

What are Climate-related Risks and Opportunities?

Climate Change

Long-term changes in the Earth's climate that are warming the atmosphere, ocean and land. Climate change is affecting the balance of ecosystems that support life and biodiversity, and impacting health. It also causes more extreme weather events, such as more intense and/or frequent hurricanes, floods, heat waves, and droughts, and leads to sea level rise and coastal erosion as a result of ocean warming, melting of glaciers, ad loss of ice sheets.

Source: United Nations Development Project - The Climate Dictionary, 2023

Climate Risks

There are two categories of climate risks:

- •Transition Risks: Risks related to the transition to a lower-carbon economy.
- Physical Risks: Risks related to the physical impacts of climate change.

Source: Recommendations of the Task Force on Climate-related Financial Disclosures

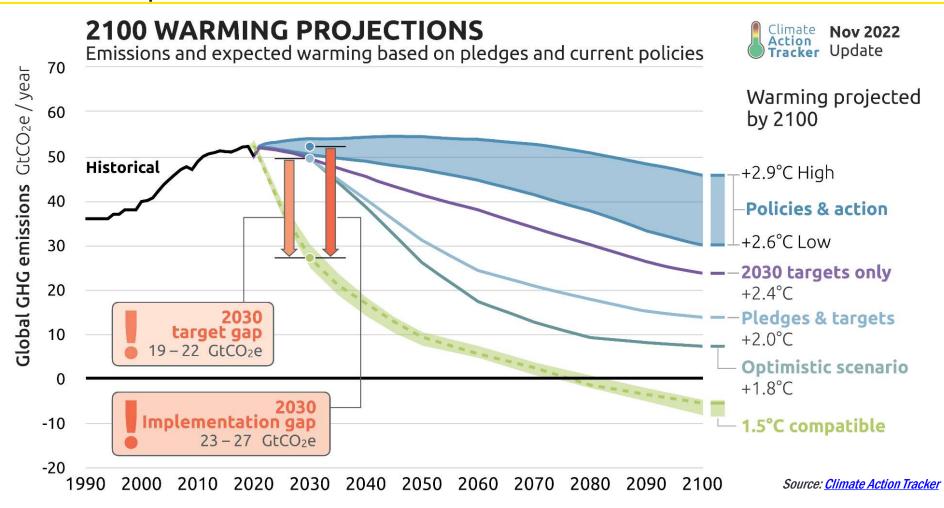
Climate-related Opportunities

Opportunities in relation to efforts in mitigating and adapting to climate change.

Source: Recommendations of the Task Force on Climate-related Financial Disclosures

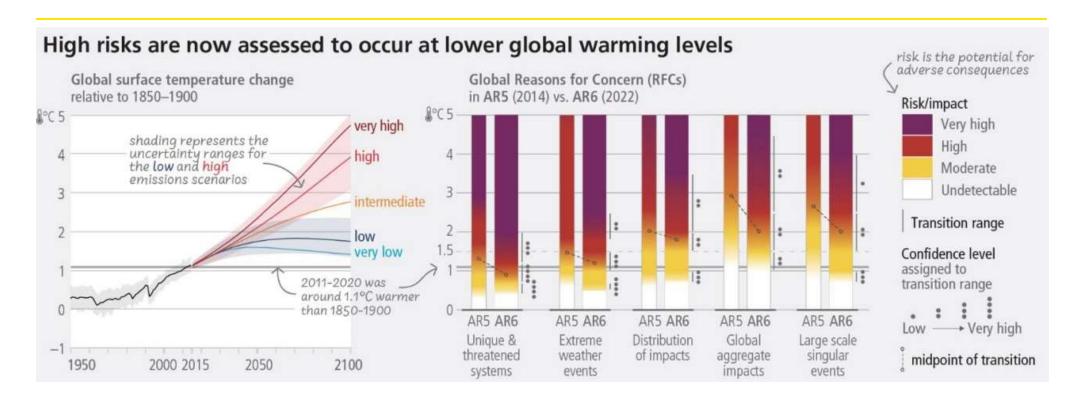


What is the Latest Projection on Global Greenhouse Gases Emissions and the Global Temperature Rise?





How Climate Risk is affected by Global Surface Temperature Change?



Source: IPCC AR6 Synthesis Report

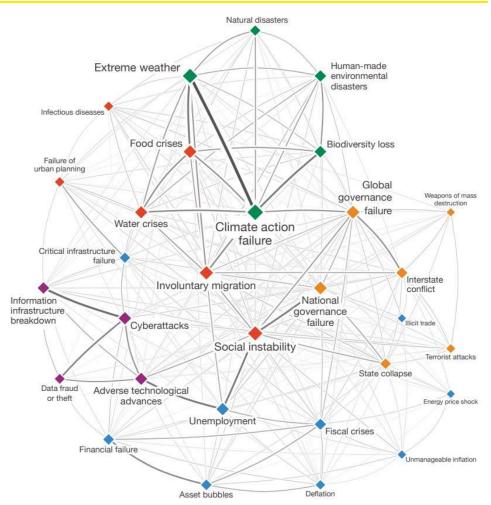


Relationship between Climate Risks and other risks



Climate risks are interconnected with dozens of risks we encounter.

- In addition to the human health impacts, involuntary migration, and biodiversity loss, climate change also threatens the stability of financial markets and the broader economy.
- ➤ The physical impacts and transition risks are likely to manifest in a way that is cumulative and unexpected.
- ➤ Left unmitigated, climate change risks can impact supply chains, asset valuations, access to capital, insurability, etc



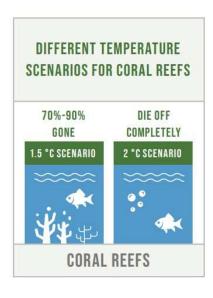
Source: World Economic Forum Global Risks Perception Survey 2019-2020

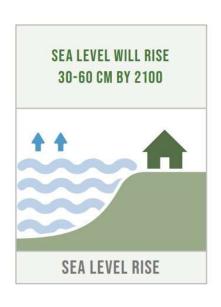


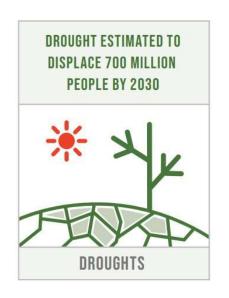
What are the consequences if Climate Risks are neglected

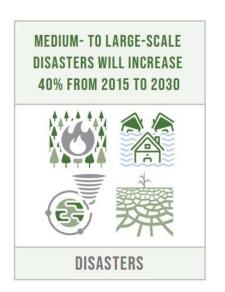


OUR WINDOW TO AVOID CLIMATE CATASTROPHE IS CLOSING RAPIDLY



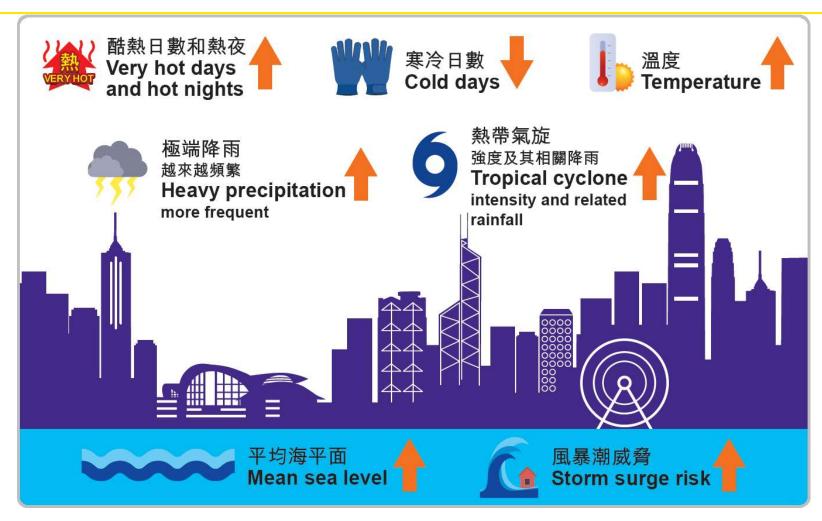








What are our observations in Hong Kong?





How Climate-related Risks and Opportunities affect Financials?



Source: Recommendations of the Task Force on Climate-related Financial Disclosures



What is EXAMPLEs of Climate-related Risks?

Transition Risks	Potential Financial Impacts			
Policy and Legal				
Increased pricing of GHG emissions	Increased operating costs (e.g., higher compliance costs, increased insurance premiums)			
Enhanced emissions reporting obligations	Write-offs, asset impairment, and early retirement of existing assets due to policy changes			
Mandates on and regulation of existing products and services	Increased costs and/or reduced demand for products and services resulting from fines or judgements			
Exposure to litigation				
Technology				
 Substitution of existing products and services with lower emission options Unsuccessful investment in new technologies Costs to transition to lower emissions technology 	Write-offs and early retirement of existing assets			
	Reduced demand for products and services			
	Research and development expenditures in new and alternative technologies			
	Capital investments in technology development			
	Costs to adopt/deploy new practices and processes			



What is EXAMPLEs of Climate-related Risks?

Transition Risks	Potential Financial Impacts	
Market		
Changing customer behavior	Reduced demand for goods and services due to shift in consumer preferences	
Uncertainty in market signals	• Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g.,	
Increased cost of raw materials	waste treatment)	
	Abrupt and unexpected shifts in energy costs	
	Change in revenue mix and sources, resulting in decreased revenues	
	Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)	
Reputation		
Shifts in consumer preferences	Reduced revenue from decreased demand for goods/services	
Stigmatization of sector	Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain	
Increased stakeholder concern or negative	interruptions)	
stakeholder feedback	 Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) 	
	Reduction in capital availability	



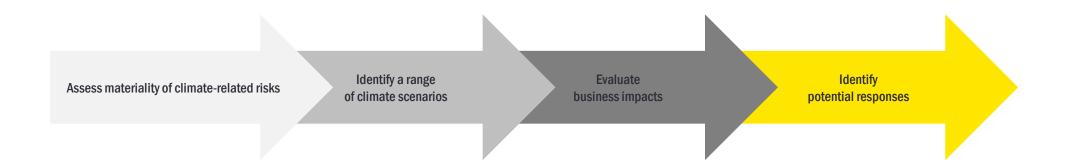
What is EXAMPLEs of Climate-related Risks?

Climate-related Physical Risks	Potential Financial Impacts
Acute Increased severity of extreme weather events such as cyclones and floods	 Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism)
 Chronic Changes in precipitation patterns and extreme variability in weather patterns Rising mean temperatures Rising sea levels 	 Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) Increased capital costs (e.g., damage to facilities) Reduced revenues from lower sales/output Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations



What is The Typical Way of Assessing Climate Risks on an organization?

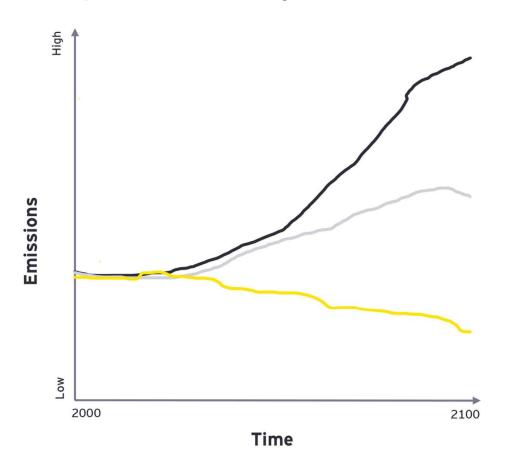
- > As discussed previously, no one is certain about the trajectory of global temperature rise.
- ➤ Given the uncertainty, the TCFD recommends the use of scenario analysis to test the resiliency of an organization under different future states. Scenarios aren't predictions or forecasts but possible future states.
- > By selecting a range of future scenarios, organizations can identify different risks and opportunities and use that to inform the business strategy.





Relationship between Scenarios and Impact of Climate-related Risks

An example in the context of a clothing business



3-5 degrees: Uncontrolled climate change

- Scarcity of raw materials e.g. cotton
- Distortion of seasonal clothing market
- Extensive weather disruptions to production and supply chain
- ► Extensive social disruptions to production and supply chain

2-3 degrees: Slow transition

- Increased price of cotton
- Unpredictability of seasonal clothing market
- Social and weather disruptions to production and supply chain
- ► Change in consumer preferences and competition
- Requirements related to metals, and materials

Below 2 degrees: Sustainable disruption

- Increased cost of transportation
- Changing consumer preferences and competition from low-carbon alternatives e.g. circular solutions, new materials (hemp, bamboo), durability
- Regulation of "fast fashion"
- Limitation on animal based materials e.g. wool, leather, and limits of mining of metals

Physical impacts

Transitional impacts



A Typical Climate Scenario Analysis

Assess materiality of climate-related risks

Market and Technology

Supply and demand shifts related to innovations in support of a low-carbon economy.

Reputation

Growing expectations for responsible conduct from stakeholders, including investors, lenders and consumers.

Policy and Legal

An evolving patchwork of requirements at international, national and state level.

Physical risks

Physical changes and extreme weather events related to climate changes.

What are the current and anticipated organizational exposures to climate-related risks and opportunities? Do these have the potential to be material in the future? Are organizational stakeholders concerned?

Identify and define range of scenarios

Scenarios inclusive of a range of transition and physical risks relevant to the organization.

What scenarios (and narratives) are appropriate, given the exposures? Consider input parameters, assumptions, and analytical choices. What reference scenario(s) should be used? Key parameters and assumptions help organizations identify and understand the material drivers for their business, key parameters and assumptions, and then build these into their scenarios.

- Parameters used: macro trends; GDP, macro-economic variables, demographic and societal changes.
- Assumptions made: policy changes, technological developments, energy mix, pricing of key commodities, and how these are reflected by microeconomic factors.
- Analytical choices: choice of scenarios (publicly available scenarios or organizational specific scenarios), qualitative vs. quantitative analysis, time horizons, supporting data and models.

Evaluate business impacts

Impact on:

- ▼ Inputs costs
- Operating costs
- Revenues
- Supply chain
- Business interruption
- **▼** Timing

Evaluate the potential effects on the organization's strategic and financial position under each of the defined scenarios, identify key sensitivities. Identify potential responses

Responses might include

- Changes to business model
- Changes to portfolio mix
- Investments in capabilities and technologies

Use the results to identify applicable, realistic decisions to manage the identified risks and opportunities. What adjustments to strategic/financial plans would be needed?

Example of Publicly Available Scenarios		
Physical Risks	Transition Risks	
RCP (1.9, 2.6, 3.4, 4.5, 6.0, 7.0, 8.5)	IEA (NZE2050, 2DS, B2DS, 450, SDS, STEPS, CPS, APS) Greenpeace DDPP IRENA BNEF NGFS	

Source: CDP



What is EXAMPLEs of Climate-related Opportunities?

Туре	Climate-Related Opportunities	Potential Financial Impacts
Resource Efficiency	 Use of more efficient modes of transport Use of more efficient production and distribution processes Use of recycling Move to more efficient buildings Reduced water usage and consumption 	 Reduced operating costs (e.g., through efficiency gains and cost reductions) Increased production capacity, resulting in increased revenues Increased value of fixed assets (e.g., highly rated energy efficient buildings) Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	 Use of lower-emission sources of energy Use of supportive policy incentives Use of new technologies Participation in carbon market Shift toward decentralized energy generation 	 Reduced operational costs (e.g., through use of lowest cost abatement) Reduced exposure to future fossil fuel price increases Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon Returns on investment in low-emission technology Increased capital availability (e.g., as more investors favor lower-emissions producers) Reputational benefits resulting in increased demand for goods/services



What is EXAMPLEs of Climate-related Opportunities?

Туре	Climate-Related Opportunities	Potential Financial Impacts
Products and Services	Development and/or expansion of low emission goods and services	Increased revenue through demand for lower emissions products and services
	Development of climate adaptation and insurance risk solutions	Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)
	Development of new products or services through R&D and innovation	Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
	Ability to diversify business activities	
	Shift in consumer preferences	
Markets	Access to new marketsUse of public-sector incentives	Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks)
	Access to new assets and locations needing insurance coverage	Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	Participation in renewable energy programs and adoption of energy efficiency measures	Increased market valuation through resilience planning (e.g., infrastructure, land, buildings)
	Resource substitutes/diversification	Increased reliability of supply chain and ability to operate under various conditions
		Increased revenue through new products and services related to ensuring resiliency

