustrate potential pathways and outcomes	Greater rigor and sophistication in the use of data sets and quantitative models and analysis
Qualitative disclosure	**Robust scenario analysis**	**In-depth consideration on qualitative disclosure**
Most organizations are expected to perform qualitative scenario analyses and will provide more qualitative disclosures.	Larger organizations should consider conducting more robust scenario analysis to assess the resilience of their strategies.	Recommends organizations that may be more significantly affected by transition risk and/or physical risk consider more in-depth, quantitative disclosure around scenario analysis.

Climate scenarios (Not exhaustive)

Scenario	Definition	Key Features	Physical Risks	Transition Risks
RCP (Representative Concentration Pathways)	A set of greenhouse gas concentration trajectories used in climate modeling.	Focuses on radiative forcing levels (e.g., RCP2.6, RCP4.5, RCP6.0, RCP8.5) by the year 2100.	Increased frequency of extreme weather events, sea-level rise, and ecosystem disruption.	Limited; primarily focused on emissions pathways rather than socioeconomic factors.
SSP (Shared Socioeconomic Pathways)	Scenarios that describe possible future societal developments and their implications for climate change mitigation and adaptation.	Includes five pathways (SSP1 to SSP5) that consider factors like economic growth, inequality, and technological development.	Vulnerability to climate impacts varies by pathway (e.g., SSP1 may have lower risks due to sustainable practices).	Policy shifts, technological changes, and societal adaptations can create risks and opportunities.
IEA (International Energy Agency)	Provides energy-related scenarios focusing on technology and policy pathways to achieve climate goals.	Includes scenarios like the Net Zero Emissions by 2050 (NZE) Scenario and Stated Policies Scenario (STEPS), emphasizing energy transition and efficiency.	Physical risks related to energy infrastructure (e.g., impacts of extreme weather on energy supply).	Regulatory changes, market shifts towards renewable energy, and technological advancements.
NGFS (Network for Greening the Financial System)	A framework for assessing climate-related risks and opportunities in the financial sector.	Offers scenarios that incorporate physical and transition risks, focusing on the financial implications of climate change.	Physical risks from climate impacts on assets and investments (e.g., property damage from flooding).	Transition risks related to policy changes, shifts in market preferences, and investment strategies.

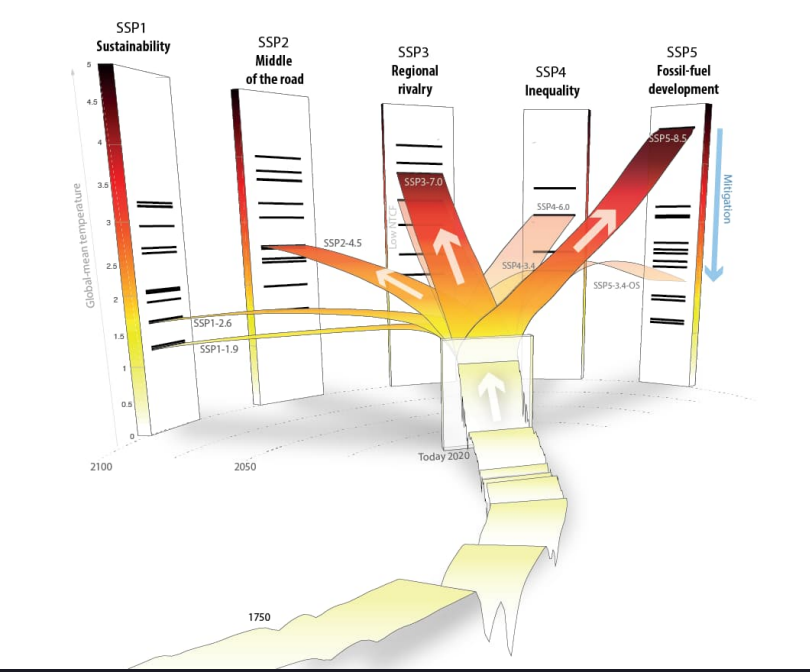
Climate scenarios : 4 RCP scenarios



RCP Scenario	Description	Temperature Implications
RCP2.6	Represents a pathway that aims to limit global warming to below 2°C, with significant reductions in greenhouse gas emissions. This scenario involves aggressive mitigation strategies, including a rapid transition to renewable energy and substantial improvements in energy efficiency.	Aiming for a temperature increase of well below 2°C, with efforts to limit warming to 1.5°C.
RCP4.5	A stabilization scenario where emissions peak around 2040 and then decline. It assumes a moderate level of climate action, including the implementation of policies to reduce emissions and promote sustainable practices.	Likely results in a temperature increase of approximately 2.0°C to 2.5°C by 2100.
RCP6.0	A scenario where emissions continue to rise until around 2050, followed by a gradual decline. It reflects a future with limited climate policies and moderate efforts to mitigate climate change.	Likely leads to a temperature increase of around 2.5°C to 3.0°C by 2100.
RCP8.5	Represents a high greenhouse gas emissions scenario characterized by continued reliance on fossil fuels and limited climate action. This pathway assumes no significant efforts to mitigate emissions, leading to substantial warming.	Likely results in a temperature increase of approximately 3.0°C to 4.0°C or more by 2100.

Source: *Representative Concentration Pathway (RCP) | GRID-Arendal*

Climate scenarios : 5 SSP scenarios

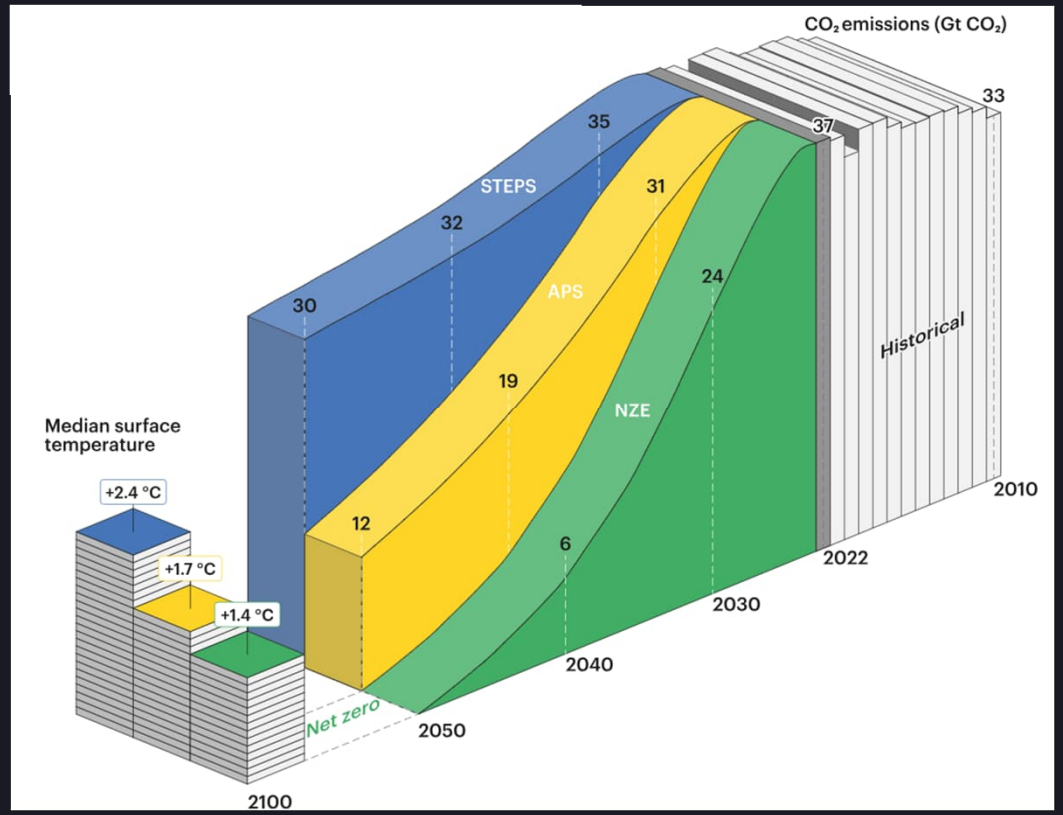


The SSP scenarios and their five SSP families. Shown are illustrative temperature levels relative to pre-industrial levels with historical temperatures (front band), current (2020) temperatures (small block in middle), and the branching of the respective scenarios over the 21st century along the five different socioeconomic families. The small black horizontal bars on the 2100 pillars for each SSP indicate illustrative temperature levels for the range of SSP scenarios that were available from the IAM community at the time of creating the baseline SSP scenarios. [Source: Meinshausen et al. (2020)[3]]

SSP Scenario	Description	Temperature Implications
SSP1: Sustainability	Focuses on a world that prioritizes sustainable development, with strong policies promoting environmental protection, reduced inequality, and a shift towards renewable energy. This scenario envisions a future with low challenges to mitigation and adaptation.	Aiming for well below 2°C, with significant efforts to limit warming to 1.5°C.
SSP2: Middle of the Road	Represents a scenario where trends follow historical patterns, with moderate challenges to both mitigation and adaptation. It assumes a balance between economic growth and environmental sustainability, leading to gradual progress in addressing climate change.	Likely results in a temperature increase of around 2°C, depending on the effectiveness of policies.
SSP3: Regional Rivalry	Envisions a fragmented world characterized by geopolitical tensions, nationalism, and limited international cooperation. This scenario presents high challenges to both mitigation and adaptation, with a focus on regional development and less emphasis on global sustainability efforts.	Likely leads to a temperature increase of 2.5°C to 3°C or higher due to limited climate action.
SSP4: Inequality	Highlights a world with high inequality, where social and economic disparities hinder progress on climate change. This scenario presents high challenges to mitigation but low challenges to adaptation, as wealthier regions may adapt more easily while poorer regions struggle.	Likely results in a temperature increase of around 2.5°C, with uneven impacts across regions.
SSP5: Fossil-Fueled Development	Depicts a scenario driven by rapid economic growth fueled by fossil fuels, with a focus on technological advancements. This scenario presents low challenges to mitigation but high challenges to adaptation, as environmental degradation and climate impacts increase.	Likely leads to a temperature increase of 3°C or more due to continued reliance on fossil fuels.

Source: *Understanding Shared Socio-economic Pathways (SSPs) – ClimateData.ca*

Climate scenarios : 3 IEA scenarios

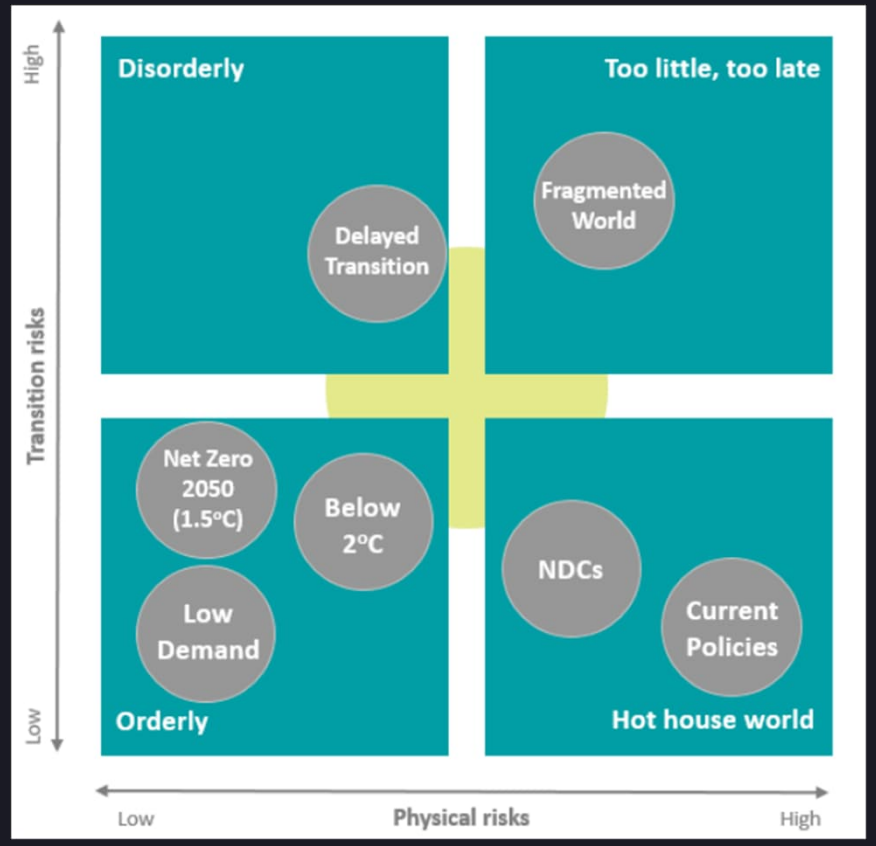


Scenario	Full Name	Description	Approx. Warming Outcome 2050
STEPS	Stated Policies Scenario	Projects future based on currently enacted policies and measures.	~2.5–2.7°C
APS	Announced Pledges Scenario	Includes both stated policies and announced net-zero or climate pledges (even if not yet implemented).	~1.7–1.8°C
NZE	Net Zero Emissions by 2050 Scenario	Roadmap to global net-zero CO_2 emissions by 2050, aligned with 1.5°C goal.	~1.5°C
SDS* (discontinued)	Sustainable Development Scenario	Previously aligned with Paris goals (<2°C) and SDGs, but no longer used.	~1.7°C

*SDS is replaced by NZE in 2021 to reflect stronger global ambition for 1.5°C.

Source: *Secure and people-centred energy transitions – World Energy Outlook 2023 – Analysis - IEA*

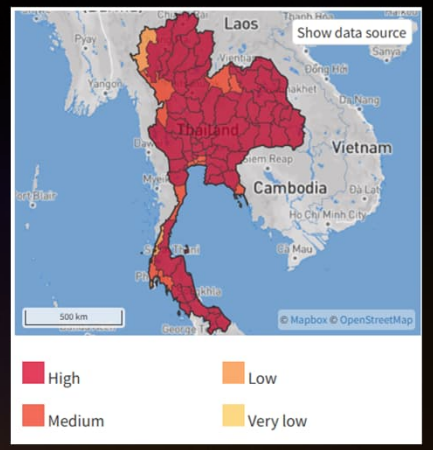
Climate scenarios : 7 NGFS scenarios



Source: *NGFS Climate Scenarios Technical Documentation v5.0*

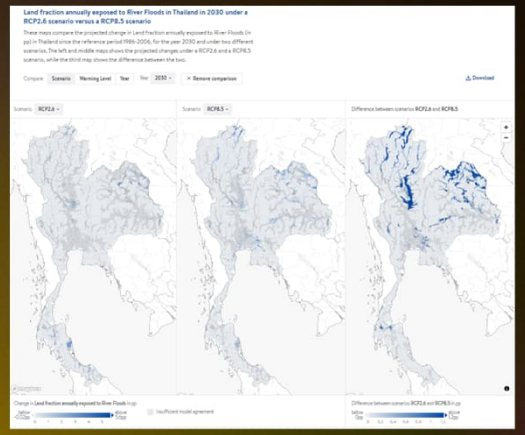
NGFS Scenario	Description	Temperature Target
Current Policies Scenario	Reflects the impact of existing policies and regulations without additional measures to mitigate climate change. It serves as a baseline for assessing climate-related risks.	No specific target; likely leads to significant warming.
Net Zero 2050 Scenario	Illustrates a pathway to achieve net-zero greenhouse gas emissions by 2050, emphasizing the need for significant reductions in emissions across all sectors and the adoption of sustainable practices.	Aiming for well below 2°C, potentially close to 1.5°C.
2°C Scenario	Provides a pathway to limit global warming to 2°C above pre-industrial levels, requiring substantial emissions reductions and a transition to low-carbon technologies and practices.	2°C
1.5°C Scenario	Aims to limit global warming to 1.5°C, necessitating even more aggressive emissions reductions and rapid implementation of sustainable technologies and practices across all sectors.	1.5°C
Delayed Transition Scenario	Assumes a slower transition to a low-carbon economy, where policies are implemented later than necessary, leading to higher emissions in the short term and increased risks in the long term.	Likely results in higher warming, potentially exceeding 2°C.
Disorderly Transition Scenario	Envisions a scenario where abrupt policy changes and market shifts occur due to climate-related events, resulting in significant economic disruptions and increased financial risks.	Potentially leads to warming above 2°C, depending on the severity of disruptions.
Orderly Transition Scenario	Describes a gradual and well-managed transition to a low-carbon economy, with proactive policies and investments that minimize economic disruptions and support sustainable growth.	Aiming for 2°C or lower, with a focus on stability and sustainability.

Examples of tools – Physical risk



Source: *Think Hazard - Thailand - River flood*

ThinkHazard is an interactive online tool that helps users assess natural hazard risks in specific locations. It provides valuable information on various hazards, including earthquakes, floods, and landslides, enabling informed decision-making for disaster preparedness, risk management, and resilience planning.

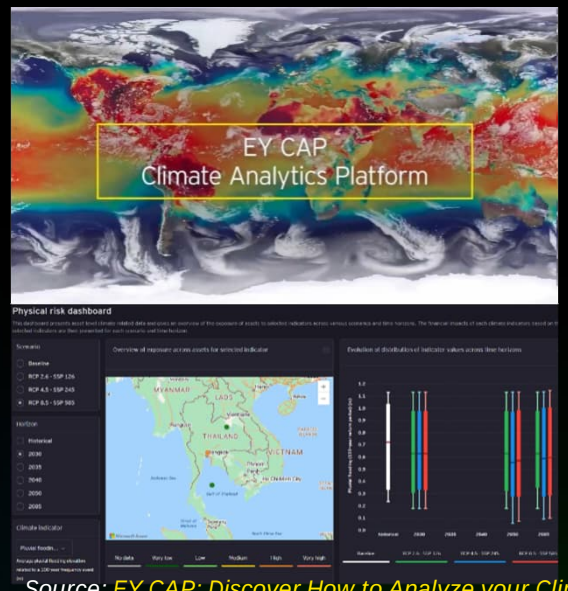


Source: *Climate Analytics – Climate impact explorer*

The Climate Analytic Tool is a robust platform that evaluates climate-related risks and impacts. It provides organizations with essential data and insights to assess vulnerabilities, inform adaptation strategies, and enhance resilience against climate change, supporting sustainable decision-making processes.

Source: *Aqueduct Water Risk Atlas*

The Aqueduct Water Risk Tool is an innovative platform that assesses water-related risks globally. It provides users with data-driven insights on water scarcity, floods, quality, and regulatory challenges, enabling organizations to make informed decisions for sustainable water management and resource allocation.

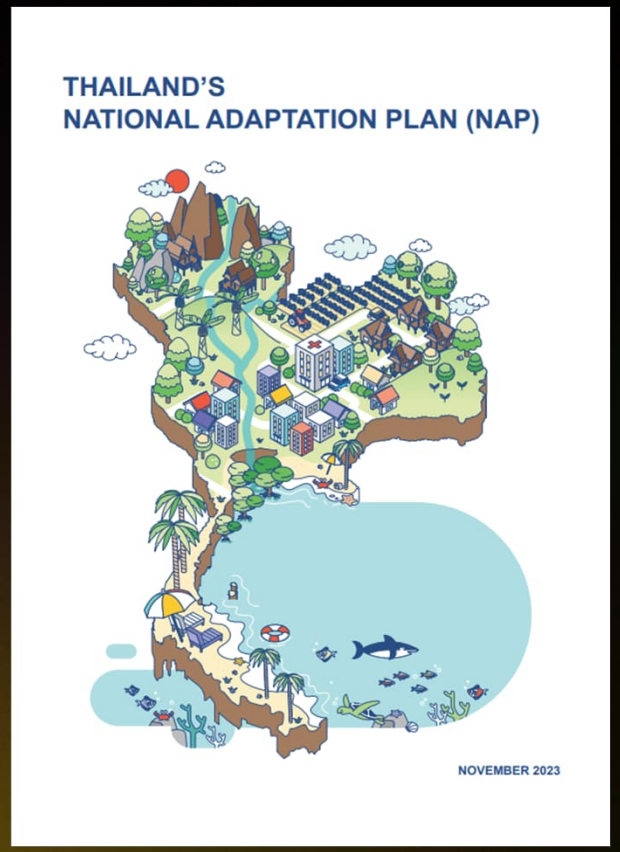


Source: *EY CAP: Discover How to Analyze your Climate Risks with EY*

EY Climate Analytics Platform (EYCAP)

A comprehensive platform leveraging IPCC-aligned data and 30+ climate models to assess physical and transition risks. It supports customized hazard analysis, financial impact evaluation across the value chain, and offers high-resolution global coverage locations.

Examples of tools – Physical risk



Source: NAP_THAILAND_2024.pdf

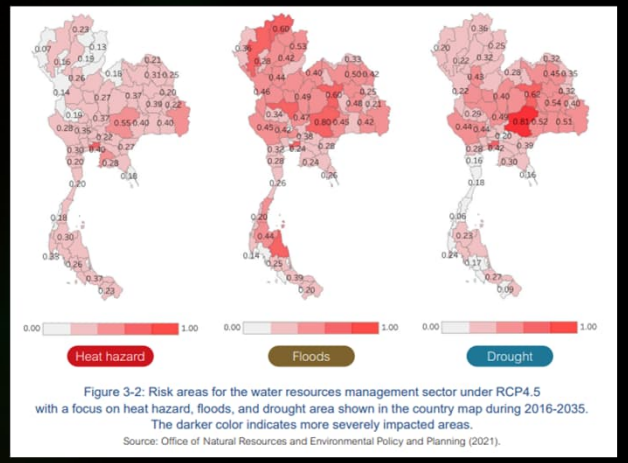


Figure 3-2: Risk areas for the water resources management sector under RCP4.5 with a focus on heat hazard, floods, and drought area shown in the country map during 2016-2035. The darker color indicates more severely impacted areas.
Source: Office of Natural Resources and Environmental Policy and Planning (2021).

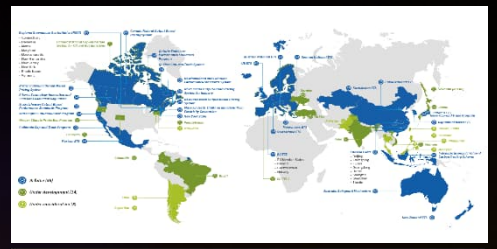
Risk areas for the water resources management sector under RCP4.5 with a focus on heat hazard, floods, and drought area shown in the country map during 2016-2035.

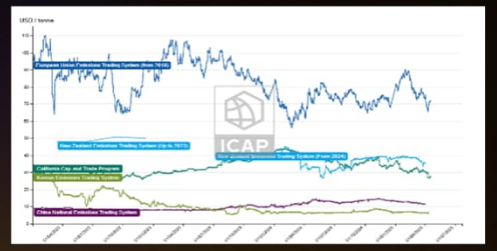
Risks for the Water Resources Management Sector		Areas
Risk areas to heat stress	RCP 4.5	Bangkok, Nakhon Ratchasima, Ubon Ratchathani, Chon Buri, Samut Prakan, Buri Ram, Si Sa Ket, Surin, Roi Et, and Khon Kaen.
	RCP 8.5	Bangkok, Nakhon Ratchasima, Ubon Ratchathani, Chon Buri, Samut Prakan, Si Sa Ket, Buri Ram, Surin, Roi Et, and Khon Kaen.
Risk areas to floods	RCP 4.5	Nakhon Ratchasima, Nakhon Si Thammarat, Chiang Mai, Bangkok, Nakhon Sawan, Chiang Rai, Khon Kaen, Ubon Ratchathani, Phitsanulok, and Nan.
	RCP 8.5	Nakhon Ratchasima, Bangkok, Nakhon Si Thammarat, Chiang Mai, Nakhon Sawan, Khon Kaen, Chiang Rai, Ubon Ratchathani, Phitsanulok, and Phra Nakhon Si Ayutthaya.
Risk areas to drought	RCP 4.5	Nakhon Ratchasima, Bangkok, Khon Kaen, Ubon Ratchathani, Roi Et, Chaiyaphum, Surin, Buri Ram, Udon Thani, and Si Sa Ket.
	RCP 8.5	Nakhon Ratchasima, Bangkok, Khon Kaen, Ubon Ratchathani, Roi Et, Nakhon Sawan, Udon Thani, Buri Ram, Sakon Nakhon, and Chaiyaphum.

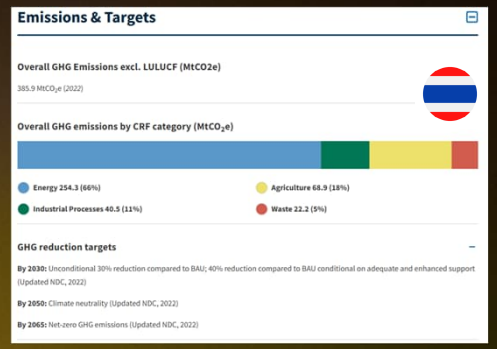
Top 10 risk areas divided by climate scenarios during 2016-2035 for the water resources management sector.

Thailand's National Adaptation Plan (NAP) outlines a strategic framework to enhance the country's resilience to climate change impacts. The latest version emphasizes addressing climate risks through comprehensive assessments and adaptation measures across various sectors, including agriculture, water resources, and public health. It incorporates climate scenarios based on Representative Concentration Pathways (RCPs) to evaluate potential future conditions. By integrating scientific data and stakeholder engagement, the NAP aims to guide sustainable development and ensure effective responses to the challenges posed by climate change.

Examples of tools – Transition risk

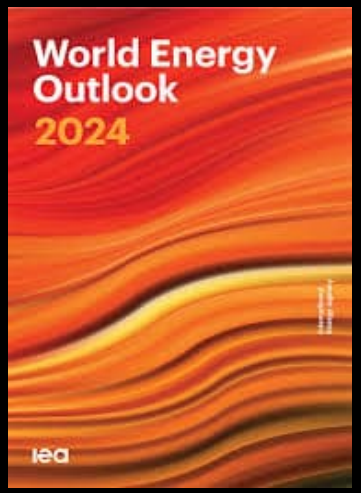


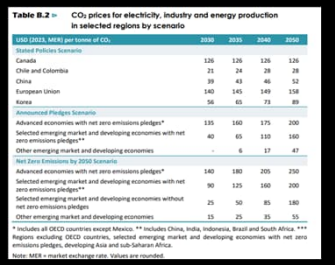


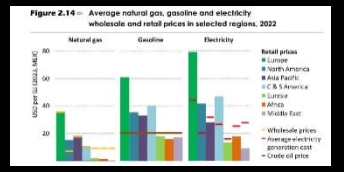


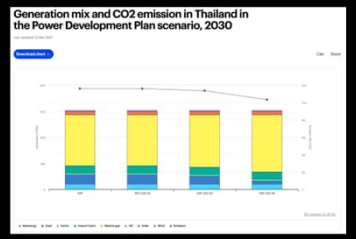
Source: [Welcome to the ICAP ETS Map | International Carbon Action Partnership]

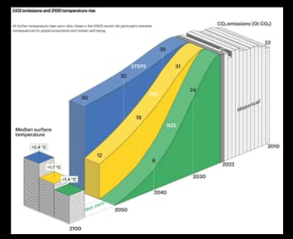
The ICAP Map is an interactive tool that provides comprehensive information on carbon pricing initiatives worldwide. It offers insights into various carbon markets, including cap-and-trade systems and carbon taxes, helping users understand the landscape of carbon pricing. By visualizing data on emissions trading schemes, the ICAP Map supports policymakers, businesses, and researchers in navigating and analyzing carbon pricing mechanisms effectively.











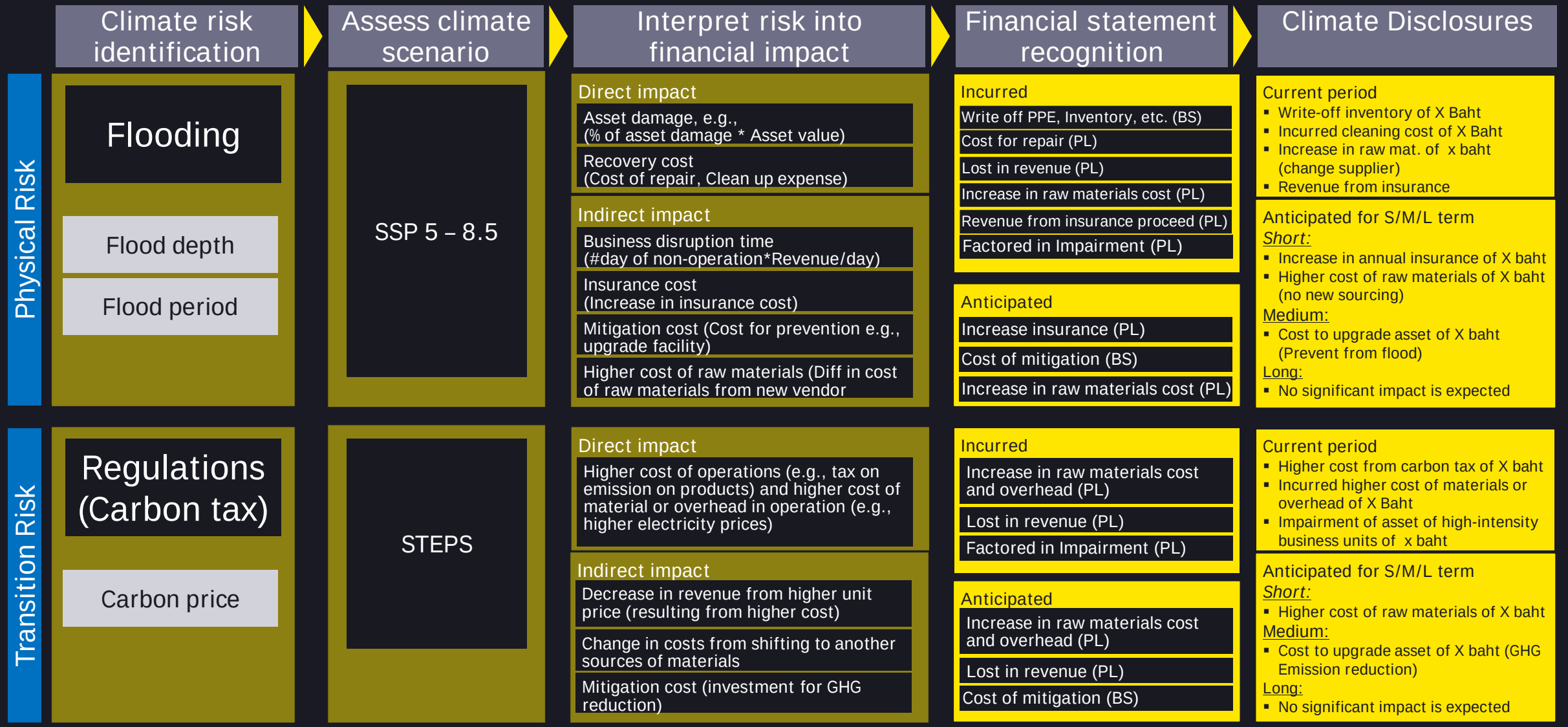
Source: [World Energy Outlook 2024 – Analysis - IEA]

The IEA World Energy Outlook presents climate scenarios that analyze future energy trends, incorporating factors such as carbon pricing and energy prices. These scenarios provide insights into potential pathways for achieving climate goals, highlighting the impact of policy decisions on energy consumption, emissions, and market dynamics. The analysis aids governments and stakeholders in formulating strategies for sustainable energy transitions and climate resilience.

Chapter 3.3

แนวทางการประเมินผลกระทบทางการเงิน

Example of assessing financial impacts from climate risk



This is for illustrative only. The impacts are not exhaustive, and the entity shall justify the materiality for disclosure.

Example of financial impacts form climate risk: Qualitative

Sector	Physical Risk	Transition Risk	Financial Impact
Power and Utility	▪ Extreme weather events ▪ (tropical cyclone, floods) ▪ Drought affecting hydropower generation ▪ Sea-level rise impacting coastal facilities	▪ Regulatory changes (carbon pricing, emissions limits) ▪ Shift to renewable energy sources ▪ Stranded assets in fossil fuel investments	▪ Increased operational costs due to infrastructure damage ▪ Potential loss of revenue from fossil fuel assets ▪ Increased capital expenditure for adaptation measures
Real Estate	▪ Flooding and storm damage to properties ▪ Heatwaves affecting livability and property demand ▪ Wildfires threatening properties in vulnerable areas	▪ Changes in zoning laws and building codes ▪ Increased insurance costs due to climate risks ▪ Market shifts towards sustainable buildings	▪ Decreased property values in high-risk areas ▪ Higher maintenance and retrofitting costs ▪ Potential loss of rental income in affected areas
Financial Sector	▪ Physical damage to collateral ▪ (e.g., properties) ▪ Disruption of operations due to extreme weather ▪ Liability risks from climate-related lawsuits	▪ Increased regulatory scrutiny on climate risks ▪ Reputational risks from financing fossil fuels ▪ Market volatility due to climate-related events	▪ Increased default risk on loans in affected sectors ▪ Potential losses from investments in stranded assets ▪ Increased costs for risk management and compliance

Source: EY Researches

Chapter 3.4

การเปิดเผยข้อมูล

Strategy: Illustrative of disclosure

Risks and opportunities, effects, and strategy

Disclose for user to understand the climate-related risks and opportunities that could reasonably be expected to affect the entity's prospects

Risk and status under 'the Group's view of the world'	Nature of the risk (considered before any mitigation or adaptation efforts)	Mitigation or adaption efforts
Flood risk vulnerability of assets (physical risk) ▪ Time horizon: Short, medium and long-term ▪ Status: Increasing	Adverse extreme weather events may on occasion impact supply chains and distribution routes. The Zahara site within Argentina experienced flooding in the current financial year with a total financial effect of US$Xm (as outlined further in Section 2.4 below). Modelling has been undertaken covering the next 15 years to inform understanding of the Group's exposure to existing and emerging flood risk to implement appropriate measures to optimise business resilience. As a result, the Group noted that the magnitude of this impact within Zahara is significant, with limited exposure for the Mettaville site (Australia) and Topaz (South Africa). A detailed assessment has been performed of the Zahara site below to provide further details on the anticipated effects over the short, medium and long-term. Although short-term exposure remains significant, it is noted that mitigation efforts are expected to reduce the risk of exposure by 2035.	For the financial effects resulting from floods to stabilise, in combination with the expected increase in carbon pricing, the Group expects to place the Zahara oil field into care and maintenance earlier than previously planned. Additionally, the implementation of mitigation and adaptation measures designed to protect the assets from damage or business interruptions from future floods might positively impact the efficiency of future operations. Further, details of mitigation and adaptation efforts are outlined in the anticipated financial effects section below.

- Describe climate-related risks and opportunities
- whether it is physical risk or transition risk
- Specify which time horizons is expected

- how the entity has responded to, and plans to respond to, climate-related risks and opportunities in its strategy and decision-making

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

This examples illustrates example of flood risk (Physical Risk)

Strategy: Illustrative of disclosure

Financial impacts (cont.)

Risk/Opportunity	2025 effects	Significant risk of material adjustment in 2026	Anticipated financial effects over short, medium and long-term
Flood risk vulnerability of assets (Physical risk)	In 2025, a severe flood impacted the lower petroleum fields in Zahara (Argentina), which resulted in a total effect on the consolidated financial statements of US$Xm. The composition of this amount is explained below. This amount does not include 'forgone revenue' from production that did not occur because of the flooding disruption. The flood resulted in: ▪ A write-off of damaged plant and equipment of US$Xm and acquisition of replacement equipment of US$Ym.	The extent of flooding in 2025 in Zahara was far greater than had been assumed in the Group's site rehabilitation plans. Environmental consultants have been engaged to re-evaluate the adequacy of the current rehabilitation plans, which will impact the estimated rehabilitation costs at the end of the field's life. The review is not yet complete and is awaiting further engineering data to be obtained and analysed.	Flood risk is expected to reduce the future cash flows that the Group expects to generate from these operations in the short to medium-term. In the long-term, this is expected to stabilise as the investments on mitigation and adaptation measures in the Climate Transition Plan are expected to reduce the magnitude of the exposure to flooding due to the closure of Zahara. In the short-term, the financial effects are expected to be a consequence of: ▪ Business interruptions due to sites being inaccessible or non-operational during the flood and clean up phase. These business interruptions will impact the volume of product sales as well as potentially expose the Group to liquidated damages claims from existing long-term customer contracts with minimum delivery conditions. ▪ Plant and equipment damage, which either will need to be repaired or replaced.
	▪ A write-off of inventories of US$Xm, which were lost after a storage tank was damaged by floodwater. ▪ An increase in repairs and maintenance costs of US$Xm to clean the site. Revenue from contracts with customers decreased by US$Xm The Group incurred liquidated damages of US$Xm associated with late delivery of products to a customer as a result of the business interruptions during and after the flooding. These interruptions were not classed as a force majeure event. Both have been presented in the statement of financial performance. The Group received insurance proceeds of US$Xm, which has been presented in the statement of financial performance. The insurance proceeds and existing working capital was used to fund the acquisition of the replacement equipment (Refer to Notes X, Y and Z of the Group's 2025 consolidated financial statements for further information.	The findings from this review will be discussed by the Board in 2026 and may result in a material change to the Group's rehabilitation provision for this site if it differs materially from current estimates Additional rehabilitation costs may also impact the headroom in asset impairment model for the Zahara CGU, which creates the potential for asset impairment in 2026. Refer to Note X of the Group's 2025 consolidated financial statements for further information.	▪ Increased operating costs associated with site clean-up and maintenance. There is a high degree of measurement uncertainty associated with the short-term financial effects of flood risk given difficulties in estimating the frequency and severity of such an event or events over such a short time horizon. Additional financial effects in the medium term are expected to arise from: ▪ Increased annual insurance costs of US$Xm due to increasing prevalence and severity of floods ▪ Costs of US$Xm to upgrade assets to mitigate or adapt to flooding risk These costs are expected to be financed from new debt facilities ▪ Increased annual rehabilitation costs (of US$Xm to US$Xm) which will impact the rehabilitation provision (by US$m) In the long term, the financial effects of floods are expected to have stabilised, based on the assumptions that: ▪ The Zahara oil field is closed (as discussed further in the transition risk relating to changing customer demand in section 2.3 above), due to high concentrations of CO_2 in the reserves and increasing carbon pricing impacting profitability. ▪ The implementation of mitigation and adaptation measures which are designed to protect the assets from damage or business interruptions from future floods will take effect. These measures are expected to improve the efficiency of operations and should offset the effect of increases in operating costs when future flood events occur.

- How climate-related risks and opportunities have affected its financial position, financial performance and cash flows for the reporting period (Current Period)
- A significant risk of a material adjustment within the next annual reporting period to the carrying amounts of assets and liabilities reported in the related financial statements
- How the entity expects its financial position to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities, taking into consideration investment and disposal plan, and source of funding
- How the entity expects its financial performance and cash flows to change over the short, medium and long term, given its strategy to manage climate-related risks and opportunities

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Financial impacts

2025 effects

In 2025, a severe flood impacted the lower petroleum fields in Zahara (Argentina), which resulted in a total effect on the consolidated financial statements of US$Xm. The composition of this amount is explained below. This amount does not include 'forgone revenue' from production that did not occur because of the flooding disruption.

The flood resulted in:

- A write-off of damaged plant and equipment of US$Xm and acquisition of replacement equipment of US$Ym.
- A write-off of inventories of US$Xm, which were lost after a storage tank was damaged by floodwater.
- An increase in repairs and maintenance costs of US$Xm to clean the site.

Connected information

- Collect financial information incurred/recognized in FS related to the flooding
- May consider refer to related clauses in financial statement (FS) to demonstrate connected information

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Financial impacts (cont.)

Anticipated financial impacts may not be recognized or disclosed in the financial statements yet

Anticipated financial effects over short, medium and long-term

Additional financial effects in the medium term are expected to arise from:

- Increased annual insurance costs of US$Xm due to increasing prevalence and severity of floods
- Costs of US$Xm to upgrade assets to mitigate or adapt to flooding risk These costs are expected to be financed from new debt facilities
- Increased annual rehabilitation costs (of US$Xm to US$Xm) which will impact the rehabilitation provision (by US$m)

In the long term, the financial effects of floods are expected to have stabilised, based on the assumptions that:

- The Zahara oil field is closed (as discussed further in the transition risk relating to changing customer demand in section 2.3 above), due to high concentrations of CO_2 in the reserves and increasing carbon pricing impacting profitability.
- The implementation of mitigation and adaptation measures which are designed to protect the assets from damage or business interruptions from future floods will take effect. These measures are expected to improve the efficiency of operations and should offset the effect of increases in operating costs when future flood events occur.

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Climate Resilience

Low-warming world

The implications for the Group's strategy and business model have been considered in the table below, this includes the Group's response to the effects identified.

Net-zero emissions is achieved by 2050; global warming limited to 1.5°C above pre-industrial levels rise.

ced early and become gradually more e is required for business resilience. o the demand for sustainable products.	Overall physical risk exposure: Low-Medium Overall transition risk exposure: Medium-High

High-warming world

Failure of current policies and commitments that are in place under 'the Group's view of the world' resulting in no robust climate-action regulations or policies installed and leading to extreme climate change.

Governments' response to climate change is slow and adaption measures to reduce emissions are halted. In this scenario there is an absence of policy in various jurisdictions leading to high-warming outcome.	Overall physical risk exposure: Very High Overall transition risk exposure: Low-Medium

Short term - 2027	Medium term - 2028-2034	Long term 2050
Physical risk exposure: Low-Medium **Transition risk exposure: Low**	**Physical risk exposure: Medium-High** **Transition risk exposure: Low-Medium**	**Physical risk exposure: Very High** **Transition risk exposure: Low-Medium**
Governments remain divided on climate action policy, leading to a lack of coordination action on emissions reductions. Some governments roll back on emissions reduction polices resulting in weakened environmental standards. While transition risks remain low, physical impacts of climate events begin to compound. Increased frequency of extreme weather events such as floods, cyclones and bushfires impact both mining operations and logistics, particularly within vulnerable regions where infrastructure is less developed. Without sufficient investment in climate adaptation measures, mining companies face rising operational disruptions.	A lack of robust transition policies keeps transition risks low, but due to rising costs and potential scarcity, the industry may face pressure to secure alternative water and energy sources to continue operations. Carbon markets remain undeveloped with limited pressure from stakeholders and customers to shift to sustainable mining practices. Physical climate change impacts intensify with more frequent severe weather events such as flooding, droughts, bushfires and heat stress. These events result in an increase in operational downtime and damage to critical mining infrastructure. Flooding and extreme weather	Governments focus on short-term adaptation measures as opposed to decarbonisation, keeping transition risks relatively low. The mining industry remains vulnerable to climate impacts. Resilience measures, such as technologies to recycle water or autonomous mining become essential to sustaining operations but come with high associated costs and difficulties to implement and upscale.

This example use two scenarios

Describe scenarios used for analysis

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Climate Resilience

Describe scenarios used for analysis

Short term - 2027	Medium term - 2028-2034	Long term 2050
Physical risk exposure: Low-Medium **Transition risk exposure: Low**	**Physical risk exposure: Medium-High** **Transition risk exposure: Low-Medium**	**Physical risk exposure: Very High** **Transition risk exposure: Low-Medium**
Governments remain divided on climate action policy, leading to a lack of coordination action on emissions reductions. Some governments roll back on emissions reduction polices resulting in weakened environmental standards. While transition risks remain low, physical impacts of climate events begin to compound. Increased frequency of extreme weather events such as floods, cyclones and bushfires impact both mining operations and logistics, particularly within vulnerable regions where infrastructure is less developed. Without sufficient investment in climate adaptation measures, mining companies face rising operational disruptions.	A lack of robust transition policies keeps transition risks low, but due to rising costs and potential scarcity, the industry may face pressure to secure alternative water and energy sources to continue operations. Carbon markets remain undeveloped with limited pressure from stakeholders and customers to shift to sustainable mining practices. Physical climate change impacts intensify with more frequent severe weather events such as flooding, droughts, bushfires and heat stress. These events result in an increase in operational downtime and damage to critical mining infrastructure. Flooding and extreme weather	Governments focus on short-term adaptation measures as opposed to decarbonisation, keeping transition risks relatively low. The mining industry remains vulnerable to climate impacts. Resilience measures, such as technologies to recycle water or autonomous mining become essential to sustaining operations but come with high associated costs and difficulties to implement and upscale.

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Climate Resilience (cont.)

Need to disclose how entity respond to each scenario

Capacity to adjust/adapt the Group's strategy and business model to climate change

The Group's capacity to remain resilient to climate change is influenced by maintaining financial flexibility to allocate capital efficiently towards emerging climate priorities. This enables the Group to respond should risks and opportunities change as a result of shifting global action. The key areas of potential changes to capital allocation are, as follows:

If a low-warming world scenario were to eventuate, the Group has capacity to:

- Increase capital allocation to the Renewable Energy Development Fund in the short-term
- Aggressively seek joint venture (JV) opportunities in green hydrogen and green ammonia projects in the short to medium term (contingent on the expected government policies)
- Accelerate investment in CCS at key oil and gas assets

Alternatively, if a high-warming world scenario were to eventuate, the Group has capacity to:

- Increase capital for adaptation projects responding to increased exposure to changing weather
- Moderate capital investment in alternative energy projects, in particular CCS, due to lower carbon pricing impacting the business case for large scale GHG emissions abatement projects
- Balance capital investment in Renewable Energy Development Fund to focus on jurisdictions with more mature renewable energy markets

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Strategy: Illustrative of disclosure

Climate Resilience (cont.)

Need to disclose capacity of entity to adjust and adapt strategy, and financial resource plan

The Group's ability to redeploy, repurpose, upgrade or decommission existing assets

Low-warming scenario

- Evaluate timing of the exit of the Group's oil and gas assets where CCS is unlikely to be viable through divestment or decommissioning
- Accelerate implementation of electrification of mining operations particularly in jurisdictions with significant exposure to carbon pricing
- Prioritise investment in nature-based solutions and direct air capture facilities
- Accelerate expansion of critical minerals assets

High-warming scenario

- Consider shifting production across the portfolio to assets less exposed to physical risks of climate change
- Establish and implement climate resilience plans for exposed assets and decommission any assets where physical impacts of climate change would render the assets unprofitable

The above actions will be implemented should it become clear that a pathway more aligned to the above scenarios is emerging. Further detail on the outcomes of the scenario analysis is provided in the table above.

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Example disclosure : Note to financial statements

Major judgments and accounting estimates

IMPAIRMENT OF PROPERTY, PLANT AND EQUIPMENT, INTANGIBLE ASSETS AND GOODWILL

As part of the determination of the recoverable value of assets for impairment (IAS 36), the estimates, assumptions and judgments mainly concern hydrocarbon prices scenarios, operating costs, production volumes and oil and gas proved and probable reserves, refining margins and product marketing conditions (mainly petroleum, petrochemical and chemical products as well as renewable industry products). The estimates and assumptions used by the executive management are determined in specialized internal departments in light of economic conditions and external expert analysis. The discount rate is reviewed annually.

In 2020, in line with its new Climate Ambition announced on May 5, 2020, which aims at carbon neutrality, TotalEnergies had reviewed its oil assets that could be qualified as "stranded", and therefore had decided to impair its oil sands assets in Canada.

Impairment of assets and the method applied are described in Note 3 "Business segment information".

Note 3 Business segment information

Impairment losses recognized by segment

Impairments recognized in 2022 have an overall impact of $(15,743) million in net income, TotalEnergies share, and mainly relate to the Company's assets in Russia, for an amount of $(14,756) million.

The CGUs of the Exploration & Production segment are defined as oil and gas fields or groups of oil and gas fields with industrial assets enabling the production, treatment and evacuation of the oil and gas. For the financial year 2022, the Company recorded impairments of assets over CGUs of the Exploration & Production segment for $(588) million in operating income and $(11,141) million in net income, TotalEnergies share.

Impairments recognized in 2022 mainly relate to the Company's assets in Russia for an amount of $(10,527) million in net income TotalEnergies share, mainly relating to the investment in Novatek.

They also take into account the impairment of the North Platte project assets for $(957) million in net income, TotalEnergies share, following the Company's decision announced in February not to sanction and so to withdraw from this deepwater project in the Gulf of Mexico.

The impairments recognized also include a reversal of impairment on the Company's assets in Canada. In the context of the project to spin-off the Company's upstream activities in Canada, an impairment test was carried out, and the resulting value in use led to a reversal of impairment of $728 million in net income, TotalEnergies share.

2.3 DIVESTMENT PROJECTS

As of December 31, 2022, there is no material divestment project recorded in "assets held for sale".

In line with its low-carbon strategy, TotalEnergies announced in September 2022 its intention to exit the Canadian oil sands through a spin-off of its subsidiary TotalEnergies EP Canada in 2023. The spin-off is expected to be submitted to the vote of the Annual General Meeting of Shareholders in May 2023.

As of December 31, 2022, the subsidiary TotalEnergies EP Canada is not presented as an asset held for sale in the consolidated financial statements, as the transaction is notably subject to approval of TotalEnergies' shareholders in May 2023.

TotalEnergies

As impact of regulations, the Company has determined some asset as stranded asset and recognized as impairment in 2020.

In 2022, the company has plan to spin-off such Canada asset and disclose whether or not such subsidiary is classified in asset held for sale in its noted to financial statements

Source:https://totalenergies.com/sites/g/files/nytnzq121/files/documents/2023-03/TotalEnergies_URD_2022_EN.pdf

Chapter 4

แนวทางการและตัวอย่างการเปิดเผย: การบริหารจัดการความเสี่ยง

Risk Management : Key disclosures

What the company needs to have

Risk Management

1. Risk management process that identifies, assess, prioritise and monitor climate-related risks as part of enterprise risk management

Key disclosures

Risk Management

1. Climate-related risk process

Risk Management : Example of disclosure

Commerce: CP Axtra

CP Axtra incorporated climate change risk into its enterprise risk management (ERM) using the COSO ERM Framework. The risk management process included governance, strategy & objective, performance setting, review & revision, and information, communication & reporting.

Climate Change Risk Management

Having completed the climate change risk assessment, CP Axtra adopts the Committee of Sponsoring Organizations of Treadway Commission (COSO) international standard to guide its risk policies, objectives, management frameworks, and management structure. See **Figure** 4 for how climate change risk management is integrated in the Company's adoption of the COSO ERM Framework.

Figure 4 Climate Change Risk Management in the COSO ERM Framework

Climate change as a cross-cutting theme is well embedded in this COSO ERM Framework. CP Axtra has established robust climate governance, as described in the **Governance** section of the report. Under the **Strategy & Objective Setting** pillar, a comprehensive climate change risk assessment was conducted and introduced above. Based on the findings of the climate change risk assessment, the climate strategy framework which outlines the Company's climate-related targets, pillars and key initiatives has been formulated by the Climate Resilience Working Group and endorsed by the Sustainability Development Committee (see next section for more information). Meanwhile, under **Performance**, the Company has made climate action plans, informed by the climate change risk assessment and the climate strategy framework, to prioritize the risk items and **response** measures that it will focus on in the short, medium, and long term. Climate performance has been and will continue to be regularly tracked by key performance indicators (KPIs) and will be **reviewed** annually by the Climate Resilience Working Group, while revisions of the climate strategy, targets and KPIs will be conducted on an as-needed basis. Finally, CP Axtra is committed to constantly updating and communicating its climate strategy and performance Climate resilience's at link Environment (Home) | CP Axtra including our TCFD report at tcfd-report-en.pdf and the CDP Report at cdp-report-en.pdf

Source : CP Axtra Public Company Limited: TCFD Disclosures 2025, TCFD Report Rev.02, 23 May 2025

Risk Management：Example of disclosure

Food: ThaiBev

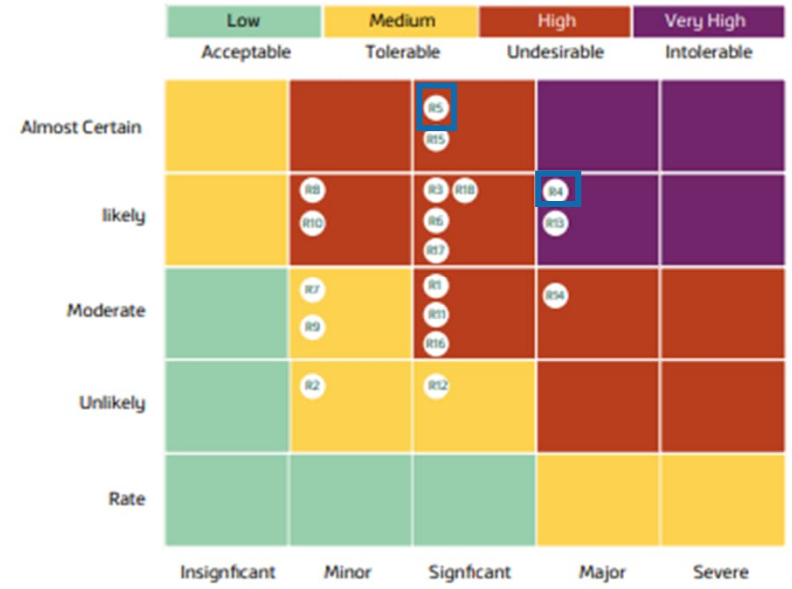
ThaiBev considered climate-related risks in the overall risk management including risk prioritization. Climate-related issues were ranked as 'very important' by ThaiBev.

The identified climate-related risks and opportunities are prioritized via the following primary activities to develop effective risk management measures:

- Stakeholder engagements with senior ThaiBev executives to assess the impact of identified climate-related risks on the organization across three key aspects: finance, operations, and reputation.
- Interviews to evaluate the significance of potential climate-related impacts across nine key stakeholder groups: customers, consumers, investors, communities, regulators, trade associations, vulnerable group, employees, and suppliers.

Climate-related issues that were ranked as "very important" by ThaiBev and its relevant stakeholders were considered material sustainability issues (figure 7). As part of the ranking, assessment, scoping, prioritization, and monitoring of identified risks and opportunities, regulatory risks are also considered. In line with the potential implementation of Climate Change Act: Thailand Climate Change Act will mandate regular climate-related assessments, which will inform decision-making and guide investments in operations. By integrating climate risk considerations in risks and opportunities assessment processes, ThaiBev aims to safeguard its business and ecosystems against the adverse effects of a changing climate and upcoming regulation.

Figure 7: Risk Heat Map



Strategic Risk

1. Business Investment Risk
2. Corporate Image and Reputational Risk
3. Macroeconomic and Industry Structure Risk

ESG Risk

4. Water-related Risk
5. Climate Change Risk
6. Packaging Management Risk
7. Stakeholders' Health and Safety Risk
8. Changing Consumer Behavior and Demographic Shifts Risk
9. Ethics and Compliance Risk
10. Geopolitical Risk

Operational Risk

11. Supply Chain Risk
12. Financial Risk
13. Human Capital and Succession Risk
14. Business-related Regulatory Shifts Risk
15. Cyber Threats and Data Privacy Risk

Emerging Risk

16. Adverse Outcomes of AI Technologies Risk
17. Extreme Weather Events Risk
18. Natural Resource Shortages Risk

Source : Thai Beverage Public Company Limited, Task Force on Climate-Related Financial Disclosure (TCFD) Report 2024

Chapter 5

แนวทางการและตัวอย่างการเปิดเผย: เป้าหมายและตัวชี้วัด

Metrics and Targets: Key disclosures

What the company needs to have	Key disclosures
Metrics 1 GHG emission data by scope 2 Amount and percentage of assets or business activities vulnerable to climate-related risks & opportunities, capital deployment* 3 Internal carbon price 4 Renumeration that ties to climate-related performance** 5 List of metrics relevant to the industry **Targets** 1 Climate-related KPIs	**Metrics** 1 Scope 1-3 GHG emissions 2 3 Other climate-related metrics 4 Climate-related renumerations 5 Industry-based disclosures **Targets** 1 Climate-related targets

* Disclosure item under Metrics but in practice, such information is often appeared under Strategy
** Disclosure item under Metrics but in practice, such information is often appeared under Governance

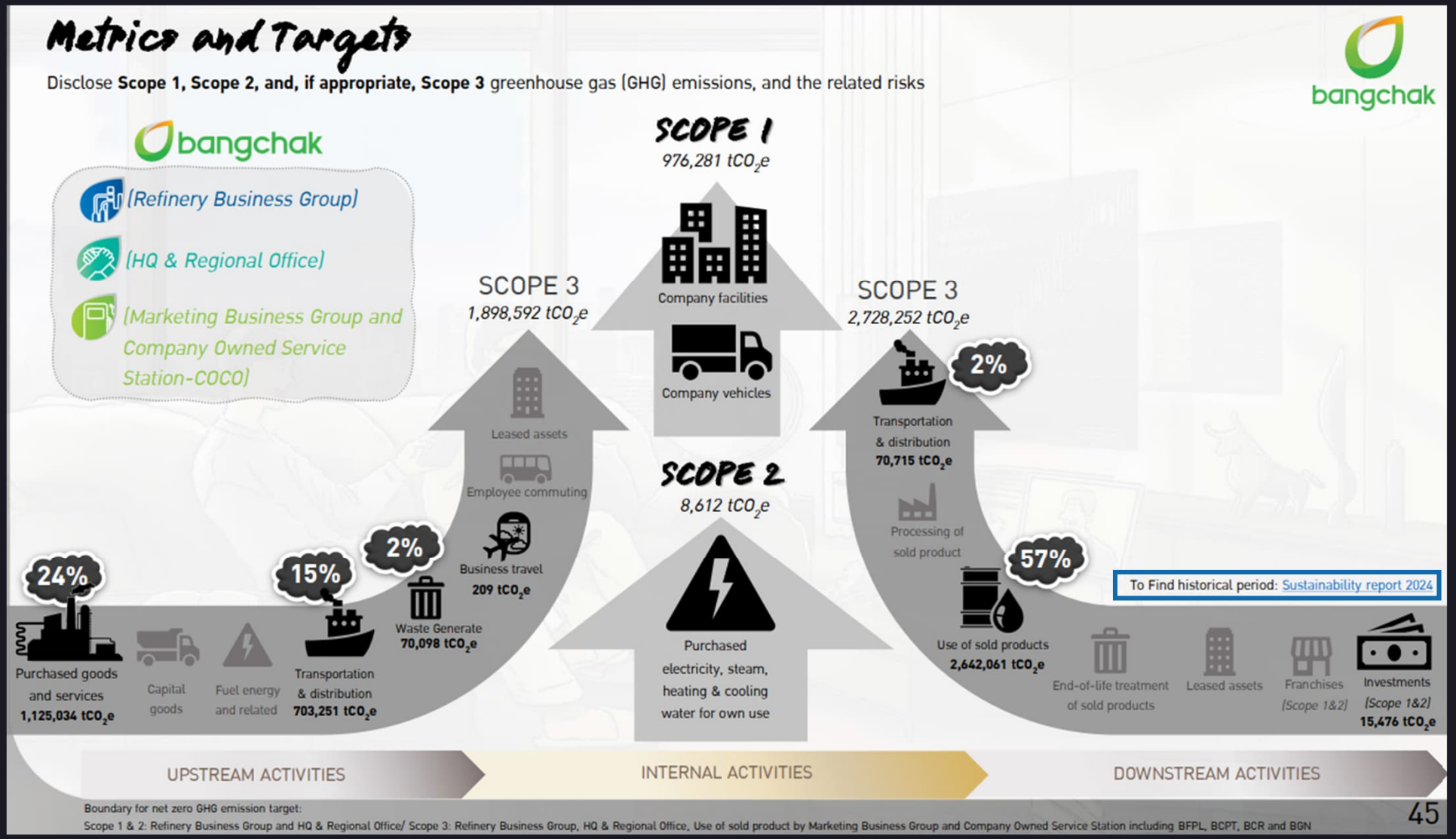
According to public hearing document issued by SEC, GHG emission data shall be verified by those who registered with TGO or have verified in accordance with internally accepted assurance standards (e.g. ISAE, ISSA 5000 or ISO).

Additionally, Singapore mandates listed companies to verify GHG emission scope 1 & 2 from 2027 onwards. Other countries such as Malaysia are considering the mandatory verification of GHG emission data.

Metrics and Targets: Example of “Metrics” disclosure

Energy: Bangchak

Bangchak disclosed GHG emission by scope (1, 2 & 3) including the breakdown of scope 3 and referred to the sustainability report for comparative information.



Source : Bangchak Corporation Public Company Limited, Climate Strategy Task Force on Climate -Related Financial Disclosures (TCFD 2025)

Metrics and Targets: Example of “Target” disclosure

1a)	Transition to Electric Mining Fleet
Metric	Percentage (%) of mining fleet that is converted to electric-powered vehicles
Objective	Mitigation of Scope 1 and 2 GHG emissions
Scope	Applies to all operations (including international), and the entire mining fleet
Period	
Base period	
Milestones a	
Target type (	
Alignment wi commitment	
Validation	
Review proce	
Metrics for m	
Revision	
Progress ach and status at	

1b)	Target to reduce Scope 1 and 2 emissions by 30%
Metric	Portfolio-wide emissions (carbon dioxide, methane and nitrous oxide) reduction to net zero for Scope 1 and 2 emissions by 2050 with reference to the base line period 2023, measured in CO_2-e
Objective	Mitigation of Scope 1 and 2 GHG emissions
Scope	Applies cross the portfolio within the reporting entity
Period	2025-2050
Base period	2023
Milestones and interim targets	30% conversion by 2030
Target type (absolute or intensity)	Absolute quantitative target
Carbon credits	To achieve the interim target by 2030, some carbon credits are planned to be used (with a limit of XX% of planned carbon reduction), For the 2050 long-term target, there is no planned use of carbon credits to achieve this target. This approach is discussed further in the next section.
Alignment with jurisdictional commitment	Informed by the latest international climate agreements (Paris)
Validation	The target and methodology have been validated by [Third Party Validator Name].
Review process	This target is reviewed quarterly by the ESG Committee and follows the escalation process of the ESG targets as set out in the Governance section.
Metrics for monitoring progress:	Portfolio-wide emissions reduction to net zero by year end 2049
Revisions	Any revision to the target will be disclosed and explained in the annual climate-related report. No revisions have been made to the target in the current period.
Progress achieved during the year and status at year end	The Group provides potential pathways it follows that will allow it to achieve the 2050 target. The Group continues to make progress towards this target noting a 15% reduction was achieved in the current year

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

- Disclose targets & requirement for each target
- Approach to setting and review target
- Performance against target
- Specific requirement if target is GHG Target

Target setting process and review approach

The Group's climate targets and the methodologies for setting these targets have been validated by independent third party XYZ Consultants in January 2025.

The Group conducts quarterly reviews of its climate targets. These reviews involve a comprehensive assessment by the ESG committee, which includes both internal experts and external advisors.

Progress towards climate targets is monitored using a set of key performance indicators (KPIs), including GHG emissions intensity, renewable energy usage, and energy efficiency improvements.

Any revisions to the targets are made based on the outcomes of the quarterly reviews. For instance, if a target is found to be either too ambitious or not ambitious enough, adjustments are made accordingly. Each revision is accompanied by a detailed explanation and approval by the Board, highlighting the rationale behind the change. There have been no changes to previously set targets in the current period.

Performance against climate-related targets

The Group has made significant strides in reducing its carbon footprint. Over the past year, the Group has achieved an XXX% reduction in GHG emissions intensity, surpassing its annual target of XXX%. The analysis indicates a positive trend in the company's climate performance, driven by increased investment in renewable energy projects and the implementation of energy-efficient technologies across its operations. Additionally, there has been a notable shift towards more sustainable practices in supply chain management, contributing to overall performance improvements.

Planned use of carbon credits to achieve its targets

The Group’s primary goal is to reduce operational GHG emissions through structural abatement measures. The Group aims to achieve its emissions reduction targets by implementing effective GHG mitigation strategies, noting that between now and the 2030 interim target, the Group plans to use voluntary carbon credits to bridge the shortfall, arranging it remains on track to meet its objectives.

Metrics and Targets: Example of “Target” disclosure

1b)	Target to reduce Scope 1 and 2 emissions by 30%
Metric	Portfolio-wide emissions (carbon dioxide, methane and nitrous oxide) reduction to net zero for Scope 1 and 2 emissions by 2050 with reference to the base line period 2023, measured in CO_2-e
Objective	Mitigation of Scope 1 and 2 GHG emissions
Scope	Applies cross the portfolio within the reporting entity
Period	2025-2050
Base period	2023
Milestones and interim targets	30% conversion by 2030
Target type (absolute or intensity)	Absolute quantitative target
Carbon credits	To achieve the interim target by 2030, some carbon credits are planned to be used (with a limit of XX% of planned carbon reduction), For the 2050 long-term target, there is no planned use of carbon credits to achieve this target. This approach is discussed further in the next section.
Alignment with jurisdictional commitment	Informed by the latest international climate agreements (Paris)
Validation	The target and methodology have been validated by [Third Party Validator Name].
Review process	This target is reviewed quarterly by the ESG Committee and follows the escalation process of the ESG targets as set out in the Governance section.
Metrics for monitoring progress:	Portfolio-wide emissions reduction to net zero by year end 2049
Revisions	Any revision to the target will be disclosed and explained in the annual climate-related report. No revisions have been made to the target in the current period.
Progress achieved during the year and status at year end	The Group provides potential pathways it follows that will allow it to achieve the 2050 target. The Group continues to make progress towards this target noting a 15% reduction was achieved in the current year

For each target:-

- Metric
- Objective
- Regions/ entity included
- Period
- Based period
- Milestone
- Absolute/ Intensity

Source: ey-gl-ifrs-good-group-climate-disclosures-03-2025.pdf

Q&A

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Governments and organizations around the world are increasingly focusing on the environmental, social and economic impacts of climate change and the drive for sustainability.

Your business may face new regulatory requirements and rising stakeholder concerns. There may be opportunities for cost reduction and revenue generation. Embedding a sustainable approach into core business activities could be a complex transformation to create long-term shareholder value.

The industry and countries in which you operate as well as your extended business relationships introduce specific challenges, responsibilities and opportunities.

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APAC no. 15001578

ED None.

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