UK PACT

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DISCLOSURE INSIGHT ACTION

GRI

# TCFD Deep Dive: Climate risk assessments & Scenario Analysis

Delivered by CDP

June 2021

# UK PACT: Partnering for Accelerated Climate Transitions

## UK PACT is a £60 million programme running between 2018 and 2022

### Mission and vision

- Delivered by **BEIS, the UK's Department for Business, Energy and Industrial Strategy**, through the UK's International Climate Finance (ICF)
- Supporting **achievement of Nationally Determined Contributions (NDCs)** and the long-term goal of the 2015 Paris Agreement to **limit dangerous climate** change
- **Demand-driven**, adjusting key focus areas based on partner countries' needs and sectoral priorities

### We will achieve this by:

- Working with partner countries to improve the capacity and capability of key institutions to reduce emissions and foster inclusive economic growth
- Addressing barriers and constraints to clean growth
- Pursuing opportunities for greater climate ambition

For more information, visit www.ukpact.co.uk

# UK PACT: Partnering for Accelerated Climate Transitions

## Delivered by CDP and GRI

**Closing the gap on sustainable finance and enabling green recovery through capacity-building in CDP's TCFD-aligned disclosures and the GRI standards**

This will be done through:

- Workshops
  - *Beginner*
  - *Advanced*
  - *Capital markets*
- Published materials
- Follow-up engagement

For more information, visit www.ukpact.co.uk

# Beginner Workshops

## Delivered by CDP and GRI

### Day 1

*Recording of CDP session here*

**Agenda**

CDP DISCLOSURE INSIGHT ACTION

| Time (GMT+7) | Topic | Speaker |
|---|---|---|
| 09:35-09:40 am | Welcome and opening remarks | Ms. Ratvalee Anantananont, The Stock Exchange of Thailand |
| 09:40-09:45 am | Introduction and opening remarks | Ms. Alexandra McKenzie, FCDO |
| 09:45-10:00 am | State of play | Ms. Pratima Divgi, CDP |
| 10:00-10:25 am | Concepts and components of the TCFD | Mr. Joseph Gualtieri, CDP |
| 10:25-10:35 am | Q&A | |
| 10:35-10:45 am | **Break** | |
| 10:45-11:05 am | Developing a TCFD roadmap through CDP | Mr. Fredrik Andersen, CDP |
| 11:05-11:15 am | Getting started with your TCFD report | Ms. Elim Kwok, CDP |
| 11:15-11:30 am | Guest speaker – PTT Global Chemical Public Company Limited | Dr. Natthakorn Kraikul, PTT GC |
| 11:30-11:35 am | Closing remarks | Mr. Fredrik Andersen, CDP |
| 11:35 am -12:00 pm | Q&A | |

### Day 2

*Recording of GRI session here*

GRI

**Agenda**

**Session 1: Introduction – What Business Can Do for SDGs**

1. The Why's and How's of Sustainable Business
2. Conceptual Thinking of Sustainable Business
3. International and National Framework of Sustainability
4. Creating Changes in One Go through Reporting

Session 2: Mapping the Intersections of Sustainability & SDGs

1. Introducing Reporting Tools (TCFD, GRI Standards, and SDGs)
2. Reporting Standards/Frameworks and Examples for each issue
3. Gender Lens for Gender and Diversity & Inclusion

For more information, visit www.ukpact.co.uk

# TCFD Deep Dive: Climate risk assessments & Scenario Analysis

Advanced workshop

June 2021

CDP
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# Today's Learning Outcomes

- Become familiar with climate-related risks in the context of the TCFD recommendations
- Learn key elements of climate risk management practices
- Become familiar with various types of climate-related Scenario Analysis
- Learn various approaches to climate-related Scenario Analysis
- Take first steps to begin or improve climate-risk assessment and climate-related scenario analysis
- Know where to find resources

# Thank you to our partners:

CDP
DISCLOSURE INSIGHT ACTION

UK PACT
GREEN RECOVERY CHALLENGE FUND

British Embassy Bangkok

GRI

SET

# Agenda

| Time (GMT+7) | Topic | Speaker |
|---|---|---|
| 1:30-1:35pm | Housekeeping | |
| 1:35-1:40 | Welcome and opening remarks | Ms. Ratvalee Anantananont, The Stock Exchange of Thailand |
| 1:40-1:45 | Opening remarks | Mr. Andrew Beirne, FCDO |
| 1:45-1:55 | Recap of the TCFD | Mr. Fredrik Andersen, CDP |
| 1:55-2:40 | Climate-risk Assessments | Ms. Lau Xin Yi, The Carbon Trust |
| 2:40-2:50 | Q&A | |
| 2:50-3:00 | **Break** | |
| 3:00-3:45 | Climate-related Scenario Analysis | Ms. Lau Xin Yi, The Carbon Trust |
| 3:45-4:00 | Q&A and closing remarks | |

# Opening Remarks

**Ms. Ratvalee Anantananont**

Senior Vice President, Sustainable Development Department 1

The Stock Exchange of Thailand

# Opening Remarks

**Mr. Andrew Beirne**

Economic and Prosperity Counsellor & UK permanent representative to UNESCAP

British Embassy Bangkok

# Recap of the TCFD

**Mr. Fredrik Andersen**

Engagement Lead

CDP

# How CDP Work With Companies and Investors

Use CDP to make informed decisions and reward companies with superior performance.

INVESTORS & PROCURERS

DISCLOSURE REQUEST

CDP DISCLOSURE INSIGHT ACTION

COMPANIES

Measure their impact to improve performance

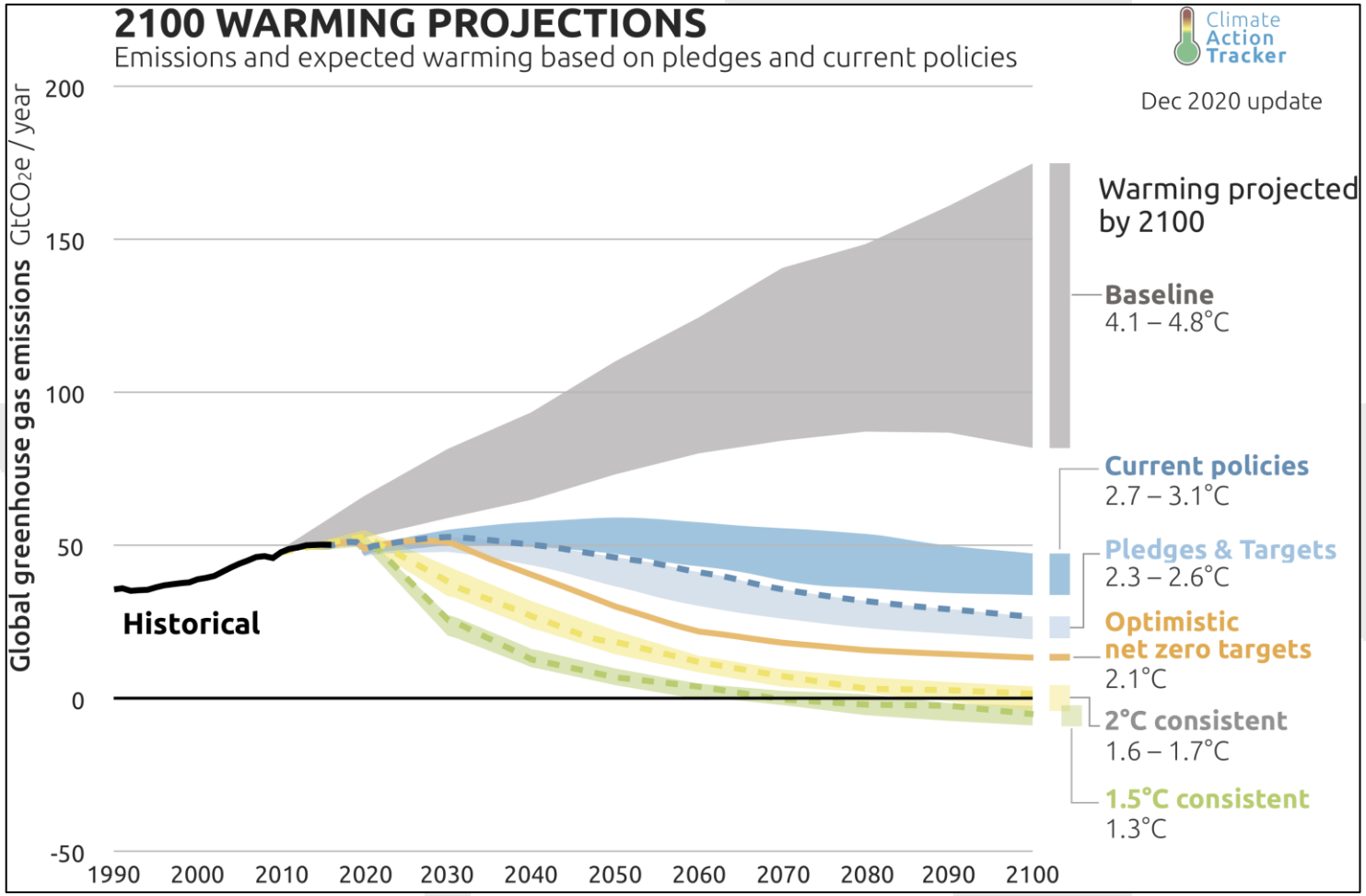
TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Companies take action to tackle climate change, safeguard water resources and prevent the destruction of forests.

Provide environmental data through CDP's online platform

# Global state of play - emissions

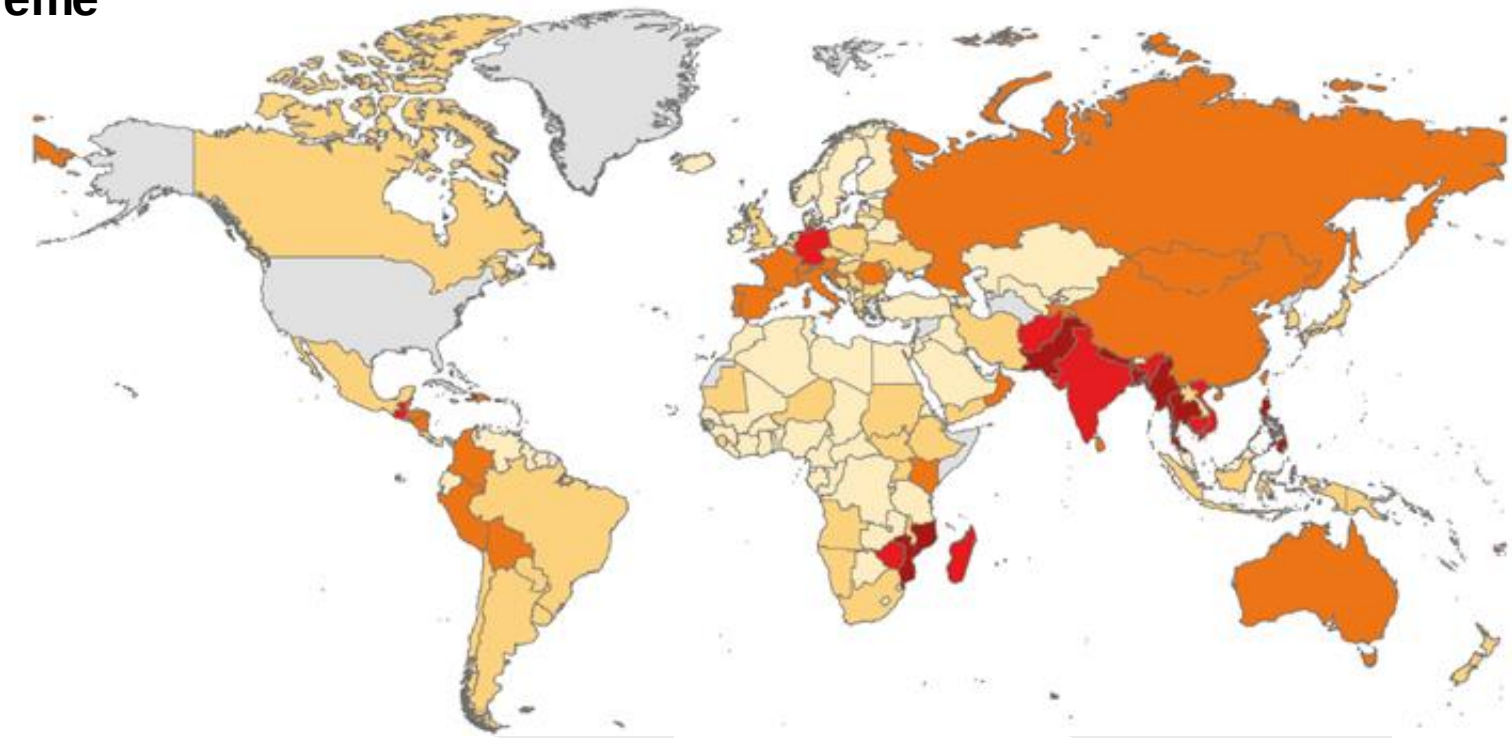
- Carbon emissions continue to rise
- Projected warming of over 4°C of warming by end of the century
- Double the global temperature increase sought by the Paris Agreement
- Annual 7.6% reduction in emissions is required from 2020
- Transition risks to limit warming to 1.5 include policy and regulation, technological advancements and reputational impacts.



# Countries most affected by extreme weather events

**Countries most affected by extreme weather events (2000-2019)**

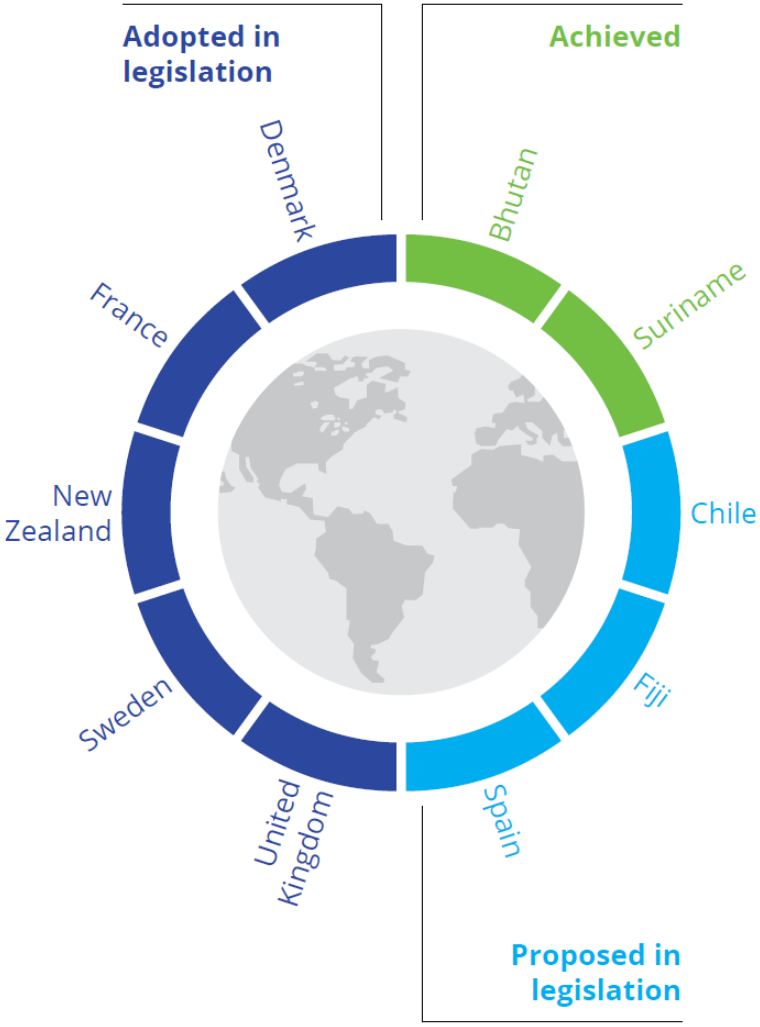
1 Puerto Rico
2 Myanmar
3 Haiti
4 Philippines
5 Mozambique
6 The Bahamas
7 Bangladesh
8 Pakistan
9 Thailand



Source: Germanwatch, 2021

# The race to net zero emissions

- >70 countries are now committed to working towards net zero GHG emissions by 2050
- 114 countries expressed commitments to update NDCs by end-2020
- 97 countries now mention carbon pricing in their NDCs




Source: World Bank

# Climate Action, the Paris Agreement, and CDP

UNITED NATIONS PARIS CLIMATE AGREEMENT SIGNING CEREMONY 22 APRIL 2016

**G20 Finance Ministers**

FSB FINANCIAL STABILITY BOARD

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES


Source: United Nations, FSB, TCFD

# The TCFD Recommended Disclosures

| Governance | Strategy | Risk Management | Metrics and Targets |
|---|---|---|---|
| Disclose the organization's governance around climate-related risks and opportunities. | Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material. | Disclose how the organization identifies, assesses, and manages climate-related risks. | Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material. |
| **Governance recommended disclosures** | **Strategy recommended disclosures** | **Risk Management recommended disclosure** | **Metrics & Targets recommended disclosures** |
| a) Describe the board's oversight of climate related risks and opportunities. | a) Describe the climate related risks and opportunities the organization has identified over the short, medium, and long term. | a) Describe the organization's processes for identifying and assessing climate-related risks. | a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. |
| b) Describe management's role in assessing and managing climate related risks and opportunities | b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning. | b) Describe the organization's processes for managing climate related risks. | b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks |
| | c) Describe the resilience of the organization's strategy, taking into consideration different climate related scenarios, including a 2°C or lower scenario. | c) Describe how processes for identifying, assessing, and managing climate related risks are integrated into the organization's overall risk management. | c) Describe the targets used by the organization to manage climate related risks and opportunities and performance against targets. |

# Turning TCFD Recommendations Into Questions

What investors and companies *should* be evaluating.

How to provide complete, comparable, information for each question. Resources to take action on metrics.


Breakdown of recommendations into accessible, actionable metrics.

What is best practice for each metric.

Standardized, comparable, decision-ready data

# Climate Action, the Paris Agreement, and CDP

**Climate-related scenario-analysis**

**Climate-related risk assessment**


Source: United Nations, FSB, TCFD

# Climate-risks & Scenario Analysis

Ms. Lau Xin Yi
Green Finance Lead, Southeast Asia

The Carbon Trust

# Demystifying climate-related risk assessment and climate scenario analysis: What can corporates and financial institutions do?

Presenter: Ms. Lau Xin Yi, Green Finance Lead, South East Asia, Carbon Trust

# Introduction to the Carbon Trust

# Who we are

## The Carbon Trust

- works with businesses and governments, helping them to align their strategies with climate science and meet the goals of the Paris Agreement;
- provides expert advice and assurance, giving investors and financial institutions the confidence that green finance will have genuinely green outcomes; and
- supports the development of low carbon technologies and solutions, building the foundations for the energy system of the future.

Headquartered in London, the Carbon Trust has a global team of over 200 staff, representing over 30 nationalities, based across five continents. We opened our South East Asia office in Singapore in early 2019 and we are working with a growing number of governments, businesses and financial institutions across the region.

# What we do

- Green finance
- Assurance and certification
- Business advisory
- Programme design and management
- Technology Innovation
- Policy advice

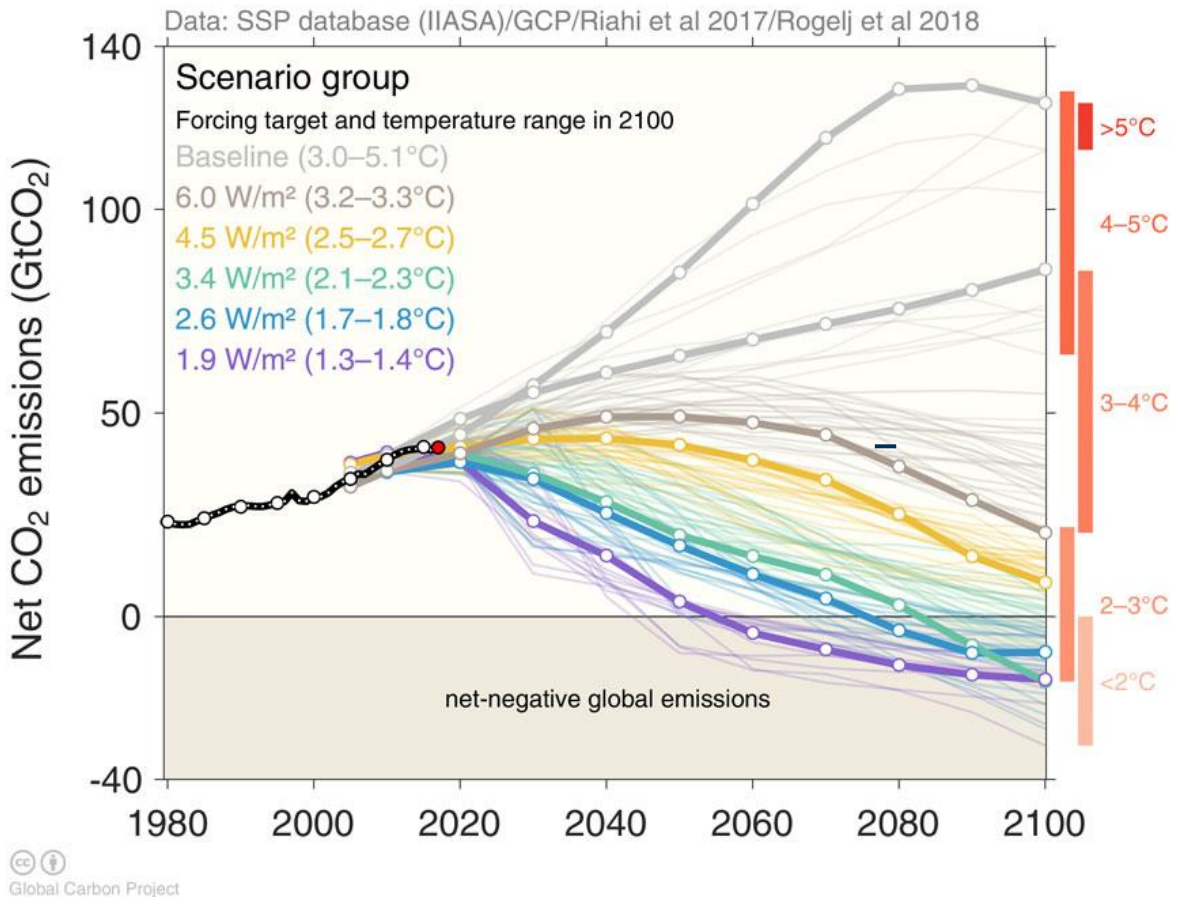
# Agenda - Climate-related risk management

1. Introduction and background
2. TCFD recommendations – Risk Management
3. Emerging Best Practices in Risk Management – Insights from the Climate Financial Risk Forum
4. Q&A

# 1. Introduction and background

# Observed emissions and emissions scenarios

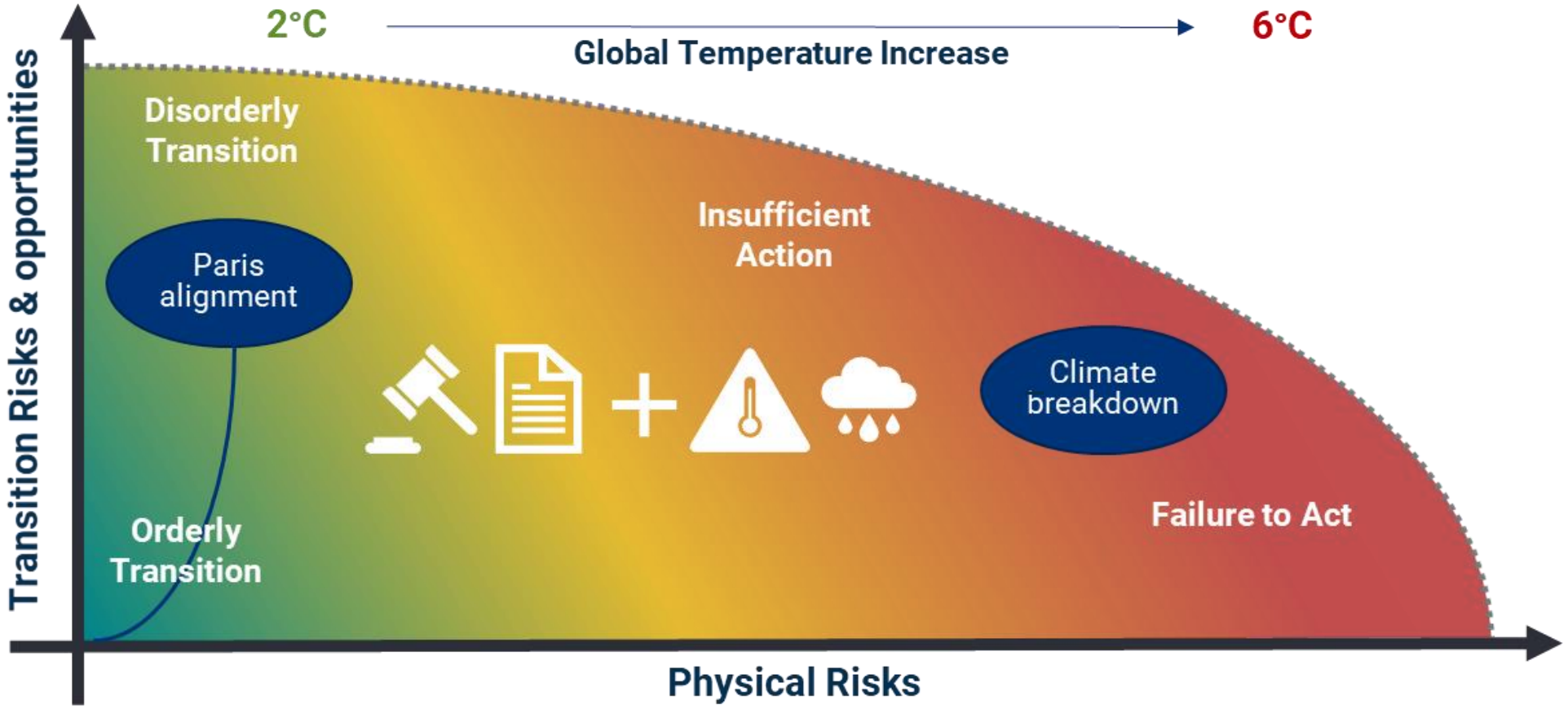
The emission pledges to the Paris Agreement avoid the worst effects of climate change (4-5°C); most studies suggest the pledges give a likely temperature increase of about 3°C in 2100




*Source: Global Carbon Project (2019)*

# Climate change is impacting market dynamics

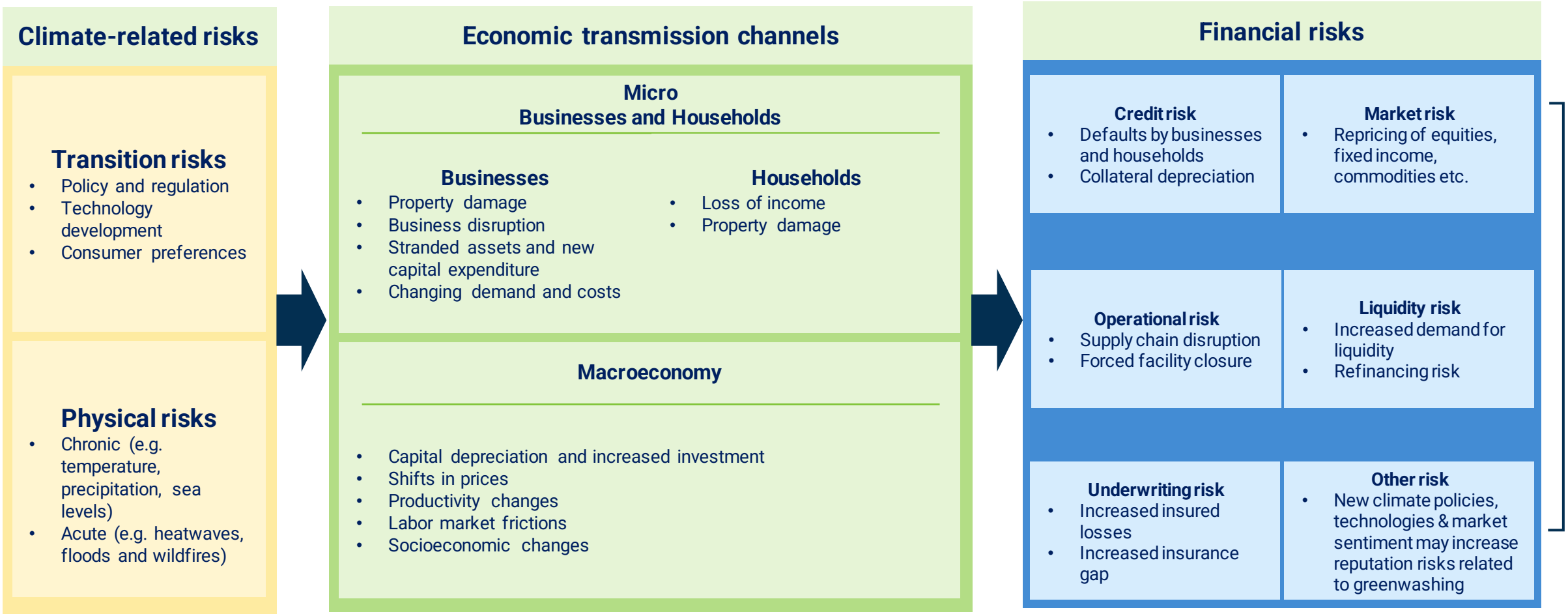
Climate-related risks can only increase from this point on




*Source: The Carbon Trust*

# Transmission channels

## From climate-related risks to financial risks



# Mitigating and Adapting to Climate Change also Produce Opportunities

## Resource Efficiency

Reduced operating costs by improving efficiency across production and distribution processes, buildings, machinery/ appliances, and transport/ mobility

## Energy Source

Savings on annual energy costs arising from shift toward low emission energy sources

## Products and Services

Organisations that innovate and develop new low-emission products and services may improve their competitive position and capitalise on shifting consumer and producer preferences.

## Markets

Access to new markets or types of assets may help organisations to diversify their activities and better position themselves for the transition to a lower-carbon economy

## Resilience

Adaptive capacity to respond to climate change to better manage the associated risks and seize opportunities

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# Poll Question

Which of the following shape(s) the climate change related risks and opportunities for an organisation? Please select those that apply.

- Option 1: Regulations and carbon price
- Option 2: Availability of jobs
- Option 3: Technology breakthroughs
- Option 4: Consumer behaviour shifts
- Option 5: Physical impacts of climate

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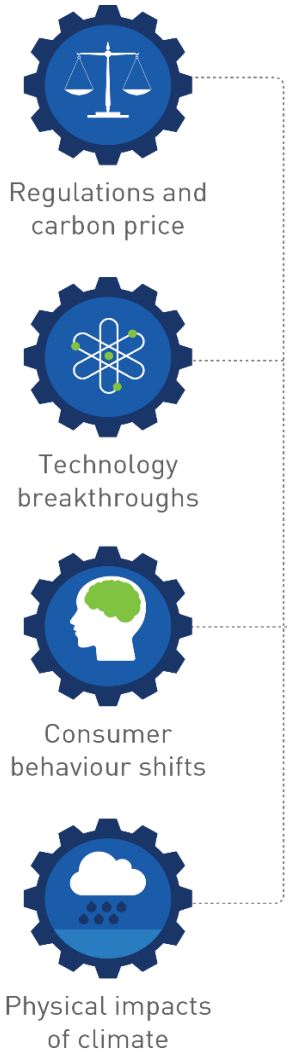
# Poll Answer

## Which of the following shape(s) the climate change related risks and opportunities for an organisation?




Regulatory requirements related to climate change (e.g. carbon tax) makes it more costly for carbon-intensive sectors to operate in the future

Technological breakthroughs will affect the competitiveness of certain organisations, their production and distribution costs, and ultimately the demand for their products and services from end users

Consumer behaviour shifts could lead to higher demand for products which are sustainably sourced or produced

Increased severity of extreme weather events could affect organisations' premises, operations, supply chain, transport needs, and employee safety

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# 2. TCFD recommendations – Risk Management

# How will climate change affect your business?

*TCFD is a disclosure framework of 11 questions across 4 categories*


## Governance

a) **Board oversight** of climate-related risks and opportunities
b) **Management role** in risk assessment and management

## Strategy

a) **Risks and opportunities** identified
b) **Impact** on business, strategy, and planning
c) **Resilience of strategy** to different scenarios

## Risk Management

a) Process for **identifying and assessing** climate-related risks
b) Process for **managing** climate-related risks
c) **Integration** with overall risk management

## Metrics and Targets

a) **Metrics** for climate-related risk assessment
b) **Scope 1, 2, and** (if needed) **3** emissions and related risks
c) **Targets** for risks and opportunities and related performance

*Source: TCFD 2017 Report*

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# Recommended Disclosure

## Risk Management (Guidance for All Sectors)

- To evaluate an organisation's overall risk profile and risk management activities, it is important to understand how an organisation's climate-related risks are identified, assessed, and managed and whether those steps are integrated into existing risk management processes.

| | Recommended Disclosure a) Describe the organisation's processes for identifying and assessing climate-related risks |
|---|---|
| Guidance for All Sectors | • Organisations should describe their risk management processes for identifying and assessing climate-related risks. An important aspect of this description is how organisations determine the **relative significance of climate-related risks in relation to other risks**.<br><br>• Organisations should describe whether they consider **existing and emerging regulatory requirements** related to climate change (e.g., limits on emissions) as well as other relevant factors considered.<br><br>• Organisations should also consider disclosing the following: (1) processes for assessing the potential size and scope of identified climate-related risks and (2) definitions of risk terminology used or references to existing risk classification frameworks used. |

# Recommended Disclosure (continued)

## Risk Management (Guidance for All Sectors)

| | Recommended Disclosure b) Describe the organisation's processes for managing climate-related risks |
|---|---|
| Guidance for All Sectors | • Organisations should describe their **processes for managing** climate-related risks, including how they make decisions to mitigate, transfer, accept, or control those risks.<br><br>• In addition, organisations should describe their **processes for prioritising** climate-related risks, including how materiality determinations are made within their organisations. |
| | **Recommended Disclosure c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management** |
| | • Organisations should describe how their processes for identifying, assessing, and managing climate-related risks are integrated into their overall risk management. |

# Steps for TCFD disclosure

- Our approach to TCFD project is based on the idea that the risk evaluation process has to be cost efficient. Focus on what is material and critical to decision-making, and avoid getting lost in the detail.
- In the figure below, we propose practical steps a company can take to set the foundation for a TCFD-aligned disclosure

# Steps for TCFD disclosure (continued)

# 3. Emerging Best Practices in Risk Management

## Insights from the Climate Financial Risk Forum

# Overview

- Output from the cross-industry Risk Management Working Group of the UK's Prudential Regulation Authority and Financial Conduct Authority's Climate Financial Risk Forum
- Guide has been written **by industry, for industry**. Aimed at banks, asset managers and insurers of all sizes
- Risk Management Chapter provides practical guidance on **how** to address climate risks within financial institutions

# Scope of the workshop (*)

| | |
|---|---|
| * | Risk governance |
| * | Risk management frameworks |
| * | Risk appetite |
| * | Risk assessment for insurance underwriting, credit, financial market and operational risks |
| | Data and tools |
| | Training and culture |
| | Challenges, barriers and gaps |

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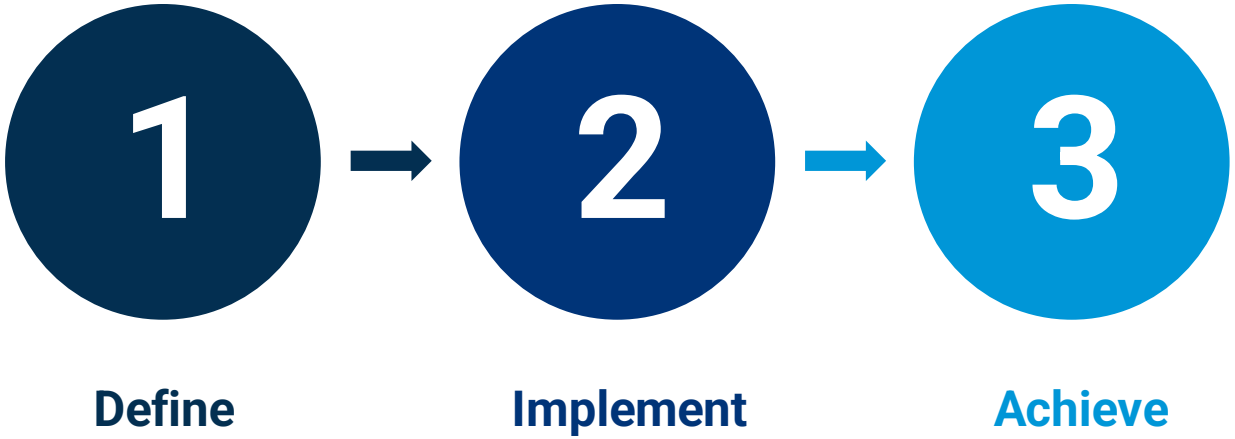
# 1. Risk governance



# Risk governance


**Define**

- Effective governance should ensure there is understanding, oversight and accountability for financial risks arising from climate change (i.e. climate risk) **at all levels of an institution**
- Key to embedding effective governance is the **board's understanding and oversight** of the firm's approach to management of climate risks
- One potential indicator of the firm's quality of climate risk governance could be based on the extent to which climate risk management is integrated effectively into established risk management

# Risk governance

2

**Implement**

## Steps for setting-up board governance

1. Deliver a tailored training programme to the board on climate risk; consider using external experts where necessary
2. Update board committee terms of reference to include climate risk
3. Provide periodic regular updates to relevant board committee(s) on:
   - The firm's progress in preparing for and implementing climate risk management
   - Risk reporting metrics (Risk Appetite and metrics developed)
4. The board to provide review and challenge on:
   - Undue or unexpected climate risk concentrations
   - The firm's strategy/ corporate plan, considering the climate risk profile, through a short (e.g. 3-5 year), medium (e.g. 10 year) and long-term (e.g. 30 years) lens
   - Materiality assessments and scenario analysis by climate outcomes and time horizons
   - Emerging regulatory, reputational and legal obligations

# Risk governance

3

Achieve

## Good practice includes

1. Effective management and oversight from the board
2. Appropriate allocation of Senior Management Responsibility
3. Clear roles, responsibilities and accountability across all three lines of defence
4. Updated risk frameworks and policies for relevant risk types through which climate risks manifest
5. Board approved Risk Appetite and management reporting metrics
6. Clear risk authorities, reflecting the materiality of risks, which are implemented effectively
7. Controls embedded into relevant processes covering risk identification, assessment, acceptance or approval, monitoring and reporting
8. Education and awareness building to develop climate risk understanding at all levels in an organisation

# Example:
# Allocating roles and responsibilities across three lines of defence

| | Example activities |
|---|---|
| First line | • Carry out initial climate risk assessment when onboarding clients or during periodic review of existing clients<br>• Engage with clients to understand carbon intensities and their business plans for mitigating climate risk<br>• Understand, assess and consider uncertainties and developments around timing and channels of climate risk |
| Second line | • Set up and own central risk frameworks<br>• Develop the tools for identifying and assessing climate risks<br>• Deliver climate risk training<br>• Develop scenarios and undertake stress testing<br>• Support first line activity to understand, assess and consider uncertainties and developments around timing and channels of climate risk |
| Third line | Review control design and execution |

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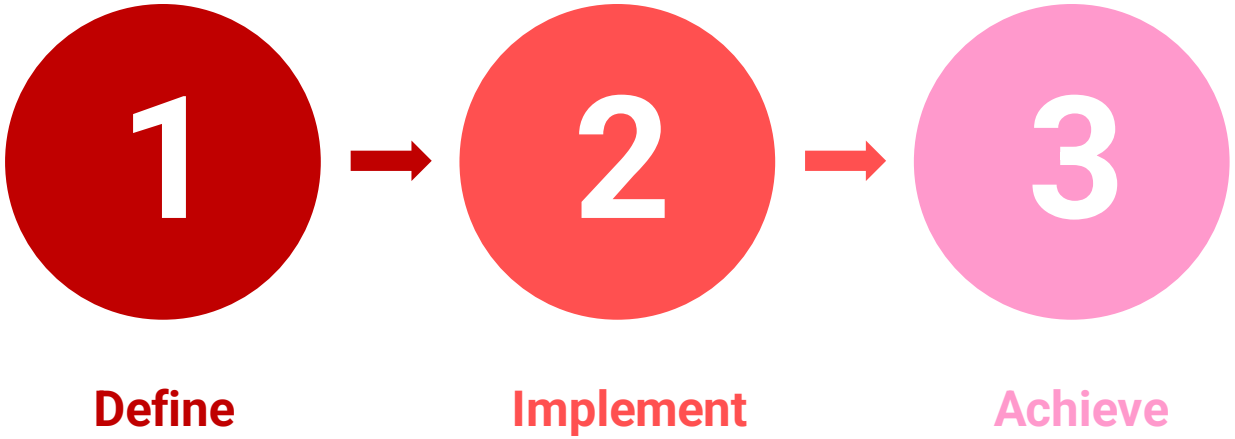
# 2. Risk management frameworks



# Risk management frameworks


**Define**

- Risk management frameworks are a key means by which risk governance, especially climate risk governance can be operationalised
- Climate risk should be integrated into existing enterprise risk management frameworks, strategically and in line with board level risk appetite

# Risk management frameworks

2

Implement

## Implementing risk management framework involves

1. Undertaking a materiality assessment of climate risks. This helps the firms to determine the best approach to treat climate risk.
2. Three ways to approach climate risk and develop risk management frameworks by treating climate risk as
   (a) a standalone, principal, risk type using the firms' established practice in deciding and managing principal risk types;
   (b) a risk within other existing risk types (i.e. a "cross-cutting" risk) or
   (c) both within existing risk types and as a principal risk

# Example: Approach to establishing frameworks by risk type

Materiality assessment to establish exposure and sectors/ geographies which are vulnerable to climate risk

Identify existing risk types impacted by climate change

Decision to treat climate risk as a standalone risk type or a cross-cutting risk type

**Cross-cutting risk type**

- Develop risk definition and subtypes (e.g. physical, transition)
- Identify high priority risk type frameworks (e.g. credit, market, operational) to integrate climate risk into. Develop a plan to update these.
- Develop proposals for integrating into risk-type frameworks
- Develop risk categories and authority matrix

**Principal/ standalone risk**

Develop and implement dedicated framework and policies, as relevant.

Whilst a dedicated framework will include specific elements on its own (e.g. governance around data quality), the linkage to other risks is still an important area to consider

*Source: Climate Financial Risk Forum Guide 2020, Risk Management Chapter*

# Risk management frameworks

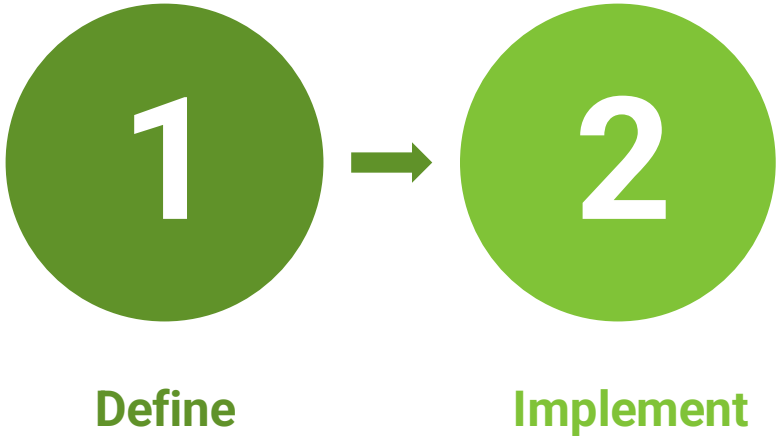
3

Achieve

## Good practice includes

1. Good practice is to treat climate risk as a cross-cutting risk type that manifests through most of the established principal / standalone risk types. Whether treated as a principal risk or a cross-cutting risk type, linkages of climate risks with established risk types (particularly the more material risks such as underwriting, credit, operational and financial market) should be established and understood in the firm.
2. There should be tools to identify and assess physical and transition risks
3. Central risk frameworks and relevant policies should be updated
4. A uniform risk taxonomy and risk categories should be developed – both for individual clients and transactions (particularly for material transactions), and at an aggregate portfolio level so risk concentrations may be assessed.
5. Climate risk Management Information should be included in established risk reporting (e.g. to governance committees).

# 3. Risk appetite



# Risk appetite


**Define**

- Risk appetite should reflect and communicate the level of climate financial risk that an institution is willing to take, tailored to the business model
- May incorporate broader considerations based on Environmental, Social and Governance (ESG), reputational risk or corporate responsibility which may already be in place within the firm
- Metrics is a key component of risk appetite. The quantitative or qualitative measures allow the business and risk committees to monitor the risk profile.
  - If climate risk is a standalone risk category, the risk appetite should also have a 'statement' articulating the acceptable risk level e.g. 'being aligned with the Paris Agreement'

# Quantitative metrics

| Metric | Overview | Examples |
|---|---|---|
| Monitoring | Metrics that will alert management to a potential change which could mean that risk appetite may be breached | • % limit on exposures or investments in high transition risk industries<br>• % mortgage portfolio exposure to high physical risk locations under scenario X |
| Wider CSR/ Rep Risk/ ESG Lens/ Portfolio Steering | Metrics which focus on alignment of the portfolio to the strategic priorities or ESG/ CSR commitments, rather than measuring the financial exposure to climate risk | • Carbon footprint including supply chain<br>• Weighted average carbon intensity, based on relative investment share or lending provided |

# Risk appetite

2

Implement

## Initial steps in defining a climate risk appetite

1. Consider business strategies, the existing portfolio and the type of climate risks faced.
2. Engage the board to probe specific aspects of risk appetite, for example
   (a) **Defining the brand, ambition and targets:** What global frameworks do we want to commit to? E.g. Paris Agreement, TCFD, Principles for Responsible Banking. What does this mean practically?
   (b) **Aligning the business model:** Are we willing to exit profitable customers or sectors? What timeframe is our exit strategy over? Which exit / reduce strategies could be implemented?
3. Develop and approve a qualitative statement
4. Identify metrics which can be used to track climate risks to the firm and work with business and risk to determine appropriate appetite or tolerance thresholds
5. In the longer-term, assess how metrics can best include the results from scenario analysis and impact assessments

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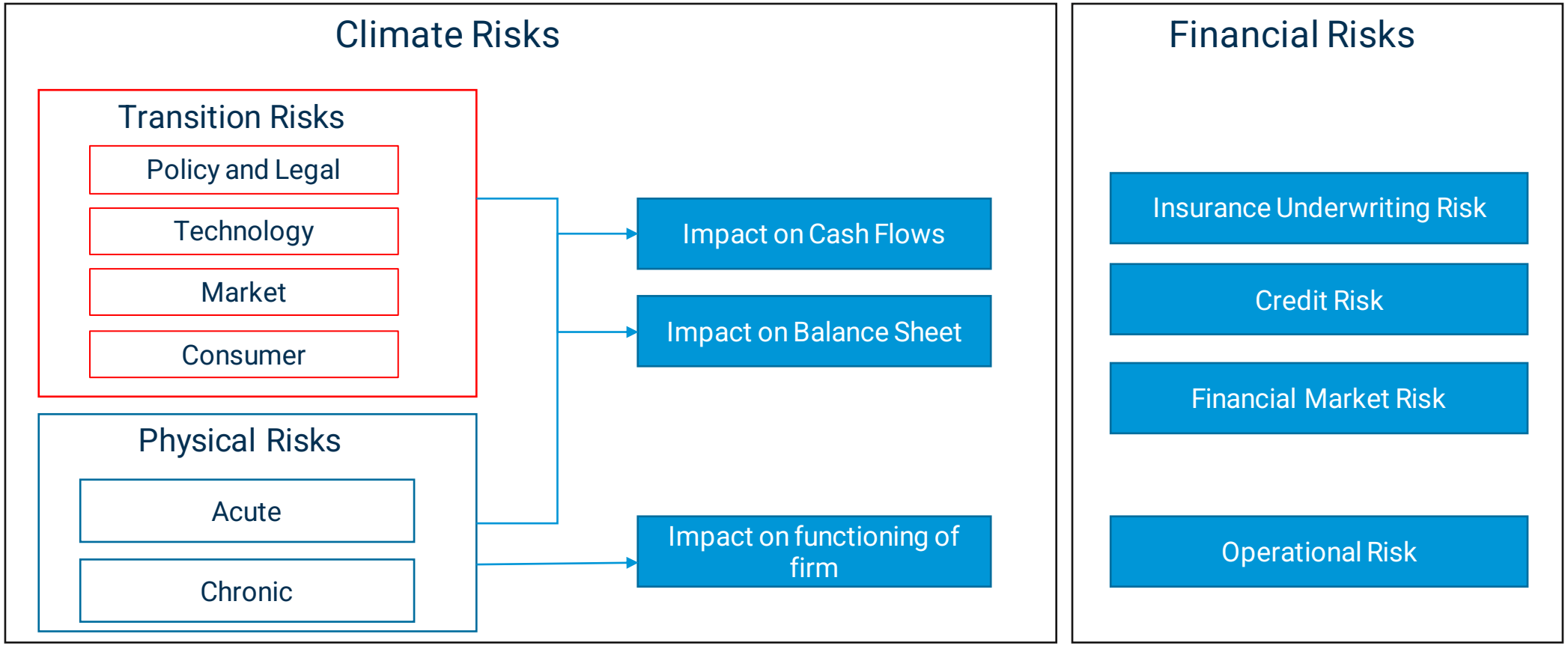
# 4. Risk Assessment

- Risk assessment of the financial risks as well as the non-financial risks is essential to measure, monitor and mitigate the risk within a firm's appetite.
- Scenario analysis is a key risk and business analysis tool to assess the impact of climate change, especially given the underlying uncertainties in how and when risks will manifest.
- Four risk categories are most material and applicable across the financial sector




*Source: Climate Financial Risk Forum Guide 2020, Risk Management Chapter*

# Types of financial risks most material across the financial sector

1

Define

## Types of Financial Risks

**Insurance underwriting risk**: E.g. Insurance losses can also be associated with valuation of the liabilities (reserving) and pricing, particularly affecting: (i) General Liability and Directors and Officers (D&O) cover due to climate related litigations; and (ii) Credit & Surety cover related to stranded assets

**Credit risk**: Credit risk analysis would consider climate impact upon all P&L, cash flow, and Balance Sheet metrics. Risk due diligence increasingly incorporates a qualitative assessment of client's board's understanding, commitment, and communication on climate change issues

**Financial market risk**:

(a) The market value (MV) loss due to societal, legal and technological response to climate change, particularly affecting bonds and loans, commodities and equities (i.e. transition risk); or

(b) The MV loss due to concern over actual climate/ weather events (i.e. physical risk)

**Operational risk**:

- Physical risks affecting the operations of financial institutions (business continuity events) as a result of increasing frequency and severity of weather events
- Supplier/ third-party operational risk arising from climate events

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# Steps to manage climate-related financial risks

2

Implement

| Types of Financial Risks |
| --- |
| **Insurance underwriting risk**: Research climate change, define and operationalise risk appetite, assess processes, data and tools as well as establish risk mitigation plan |
| **Credit risk**: Formal training is needed to educate both lines of defence regarding terminology, metrics, and bank policy; engagement with clients that appear to be lagging |
| **Financial market risk**:<br>• Short term: Use of tools and systems to incorporate climate risks; portfolio monitoring; climate reporting<br>• Medium term: Include risk appetite limits within climate financial risk management; combine top-down holistic views of societal climate risk with bottom-up sector and asset level modelling |
| **Operational risk**:<br>• Developing and implementing, where appropriate, risk appetite statements, operational limits and triggers<br>• Exposures against these limits can then be monitored and reported to on an ongoing basis<br>• Recording/ categorising any climate-related operational losses or events, and include losses or events in BAU risk reporting |

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# Summary

- Climate risk can be categorised as physical risks and transition risks, and both of them carry financial impacts.
- Those who proactively mitigate and adapt to climate change can reap opportunities such as resource efficiency, a more diversified market as well as climate resilient supply chain. These can generate financial benefits.
- Risk Management is one of the core areas in the TCFD recommendations and our webinar today examined the steps which can be taken to implement risk management across all sectors, as well as the recommended disclosures. It is important that the risk evaluation process is cost efficient; the principle is to focus on what is material and critical to decision-making, and avoid getting lost in the detail.
- Another source of information is the Climate Financial Risk Forum Guide 2020, specifically the Risk Management Chapter which is aimed at banks, asset managers and insurers of all sizes. Our webinar focused on four topics within the Chapter, namely Risk Governance, Risk Management Frameworks, Risk Appetite as well as Risk Assessment.
- Some of the information may be more relevant for different firms however, the evolving environment and commercial realities have heightened the urgency for corporates and financial institutions to develop an understanding of their vulnerabilities and assess the strategic and business opportunities.

# Q&A

# Break

# Demystifying climate-related risk assessment and climate scenario analysis: What can corporates and financial institutions do?

Presenter: Ms. Lau Xin Yi, Green Finance Lead, South East Asia, Carbon Trust

# Agenda – Climate Scenario Analysis

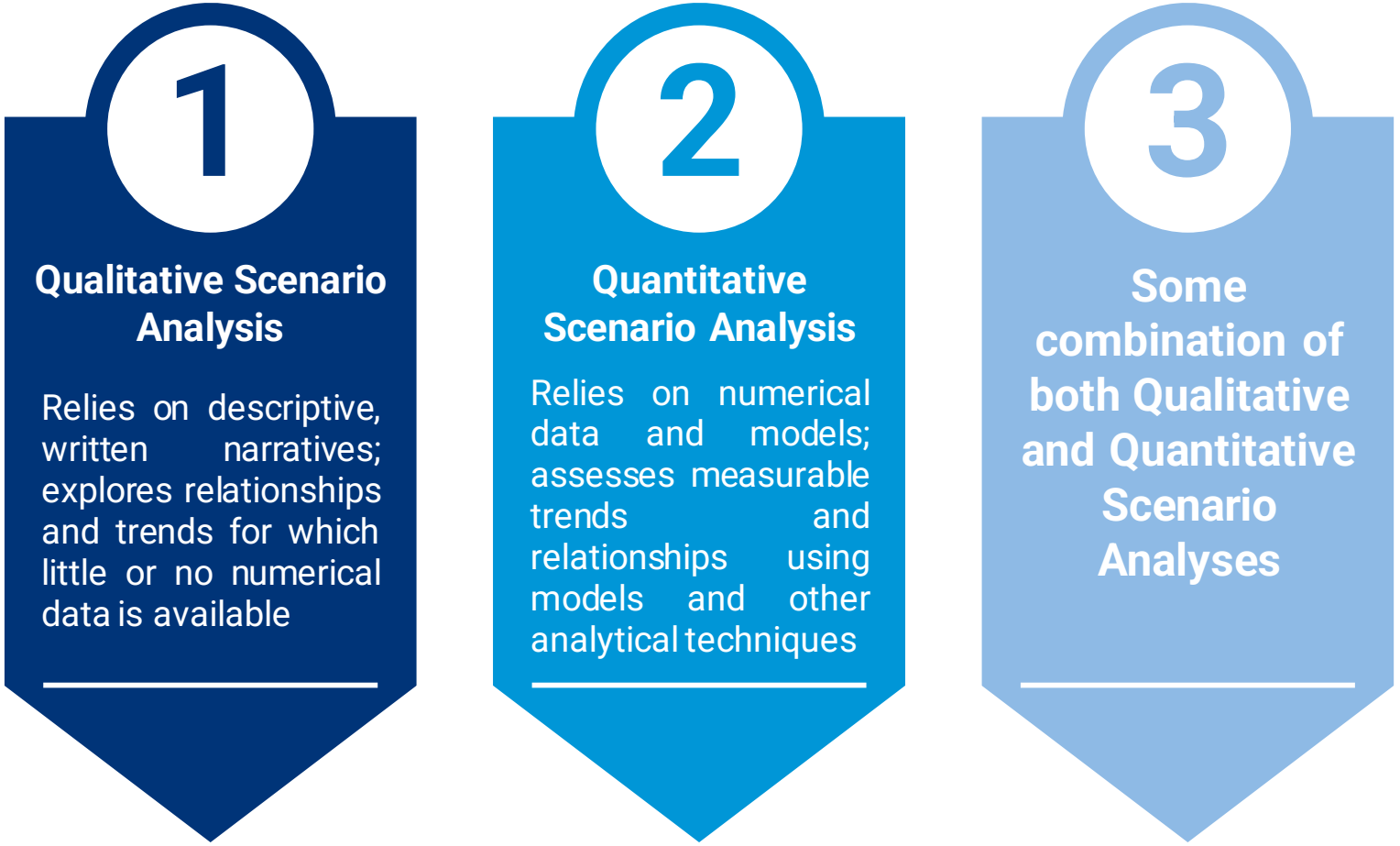
1. Introduction and background
2. TCFD recommendations – Scenario Analysis
3. Emerging Best Practices in Risk Management – Insights from the Climate Financial Risk Forum
4. Case study
5. Q&A

# 1. Introduction and background

# Overview of Scenario Analysis

- Scenario analysis is a process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty
- Scenarios are hypothetical constructs and provide a way for organisations to consider how the future might look if certain trends persist or certain conditions are met
- The uncertain timing and magnitude of climate change impacts present challenges for individual organisations in understanding the potential effects of climate change
- Scenarios enable an organisation to explore and understand how various combinations of climate-related risks, both transition and physical risks, may affect its businesses, strategies and financial performance over time

# Overview of Scenario Analysis (continued)

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# Motivations behind using scenario analysis for climate change

## Help organizations consider issues, like climate change, with certain characteristics

- Possible outcomes that are highly uncertain
- Outcomes that will materialise over the medium to longer term
- Potential disruptive effects that, due to uncertainty and complexity, are substantial

## Enhance organisations' strategic conversations about the future

Broaden decision makers' thinking across a range of plausible scenarios, including those where climate-related impacts can be significant

## Help organizations frame and assess the potential range of plausible business, strategic, and financial impacts from climate change and the associated management actions

May lead to more robust strategies under a wider range of uncertain future conditions

## Help organizations identify indicators to monitor the external environment

Allows organisations to reassess and adjust their strategies and financial plans accordingly

## Assist investors in understanding the robustness of organisations' strategies and financial plans and in comparing risks and opportunities across organisations

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# 2. TCFD Recommendations – Scenario Analysis

# Assessing the exposure to physical and transition risks

- Exposure to Transition Risks
  - Transition risk scenarios are particularly relevant for resource-intensive organisations with high GHG emissions within their value chains
  - Policy actions, technology or market changes aimed at emissions reductions, energy efficiency, subsidies or taxes may have a particularly direct effect
  - A key type of transition risk scenario is a 2°C scenario, which lays out a pathway and an emissions trajectory consistent with holding the increase in the global average temperature to 2°C above pre-industrial levels
- Exposure to Physical Risks
  - A wide range of organisations are exposed to climate-related physical risks. Physical climate-related scenarios are particularly relevant for organisations exposed to acute or chronic climate change
  - Physical risk scenarios generally identify extreme weather threats of moderate or higher risk before 2030 and a larger number and range of physical threats between 2030 and 2050
- Although there are certain sectors with greater exposure, all sectors and parts of society will be exposed to risk. As a systemic risk factor, it is important for companies to consider what other sectors or infrastructure they are reliant on

# Recommended Approach to Scenario Analysis

- For organisations just beginning to use scenario analysis, it may be appropriate to use a qualitative approach that progresses and deepens over time
- For organisations with more extensive experience in conducting scenario analysis, greater rigour and sophistication in the use of data and quantitative models and analysis may be warranted
- The choice of approach will depend on an organisation's needs, resources and capabilities
- In conducting scenario analysis, organisations should strive to achieve:
  - **transparency** around parameters, assumptions, analytical approaches, and time frames;
  - **comparability of results** across different scenarios and analytical approaches;
  - **adequate documentation** for the methodology, assumptions, data sources, and analytics;
  - **consistency of methodology** year over year;
  - **sound governance** over scenario analysis conduct, validation, approval, and application; and
  - **effective disclosure** of scenario analysis that will inform and promote a constructive dialogue between investors and organisations on the range of potential impacts and resilience of the organisation's strategy under various plausible climate-related scenarios

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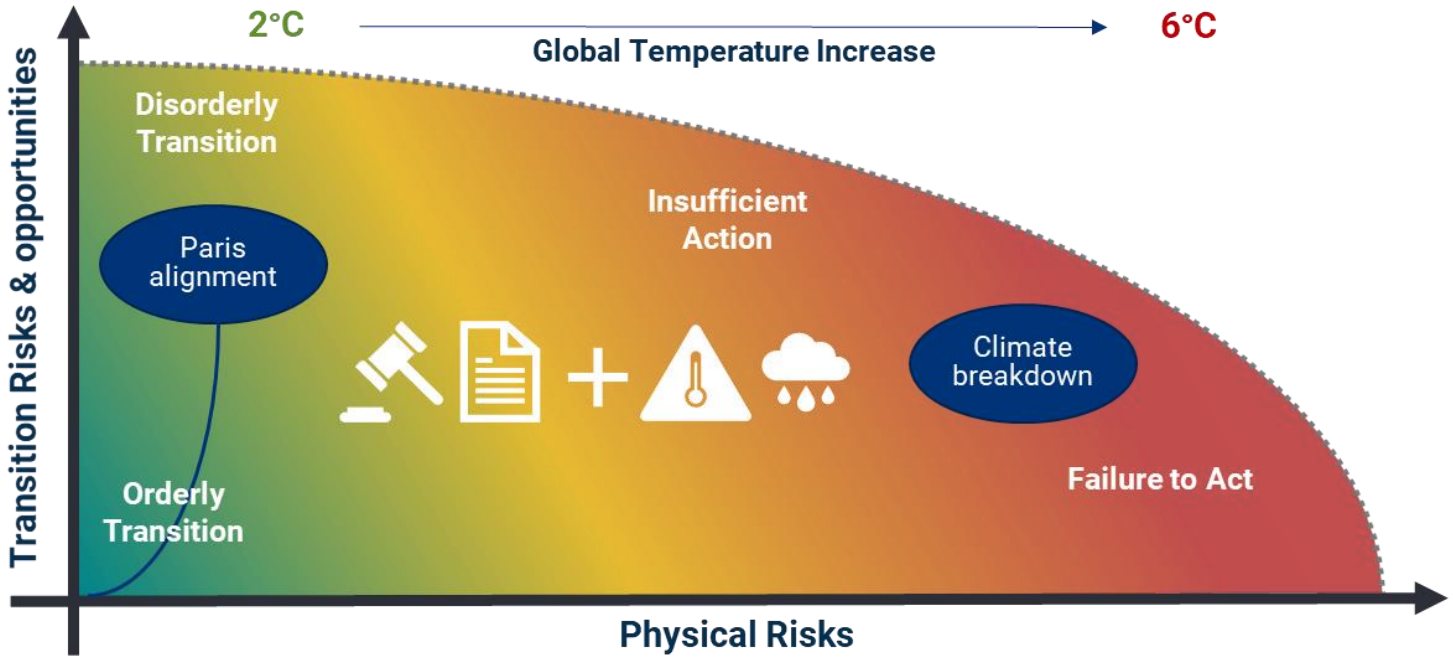
# Selecting appropriate scenarios and applying these for financial analysis

- The TCFD recommends the use of temperature-based scenarios
  - Comprehensive and holistic scenarios analysing how the world might develop, and the corresponding impacts that these pathways have on average global temperature and resultant climate change

- Types of scenarios:
  - Smooth and orderly transition to a low-carbon economy
  - A lack of transition or transition based on known technology and policy developments
  - Disorderly transition




*Source: The Carbon Trust*

# Selecting appropriate scenarios and applying these for financial analysis (continued)

- The TCFD also recommends that organisations use a 2°C or lower scenario in addition to two or three other scenarios most relevant to their circumstances
  - For companies new to scenario analysis: consider a scenario which outlines an orderly transition to a low-carbon economy (one consistent with the Paris Agreement goal of limiting warming to 2°C), and another non-transition scenario (aligned to current policies and pledges leading to approximately 3°C of warming by the end of the century)
  - For companies familiar with scenario analysis: consider extreme scenarios such as abrupt and disorderly transitions and the breach of climatic tipping points. For example, scenarios aligned to the highest ambition of the Paris Agreement of limiting warming to 1.5°C, as well as 'no-additional policy' scenarios exceeding 4°C of warming

- Scenarios also differ in the level of granularity offered, the sectoral focus taken, the driving datasets and assumptions, and the underlying narrative described
- Companies can choose between a wide set of resources, and often scenario data comes form a variety of sources depending on the risk or opportunity in question
- Factors to consider in selecting scenario data: general implications for strategy, capital investment, cost and revenue both at a company-level and at the specific regional- or market-level where specific impacts of climate change are likely to arise

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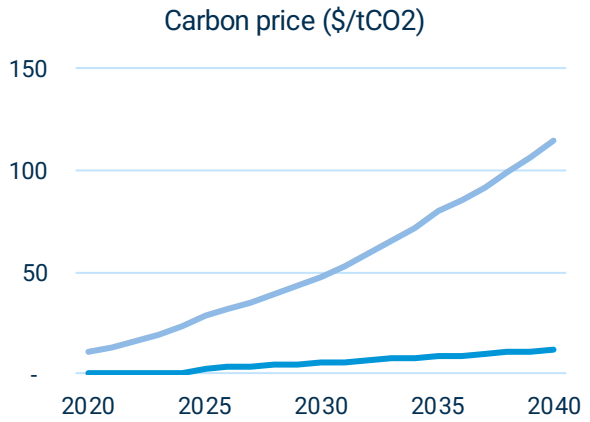
# Example quantification – Oil & Gas

*Assessed risk: higher tax payable due to increased carbon tax rate*

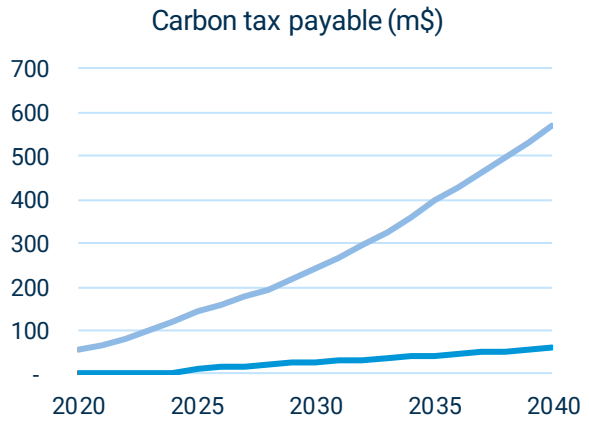



**Projected carbon price**

1. Extract Russian carbon price projections from climate scenario database

Source: IIASA, SSP database

- Baseline: SSP2-45, R5.2REF
- Transition: SSP1-26, R5.2REF



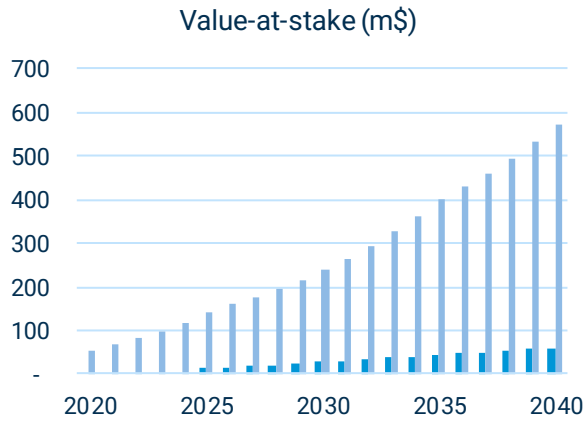

**Resulting impact on value driver (tax payable)**

2. Develop calculation for carbon tax impact:

***Scope 1 emissions * carbon price***

Source:

- Calculation: UK Government 2020 consultation on carbon tax report
- Scope 1 emissions: Company reports (assumed 500 tCO2)




**Value-at-stake**

3. Calculate difference in impact on tax payable between BAU scenario (no carbon tax) and the two climate scenarios

*Illustrative purposes only*

2°C scenario

3°C scenario

# Disclosure Considerations for Non-Financial Organisations

- For an organisation in the initial stages of implementing scenario analysis or with limited exposure to climate-related issues: disclosing how resilient, qualitatively or directionally, the organisation's strategy and financial plans may be to a range of relevant climate change scenarios
- Organisations with more significant exposure to climate-related issues: disclosing key assumptions and pathways related to the scenarios they use to allow users to understand the analytical process and its limitations

| **Organisations with more significant exposure to climate-related issues should consider disclosing key aspects of their scenario analysis, such as the ones described below** |
|---|
| 1. The scenarios used, including the 2°C or lower scenario |
| 2. Critical input parameters, assumptions, and analytical choices for the scenarios used, including such factors as:<br>– Assumptions about possible technology responses and timing (e.g., evolution of products/services, the technology used to produce them, and costs to implement)<br>– Assumptions made around potential differences in input parameters across regions, countries, asset locations, and/or markets<br>– Approximate sensitivities to key assumptions |
| 3. Time frames used for scenarios |
| 4. Information about the resiliency of the organisation's strategy |

# 3. Emerging Best Practices in Risk Management

## Insights from the Climate Financial Risk Forum

# Overview

- Output from the cross-industry Scenario Analysis Working Group of the UK's Prudential Regulation Authority and Financial Conduct Authority's Climate Financial Risk Forum
- Guide has been written **by industry, for industry**. Aimed at banks, asset managers and insurers of all sizes
- Scenario Analysis Chapter provides practical guidance on **how** to use scenario analysis to assess climate-related financial risks to inform firm's strategy and business decisions

# Scope of the workshop

Climate scenarios for the financial services industry

Scenario identification and development

Scenario assessment

Challenges and barriers

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# 1. Climate Scenarios for the Financial Services Industry

# Climate-related questions to be answered by scenario analysis

- Before beginning the process, it is important to be clear what question/ business decision the scenario analysis is intended to help the firm answer
- Uses of climate scenario analysis –
  - Help firms better identify climate-related financial risks and opportunities, guide successful corporate strategies
  - Provide useful information on how the company will perform under different future states
  - Better anticipate the macro-financial consequences of selected temperature and emission pathways
  - Test how resilient a firm is to climate-related financial risks
  - Test the alignment of a firm's business, investment portfolios or funds with a specific pathway – e.g. a 1.5°C or 2°C scenario
  - 'Reverse stress testing' to see how much stress a firm can withstand before its business model fails

# Identify potential exposures to climate change

Three steps to identify potential exposures

- Examine both physical and transition transmission channels
- Identify climate-related financial risks and opportunities
- Conduct exposure analysis and assess materiality

# Examine both physical and transition transmission channels

## Physical transmission channels

- Climate change is expected to lead to an increase in the frequency and severity of 'acute' weather-related events – such as floods and droughts – as well as longer-term 'chronic' shifts in climate – such as increases in average temperatures and sea level rise
- Impacts from physical risk channels:

### Direct Effects

Acute physical events (e.g. flood) or chronic physical effects (e.g. sea level rise)

Loss of output and costs of repair impact corporate balance sheets

### Indirect Effects

Long-term chronic changes in climate patterns as well as the broader impact of extreme events

Disruption to a supply chain or support and adaptation costs borne by the sovereign would in turn, impact on inflation, interest rates and long-term productivity

# Examine both physical and transition transmission channels

## Transition transmission channels

- Transition risks and opportunities can operate through a number of transmission channels, including key components that contribute to lower emission pathways and their economic consequences e.g. use of renewable energy sources
- Impacts from transition risk channels:

### Direct Effects

Climate policies penalise fossil fuel production as well as the production and use of emission-intensive goods and services

Firms will face:
- Direct risks from stranded assets
- Negative movements in bond and equity valuations
- Changes in cash flows
- Deterioration in the credit risk profile of customers in affected sectors

Climate policies and technological development

Promote firms involved in the production of goods and services that assist in reducing emissions

### Indirect Effects

Climate policies

Changing the prices of a broad basket of goods and services and affecting aggregate patterns of demand and supply

# Identify climate-related financial risks and opportunities

- Two complementary approaches that firms can take:

**Starting point: Business profile and risk register of firms**

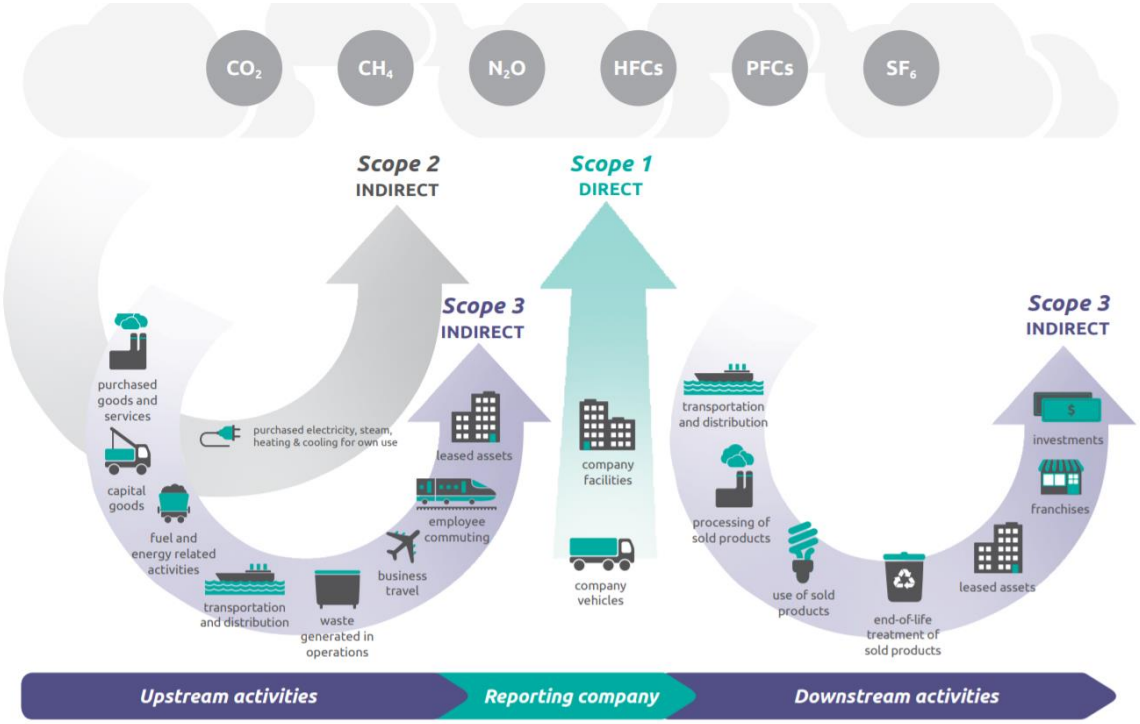
Which business areas or risks are vulnerable to the physical effects of climate change/ transition to a low-carbon economy?

**Starting point: Future climate scenario**

How macroeconomic variables used in existing financial risk assessments could be affected?

# Conduct exposure analysis and assess materiality

- Firms need to source relevant data to assess their exposure to material climate risks
- For example, having data on the location of suppliers, facilities, customers and sales is important for transition and physical channels
- Firms could also source Scope 1, 2 and 3 GHG emissions data about their exposures – focusing on exposures with the highest carbon intensities and longer durations as well as examine the type of the financial relationship (e.g. lending commitment, bond underwriting etc)

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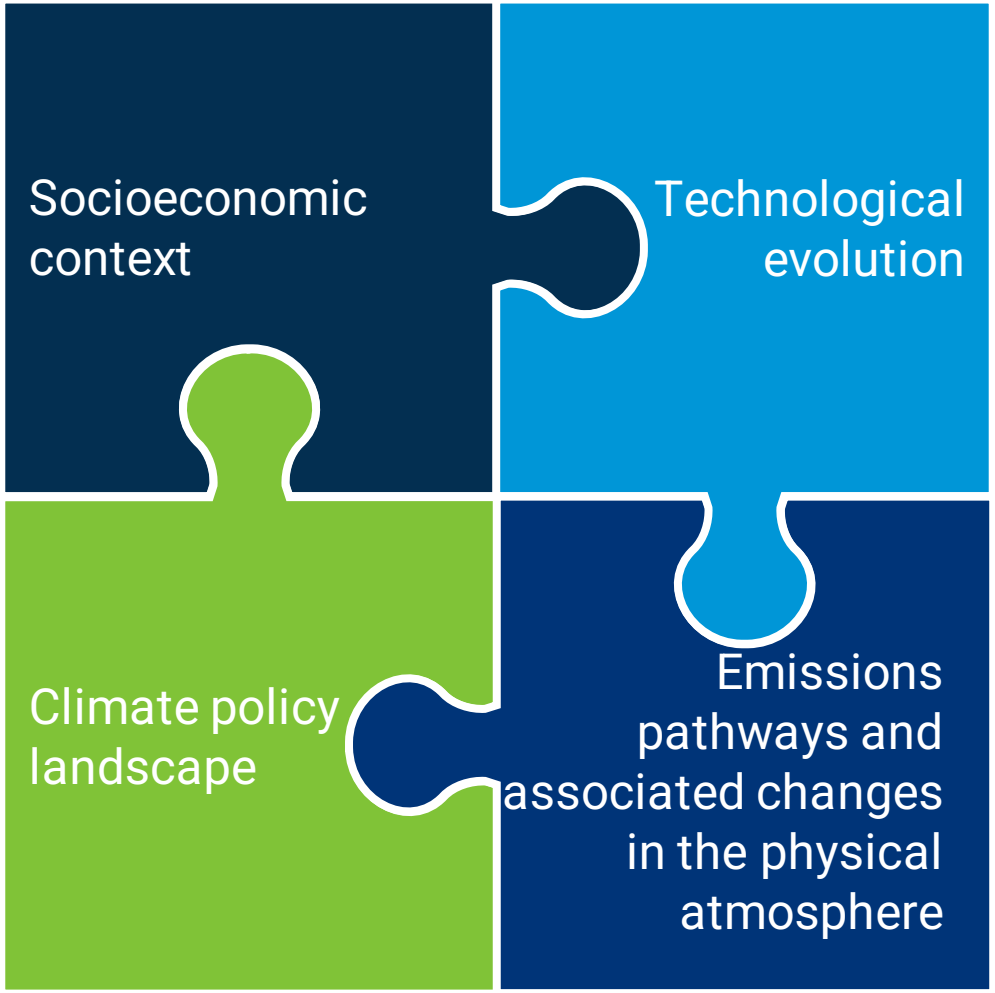
# 2. Scenario Identification and Development

# Components of climate scenario

- A climate scenario can typically be described using a combination of the following components:



# Data Sources

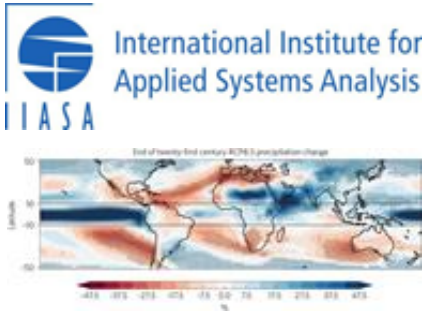
*Different types of scenarios exist, each providing appropriate underlying data for relevant risks and opportunities. These are examples of data sources*

**Transition scenarios** | **Physical scenarios**

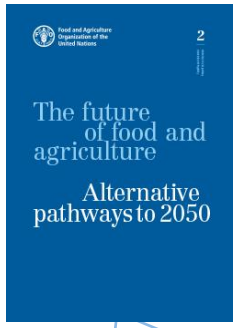
**Sector-specific models** | **Integrated Assessment Models (IAMs)** | **Climate models**



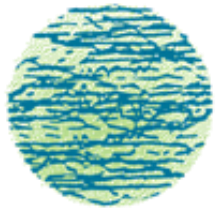





Data on energy consumption by industry and source can show energy projections across sectors







Data on the agricultural indicators such as GHG emissions in agriculture and crop production (tonnes/ha)

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Data on water availability in nearby basins can show availability of water for agriculture and pulp and paper processes


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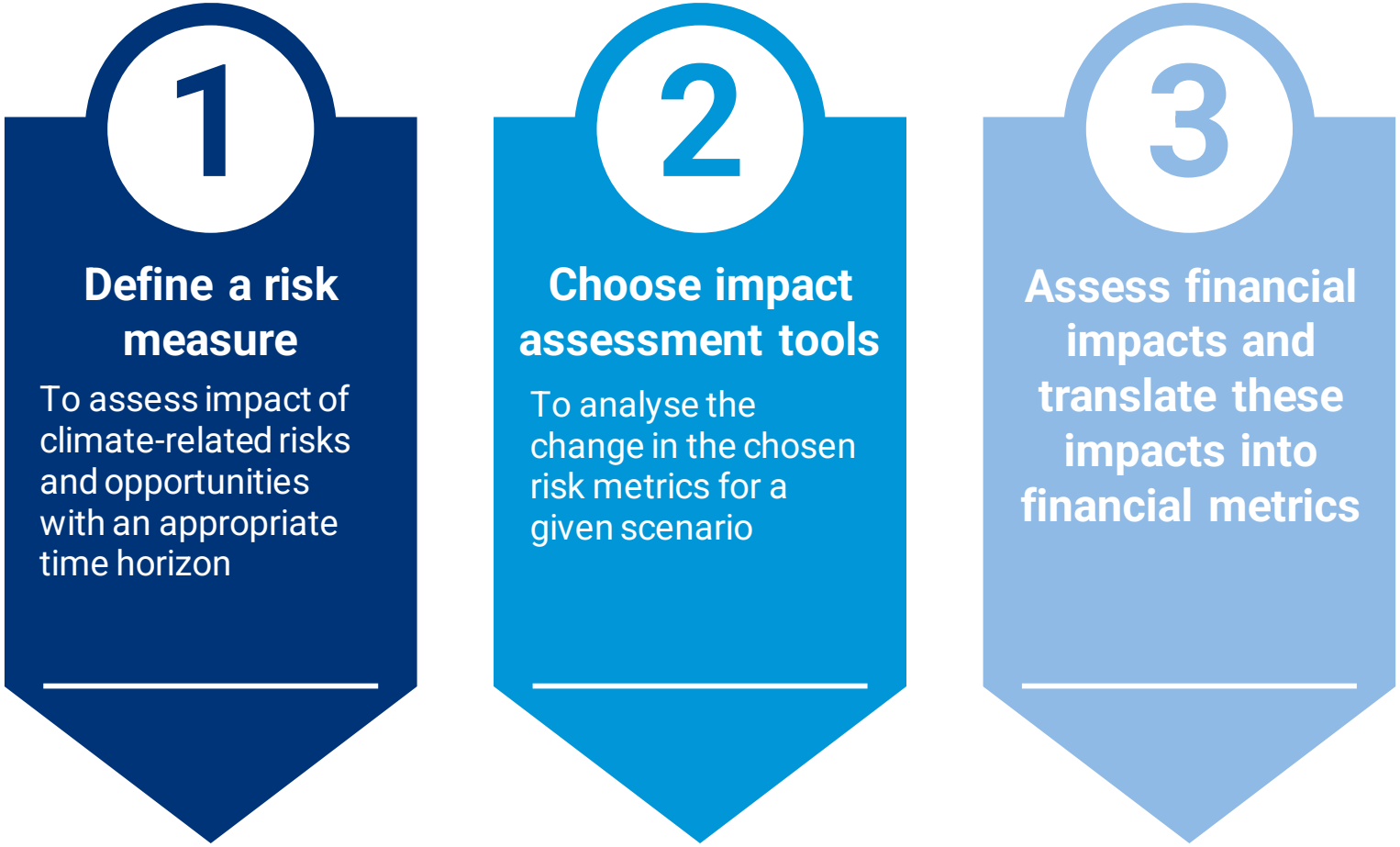
# 3. Scenario Assessment

# Overview

When assessing exposures to physical and transition risks, firms need to:




# 4. Challenges and Barriers

# Key challenges and barriers in performing scenario analysis

Challenge #1

**Breadth and magnitude of transition and physical risks**

- Hard to know where to start and which effects to prioritise in analysis
- Risks will likely be correlated and, potentially aggravated by tipping points, in a non-linear fashion
- Impacts could be much larger, and more widespread and diverse than those of other structural changes

- Specify the purpose of the scenario, and to focus its design on the most relevant components
- It may be preferable to start with a simplified outline scenario, using existing research, data and models, and iterate, adding additional elements where material

# Key challenges and barriers in performing scenario analysis

Challenge #2

**Extended and uncertain time horizons and feedback loops**

- The time horizons over which climate-related financial risks may be realised are uncertain
- Their full impact may crystallise beyond most current business planning horizons

- List different ways in which key financial indicators of interest might have a high, medium or low value due to climate-related factors by the future timeframes of interest
- Consider the consequences of these changes occurring in a variety of simple time sequences

# Key challenges and barriers in performing scenario analysis

Challenge #3

**Weakness of many climate economic models**

Economic models tend to have mild or simplistic damage functions that fail to respond in a way that is consistent with the scientific analyses and expectations

“Don't let the perfect be the enemy of the good"

# Key challenges and barriers in performing scenario analysis

Challenge #4

**Data gaps and comparability of disclosures**

- Firms may need to use additional metrics requiring new data and new modelling methods to capture climate impacts on the economy and their business
- Low comparability of climate-related disclosures from companies regarding their climate change risks and opportunities

In the short term, the use of reference scenarios and good disclosure about scenario selection and design will be the key mitigants

# Key challenges and barriers in performing scenario analysis

Challenge #5

**Cognitive bias**

For example, people unconsciously assess probability of a future event or outcome on the basis of how easily they can remember past examples or how easily they can imagine possible events

To avoid some cognitive biases, it is important to use scenario analysis to assess a wide range of potential future outcomes, particularly outcomes that might seem unlikely today

# Summary

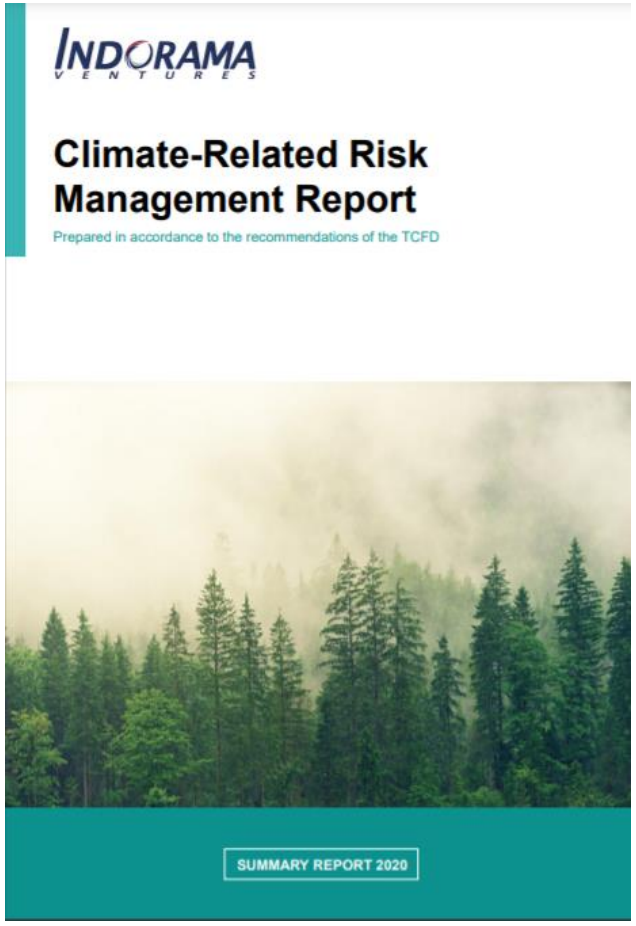
- Scenario analysis is a process for identifying and assessing the potential implications of a range of plausible future states under conditions of uncertainty
- Scenarios enable an organisation to explore and understand how various combinations of climate-related risks, both transition and physical risks, may affect its businesses, strategies and financial performance over time
- The choice of approach to scenario analysis (qualitative or quantitative) will depend on an organisation's needs, resources and capabilities
- The TCFD recommends the use of temperature-based scenarios, as well as for organisations to use a 2°C or lower scenario in addition to two or three other scenarios most relevant to their circumstances.
- The disclosure of organisations' forward-looking assessments of climate-related issues is also important for investors and other stakeholders in understanding how vulnerable individual organisations are to transition and physical risks and how such vulnerabilities are or would be addressed
- The CFRF Guide's Scenario Analysis chapter is another resource on how to use scenario analysis to assess climate-related financial risks to inform firms' strategy and business decisions. The Chapter focuses on climate scenarios for the financial services industry, scenario identification and development as well as scenario assessment. The Guide also recognises a number of challenges and barriers in performing scenario analysis

# 4. Case Study

SET: IVL

# Case study: Indorama Ventures Public Company Limited, Thailand

## Indorama Ventures (IVL) is one of the world's leading producers in the intermediate petrochemicals industry and a global manufacturer of wool yarns




**TCFD as part of IVL's climate strategy**

**Purpose:** The chemical sector supplies a broad range of products that serve a range of markets and industries. The chemical sector is a large energy user and greenhouse gas (GHG) emitter, and faces risks associated with climate change and other sustainability issues. It is linked across entire value chains across almost all other industries, and is a key enabler of the low-carbon economy.

**Implementation:** IVL is a supporter of TCFD, and have implemented core elements of the recommendations into their Climate-Related Risk Management Report to enhance the consistency, robustness and comparability of their disclosures.

**Governance:** As part of climate risk management, IVL have integrated climate-related risks into their existing risk management structure in form of 'four layers':

1. Board of Directors *(decision-making and oversight)*
2. Sustainability and Risk Management Committee *(evaluates sustainability and risk-related issues)*
3. Sustainability Steering Committee *(implements sustainability initiatives across IVL)*
4. Sustainability Champions *(drives initiatives, provides expertise and ensures best practices)*

*Indorama Ventures Climate-Related Risk Management Report, p.1-3*

# Case study: Indorama Ventures Public Company Limited, Thailand

## IVL's Climate-Related Risk Management Framework: Identification of Climate Risks and Opportunities

### Climate-Related Risks

**Transition Risk**

**Technology**

*Medium-term (3-10 years)*
Higher costs from increased energy consumption
Unsuccessful investments in new technologies
Substitution of existing products with low emissions products

**Market**

*Medium-term (3-10 years)*
Changes in consumer preferences from high carbon intensive to low carbon products
Increased cost of raw materials
Access to financing & insurance increasingly affected by climate & environmental risks

**Policy and Legal**

*Medium-term (3-10 years)*
Increased operational costs due to changes in environmental legislation
Implementation of cap-and-trade or carbon tax in jurisdictions in which the company operates
Exposure to litigation
Enhanced emissions reporting obligations

**Reputation**

*All time frames*
Global focus on plastic pollution
Movements on fossil fuel avoidance
Change in consumer preferences
Increased stakeholder concern

**Physical Risk**

**Acute**

*Medium- and long-term (3-20 years)*
Increased severity of extreme weather events such as cyclones, droughts, and floods

**Chronic**

*Medium- and long-term (3-20 years)*
Risk of sea level rise and riverine flooding for sites located in high-risk areas
Rising mean temperatures
Changes in precipitation patterns and extreme weather variability leading to production disruption
Impact of water stress on production

*IVL identifies risks at the corporate and subsidiary levels around the world through group-wide risk management, applying the enterprise risk management (ERM) framework to anticipate any issues and mitigate their impacts in advance. Climate-related risks are analysed through the perspective of (1) physical risk and (2) transition risk and their respective subcategories, and identified through short-, medium-, and long-term timeframes.*

### Climate-Related Opportunities

**Resource Efficiency**

Use of more efficient modes of transport
Use of more efficient production and distribution processes
Use of recycling
Building efficiency improvements
Reduced water usage and consumption
New technologies to reduce resource intensity in production

**Energy Source**

Use of lower emission sources of energy
Use of supportive policy incentives
Use of new technologies
Participation in carbon markets
Innovative power purchase contract structures

**Products and Services**

Development and expansion of low emission goods and services
Development of climate adaptation and risk solutions
Development of products or services through R&D and innovation
Diversification of business activities
Shift in consumer and customer preferences

**Markets**

Access to new markets
Use of public-sector incentives
Access to new assets and locations needing insurance coverage

**Resiliency**

Participation in renewable energy programs and adoption of energy efficiency measures
Resource substitution, innovation, and diversification
Development and deployment of recycling technologies
Meeting and getting ahead of emissions and single-use plastics regulation

*Opportunities that ensure sustainability efforts and measurable contributions are in line with climate science are identified and analysed.*

*Indorama Ventures Climate-Related Risk Management Report, p.5*

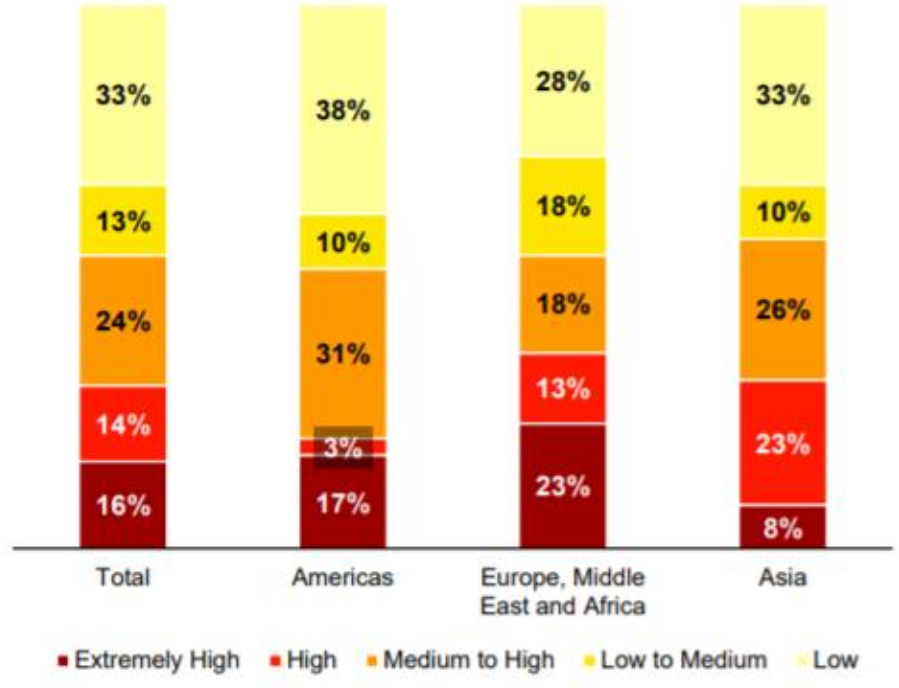
# Case study: Indorama Ventures Public Company Limited, Thailand

## Climate risk management initiatives: Water Stress Analysis

- Water risk has been identified by IVL as a key climate-related risk
- As a result, they have put in place an effective risk management system that regularly assesses their exposure to water related risks
- In 2020, a water sensitivity analysis using the AQUEDUCT Water Risk tool developed by the World Resources Institute was conducted to identify water stress locations
- The tool helped them evaluate changes in water demand, water supply, stakeholder risk, and regulations based on current and future conditions
- It also enabled them to foresee changes to water risk forecasting in 2020, 2030 and 2040
- These results have been analyzed and discussed during risk assessment committee meetings on a yearly basis to identify the necessary mitigation measures and any meaningful initiatives for IVL's operations in areas facing extreme water stress or significant risks to water usage

**IVL's Water Stress Assessment**

*(% of IVL's operations identified in water stress areas using the AQUEDUCT Water Risk Tool)*



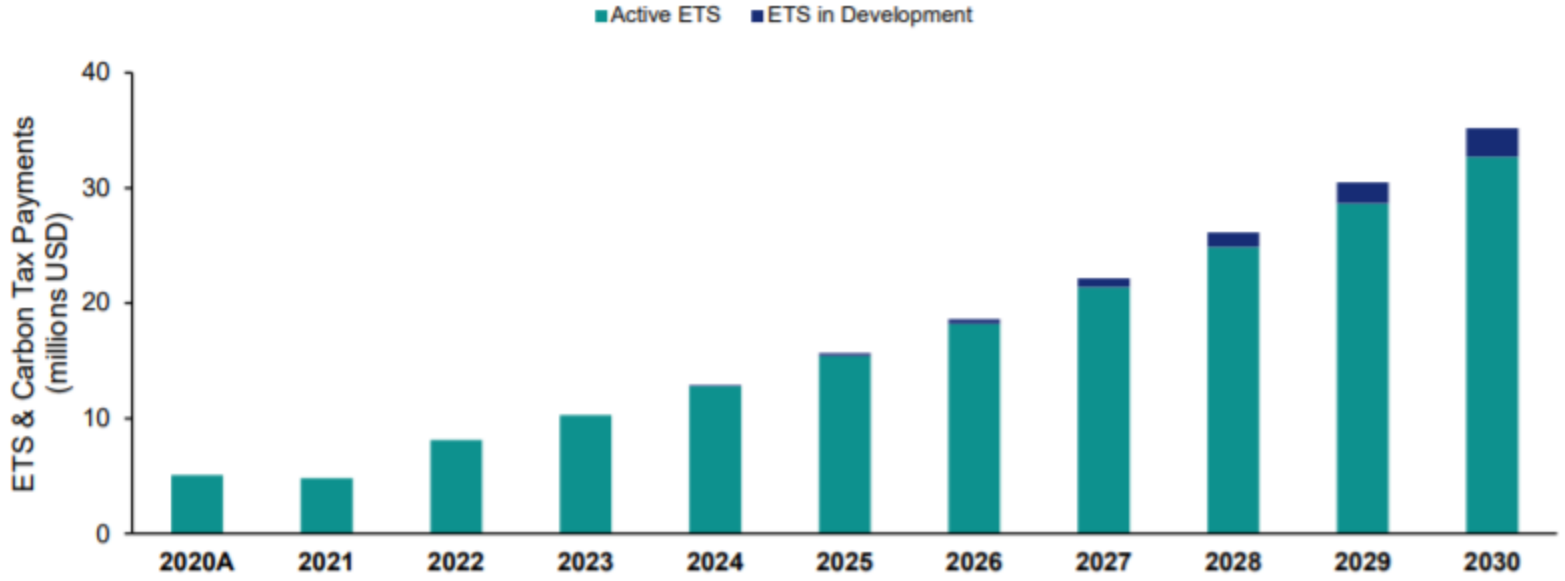

*Indorama Ventures Climate-Related Risk Management Report, p.9*

# Case study: Indorama Ventures Public Company Limited, Thailand

## Climate risk management initiatives: Carbon Pricing Financial Impact Analysis

- IVL also measures climate-related regulatory risks through financial impact modelling
- The Carbon Pricing Impact Model forecasts the annual payments IVL makes towards emissions trading schemes (ETS) worldwide
- The results of the model indicates that IVL's compliance costs are projected to increase from less than US$10m over the previous decade to between US$120m-170m over the next decade, with US$20m of the figure expected from new ETS expected to come into operation
- The model is used to inform management decisions and provide site-specific carbon prices for use in project finance

**Estimated ETS payments at IVL-level 2020-2030**




*Indorama Ventures Climate-Related Risk Management Report, p.10*

# Thank you

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# Thank you!