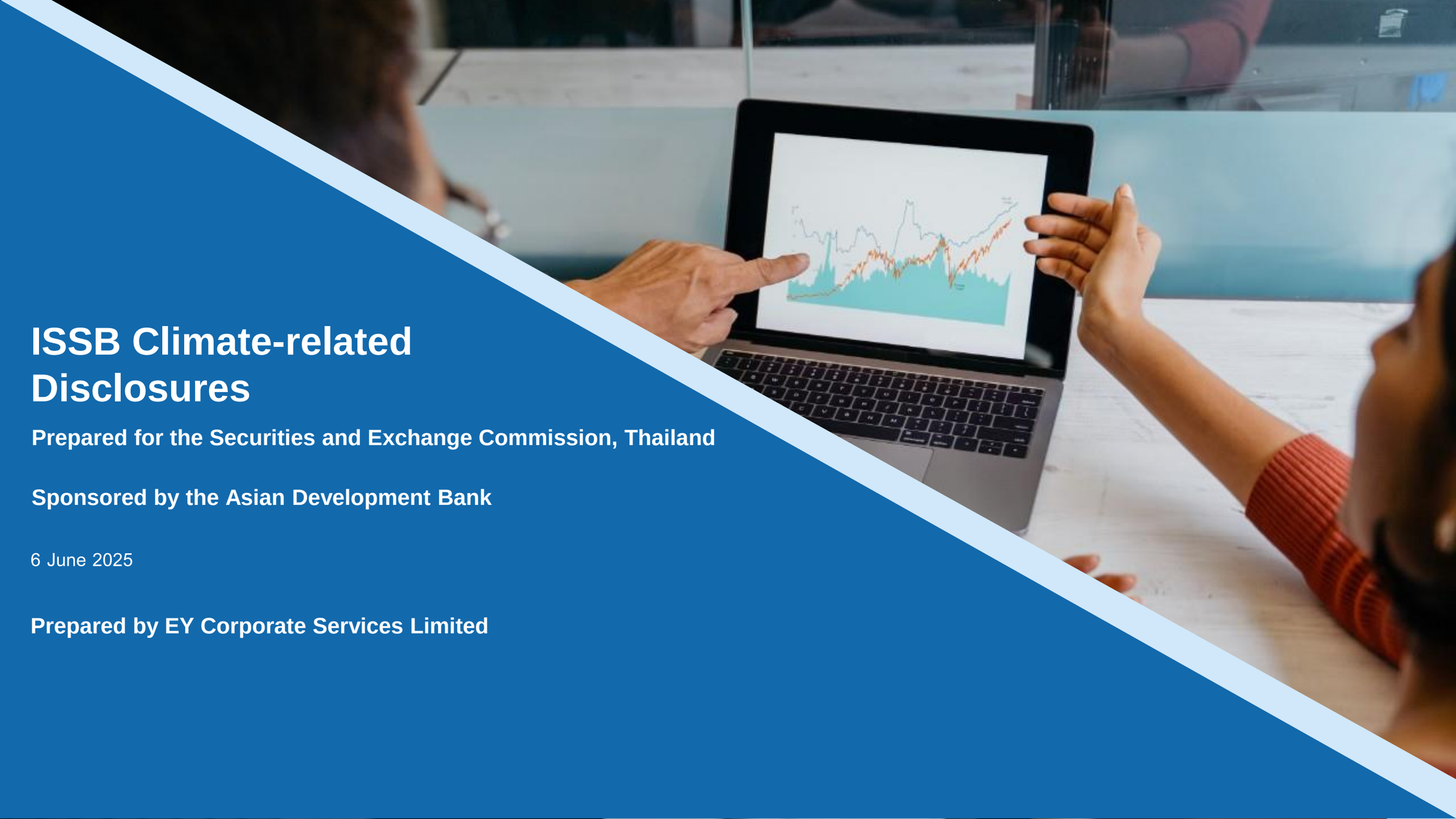


ISSB Climate-related Disclosures

Prepared for the Securities and Exchange Commission, Thailand

Sponsored by the Asian Development Bank

6 June 2025

Prepared by EY Corporate Services Limited

Topics

- Overview
- Governance
- Strategy and Risk Management
- Metrics and Targets
- Summary
- References
- Q&A

Overview: Element of IFRS S1 that applies to IFRS S2

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

Transition relief

These requirements in IFRS S1 are necessary for any disclosures. This is why if an entity only reports on climate, it still must use IFRS S1

Overview: Mechanisms to address proportionality

Summary of ISSB decisions that assist with proportionality in the application of IFRS S2

Area	Mechanisms to address proportionality challenges		Additional clarifications/mechanism to facilitate application
	Concept of ‘reasonable and supportable information without undue cost or effort’(a)	Consideration of skills, capabilities and resources	Concept of ‘unable to do so’(b)
Identification of risks and opportunities	X		
Determination of the scope of the value chain	X		
Current financial effects			X
Anticipated financial effects	X	X	X
Climate-related scenario analysis	X	X	
Measurement of Scope 3 GHG emissions	X		
Calculation of metrics in particular cross-industry metric categories	X		

(a) See paragraphs BC10–BC17 of the Basis for Conclusions on IFRS S1 for further information about using ‘reasonable and supportable information’.
(b) Although the term ‘unable to do so’ was used in the Exposure Draft, it is no longer used in IFRS S2; however, this concept is articulated through whether the current or anticipated financial effects are separately identifiable or whether the level of measurement uncertainty involved in estimating those effects is so high that the resulting quantitative information would not be useful.

Source: IFRS S2 Basic for Conclusions

IFRS S2: Content

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

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

Energy: BP

BP explains the roles and responsibilities of board committees and management. It also discloses how the company assesses the qualifications of board members regarding the Climate and sustainability expertise.

The board's role

One of the core roles of the board is to promote the success of the company for the benefit of its shareholders as a whole while having regard to various factors, including the interests of our other stakeholders and the impact of our operations on the environment and the communities where we operate.

In performing this role, the board sets and monitors bp's strategy. It is responsible for monitoring bp's management and operations and obtaining assurance about the delivery of its strategy.

Any changes to the company's purpose, strategy and values (which we call 'Who we are') are reserved for the board for approval in accordance with the board-approved corporate governance framework.

The board's responsibilities extend to oversight of bp's internal control and risk management framework, including climate-related risks and opportunities, as set out in the terms of reference of the board, available online at **bp.com/governance**.

The board considers that our strategy allows bp to be flexible to adapt to the evolution of the external environment, including market changes, to remain consistent with the Paris goals, see **page 21**.

The board and its committees have oversight of climate-related issues[f], which include climate-related risks and opportunities. Related board and committee activities are set out within the board activities section and committee reports respectively, which can be found on the pages detailed in the table on **page 43**.

Climate-related risks and opportunities were discussed at each board meeting covering strategy in 2024, and the committees considered climate-related issues where appropriate to do so in fulfilling their responsibilities. Oral reports from each of the committee chairs are given at board meetings to keep the board apprised of the relevant matters discussed including, where applicable, climate-related risks and opportunities.

Our company secretary's office manages the process by which board and committee agendas are set and works closely with teams in bp to develop materials that assist the board to discharge its responsibilities, including in respect of climate-related issues.

The board also reviewed documents containing climate-related disclosures – including these TCFD disclosures.

The board is due to receive further updates on bp's strategic process and sustainability frame in 2025.

Climate and sustainability expertise

The board believes its members possess the necessary expertise related to climate change and sustainability to support the group's strategy. In particular, six of our non-executive directors have specific climate change and sustainability expertise, as set out below.

This determination is based on an assessment of their background and experience, with a focus on their background in the energy sector, experience in executive roles and depth of experience in sustainability and climate change, including climate-related risks and opportunities.

For more general director skills information, see **page 71.**

- **Dame Amanda Blanc** is the current serving CEO at Aviva plc and has held several executive roles across the industry. She was co-chair of the UK Transition Taskforce and Principals Group Member of Glasgow Financial Alliance for Net Zero (GFANZ).
- **Helge Lund** has extensive experience in the energy sector and deep knowledge and global experience including stakeholder considerations regarding climate change risk and opportunities. He has chaired the board through the development of bp's strategy and net zero ambition and continues to have oversight of the delivery of that strategy. He served as a member of the UN Secretary-General's Advisory Group on Sustainable Energy from 2011 to 2014.

Source: BP Annual Report 2024

Governance: Example

Industrials: Indorama

Indorama discloses climate-related governance structure as well as roles and responsibilities of board, management, and operational levels.

	Governing Structure	Roles and Responsibility	Meeting Frequency
Board level	Board of Directors	• Oversight of climate-related risk and opportunities • Ensure decarbonization strategies is in-line with the company's business strategy	Yearly
	Sustainability and Risk Management Committee	• Oversight and review decarbonization activities and performance • Monitors key business risks	Quarterly
Management level	IMC	• Ensure that the decarbonization initiatives are implemented as planned	Quarterly
	Manufacturing Excellence Council	• Provide environmental stewardship including water management • Establish standard operating procedure to maximize asset operating efficiency	Quarterly
	ESG Council	• Advocates and push policies and initiatives to ensure sustainability progress	Quarterly
Operational level	Decarbonization Committee	• Monitors emerging technologies required to decarbonize operations of the companies • Evaluate financial feasibilities of sustainability initiative to be approved by the management	Monthly
	Sustainability Department	• Relay climate-related data, and monitor sustainability progress • Assisting SRMC in decarbonization performance monitoring	Monthly

Source: Indorama Ventures Public Company Limited, Climate-Related Risk Management Report 2024

Strategy and Risk Management: 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

Risk Management

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

Key disclosures

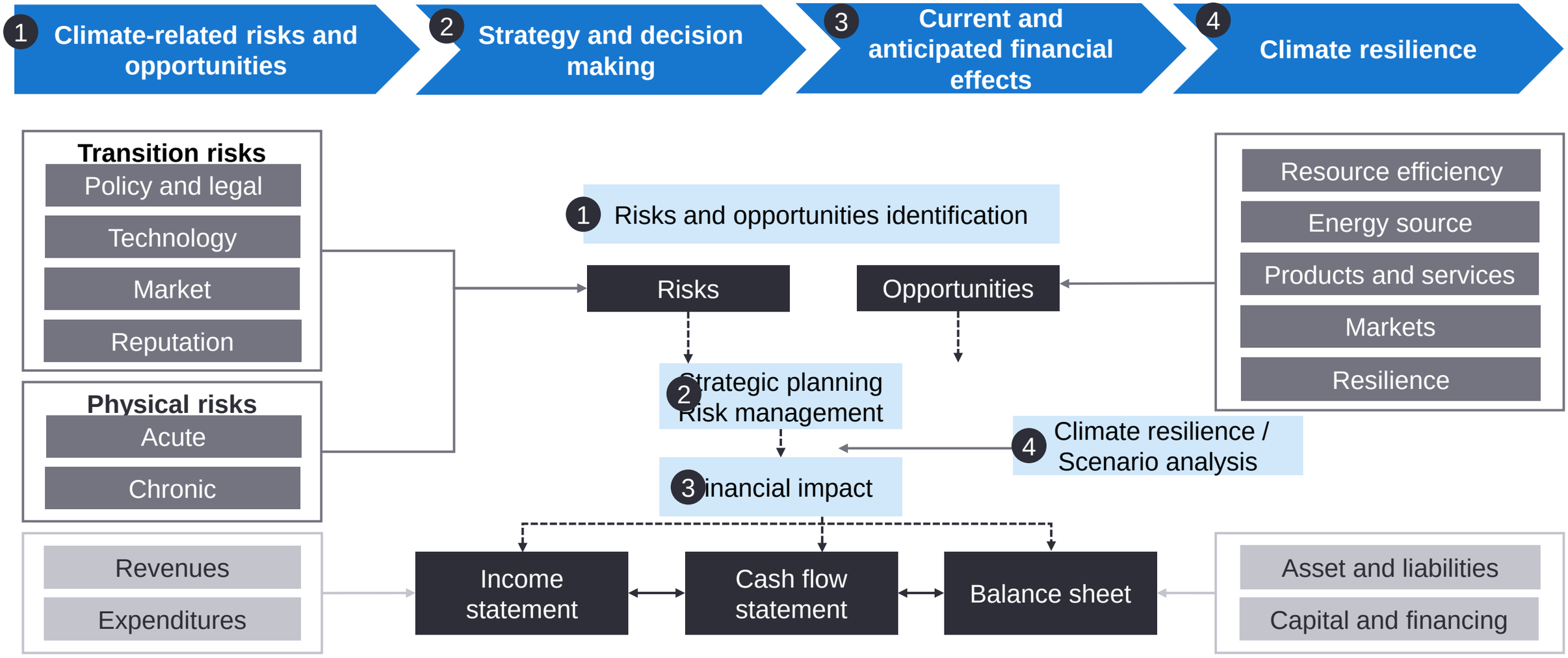
Strategy

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

Risk Management

1. Climate-related risk process

Strategy and Risk Management: Overview



Source: TCFD, Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures pg. 8, June 2017

Strategy and Risk Management: 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

Strategy and Risk Management: 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

Strategy and Risk Management: Physical risk analysis

Climate Risk Category

การจำแนกความเสี่ยงที่เกี่ยวข้องกับการเปลี่ยนแปลงสภาพภูมิอากาศ

- Transition Risk
- **Physical Risk**

1 **Climate Risk**

ระบุความเสี่ยง

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

Physical Risk
- Acute Risk
- Chronic Risk

2 **Climate Risk Drivers**

ระบุตัวขับเคลื่อนความเสี่ยง

Acute
- Flood
- Tropical cyclone

Chronic
- Sea level rise
- Increase temperature

3 **Climate Risk Driver Indicators**

ระบุตัวชี้วัดความเสี่ยง

Flood
- Flood Depth (m)

Tropical cyclone
- Wind speed (km/hr)

Drought
- Soil moisture (%)


TODAY'S CLIMATE

Droughts in Brazil and Vietnam Are Driving up Global Coffee Prices

Climate change is projected to drastically reduce suitable coffee-growing regions by 2050.

By Kiley Price
December 3, 2024

Coffee harvesters in Brazil are struggling in the aftermath of the worst drought in decades. Credit: Steffen Stubager/Anadolu Agency via Getty Images

Source: Droughts in Brazil and Vietnam Are Driving up Global Coffee Prices - Inside Climate News

4 **Financial Impact**

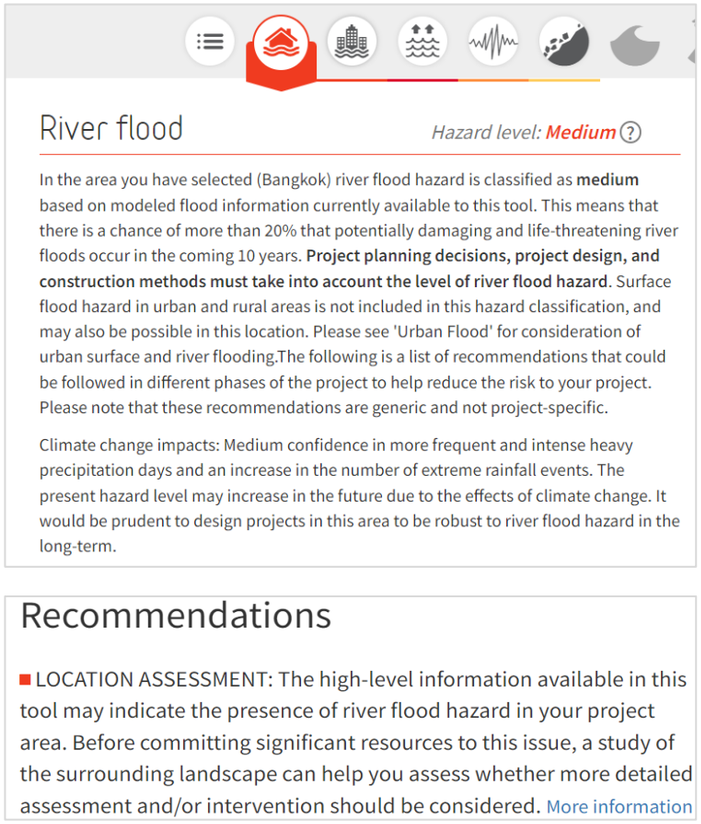
การประเมินผลกระทบทางการเงิน

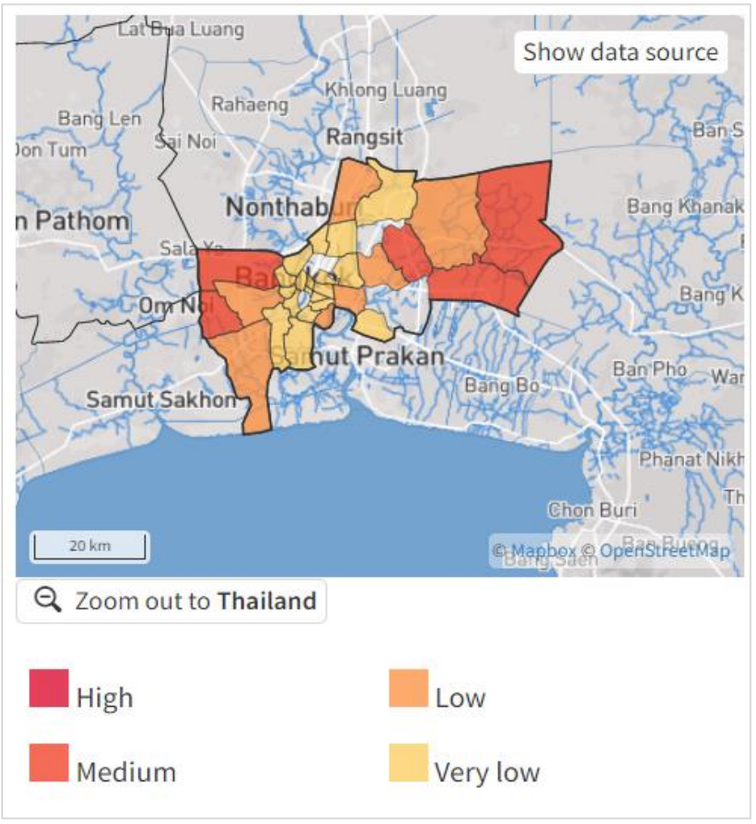
Direct Impact
- Properties are damaged by flooding/cyclone
- Impact on crop yields, causing reduced production

Indirect Impact
- *Revenue loss due to disrupting supply chains e.g. road close*

Strategy and Risk Management: Physical risk analysis

Example of tools for physical risk assessment: ThinkHazard



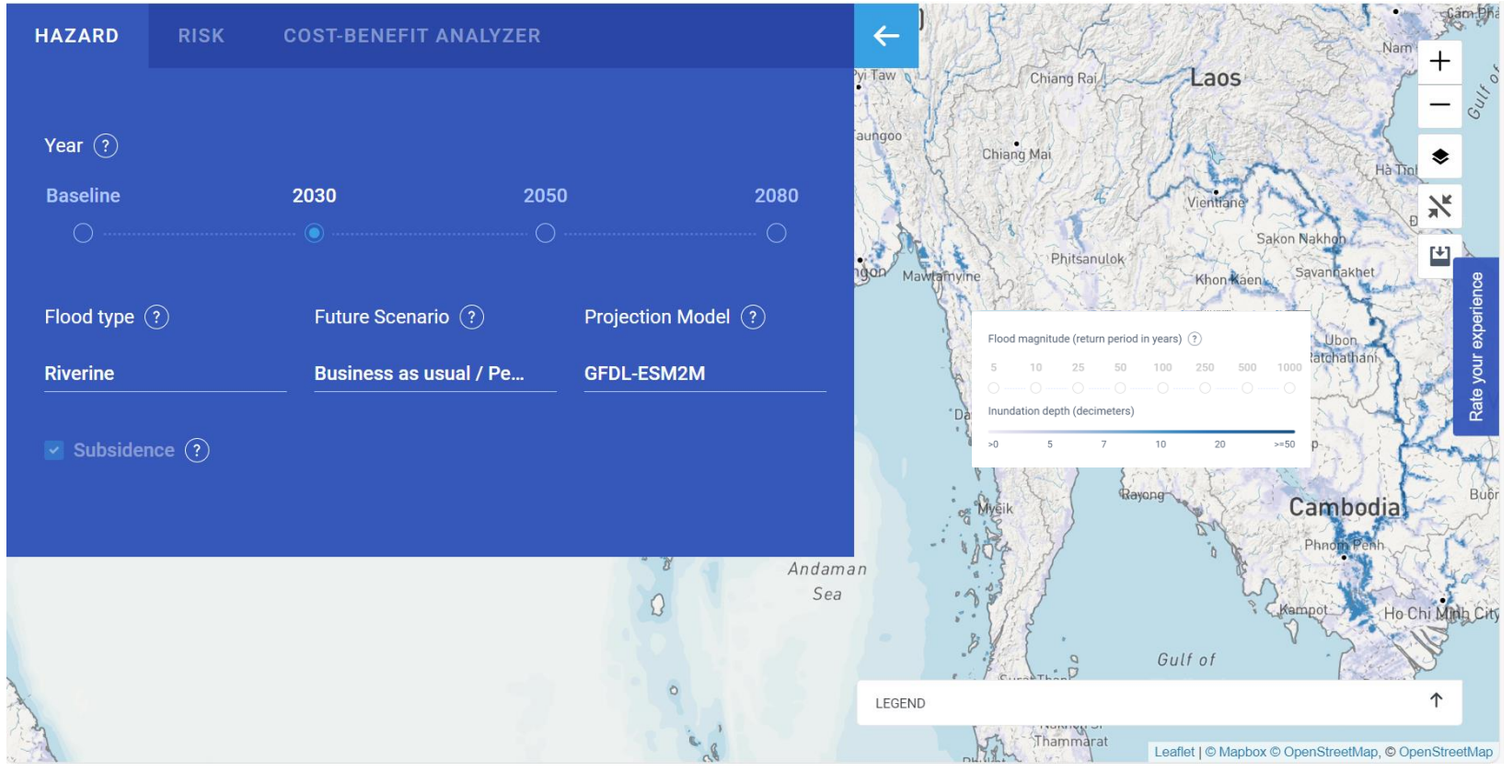


ThinkHazard! provides a general view of the hazards, for a given location, that should be considered in project design and implementation to promote disaster and climate resilience. The tool highlights the likelihood of different natural hazards affecting project areas (very low, low, medium and high), The hazard levels provided are based on published hazard data, provided by a range of private, academic and public organizations.

Source: Link: https://thinkhazard.org/en/

Strategy and Risk Management: Climate scenario analysis

Scenario analysis tool – Aqueduct Floods



Scenario Analysis

Business as Usual represent RCP 8.5, a pessimistic climate scenario under Business-as-Usual development.

Optimistic scenario represent RCP 4.5, a world with carbon emission peaking and declining by 2040 and stable economic development.

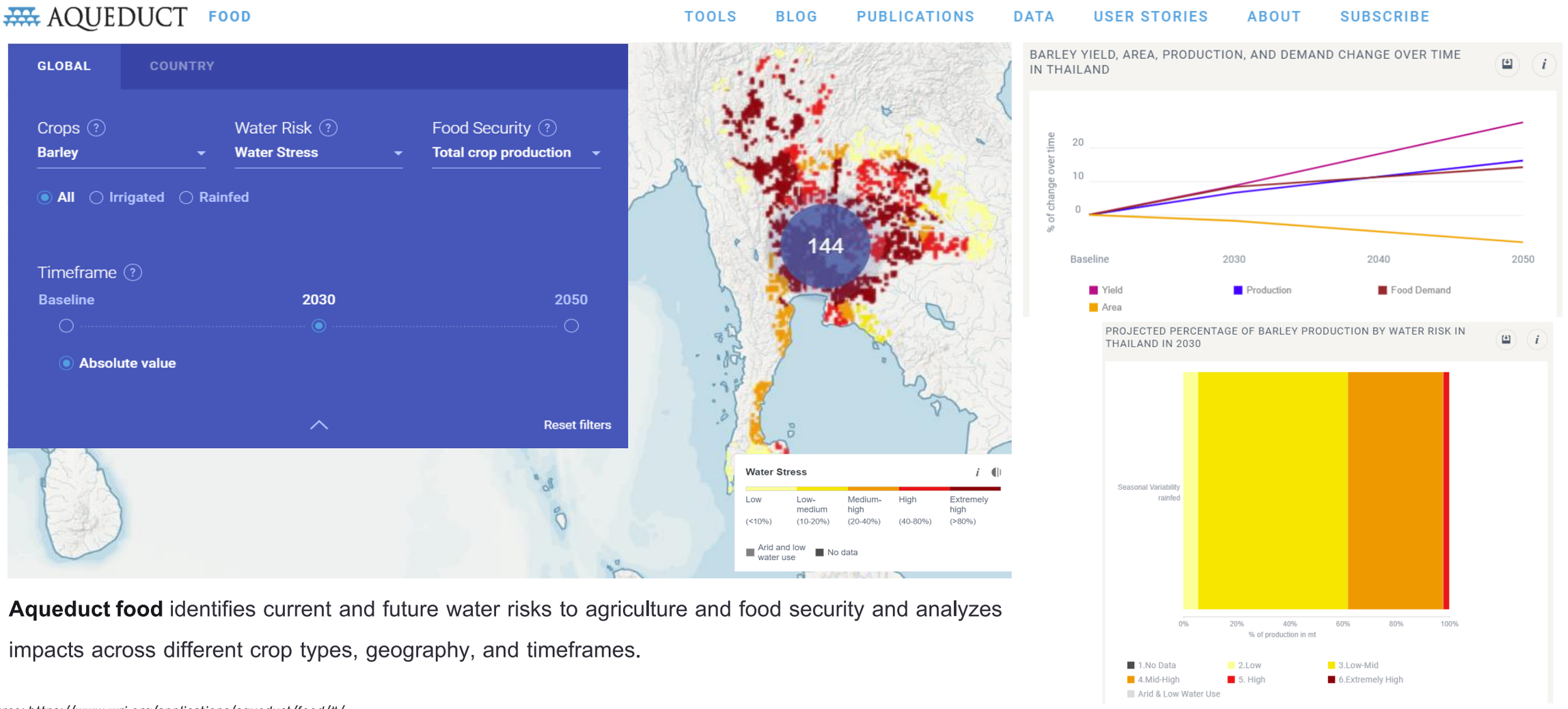
Pessimistic scenario represent RCP 8.5, a fragmented world with steadily rising global carbon emission and uneven economic development.

Aqueduct 4.0 use open-source, peer reviewed data to map water risks such as floods, droughts and stress. Aqueduct Floods identify coastal and riverine flood risks and analyze the costs and benefits of investing in flood protection.

Source: https://www.wri.org/applications/aqueduct/floods/#/

Strategy and Risk Management: Climate scenario analysis

Scenario analysis tool – Aqueduct Food

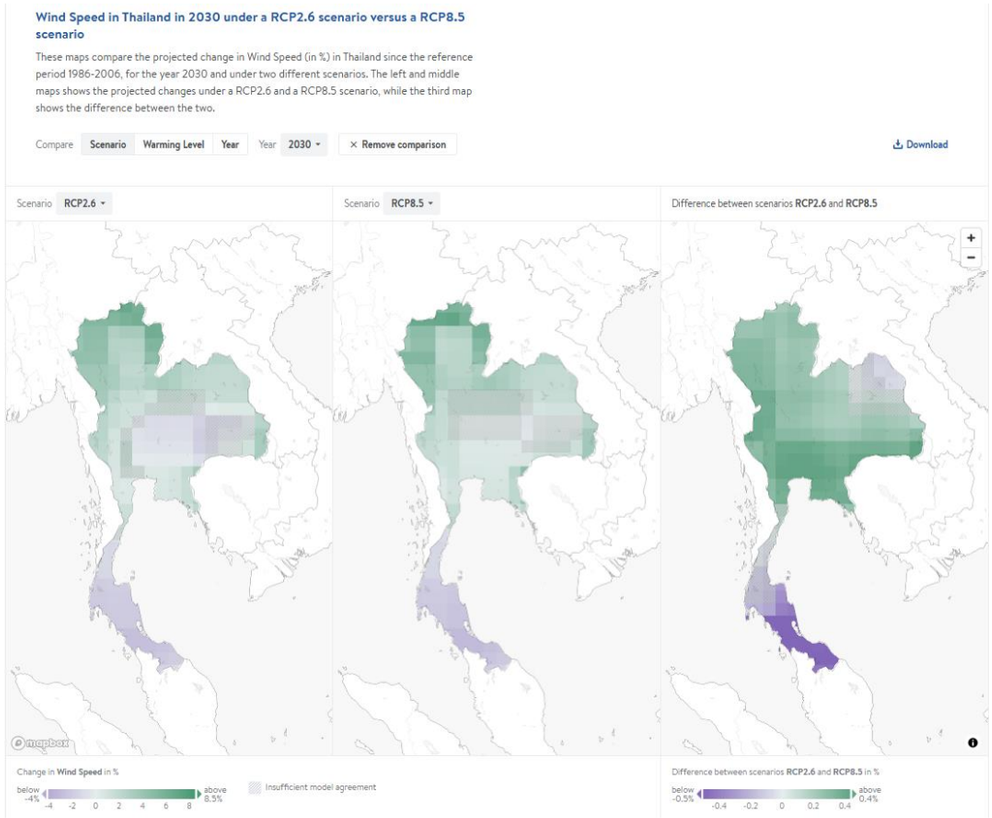


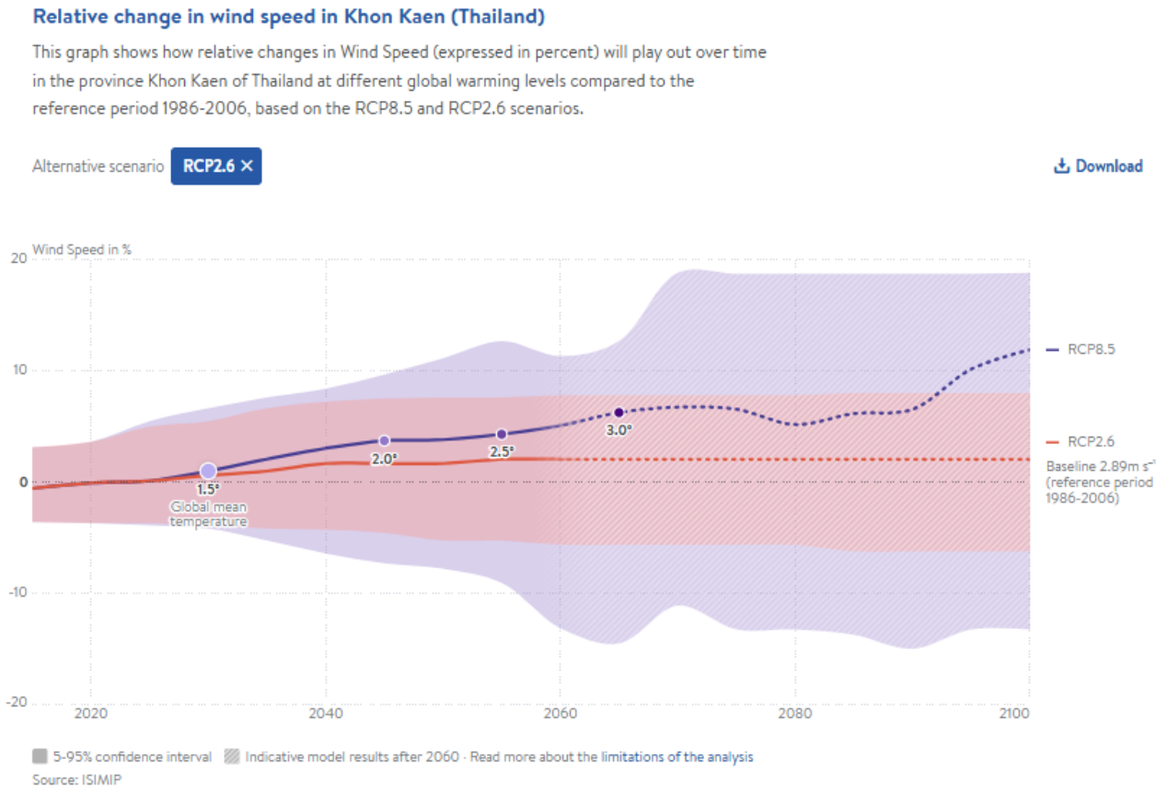
Aqueduct food identifies current and future water risks to agriculture and food security and analyzes impacts across different crop types, geography, and timeframes.

Source: https://www.wri.org/applications/aqueduct/food/#/

Strategy and Risk Management: Climate scenario analysis

Scenario analysis tool – Climate Analytics





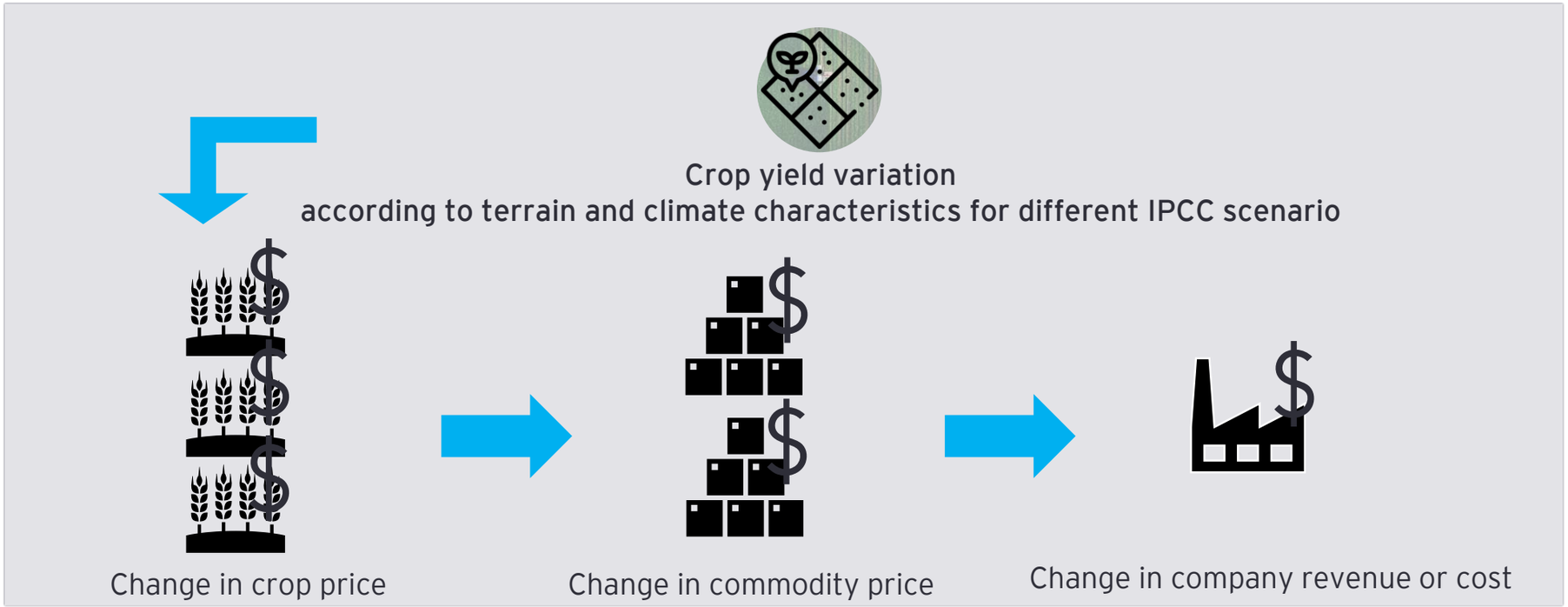
Wind Speed in Thailand in 2030 under a RCP2.6 scenario versus a RCP8.5 scenario. These maps compare the projected change in Wind Speed (in %) in Thailand since the reference period 1986-2006, for the year 2030 and under two different scenarios. The left and middle maps shows the projected changes under a RCP2.6 and a RCP8.5 scenario, while the third map shows the difference between the two.

Source: Climate Analytics – Climate impact explorer

Strategy and Risk Management: Physical risk financial impact

Main Inputs

- Commodity procurement amount (ton)
- List of the crops that constitute the commodity
- Crops sourcing region
- Water supply (m^3 and $)



Outputs

- Financial impact per crop
- Financial impact per commodity
- Impact on company annual revenue or Cost of Goods Sold

Strategy and Risk Management: Transition risk analysis

Climate Risk Category
การจำแนกความเสี่ยงที่เกี่ยวข้องกับการเปลี่ยนแปลงสภาพภูมิอากาศ

- Transition Risk
- Physical Risk

1 Climate Risk
ระบุความเสี่ยง

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

Physical Risk
- Acute Risk
- Chronic Risk

2 Climate Risk Drivers
ระบุตัวขับเคลื่อนความเสี่ยง

Policy & Legal Risk
- Carbon Pricing Mechanisms e.g. Carbon Tax, ETS, CBAM
- Mandates on and Regulation of existing products

Technology Risk
- ...

3 Climate Risk Driver Indicators
ระบุตัวชี้วัดความเสี่ยง

Carbon Pricing Mechanisms (CPM)
- Carbon Tax e.g. 200 THB/tCO2e
- Emission intensity

Mandates on and Regulation of existing products
- Oil and petroleum products

Thailand will be the second ASEAN country, after Singapore, to introduce a carbon tax, highlighting our commitment to environmental protection and sustainable development.

Source: กรมสรรพสามิต ลุยเก็บ 'ภาษีคาร์บอน' มีผลเดือน ก.พ. นี้ ยันไม่กระทบราคาน้ำมัน - Enconfund

4 Financial Impact
การประเมินผลกระทบทางการเงิน

Direct Impact
- Increase cost of operations
- Price Adjustments, lead to higher price fuel

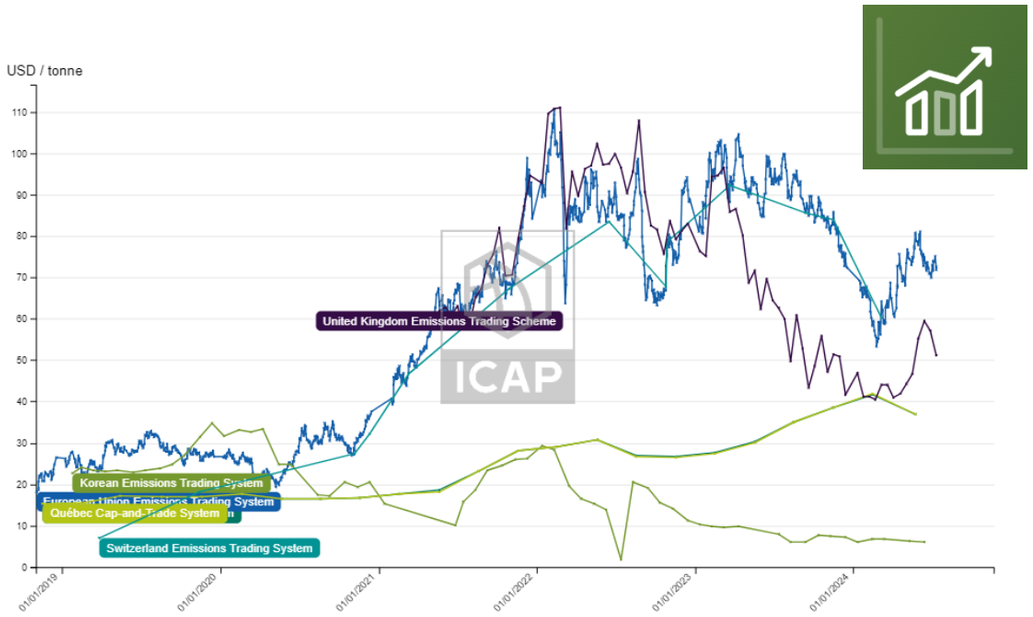
Indirect Impact
- Demand reduction
- Competitive Disadvantage

Strategy and Risk Management: Transition risk analysis

Example of tools for transition risk assessment

ETS Map: Visualize, access, and compare the current status of ETS worldwide.

Allowance Price Explorer: Track, visualize, and download allowance price around the world.



ICAP facilitates cooperation between countries, sub-national jurisdictions, and supranational institutions that have established or are actively pursuing carbon markets through mandatory cap and trade systems.

Source: Tools | International Carbon Action Partnership

Strategy and Risk Management: Transition risk analysis

Example of tools for transition risk assessment

CO2 price by IEA scenario

Table B.2 ▻ CO_2 prices for electricity, industry and energy production in selected regions by scenario

USD (2023, MER) per tonne of CO_2	2030	2035	2040	2050
Stated Policies Scenario				
Canada	126	126	126	126
Chile and Colombia	21	24	28	28
China	39	43	46	52
European Union	140	145	149	158
Korea	56	65	73	89
Announced Pledges Scenario				
Advanced economies with net zero emissions pledges*	135	160	175	200
Selected emerging market and developing economies with net zero emissions pledges**	40	65	110	160
Other emerging market and developing economies	-	6	17	47
Net Zero Emissions by 2050 Scenario				
Advanced economies with net zero emissions pledges*	140	180	205	250
Selected emerging market and developing economies with net zero emissions pledges**	90	125	160	200
Selected emerging market and developing economies without net zero emissions pledges	25	50	85	180
Other emerging market and developing economies	15	25	35	55

* Includes all OECD countries except Mexico. ** Includes China, India, Indonesia, Brazil and South Africa. *** Regions excluding OECD countries, selected emerging market and developing economies with net zero emissions pledges, developing Asia and sub-Saharan Africa.

Note: MER = market exchange rate. Values are rounded.

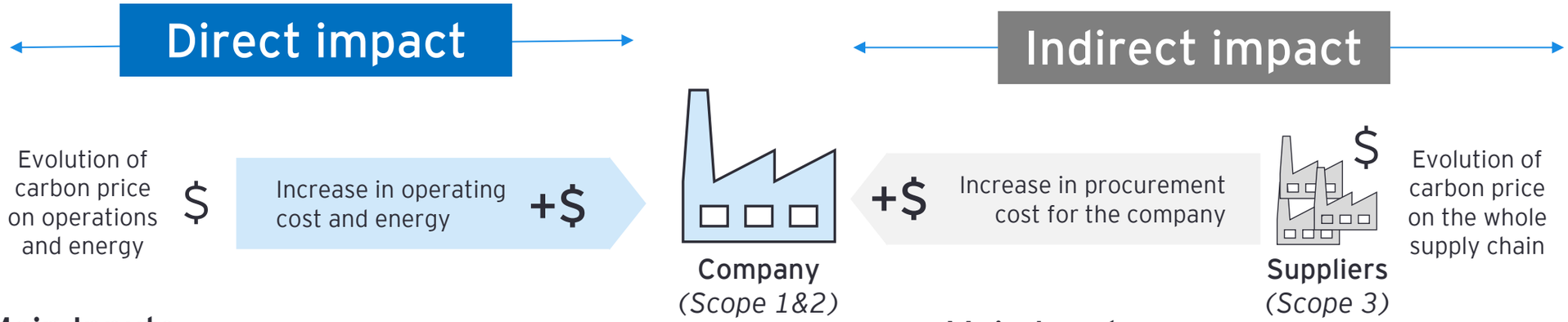
Natural gas prices by IEA scenario

Table 3.2 ▻ Global gas demand, production and trade by scenario

		STEPS			APS			NZE		
	2023	2030	2035	2050	2030	2035	2050	2030	2035	2050
Natural gas demand (bcm)	4 186	4 430	4 422	4 377	4 003	3 493	2 466	3 617	2 257	882
Power	1 642	1 657	1 602	1 513	1 519	1 258	786	1 537	773	136
Industry	936	1 037	1 080	1 136	941	888	674	852	711	338
Buildings	809	877	868	855	780	649	418	570	307	1
Transport	151	183	191	191	143	116	56	113	67	7
Inputs to low-emissions hydrogen	-	5	13	31	25	66	219	64	120	246
Other	647	671	668	651	593	510	302	482	279	156
of which: equipped with CCUS	*14*	*29*	*43*	*74*	*69*	*134*	*356*	*144*	*247*	*463*
Natural gas production (bcm)	4 218	4 430	4 422	4 377	4 003	3 493	2 466	3 617	2 257	882
Conventional gas	2 908	2 982	2 996	3 076	2 818	2 560	1 969	2 526	1 800	635
Unconventional gas	1 310	1 449	1 425	1 301	1 185	932	497	1 091	457	247
Natural gas trade (bcm)	1 039	1 189	1 214	1 234	1 044	863	466	826	517	195
LNG	546	690	719	830	653	597	290	539	339	145
Pipeline	493	499	495	403	391	266	176	287	179	50
Natural gas prices (USD/MBtu)										
United States	2.7	3.9	4.0	4.2	3.2	3.1	2.9	2.1	2.1	2.0
European Union	12.1	6.5	6.5	7.7	6.0	5.5	5.2	4.4	4.2	4.0
China	11.5	7.2	7.1	8.3	6.9	6.4	6.2	5.0	4.9	4.8
Japan	13.0	8.3	7.8	8.7	6.8	6.2	6.2	5.0	4.9	4.8

Source: World Energy Outlook 2024 – Analysis - IEA

Strategy and Risk Management: Transition risk financial impact



Main Inputs

- Company main sector of activity and localizations
- Scope 1&2 emission levels

Annual direct carbon costs per asset

Main Inputs

- Procurement value per sector and region
- Scope 3 emission levels per sector and region

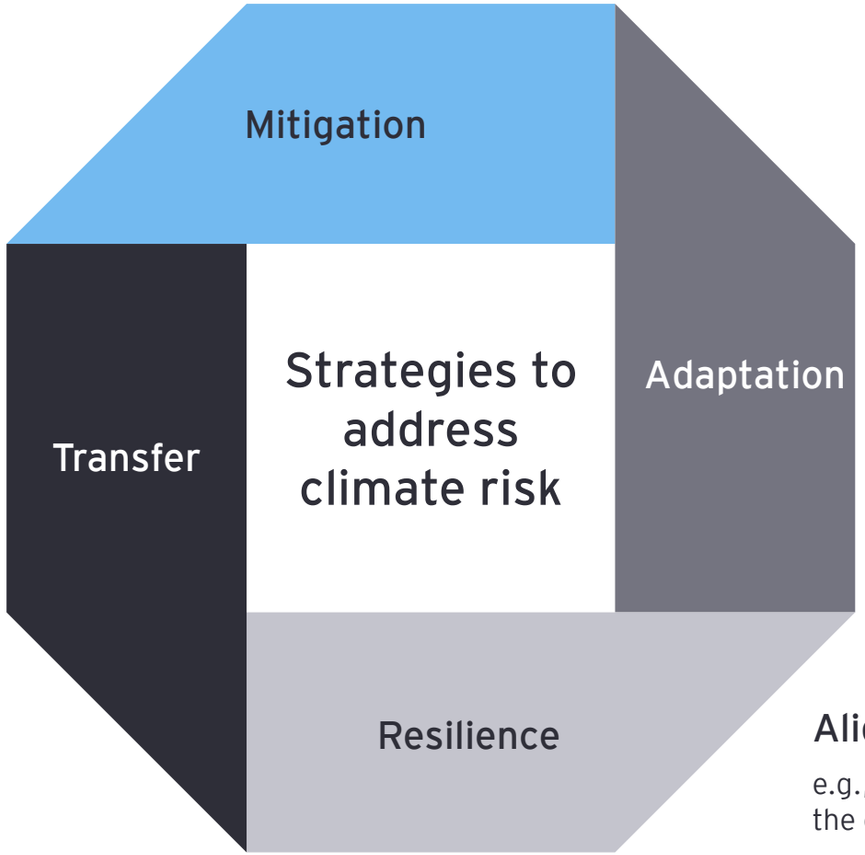
Annual indirect carbon costs per supplier (costs of regulation and costs of adaptation)

Strategy and Risk Management: Climate strategy management

Reducing exposure to risk
e.g., reducing the carbon footprint

Transferring the risk to third parties
Insurance is the common practice to transfer risk.

e.g., insurance policy that covers flood incidence.



Reducing damage or cost after exposure
e.g., building infrastructure that can handle heavy rainfalls and prevent floods.

Aligning company business plan

e.g., to be able to recover from any climate-related event, the company reserves capital for recovery actions.

Source: TCFD, Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures, 2017

Strategy and Risk Management: Example

Industrials: PTTGC

PTTGC disclosed physical and transition risks and opportunities as well as anticipated financial impact.

Climate-related risks and opportunities and impacts

Summary of climate-related risks and opportunities impact on business, strategy, and financial planning

Risk/ Opportunity	Physical Risk			Transition Risk	Transition Opportunity
Driver	Drought	Flood	Extreme Events	Carbon Price	Biofuel Demand
Impact of Identified Risks to GC Business	Drought may result in the unavailability of adequate freshwater. This may lead to disruption of production and utilities. Additionally, it may also increase the water sourcing cost as the plant requires to adopt more expensive alternate technologies.	Disruption of GC's operation resulted in revenue loss. GC's critical 1st tier feedstock supplier may delay delivery raw material but there is no significant impact to GC.	GC's design standard with a design margin of 10% can cope with maximum wind speed in Thailand. No significant impact on GC assets.	As GC's businesses are energy-intensive, the implementation of a carbon tax/price mechanism will have significant impacts on GC's overall profitability.	Increase in demand for low carbon products and bioenergy (including biofuels) driven by the need for emissions reductions presents an opportunity for business growth.
Expected Impacts Timeframe	• Long-term (2031-2050)	• Medium-term (2024-2030) • Long-term (2031-2050)	• Medium-term (2024-2030) • Long-term (2031-2050)	• Medium-term (2024-2030) • Long-term (2031-2050)	• Short-term (base case - 2022) • Medium-term (2024-2030) • Long-term (2031-2050)
Financial Implication	546.5 MTHB	16.7 MTHB*	-	110,791 MTHB	87,000 MTHB per year

*Estimated minimum financial impact for both medium- and long-terms

Identification of climate-related risks and opportunities

Timeframe and financial impact

Source: PTT Global Chemical Public Company Limited, IFRS S2 Climate-related Disclosure, June 2024

Strategy and Risk Management: Example

Resources: GPSC

GPSC disclosed risks related to water stress and drought including risk rating level, time horizon, impact unit, and financial implication.

Strategy

IFRS Sustainability

Climate-Related Risks & Opportunities

Table 7: Physical Risk Assessment Result- Quantification Analysis

Risk Rating Level: Very high | High | Moderate | Low | Minimal

Physical Risks	Risk Rating Level* – Time Horizon: 2030 SSP1-2.6	2030 SSP5-8.5	2050 SSP1-2.6	2050 SSP5-8.5	Impact Areas	Business Implications	Financial Implication (Average estimated time frame: 6 years)	Management measure and adaptation plan (Less than 5 years of implementation timeline) (Existing and New Operations: 100% coverage)	Cost response and timeline to response
Water Stress & Drought					Cogeneration Power Plants and Upstream	• Water scarcity can constrain the plant's capacity to maintain optimal cooling temperatures, potentially resulting in reduced electricity generation to prevent overheating and in extreme cases, plants may be required to shut down entirely to prevent damage. • Drought can intensify the competition for industrial water within the Map Ta Phut industrial estate, where GPSC's Cogeneration Power Plants are situated, resulting in escalated water expenses. • Water scarcity may impact GPSC's water supplier, leading to insufficient water resources for GPSC and driving up the cost of alternative water sources. • Water scarcity can result in seawater intrusion in coastal areas due to the lack of a freshwater barrier, leading to increased costs of seawater reverse osmosis (RO).	739 Million THB	• Install backup electricity from PEA/EGAT to maintain capability during emergencies. • Secure alternative sources such as demineralized water from other suppliers and consider long-term solutions such as constructing water storage ponds or rainwater harvesting systems. • Reduce water consumption. • Increase water circularity (reuse/recycle) in line with Energy Efficiency in GPSC Group's Climate Strategy. • Monitor local water availability and collaborate with the government to expand the water supply infrastructure in the Map Tha Put Industrial Area. • Acquire wastewater from other facilities for treatment and cooling purposes are all strategies that can contribute to a robust water management plan.	27 Million THB

Remark:
*Risk rating level based on recalibrated physical risk assessment considering percentage of equity share and revenues generated by plant types.

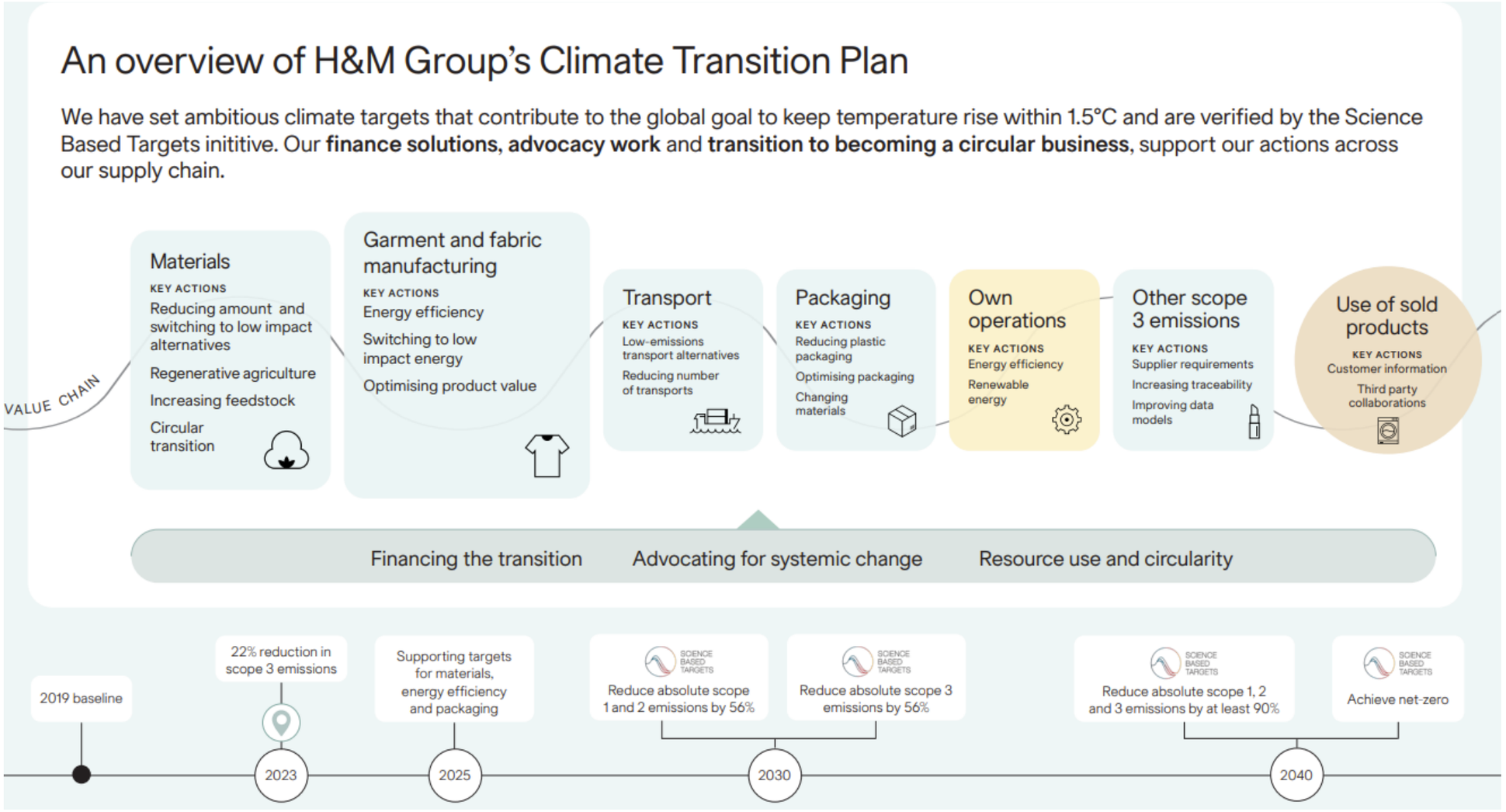
19 GPSC

Source: Global Power Synergy Public Company Limited, IFRS S2 Sustainability Disclosure Standard 2024, Climate-Related Disclosures

Strategy and Risk Management: Example

Consumer Products: H&M

H&M disclosed its Climate Transition Plan covering action plan for the value chain to reduce GHG emissions as well as the interim targets and ultimate goals to be come net zero in 2040.



Source: H&M Group, Climate Transition Plan, March 2024

Strategy and Risk Management: Example

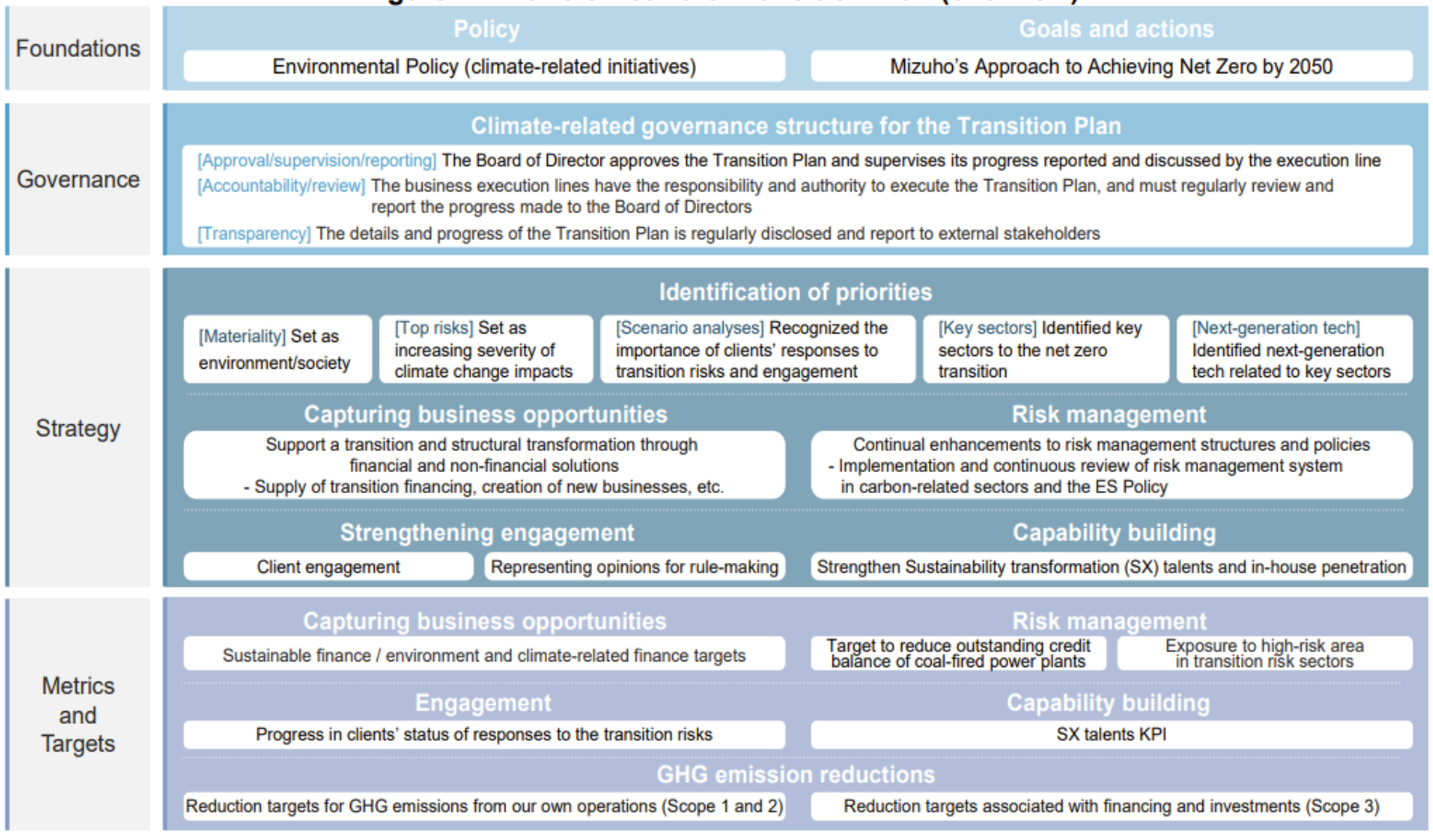
Financials: Mizuho

Mizuho disclosed its Net Zero Transition Plan by 2050. Its strategy included identifications of priorities, capturing business opportunities, risk management, strengthening engagement, and capability building. Mizuho's priorities included materiality setting, identifying top climate-related risks, performing scenario analysis to realise it's clients' responses to risks, identifying key sectors and next-generation technology for decarbonisation.

i. Net Zero Transition Plan (formulated in 2022, revised in 2023)

From the perspectives of facilitating transition in the real economy, capturing business opportunities, and enhancing risk management, we formulated the *Net Zero Transition Plan* in order to promote a more integrated responses to climate issues across the Group. The plan was formulated in reference to the transition plan frameworks from TCFD, GFANZ, and other organizations and was adopted by the Board of Directors of the Mizuho Financial Group.

Figure 4 Mizuho's Net Zero Transition Plan (overview)



Source: Mizuho Financial Group, Climate & Nature-related Report 2024

Strategy and Risk Management: Climate resilience

Proportionality approaches to climate scenario analysis includes ‘reasonable and supportable information without undue cost or effort’ and ‘consideration of skills, capabilities and resources.’ In addition, ISSB refers to practice outlined in in documents published by the Task Force on Climate-related Financial Disclosures (TCFD), including *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities (2017)* and *Guidance on Scenario Analysis for Non-Financial Companies (2020)*.

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 Most organizations are expected to perform qualitative scenario analyses and will provide more qualitative disclosures.	**Robust scenario analysis** Larger organizations should consider conducting more robust scenario analysis to assess the resilience of their strategies.	**In-depth consideration on qualitative disclosure** Recommends organizations that may be more significantly affected by transition risk and/or physical risk consider more in-depth, quantitative disclosure around scenario analysis.

Source: TCFD website and 2021 Implementing Guidance

Strategy and Risk Management: Climate resilience

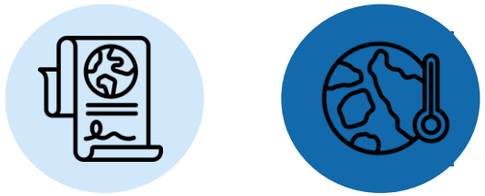
IFRS S2 includes application guidance on how to apply scenario analysis, building on TCFD materials, which requires:

- 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

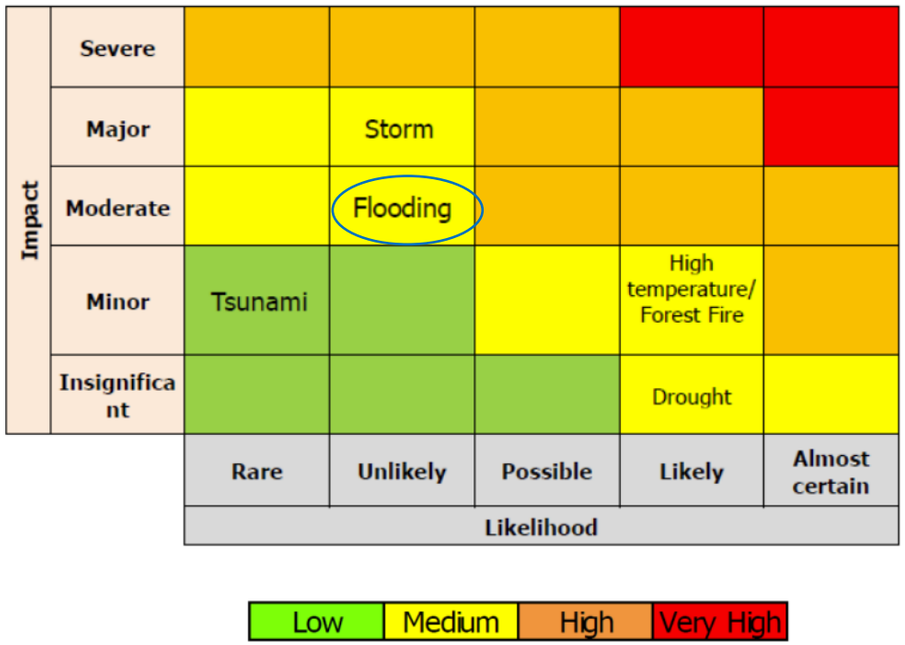
NGFS delayed transition | NGFS low demand

Strategy and Risk Management: Example

Scenario analysis – simplified

Physical Risks: the case of major flooding

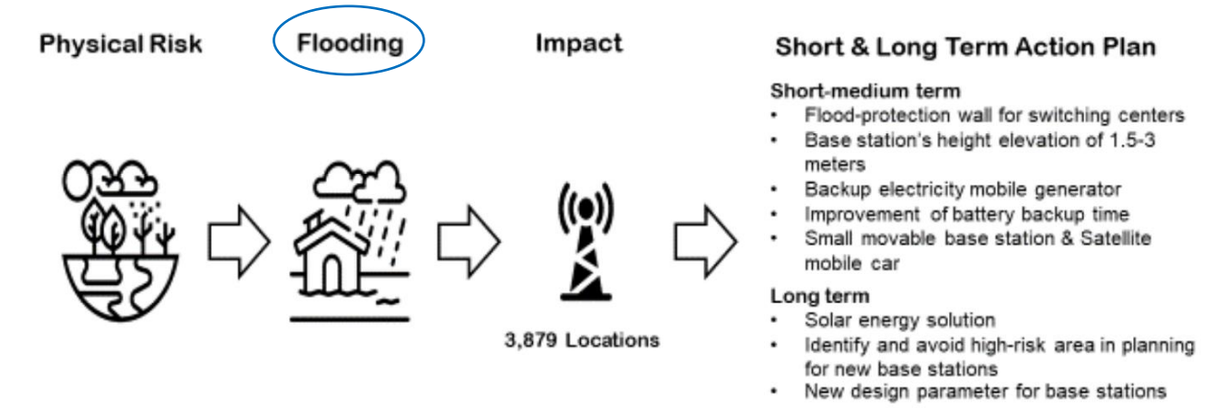
AIS uses the risk matrix to define the level of climate-related risks by considering the category of probability or likelihood against the category of consequence severity. The risk level is categorized into 4 levels, consisting of Low, Medium, High, and Very High. Our annual update identified high temperature, major floods, windstorms, and water shortage as a medium level of climate-related risks to AIS operations, shown in the matrix below. In response to such weather events, we formulate Incident Response Plan and Business Continuity Plan to manage such risks for our main infrastructure, Base Station, and Principle Node. This risk management plan includes standard designs, operational routine, and crisis response process.



Technology: AIS

AIS identified climate-related risks including flooding and selected flooding to perform simplified scenario analysis. With 3,879 locations prone to flooding, AIS derived the short and long-term action plan including flood-protection wall, base station's height elevation, etc.

AIS Business operation



Source: AIS, Task Force on Climate-related Financial Disclosures (TCFD) 2020

Strategy and Risk Management: Example

Scenario analysis – Financial impact

Industrials: PTTGC

PTTGC disclosed financial impact from both physical risk (flood) and transition risk (carbon tax).

Physical Risk Impacts

Risk/Opportunity Score Color Key

Higher Risk	Mod. Risk	Lower Risk	Limited	Lower Opp.	Mod. Opp	Higher Opp

Identified Risk	Example of Risk Implication	Financial Impacts on GC Business*	Time Horizon
Flood	• Inundation of assets, utilities, infrastructures, facilities and increased land erosion • Disruption/damage of infrastructure and movement of personnel and goods • Loss of property value • Personnel and infrastructure safety • Increase of asset insurance cost	Assumption of (water depth 1.5 m for 1 day) • Plant disruption 1 day resulted in revenue loss 0.53 million USD or 16.7 million THB. The calculation is based on the average revenue during Jan-May in the previous year) • Financial implication = revenue loss = 16.7 million THB • GC's critical 1st tier feedstock supplier may delay delivery raw material but there is no significant impact to GC. • There are 2 major customers and no significant impact on GC business	• Short-term: • Medium-term: • Long-term:

Transition Risk Impacts

Risk/Opportunity Score Color Key

Higher Risk	Mod. Risk	Lower Risk	Limited	Lower Opp.	Mod. Opp	Higher Opp

Identified Risk	Possible Risk Implication	Financial Impacts of Transition Risk on GC Business*	Time Horizon
Carbon price	• Increased capital investment in upgrading facilities or transition • Increased operating costs due to policy changes, such as compliance costs or insurance premiums • Reduced profitability due to higher costs	GC included climate change regulations as one of GC's corporate risk factor in the corporate risk assessment process conducted by the Enterprise Risk Management Committee. The additional costs arising from the implementation of carbon pricing regulations may be significant given GC's operations are energy intensive. We have quantified the potential financial implications that may affect GC as follows:	• Short-term: • Medium-term: • Long-term:

	STEPS	NZE	Difference
2030 (medium-term)			
Carbon Tax Cost (million THB)	15,838	30,457	14,619
Impact on Net Profit (%)	-26%	-50%	-24%
2050 (long-term)			
Carbon Tax Cost (million THB)	32,622	110,791	78,169
Impact on Net Profit (%)	-18%	-61%	-43%

As there are currently no carbon pricing regulations or carbon tax mechanisms in Thailand, there are no immediate impacts. We expect the implementation of a carbon tax mechanism starting in 2030.

**Note: Depend on business economic*

Source: PTT Global Chemical Public Company Limited, IFRS S2 Climate-related Disclosure, June 2024

Strategy and Risk Management: Example

Scenario analysis

Physical Scenario Analysis
Assessment Overview

Physical risks resulting from climate change can be event-driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for companies, such as direct damage to assets and indirect impacts from supply chain disruption. Companies' financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes/wind speed affecting companies' premises, operations, supply chain, transport needs, and employee safety.

Risk	Indicator	IPCC Scenario	Timeframe	Description / Criteria	Tool
Drought	Rainfall	RCP* 2.6, 4.5, 8.5	2030 - 2050	• The projection of rainfall data conducted by climate model CMIP 5** has been generated over Thailand and focus on Chonburi and Rayong Province • Standard Precipitation Index (SPI) has been calculated and use as the factor to indicate drought and flood year	AQUEDUCT THE CLIMATE EXPLORER
Flood	Rainfall	RCP 2.6, 4.5, 8.5	2030 - 2050		
Extreme Weather	Rainfall Wind speed	RCP 2.6, 4.5, 8.5	2030 - 2050	• The projection of rainfall and wind speed data conducted by climate model CMIP 5 have been generated over Thailand and focus on Chonburi and Rayong Province (Upstream) • The frequency of tropical cyclone categories 1-5 have been counted and projected	THE CLIMATE EXPLORER

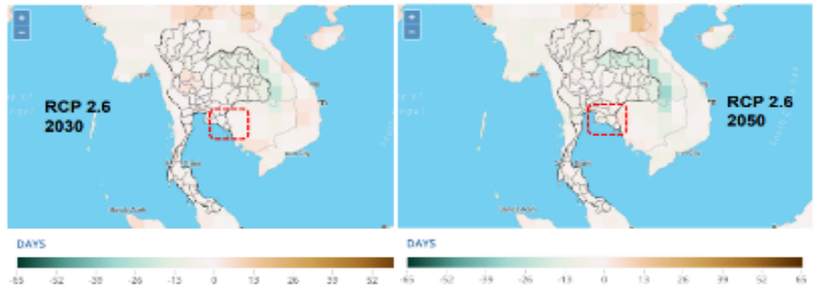
Remark:
*RCP – representative concentration pathway.
**CMIP- Coupled Model Intercomparison Project

The following Representative Concentration Pathways (RCP) (i.e., scenarios, etc.) from the IPCC were included in our physical scenario analysis.

Scenarios	Description	Global Mean Temperature Change	Maintain at 2.0 C by 2050
RCP 2.6	• Mean Radiative forcing at earth surface is 2.6 W/m^2; • High effort on the implementation of decarbonization • Medium intensity & low frequency in extreme weather	1.6 C in 2050	Possible
RCP 4.5	• Mean Radiative forcing at earth surface is 4.5 W/m^2; • Medium effort on the implementation of decarbonization • Medium intensity & medium frequency in extreme weather	2.4 C in 2050	Possible, with high uncertainty
RCP 8.5	• Mean Radiative forcing at earth surface is 8.5 W/m^2; • Low effort on the implementation of decarbonization • High intensity & high frequency in extreme weather	4.3 C in 2050	Not Possible

Physical Scenario Analysis
Qualitative Assessment: Drought

Thailand: Projection of Consecutive Dry Days



The number of consecutive dry days is likely to decreases in long-term

Impacts on Business	Examples of Risks
• Existing water shortages and constraints on the water supply • Insufficient water supply, worsening both severe harm and economic impact	• The drought in 2020 and 2005 affected large swathes in the East, where three provinces as Chachoengsao, Chon Buri, and Rayong. Drought was likely to limit production, only 7% of water at Rayong reservoir. Luckily that the situation was recovered on time.

Risk Score Color Key: Higher Risk | Mod. Risk | Lower Risk | Limited

Baseline

No.	Asset	Drought
1	Rayong: GC Operations, and GC's Suppliers	
2	Chonburi: GC Operation	
3	Samutprakan: Customer	
4	Samutsakorn: Customer	

RCP 2.6

No.	Asset	Drought	
		2030	2050
1	Rayong: GC Operations, and GC's Suppliers		
2	Chonburi: GC Operation		
3	Samutprakan: Customer		
4	Samutsakorn: Customer		

RCP 8.5

No.	Asset	Drought	
		2030	2050
1	Rayong: GC Operations, and GC's Suppliers		
2	Chonburi: GC Operation		
3	Samutprakan: Customer		
4	Samutsakorn: Customer		

Industrials: PTTGC

Disclosure on climate-related risks and opportunities through **Physical Scenario Analysis**, using three assumptions: RCP 2.6, RCP 4.5, and RCP 8.5.

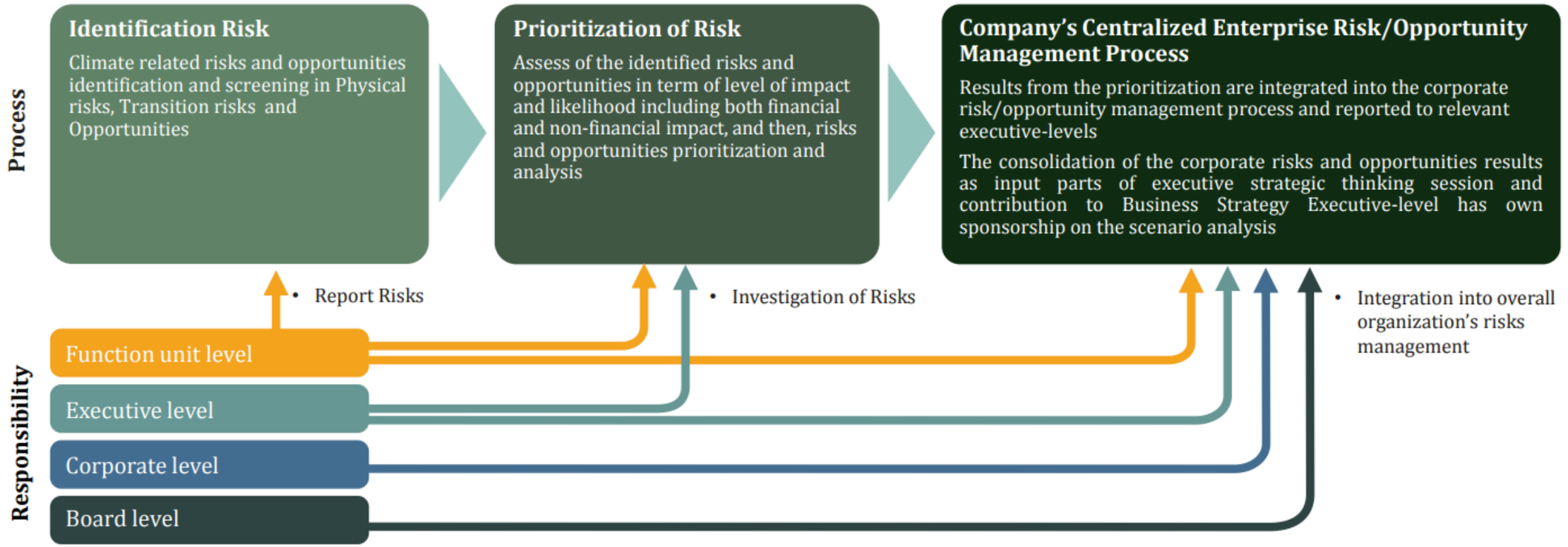
Source: PTT Global Chemical Public Company Limited, TCFD Report 2023

Strategy and Risk Management: Example

Industrials: PTTGC

PTTGC integrates climate-related risk management into enterprise risk management

Integration of Process for Identifying, Assessing, and Managing Climate-related Risks and Opportunities in Company-wide Risk Management Process



Source: PTT Global Chemical Public Company Limited, IFRS S2 Climate-related Disclosure, June 2024

Strategy and Risk Management: Example

Financials: Mizuho

Mizuho considered climate-related risks into its risk management framework and prioritised the materiality of each risk into high, medium, and low.

Figure 20 Recognition of climate-related risks

	Transition risks [Short term, Medium and long term]	Physical risks [Medium and long term]	
	Changes to the external environment caused by decarbonization	Acute risks: Changes caused by adverse weather events	Chronic risks: Changes caused by temperature increases
Credit risk	Deterioration in client business performance associated with business landscape changes	Deterioration in client business performance	Deterioration in client business performance associated with business landscape changes
		Decline in the value of collateral assets	
Market risk	Decline in the value of stock holdings associated with business landscape changes	Decline in the value of stock holdings associated with deterioration in business performance	Decline in the value of stock holdings associated with business landscape changes
	Decline in the value of stock holdings associated with macroeconomic landscape changes	Decline in the value of stock holdings associated with financial landscape changes	
Liquidity risk	Increase in funding demands from clients and deterioration in the fund-raising landscape associated with business landscape changes	Increase in funding demands from clients and deterioration in the fund-raising landscape	-
Operational risk	Stakeholders filing lawsuits and taking other legal action associated with insufficient compliance with government policies and regulations	Impairment of Mizuho's assets and occurrence of repair costs	Decline in labor force
		Interruptions to Mizuho's business	
Reputational risk	Criticism of Mizuho for inadequate, obsolescent, or non-performing climate change-related strategies		

Materiality of each risk: High | Medium | Low

Time bases: Short term: 1 to 3 years, medium and long term: up to 2050

Source: Mizuho Financial Group, Climate & Nature-related Report 2024

Metrics and Targets: Key disclosures

What the company needs to have

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

Key disclosures

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 must 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: GHG emissions

GHG emissions

Disclose an entity's absolute gross Scope 1, Scope 2 and Scope 3 GHG emissions

- **Scope 1:** direct emissions
- **Scope 2:** indirect emissions from the generation of purchased energy consumed by the entity
- **Scope 3:** all other indirect emissions that occur in the entity's value chain

Measured in accordance with the **GHG Protocol Corporate Standard**

Disclose of how and why an entity has used specific inputs, assumptions and estimation techniques to measure its GHG emissions, including any changes to these.

Scope 3 emissions

Scope 3 GHG emissions disclosure, across 15 categories, when the information is material. The 15 categories are as follows:

1. Purchased goods and services
2. Capital goods
3. Fuel and energy related activities
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets
9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchise
15. Investments

Metrics and Targets: GHG emissions

GHG emissions

Scope 3 measurement framework

Guidance to support companies

	An entity shall prioritize the use of:	If prioritized information not available, consider:
Measurement	**Direct measurement**	**Estimation** Activity data and emission factors
Data	**Primary data** e.g. Company-specific metric tons of waste generated	**Secondary data** e.g. Estimated metric tons of waste generated based on industry-average data
Scope	**More granular data** Cradle-to-gate GHG emissions for the product of interest	**Less granular data** GHG emissions and/or activity data for the entire corporation
Verification	**Verified**	**Not verified**

Source: IFRS S2, Paragraph B38 - B57

Metrics and Targets: GHG emissions

TGO and GHG Protocol comparison – illustrative only

	TGO *ข้อกำหนดในการตำนวณคาร์บอนฟุตพริ้นท์ขององค์กร ฉบับปรับปรุงครั้งที่ 6 กรกฎาคม 2565*	**GHG Protocol** *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004)* *Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)*
หลักการ	ไม่แตกต่าง (Relevance, Completeness, Consistency, Transparency, Accuracy)	
ขอบเขตขององค์กร	ไม่แตกต่าง (1.Equity share approach หรือ 2.Control approach (Financial Control, Operational Control))	
ขอบเขตการรายงาน	ไม่แตกต่าง (Scope 1, 2)	
	Scope 3 สามารถแบ่งตาม • ดำเนินการตามมาตรฐาน ISO 14064-1:2018 (4 หมวดหมู่) หรือ • ตามมาตรฐาน GHG Protocol (15 หมวดหมู่)	Scope 3 แบ่งตาม 15 หมวดหมู่
หลักการขั้นตอนการคำนวณ	ไม่แตกต่าง (1.ระบุแหล่ง 2.เลือกวิธีการคำนวณ 3.การเลือกค่า Emission 4.คำนวณ)	
หลักการการคำนวณ **Scope 1 และ 2**	ไม่แตกต่าง <u>แต่</u> GHG Protocol อาจระบุรายละเอียดประเด็นที่อาจเป็นข้อสงสัยมากกว่า เช่น • กรณีโรงไฟฟ้าขายไฟให้ภายนอก สามารถนำ emission ของไฟฟ้าส่วนดังกล่าวมาหักออกจาก Scope 1 ได้หรือไม่ • การคิดคำนวณ Scope 2 ของผู้ซื้อไฟฟ้าจะไม่รวมส่วน GHG ที่เป็นปล่อยจากการ loss ในสายส่ง	
หลักการการคำนวณ **Scope 3**	ไม่ได้ให้แนวทางในการคำนวณในแต่ละหมวดหมู่	มีเอกสารเล่มแยก Corporate Value Chain (Scope 3) Accounting and Reporting Standard อธิบายแนวทางการคำนวณ ข้อมูลที่ควรต้องใช้ในการคำนวณ

Metrics and Targets: Example

Industrials: PTTGC

PTTGC disclosed GHG emission by scope (1, 2 & 3) as well as comparative information

GHG emissions

GHG Emissions

Data performance period from 1st January to 31st December 2023
The total GHG emissions by scope within GC organizational boundary are as follows:

Emission Scopes (as defined within ISO 14064-1:2006)	GHG Emissions (million tons CO_2 equivalent)			
	2020	2021	2022	2023
Direct GHG Emissions (scope 1)	5.79	6.52	6.14	6.13
Market-based energy indirect (scope 2)*	1.78	2.03	2.04	1.83
Location based energy indirect (scope 2)*	1.97	2.06	2.04	1.81
Other relevant indirect GHG emission (scope 3)**	38.45	37.25	35.36	41.49

Remark:
* GC has purchased the energy from grid, covering 7.95% of total energy consumption within the organization.
** GHG scope 3 covers 9 categories, including Purchased goods and service, Capital goods, Upstream transportation and distribution, Waste generated in operations, Business travel, Downstream transportation and distribution, Processing of sold products, Use of sold product and End-of-life treatment of sold product.

Methodologies and Standards

1. American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009
2. IPCC Guidelines for National Greenhouse Gas Inventories, 2006
3. ISO 14064-1
4. Thailand Greenhouse Gas Management Organization: The National Guideline Carbon Footprint for organization
5. The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

Source: PTT Global Chemical Public Company Limited, IFRS S2 Climate-related Disclosure, June 2024

Metrics and Targets: Climate-related metrics

IFRS S2 *Accompanying Guidance*: Illustration of cross-industry metric categories

Metric category	Unit of measure	Example metrics
Climate-related transition risks	Amount and percentage	• volume of real estate collaterals highly exposed to transition risk • concentration of credit exposure to carbon-related assets • percentage of revenue from coal mining • percentage of revenue passenger kilometres not covered by the Carbon Offsetting and Reduction Scheme for International Aviation
Climate-related physical risks	Amount and percentage	• proportion of property, infrastructure or other alternative asset portfolios in areas subject to flooding, heat stress or water stress • proportion of real assets exposed to climate-related hazards • number and value of mortgage loans in 100-year flood zones • wastewater treatment capacity located in 100-year flood zones • revenue associated with water withdrawn and consumed in regions of high or extremely high baseline water stress
Climate-related opportunities	Amount and percentage	• revenues from products or services that support the transition to a lower-carbon economy • net premiums written related to energy efficiency and lower-carbon technology • number of (1) zero-emissions vehicles, (2) hybrid vehicles and (3) plug-in hybrid vehicles sold • proportion of homes delivered certified to a third-party, multi-attribute, green-building Standard
Capital deployment	Presentation currency	• percentage of annual revenue invested in research and development of lower-carbon products/services • percentage of investment in climate adaptation measures (for example, soil health, irrigation and technology)

Source: IFRS S2 Accompanying Guidance (This guidance accompanies, but is not part of, IFRS S2. It illustrates aspects of IFRS S2 but is not intended to provide interpretative guidance.)

Metrics and Targets: Example

Climate-related metrics

Property: Swire Pacific

Swire Pacific disclosed climate-related metrics including GHG emission and other metrices.

Metrics and targets

Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.

- The methodology used to calculate our KPIs can be found in our Reporting Methodology document. The metrics used by our operating companies can be found in their own sustainability reports.

Disclose scope 1, scope 2, and, if appropriate, scope 3 GHG emissions, and the related risks.

- We measure and report our energy consumption and the scope 1, 2 and some scope 3 carbon emissions from our operations in accordance with the listing rules of Hong Kong Exchanges and Clearing Limited and in line with the GHG Protocol.

Further reading

Swire Pacific Reporting methodology

Swire Pacific Group Companies Sustainability Reports

Metric	Unit of measure	2020	2021	2022	2023	2024[1]
Carbon emissions (scope 1 and 2) – market-based method	Tonnes of CO_2e	763,000	662,000	569,000	597,000	473,626
Carbon emissions (scope 3)	Tonnes of CO_2e	-	-	7,381,000	10,468,000	12,673,575
Total electricity used by the Group from non-renewable sources	Million kWh	861	828	755	812	646
Total renewable electricity generated on our sites	Million kWh	21	21	22	30	36
Total renewable electricity procured	Million kWh	12	103	126	180	280
% of total electricity used by the Group, generated from renewable sources	%	3.6	13.0	16.4	20.5	32.9
Proportion of Group financing from sustainable finance	%	14	18	35	47	55
Proportion of wholly owned existing buildings which are certified green buildings[2]	%	97	96	95	94	96
Proportion of wholly owned projects under development which are certified green buildings[2]	%	100	100	100	100	100
Gross rental income contributed by certified green buildings[2]	%	>98	>98	>98	>97	>97

1. An increase in our value chain emissions was driven by our Aviation division through the effects of a steady post-pandemic recovery on Cathay Pacific and HAECO.
2. Includes portfolios under Swire Properties only.

Source: Swire Pacific Sustainability Report 2024,Climate-related financial disclosures

Metrics and Targets: Industry-specific

IFRS S2 Industry-based guidance

Table 1: Volumes 1–68: Industry-based Guidance

SICS® sector and industry	IFRS S2 volume
Consumer Goods	
Apparel, Accessories & Footwear	1 (CG-AA)
Appliance Manufacturing	2 (CG-AM)
Building Products & Furnishings	3 (CG-BF)
E-Commerce	4 (CG-EC)
Household & Personal Products	5 (CG-HP)
Multiline and Specialty Retailers & Distributors	6 (CG-MR)
Toys & Sporting Goods	
Extractives & Minerals Processing	
Coal Operations	7 (EM-CO)
Construction Materials	8 (EM-CM)
Iron & Steel Producers	9 (EM-IS)
Metals & Mining	10 (EM-MM)
Oil & Gas–Exploration & Production	11 (EM-EP)
Oil & Gas–Midstream	12 (EM-MD)
Oil & Gas–Refining & Marketing	13 (EM-RM)
Oil & Gas–Services	14 (EM-SV)
Financials	
Asset Management & Custody Activities	15 (FN-AC)
Commercial Banks	16 (FN-CB)
Consumer Finance	
Insurance	17 (FN-IN)
Investment Banking & Brokerage	18 (FN-IB)
Mortgage Finance	19 (FN-MF)
Security & Commodity Exchanges	
Food & Beverage	
Agricultural Products	20 (FB-AG)
Alcoholic Beverages	21 (FB-AB)
Food Retailers & Distributors	22 (FB-FR)
Meat, Poultry & Dairy	23 (FB-MP)
Non-Alcoholic Beverages	24 (FB-NB)
Processed Foods	25 (FB-PF)
Restaurants	26 (FB-RN)
Tobacco	
Health Care	
Biotechnology & Pharmaceuticals	
Drug Retailers	27 (HC-DR)
Health Care Delivery	28 (HC-DY)
Health Care Distributors	29 (HC-DI)
Managed Care	30 (HC-MC)
Medical Equipment & Supplies	31 (HC-MS)
Infrastructure	
Electric Utilities & Power Generators	32 (IF-EU)
Engineering & Construction Services	33 (IF-EN)
Gas Utilities & Distributors	34 (IF-GU)
Home Builders	35 (IF-HB)
Real Estate	36 (IF-RE)
Real Estate Services	37 (IF-RS)
Waste Management	38 (IF-WM)
Water Utilities & Services	39 (IF-WU)
Renewable Resources & Alternative Energy	
Biofuels	40 (RR-BI)
Forestry Management	41 (RR-FM)
Fuel Cells & Industrial Batteries	42 (RR-FC)
Pulp & Paper Products	43 (RR-PP)
Solar Technology & Project Developers	44 (RR-ST)
Wind Technology & Project Developers	45 (RR-WT)
Resource Transformation	
Aerospace & Defence	46 (RT-AE)
Chemicals	47 (RT-CH)
Containers & Packaging	48 (RT-CP)
Electrical & Electronic Equipment	49 (RT-EE)
Industrial Machinery & Goods	50 (RT-IG)
Services	
Advertising & Marketing	
Casinos & Gaming	51 (SV-CA)
Education	
Hotels & Lodging	52 (SV-HL)
Leisure Facilities	53 (SV-LF)
Media & Entertainment	
Professional & Commercial Services	
Technology & Communications	
Electronic Manufacturing Services & Original Design Manufacturing	54 (TC-ES)
Hardware	55 (TC-HW)
Internet Media & Services	56 (TC-IM)
Semiconductors	57 (TC-SC)
Software & IT Services	58 (TC-SI)
Telecommunication Services	59 (TC-TL)
Transportation	
Air Freight & Logistics	60 (TR-AF)
Airlines	61 (TR-AL)
Auto Parts	62 (TR-AP)
Automobiles	63 (TR-AU)
Car Rental & Leasing	64 (TR-CR)
Cruise Lines	65 (TR-CL)
Marine Transportation	66 (TR-MT)
Rail Transportation	67 (TR-RA)
Road Transportation	68 (TR-RO)

Source: *https://www.ifrs.org/projects/completed-projects/2023/climate-related-disclosures/appendix-b-industry-based-disclosure-requirements/*

Metrics and Targets: Industry-specific

Oil & Gas: IFRS S2 Industry-based Guidance (1/2)

TOPIC	METRIC	UNIT	Up stream	Mid stream	Refine & Market	Services
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage methane, percentage covered under emission-limiting regulations	Metric tons CO_2-e (t), Percentage (%)	Y	Y	Y	N
	Amount of gross global scope1 from (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions and (5) fugitive emissions	Metric tons CO_2-e ,	Y	N	N	N
	Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	D&A	Y	Y	Y	N
Reserves Valuation & Capital Expenditures	Sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions	Million barrels (MMbbls), Million standard cubic feet (MMscf)	Y	N	N	N
	Estimated carbon dioxide emissions embedded in proved hydrocarbon reserves	Metric tons (t)CO_2-e	Y	N	N	N
	Amount invested in renewable energy, revenue generated by renewable energy sales	Presentation currency	Y	N	N	N
	Discussion of how price and demand for hydrocarbons or climate regulation influence the capital expenditure strategy for exploration, Acquisition and development of assets	Discussion and Analysis	Y	N	N	N
Water Management	(1) Total water withdrawn, (2) Total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	Thousand cubic metres (m^3), Percentage (%)	Y	N	Y	N
	Volume of produced water and flowback generated: Volume of produced water and flowback generated: percentage 1) discharged 2) injected 3) recycled; hydrocarbon content in discharged water	Thousand cubic metres(m^3), Percentage (%), Metric tons (t)	Y	N	N	N
	Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used	Percentage (%)	Y	N	N	N
	Percentage of hydraulic fracturing sites where ground or surface water quality deteriorated compared to a baseline	Percentage (%)	Y	N	N	N
	(1) Total volume of water handled in operations, (2) percentage recycled	Thousand cubic metres (m^3), Percentage (%)	N	N	N	Y
	Discussion of strategy or plans to address water consumption and disposal-related risks, opportunities and impacts	Discussion and Analysis	N	N	N	Y

Source: IFRS S2 Industry-based Guidance

Metrics and Targets: Industry-specific

Oil & Gas: IFRS S2 Industry-based Guidance (2/2)

TOPIC	METRIC	UNIT	Up stream	Mid stream	Refine & Market	Services
Product Specifications & Clean Fuel Blends	Total addressable market and share of market for advanced biofuels and associated infrastructure	Presentation currency, Percentage (%)	N	N	Y	N
	Volumes of renewable fuels for fuel blending: (1) net amount produced, (2) net amount purchased	Barrels of oil equivalent (BOE)	N	N	Y	N
Emissions Reduction Services & Fuels Management	Total fuel consumed, percentage renewable, percentage used in: (1) onroad equipment and vehicles and (2) off-road equipment	Gigajoules (GJ), Percentage (%)	N	N	N	Y
	Discussion of strategy or plans to address air emissions-related risks, opportunities and impacts	Discussion and Analysis	N	N	N	Y
	Percentage of engines in service that comply with the highest level of emissions standards for non-road diesel engine emissions	Percentage (%)	N	N	N	Y
Activity Metrics	Production of: (1) oil, (2) natural gas, (3) synthetic oil, and (4) synthetic gas	Thousand barrels per day (Mbbl/ day); Million standard cubic feet per day (MMscf/day)	Y	N	N	N
	Number of offshore sites	Number	Y	N	N	N
	Number of terrestrial sites	Number	Y	N	N	N
	Total metric ton-kilometres of: (1) natural gas, (2) crude oil, and (3) refined petroleum products transported, by mode of transport	Number	N	Y	N	N
	Refining throughput of crude oil and other feedstocks	Barrels of oil equivalent (BOE)	N	N	Y	N
	Refining operating capacity	Million barrels per calendar day (MBPD)	N	N	Y	N
	Number of active rig sites	Number	N	N	N	Y
	Number of active well sites	Number	N	N	N	Y
	Total amount of drilling performed	Number	N	N	N	Y
	Total number of hours worked by all employees	Hours	N	N	N	Y

Source: IFRS S2 Industry-based Guidance

Metrics and Targets: Example – Industry-based metrics

Electric Utilities & Power Generators: EGCO

EGCO refers to IFRS S2 *Industry-based Guidance on implementing Climate-related Disclosures* for disclosing industry-based metrics.

Table 7 IFRS S2 Sector-Specific Metrics[8]

Topic	Code	Metric	Performance 2023
Greenhouse Gas Emission	IF-EU-110a.1	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	N/A. Thailand does not have emissions limiting regulations.
		Gross global Scope 1 emissions, percentage covered under emissions-reporting regulations	N/A. Thailand does not have emissions reporting regulations.
	IF-EU-110a.2	Greenhouse gas (GHG) emissions associated with power deliveries[(a)]	9,774,509 metric ton CO_2e
	IF-EU-140a.1	Total water withdrawn, percentage in regions with High baseline water stress	0 m^3 (0%)
		Total water withdrawn, percentage in regions with Extremely High baseline water stress	0 m^3 (0%)
		Total water consumed; percentage in regions with High baseline water stress	0 m^3 (0%)
		Total water consumed, percentage in regions with Extremely High baseline water stress	0 m^3 (0%)
Water Management	IF-EU-140a.2	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	0[(b)] incidents
	IF-EU-140a.3	Description of water management risks and discussion of strategies and practices to mitigate those risks	Refer to 3.2.2 Physical Scenario Analysis.
End-Use Efficiency & Demand	IF-EU-420a.2	Percentage of electric load served by smart grid technology	N/A
	IF-EU-420a.3	Customer electricity savings from efficiency measures, by market	N/A
Nuclear Safety & Emergency Management	IF-EU-540a.1	Total number of nuclear power units, broken down by results of most recent independent safety review	N/A. EGCO does not have nuclear power units.
	IF-EU-540a.2	Description of efforts to manage nuclear safety and emergency preparedness	N/A. EGCO does not have nuclear power units.
Grid Resiliency	IF-EU-540a.1	Number of incidents of non-compliance with physical or cybersecurity standards or regulations	N/A
	IF-EU-540a.2	System Average Interruption Duration Index (SAIDI)	N/A
		System Average Interruption Frequency Index (SAIFI)	N/A
		Customer Average Interruption Duration Index (CAIDI), inclusive of major event days	N/A
Activity Metric	IF-EU-000.A	Number of: (1) residential, (2) commercial, and (3) industrial customers served	18
	IF-EU-000.B	Total electricity delivered to: (1) residential, (2) commercial, (3) industrial, (4) all other retail customers, and (5) wholesale customers	1,018,480 MWh
	IF-EU-000.C	Length of transmission and distribution lines	0 km EGCO does not own any transmission and distribution lines.
	IF-EU-000.D	Total electricity generated, percentage by major energy source, percentage in regulated markets	**Total electricity generated:** 12,088,289 MWh **Electricity generated by source:** Coal: 2,189,730 MWh (17.38%) Natural gas: 9,265,510 MWh (77.60%) Wind: 475,427 MWh (3.77%) Solar: 110,877 MWh (0.88%) Biomass: 46,745 (0.37%)
	IF-EU-000.E	Total wholesale electricity purchased	0 MWh

Disclosure reference: IFRS-S2-IBG – Issued IFRS Standards

[8] Refers to IFRS S2 guidance for the Electricity Utilities & Power Generator sector.

Source: EGCO Group, IFRS S2 Climate-related Disclosure, July 2024

Metrics and Targets: Climate-related targets

Climate-related targets

Disclosure the climate-related targets an entity has set, as well as those it is required to meet by law or regulations

The characteristics of each target including metrics used to set the target, objective, period, etc.

How the entity sets and reviews each target, and monitor progress against each target

The entity’s performance against each target and an analysis of trends or changes

Metrics and Targets: Example – Targets

Electrical & Electronic Equipment: DELTA

Delta disclosed GHG emission targets including:

- Objective
- Absolute GHG emission for scope 1 & 2 and 3
- Base period

Net Zero Target

Delta is committed to set a long-term goal to achieve net-zero emission target across the entire value chain by 2050, with the criteria and recommendations of the Science-based Targets initiative (SBTi) both direct emissions (Scope 1) and indirect emissions (Scope 2 and 3).

SCIENCE BASED TARGETS — DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

THE NET ZERO STANDARD — APPROVED NET-ZERO TARGETS

Scope 1+2	▼ 90%	by 2030
Scope 3	▼ 25%	by 2030
Scope 1+2+3	▼ 90%	by 2050

Baseline year: 2021

	Scope and Target	Adaptation Plans and Actions
Short Term (2025)	S1 S2 S3	- Decrease fossil fuel use - Improve Energy Efficiency - Increase RE use such as Solar Panel - Increase Renewable Energy Certificate (REC) - Replace Green Refrigerant - Increase EV Charger and user
Medium Term (2030)	S1 S2 S3	- Increase Utility Green Tariff (UTG) - Increase RE use - Increase EV Charger and user - Improve Energy Efficiency - Increase Green Revenue - Reduce waste - Create energy saving awareness
Long Term (2050)	S1 S2 S3	- Increase Green Revenue - Increase EV for Logistic - Sustainable Energy - Sustainable Consumption - Carbon Removal

Source: Delta Electronics Public Company Limited, IFRS S2 Climate-related Disclosure, 2023

Summary

Governance

The governance processes, controls and procedures the entity uses to monitor and manage sustainability-related risks and opportunities

Strategy

The approach the entity uses to manage sustainability-related risks and opportunities

- Sustainability-related risks and opportunities
- Business model and value chain
- Strategy and decision-making
- Financial position, financial performance and cash flows
- Resilience

Risk management

The processes the entity uses to identify, assess, prioritise and monitor sustainability-related risks and opportunities

Metrics and targets

The entity's performance in relation to sustainability-related risks and opportunities, including progress towards any targets the entity has set or is required to meet by law or regulation

Resources

- ISSB Climate-related *Disclosures*
- IFRS S2 *Industry-based Guidance on implementing Climate-related Disclosures*
- IFRS S2 *Basis for Conclusions*
- IFRS S2 *Accompanying Guidance*
- TCFD's *Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities (2017)*
- TCFD's *Guidance on Scenario Analysis for Non-Financial Companies (2020)*
- Other listed companies' Sustainability Report, 56-1 One Report, TCFD report, Climate Report
- Resources for climate scenario analysis
  - https://thinkhazard.org/en/
  - World Energy Outlook 2024 – Analysis – IEA
  - Tools | International Carbon Action Partnership
  - https://www.wri.org/applications/aqueduct/floods/#/
  - Climate Analytics — Climate impact explorer

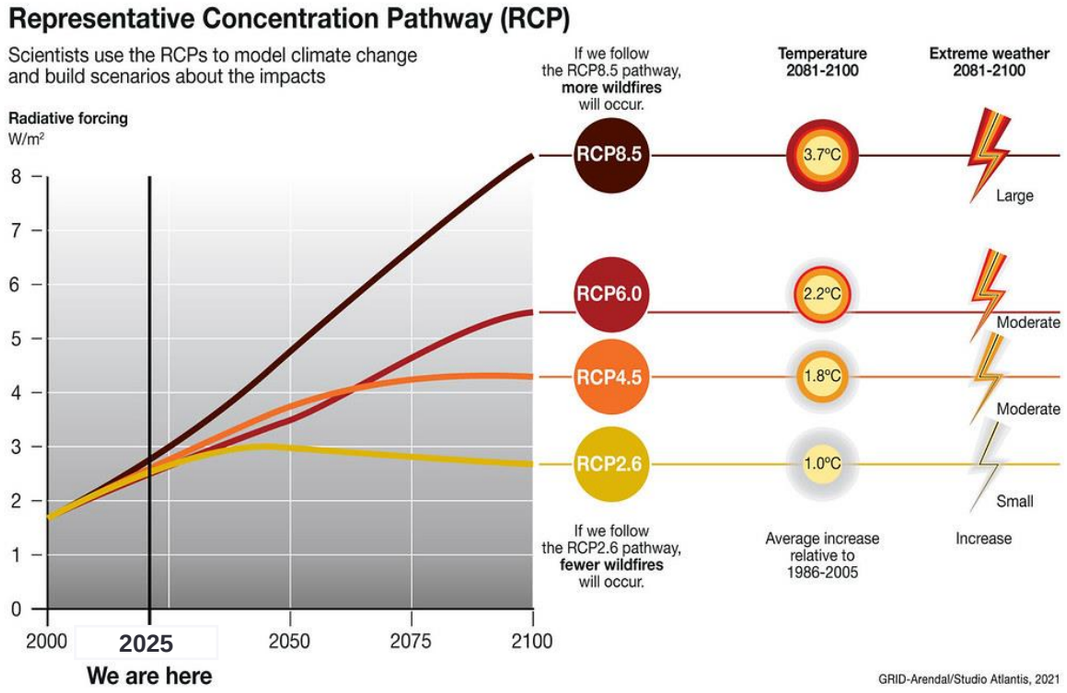

Q&A

Appendix

Climate scenarios (Not exhaustive)

Scenario	Definition	Key Features	Physical Risks	Transition Risks	Public Tools/Models
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.	CMIP (Coupled Model Intercomparison Project)
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.	IMAGE (Integrated Model to Assess the Global Environment)
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.	World Energy Model (WEM)
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.	NGFS Climate Scenarios Portal

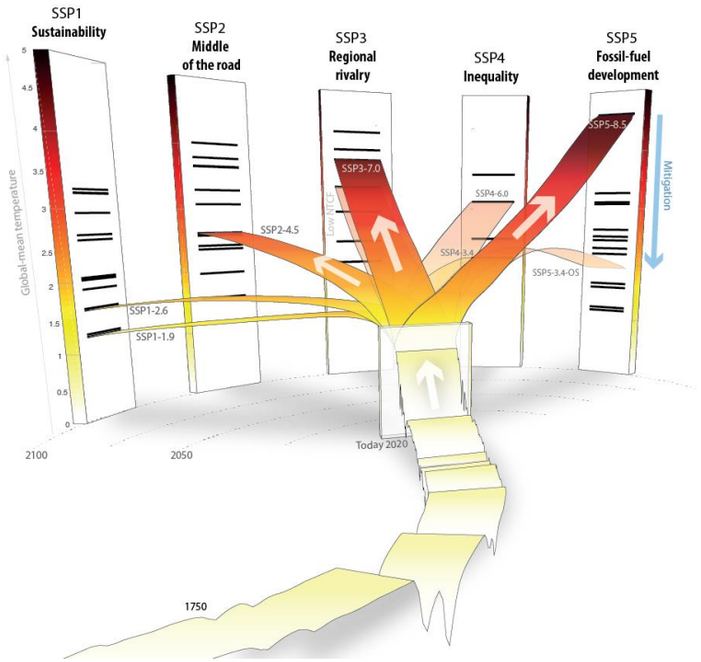
4 RCP scenarios



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*

5 SSP scenarios

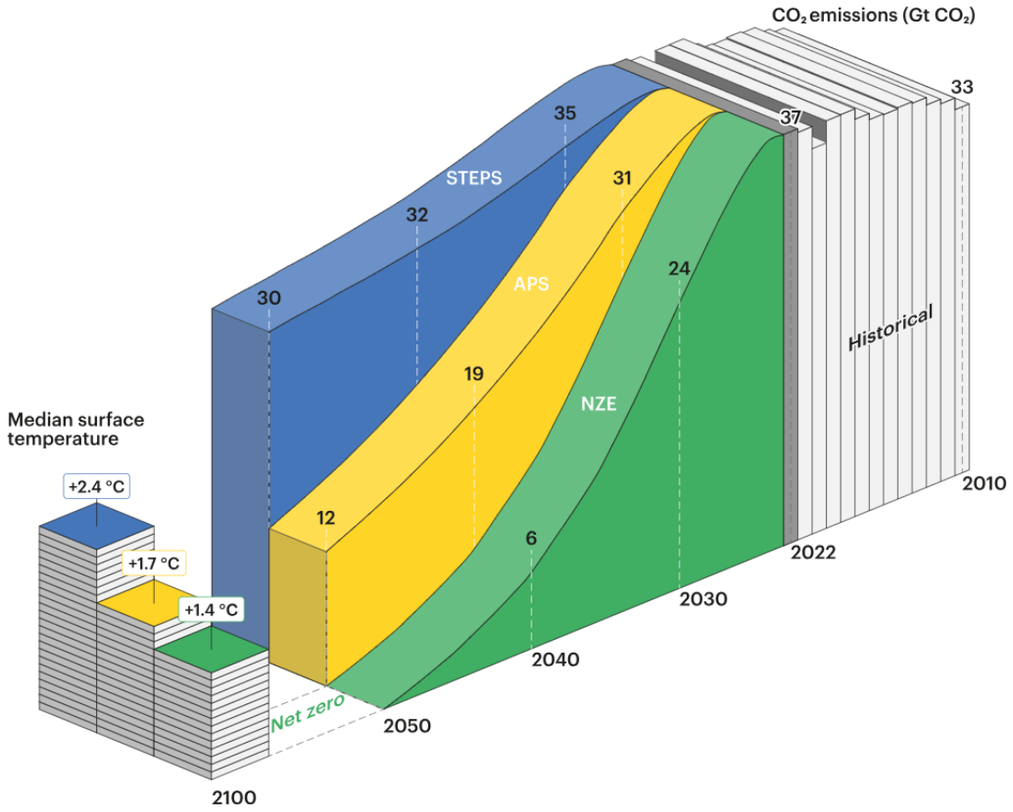


The SSP scenarios and their five SSP families. Shown are illustrative temperature levels relative to pre-industrial levels with historical temperatures (front band), current (2020) temperatures (small block in middle), and the branching of the respective scenarios over the 21st century along the five 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*

3 IEA scenarios

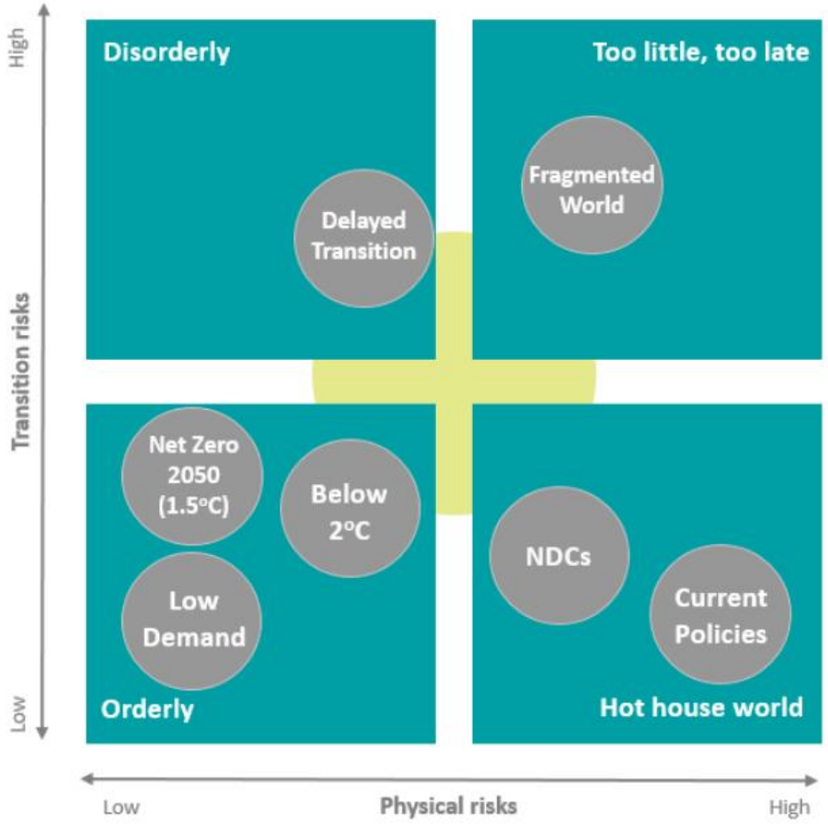


Scenario	Full Name	Description	Approx. Warming Outcome 2050
STEPS	Stated Policies Scenario	Projects future based on currently enacted policies and measures.	~2.5–2.7°C
APS	Announced Pledges Scenario	Includes both stated policies and announced net-zero or climate pledges (even if not yet implemented).	~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*

7 NGFS scenarios



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.

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