



Embedding environmental scenario analysis into routine financial decision-making in México

Dr Nina Seega

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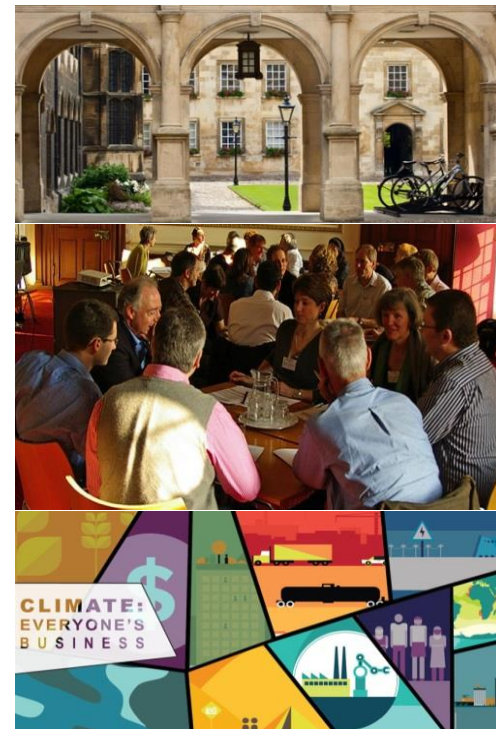
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Business and policy leaders groups

- Low carbon transformation
- Sustainable finance (banking, insurance, investment)
- Resource security

Independent research



Key takeaways

- Environmental sources of risk are material to financial firms and regulatory authorities in Mexico and globally.
- Therefore it is integral that Mexican financial firms and regulatory authorities take steps to understand, manage and measure these risks.
- Environmental scenario analysis is a key tool allowing financial firms to analyse, measure and manage material sources of environmental risk.
- México needs to take further steps to enable its financial firms and regulatory authorities to incorporate new areas of knowledge (from drought risk to the energy transition) and methodologies (such as environmental scenario analysis) into their daily financial decision-making in such a way that confidence can be built and better decisions made.

WEF 2018 global risks report

Top 5 Global Risks in Terms of Likelihood

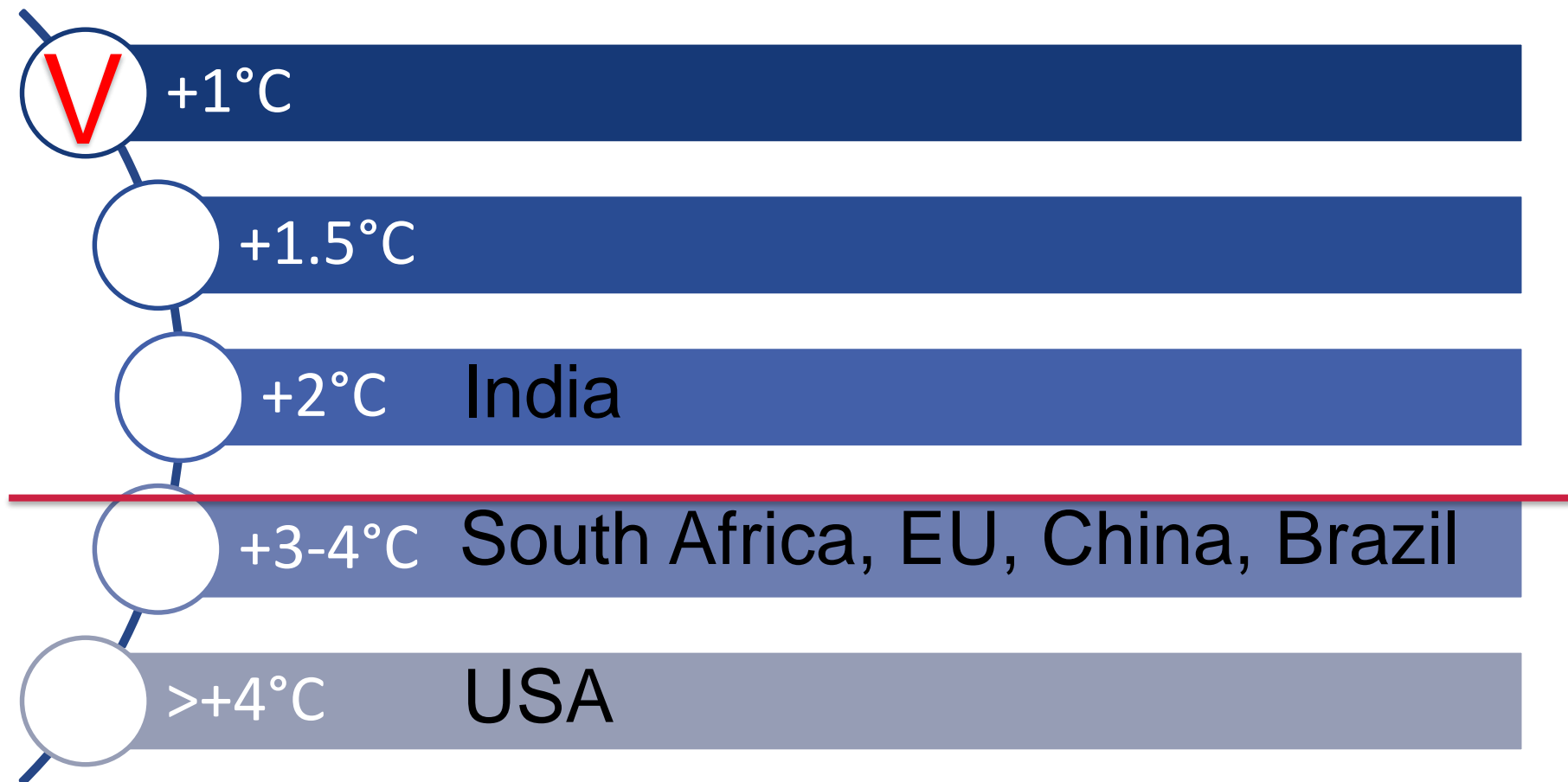
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1st	Asset price collapse	Asset price collapse	Asset price collapse	Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity	Interstate conflict with regional consequences	Large-scale involuntary migration	Extreme weather events	Extreme weather events
2nd	Middle East instability	Slowing Chinese economy (<6%)	Slowing Chinese economy (<6%)	Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events	Extreme weather events	Extreme weather events	Large-scale involuntary migration	Natural disasters
3rd	Failed and failing states	Chronic disease	Chronic disease	Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment	Failure of national governance	Failure of climate-change mitigation and adaptation	Major natural disasters	Cyberattacks
4th	Oil and gas price spike	Global governance gaps	Fiscal crises	Biodiversity loss	Cyber attacks	Water supply crises	Climate change	State collapse or crisis	Interstate conflict with regional consequences	Large-scale terrorist attacks	Data fraud or theft
5th	Chronic disease, developed world	Retrenchment from globalization (emerging)	Global governance gaps	Climate change	Water supply crises	Mismanagement of population ageing	Cyber attacks	High structural unemployment or underemployment	Major natural catastrophes	Massive incident of data fraud/theft	Failure of climate-change mitigation and adaptation

Top 5 Global Risks in Terms of Impact

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1st	Asset price collapse	Asset price collapse	Asset price collapse	Fiscal crises	Major systemic financial failure	Major systemic financial failure	Fiscal crises	Water crises	Failure of climate-change mitigation and adaptation	Weapons of mass destruction	Weapons of mass destruction
2nd	Retrenchment from globalization (developed)	Retrenchment from globalization (developed)	Retrenchment from globalization (developed)	Climate change	Water supply crises	Water supply crises	Climate change	Rapid and massive spread of infectious diseases	Weapons of mass destruction	Extreme weather events	Extreme weather events
3rd	Slowing Chinese economy (<6%)	Oil and gas price spike	Oil price spikes	Geopolitical conflict	Food shortage crises	Chronic fiscal imbalances	Water crises	Weapons of mass destruction	Water crises	Water crises	Natural disasters
4th	Oil and gas price spike	Chronic disease	Chronic disease	Asset price collapse	Chronic fiscal imbalances	Diffusion of weapons of mass destruction	Unemployment and underemployment	Interstate conflict with regional consequences	Large-scale involuntary migration	Major natural disasters	Failure of climate-change mitigation and adaptation
5th	Pandemics	Fiscal crises	Fiscal crises	Extreme energy price volatility	Extreme volatility in energy and agriculture prices	Failure of climate-change mitigation and adaptation	Critical information infrastructure breakdown	Failure of climate-change mitigation and adaptation	Severe energy price shock	Failure of climate-change mitigation and adaptation	Water crises

■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

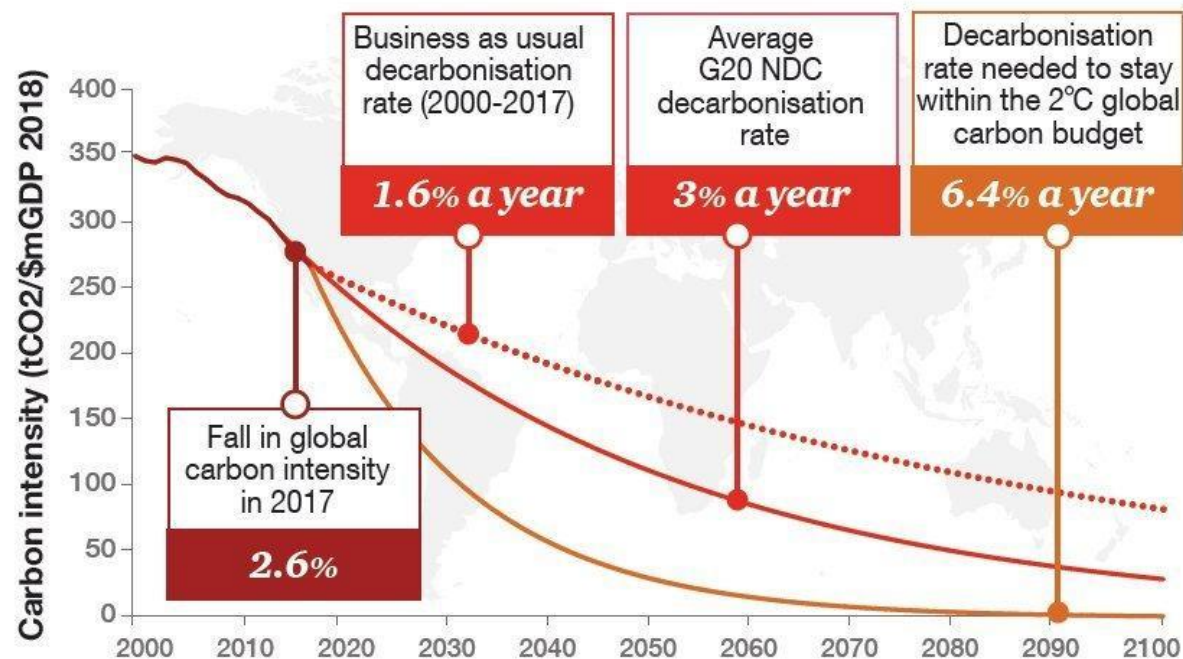
Global temperature trends by 2100



Source © Carbon Brief data

Transition pathways

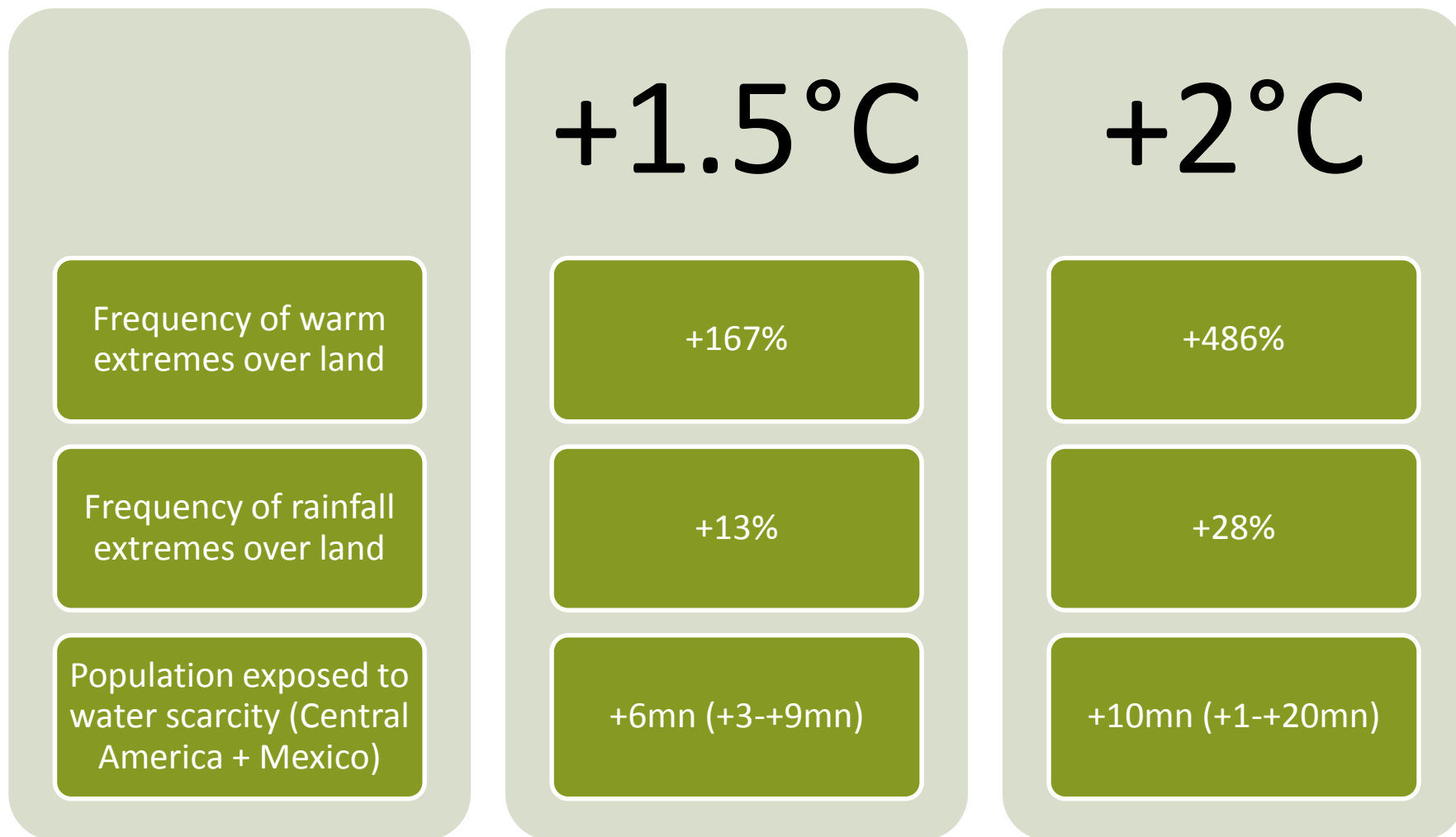
Figure 1: Low Carbon Economy Index 2018: Transition pathways



Sources: BP, Energy Information Agency, World Bank, IMF, UNFCCC, National Government Agencies, PwC data and analysis.

Notes: GDP is measured on a purchasing power parity (PPP) basis. The NDC pathway is an estimate of the decarbonisation rate needed to achieve the targets released by G20 countries. NDCs only cover the period to 2030, we extrapolate the trend in decarbonisation needed to meet the targets to 2100 for comparison.

What does this mean for Mexico



Source © Carbon Brief data

Environmental sources of risk in Mexico

- The average annual cost of natural disasters (cyclones, floods and storms) has been rising steeply in México, from 9.73 billion pesos over 2000–05 to 23.63 billion pesos over 2010–15 (National Risk Atlas, 2018).
- According to the Organisation for Economic Co-operation and Development (OECD) the cost of air pollution in México amounts to 2.9 per cent of GDP (Roy & Braathen, 2017).
- Further, transition to low carbon future can create financial risks.

Embedding environmental scenario analysis in financial decision-making

Aim: improving the integration of environmental risk into financial decision-making in South Africa and Mexico.

Project partners in Mexico: University of Cambridge Institute for Sustainability Leadership, GIZ, Banco de Mexico, ITAM.

Output: tailor-made primers for the South African and Mexican regulators and financial firms on how to develop environmental scenario analysis relevant to their own national contexts.

Timeline:

1. Initial research and design
Dec 2017 - Feb 2018
2. Test thinking in country contexts
Mar-May 2018
3. Final research and design
Jun-Aug 2018
4. Launch and dissemination
Sep-Nov 2018

University of Cambridge Institute for Sustainability Leadership team

Dr Nina Seega, Research Director, Sustainable Finance

Andrew Voysey, Director, Sustainable Finance

The link between environmental sources of risk and financial risks

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
	– Policy				
	– Technology				
– Sentiment					

Source © Andreeva, N, Voysey, A. (2016). 'Environmental risk analysis by financial institutions: a review of global practice.' Background paper for the G20 Green Finance Study Group.

Priority physical sources of risk for Mexico



Climatic

- Windstorm
- Drought
- Climate Warming



Geologic

- Earthquake



Ecosystem

- Air pollution

Transition sources of risk for Mexico



Policy

- Industrial policy
- Financial policy



Technology

- Carbon-related technologies
- Industrial technologies








Sentiment

- Investor sentiment
- Political sentiment

Bank of England examples of impacts on banks' assets

Figure 3.1: Examples of climate-related financial risks to bank's assets

	 Credit	 Market	 Operational
 Physical	<p>Increasing flood risk to mortgage portfolios</p> <hr/> <p>Declining agricultural output increases default rates</p>	<p>Severe weather events lead to re-pricing of sovereign debt</p>	<p>Severe weather events impact business continuity</p>
 Transition	<p>Tightening energy efficiency standards impact property exposures</p> <hr/> <p>Stranded assets impair loan portfolios</p> <hr/> <p>Disruptive technology leads to auto finance losses</p>	<p>Tightening climate-related policy leads to re-pricing of securities and derivatives</p>	<p>Changing sentiment on climate issues leads to reputational risks</p>

Source © Bank of England 2018

Your approach to environmental sources of risk



Approach driven by corporate social responsibility focusing on reputational risks

Approach where climate risk is viewed as a short term financial risk

Approach driven by a long term view, engaging the Board, considering current and future risks, minimizing financial risks and actively contributing to an orderly transition

Strategic approach to environmental sources of risk

Distinctive elements	Example actions
<p>Far-reaching in breadth and magnitude</p> <p>Uncertain and extended time horizons</p> <p>Foreseeable nature</p> <p>Dependency on short-term actions</p>	<p>Deepening understanding of the financial risks from climate change</p> <ul style="list-style-type: none"> • Engaging with clients to understand the risks clients face over the longer-term • Publically supporting enhanced climate-related financial disclosures • Considering how to classify and identify assets to enable climate-related risk analysis across portfolios • Using scenario analysis and forward-looking data to assess the longer term financial risks <p>Agreeing a board level firm-wide strategic response</p> <ul style="list-style-type: none"> • Reviewing board-level responsibilities to respond to, and manage, the financial risks from climate change • Considering whether the current and future financial impacts from climate change have been factored into the firm's risk appetite <p>Considering how decisions today affect future financial risks</p> <ul style="list-style-type: none"> • Beginning to integrate climate-related risk factors into forward-looking assessments • Developing a comprehensive, firm-wide framework for climate-related risk management

Source © Bank of England 2018

Environmental scenario analysis

New scale, likelihood and interconnectedness of environmental sources of risk.

Scenario analysis:

1. can enhance strategic conversations about the future, help frame and assess potential range of impacts from physical and transition sources of risk, as well as assist investors, policy makers, regulators and others to understand the robustness of organisational strategies.
2. The process of conducting scenario analysis can be as useful, if not more so, as the outputs of scenario analysis.
3. *Is seen by a wide variety of stakeholders, such as national regulatory authorities, TCFD and others as a valuable tool for understanding, measuring and managing environmental sources of risk*

Scenario analysis framework

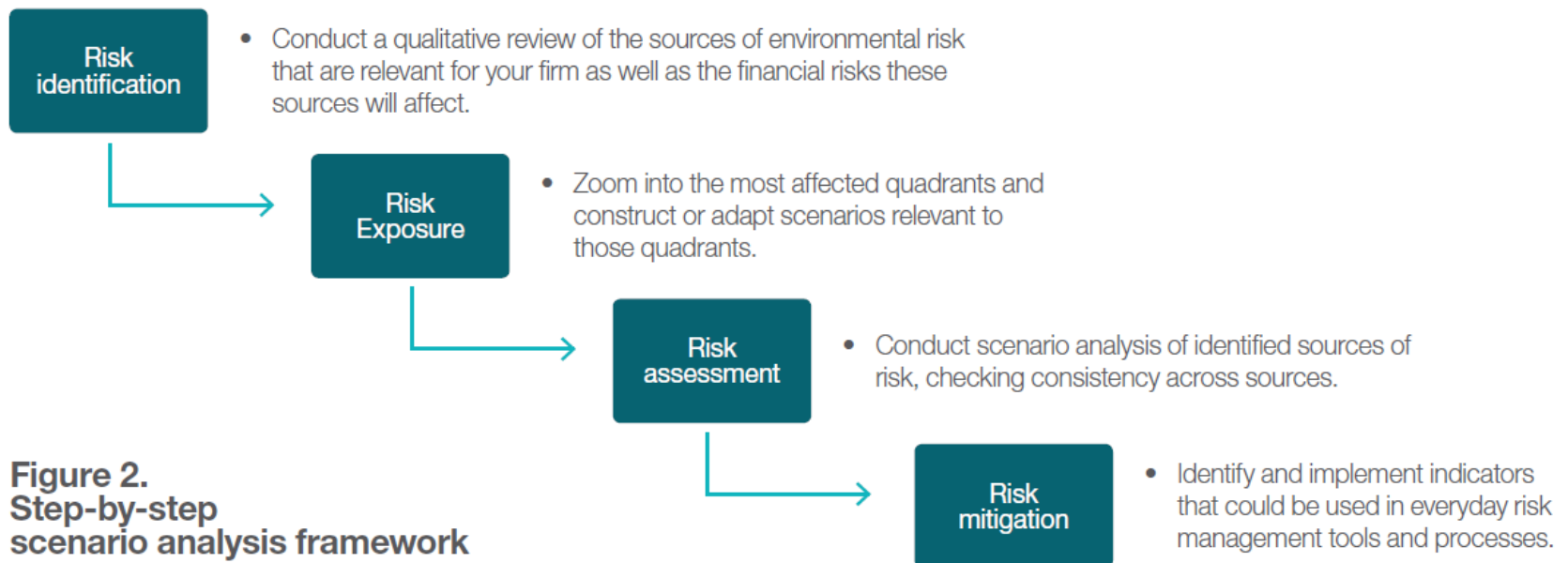
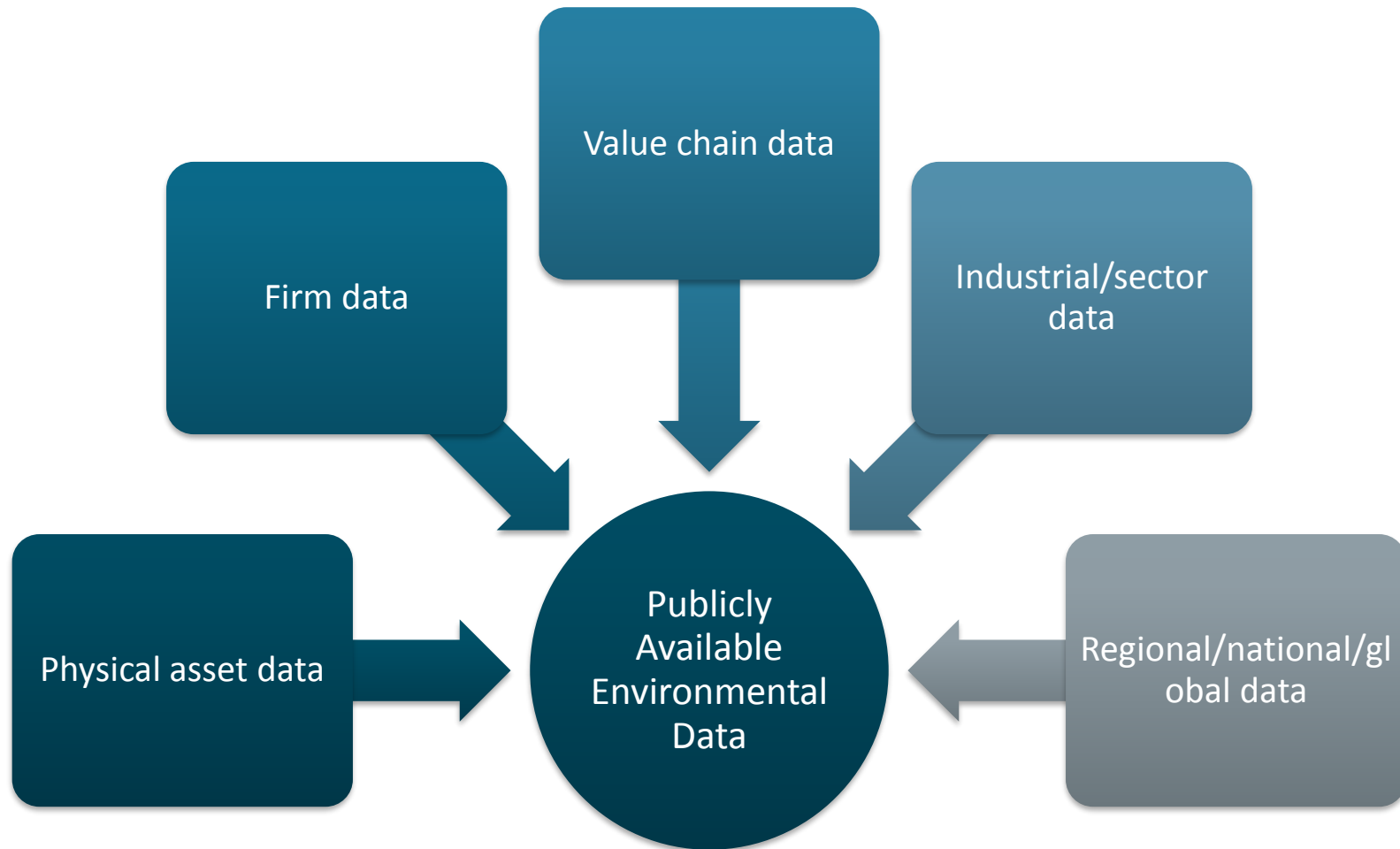


Figure 2.
Step-by-step
scenario analysis framework

Data required



Source © Bank of England, UNEP Enquiry (2017). 'Improving the availability and usefulness of publicly available environmental data for financial analysis.' Background paper for the G20 Green Finance Study Group.

Financial Stability Board's Taskforce on Climate-related Financial Disclosures

Core Elements of Recommended Climate-Related Financial Disclosures



Governance

The organization's governance around climate-related risks and opportunities

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

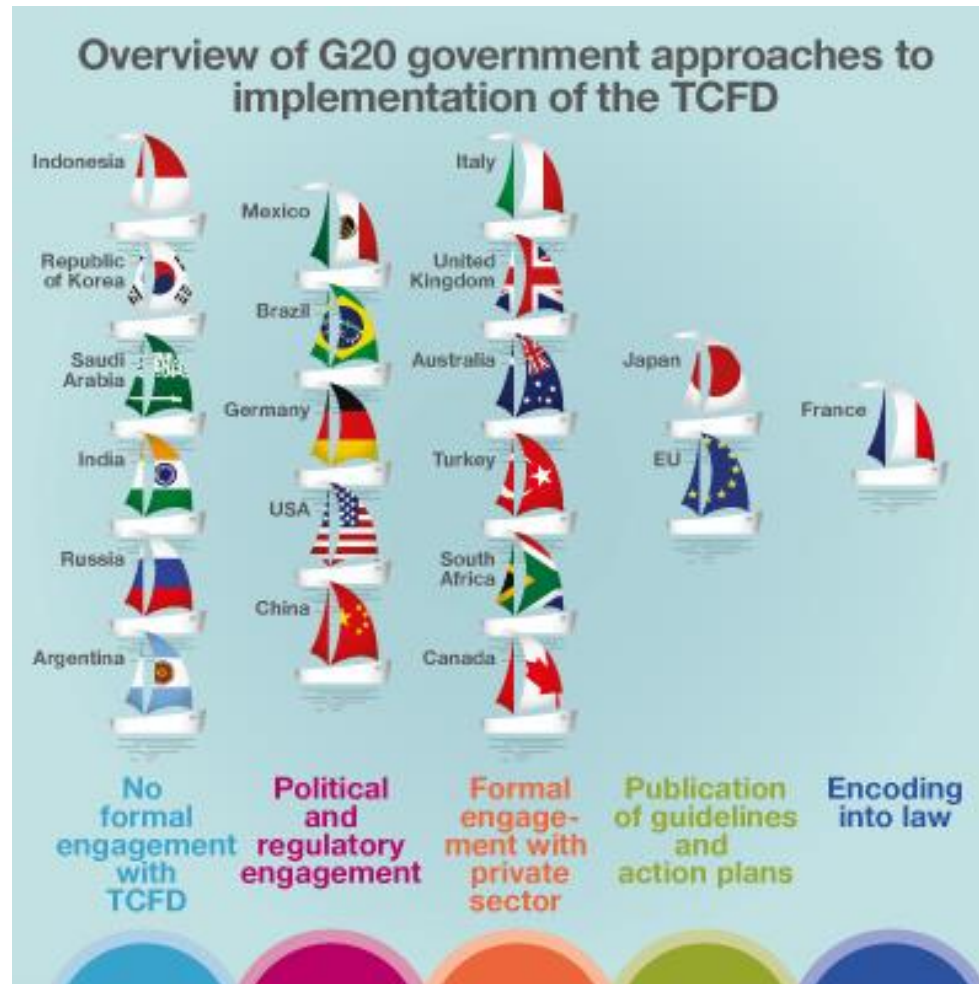
Risk Management

The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets

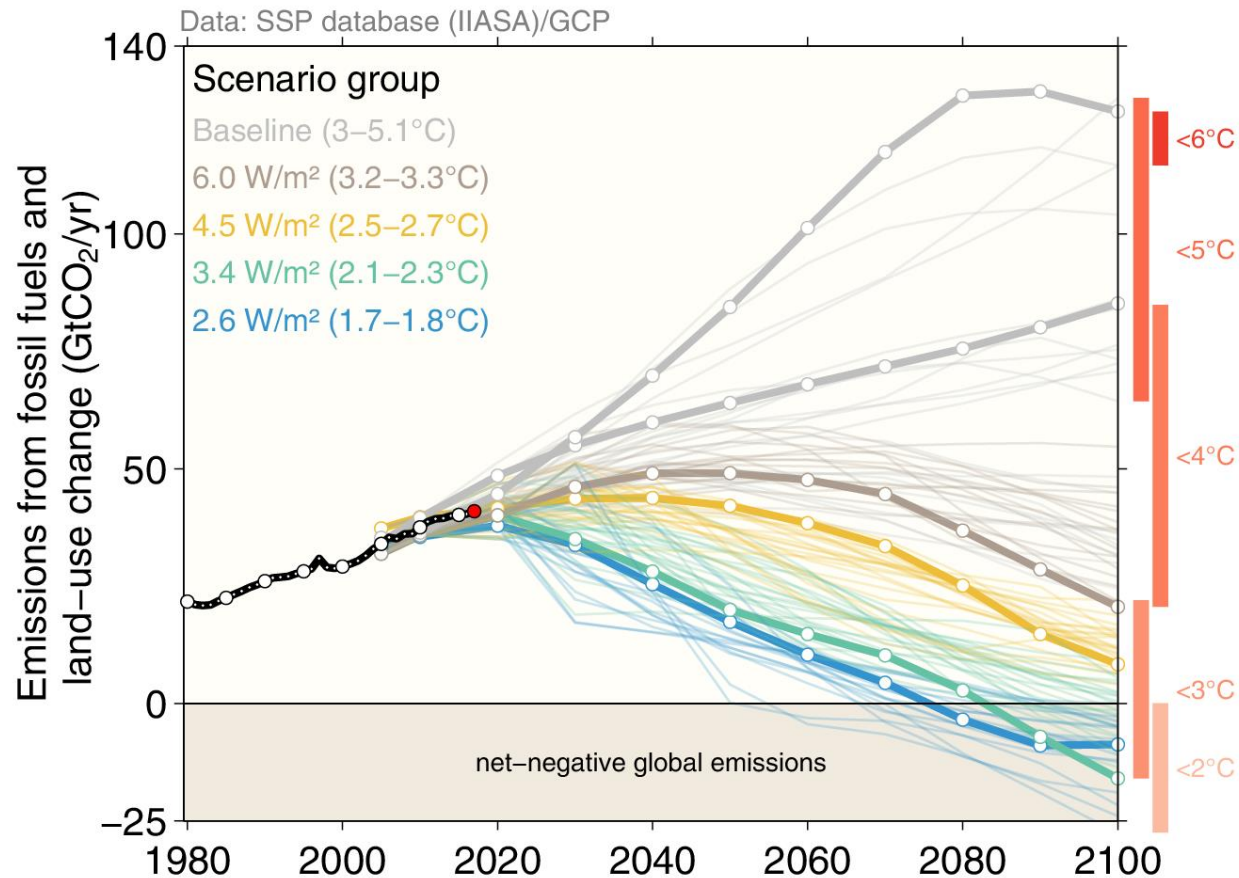
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

G20 approaches to TCFD implementation



Source © Seega, N (2018). 'Sailing from different harbours: G20 approaches to implementing the recommendations of the Taskforce on Climate-related Financial Disclosures. UK. University of Cambridge Institute for Sustainability Leadership

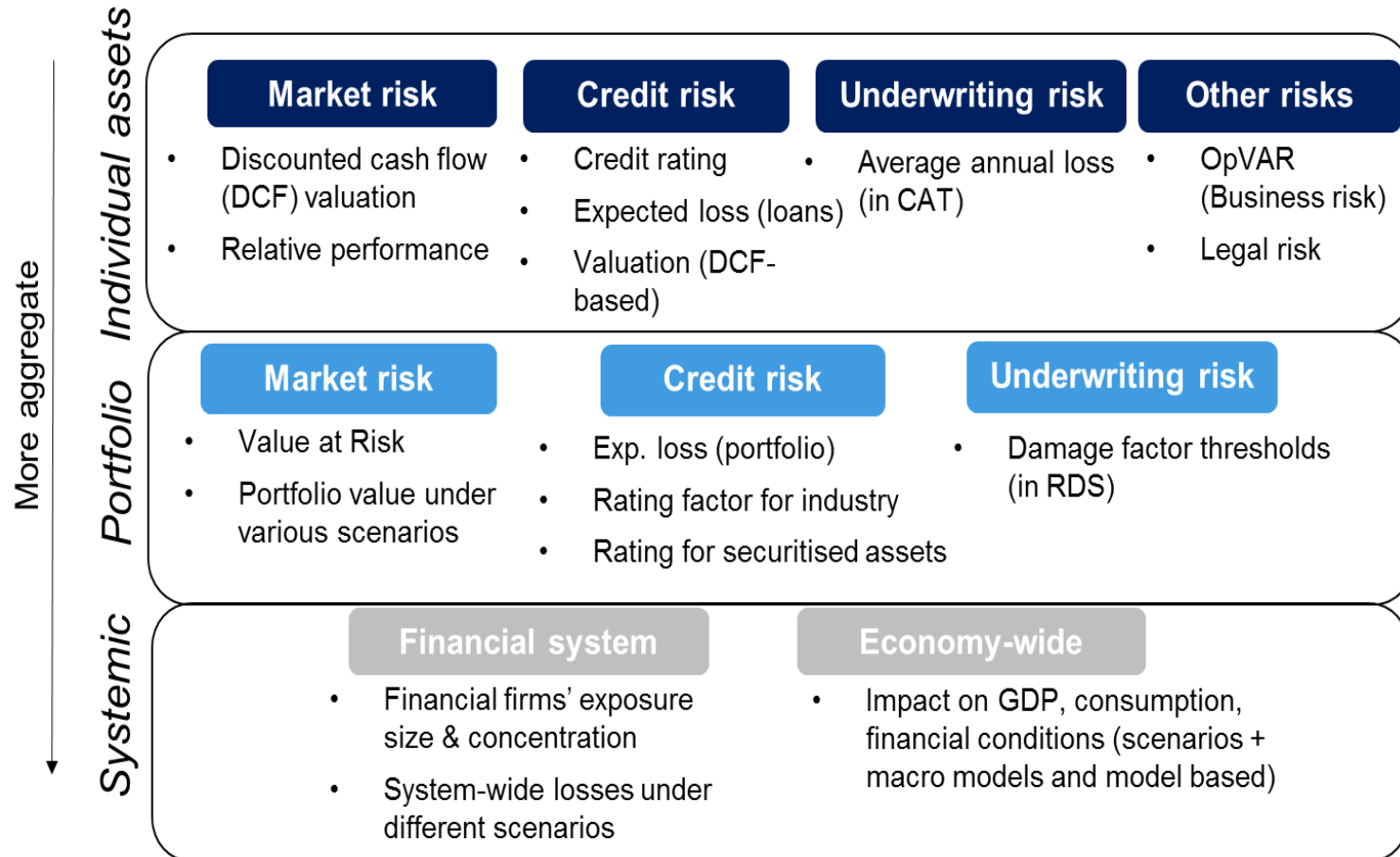
Physical and transition scenarios



Global Carbon Project

Source © Global Carbon Project 2017

Tools for understanding environmental sources of risk



Source © Bank of England, UNEP Enquiry and University of Cambridge Institute for Sustainability Leadership (2017) 'Enhancing environmental risk assessment in financial decision-making.' Background paper for the G20 Green Finance Study Group.

Case 2. Transition sources of risk for credit portfolio of utilities

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
– Policy					
– Technology					
– Sentiment					

Organisation

Barclays

Financial Sector

Banking

Environmental source of risk

Transition

Tools or approach used

Stress testing as part of the transition risk assessment method

Motivation

Investigation of possible credit risk

Case 3. Transition sources of risk inherent in infrastructure investment

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
	– Policy				
– Technology					
– Sentiment					

Organisation

ClimateWise Insurance Council

Financial Sector

Insurance

Environmental source of risk

Transition

Tools or approach used

Step-by-step guide, a methodology, open-source high-level tools, and case studies to help investors understand variations in transition risk across portfolios and within various asset types

Motivation

Investigation of possible credit risk and market risk

Case 8. Drought stress testing tool

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
	– Policy				
– Technology					
– Sentiment					

Organisation

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in partnership with the Natural Capital Finance Alliance, Risk Management Solutions and ten financial institutions from Brazil, China, México, Switzerland and the United States

Financial Sector

Banking

Environmental source of risk

Physical

Tools or approach used

Drought stress testing tool

Motivation

Investigation of possible credit risk

Case 9. Physical sources of risk for credit portfolio of agriculture clients

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
	– Policy				
– Technology					
– Sentiment					

Organisation

Itau Unibanco

Financial Sector

Banking

Environmental source of risk

Physical

Tools or approach used

Physical risk assessment via scenario analysis

Motivation

Investigation of possible credit risk

Case 5. Alignment of Swiss pension funds and insurance companies with the Paris Agreement

		Financial risks			
		Business	Credit	Market	Legal
Environmental sources	Physical				
	– Climatic				
	– Geologic				
	– Ecosystems				
	Transition				
– Policy					
– Technology					
– Sentiment					

Organisation

2dii for Swiss Federal Office for the Environment and the State Secretariat for International Financial Matters

Financial Sector

Investment Management

Environmental source of risk

Transition

Tools or approach used

Paris Agreement Capital Transaction Assessment

Motivation

Investigation of market risk arising from potential misalignment with a 2°C pathway

Recommendations for the way forward

1. Financial firms to develop methodologies and tools that enable incorporation of environmental scenario analysis into financial decision-making.
2. Financial firms to ensure that senior management is committed to implementing environmental risk analysis via scenario analysis.
3. Environmental authorities and the National Statistics Institute (INEGI) to proactively disclose environmental sources of risk data relevant and material for the financial system.
4. Financial regulators to develop, through the work of a high-level advisory group on sustainable finance, a deeper understanding of environmental sources of risk for the financial sector. Based on this understanding, regulators to introduce a clear position and agenda on environmental sources of risk.
5. Financial regulators to signal that environmental scenario analysis is a mainstream issue by adding priority environmental sources of risk to the country into the risk register for prudential supervisory activities.
6. Financial regulators to supplement this with regular in-person Board-level roundtables to discuss recent developments.
7. Convene a multi-stakeholder group (including industry practitioners, financial and environmental regulators and academic experts) to foster dialogue about environmental scenario analysis, construct a roadmap to implementation and explore creating a repository of risk data, scenarios and tools for environmental risk analysis.

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Thank you