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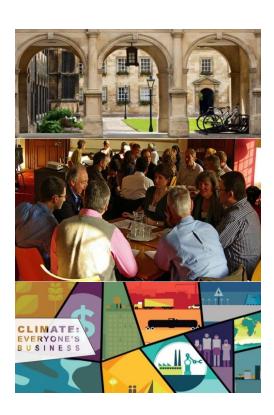
Active network of more than **7,000 members**

Executive and graduate education

Business and policy leaders groups

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

Independent research





CISL: Sustainable Finance thought leadership



CAMBRIDGE Cantre for Sustainable Finance

Embedding environmental

scenario analysis

giz 🛒 // ITAM



























Key takeaways

- Environmental sources of risk are material to financial firms and regulatory authorities in South Africa and globally.
- Therefore it is integral that South African 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.
- South Africa 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 decisionmaking in such a way that confidence can be built and better decisions made.



WEF 2018 global risks report

Тор	5 Global Risks in	Terms of Likeliho	ood 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
- 90											
Ton	5 Global Risks in	Terms of Impact	(
Тор	5 Global Risks in 2008	Terms of Impact	2010	2011	2012	2013	2014	2015	2016	2017	2018
Top				2011 Fiscal crises	2012 Major systemic financial failure	2013 Major systemic financial failure	2014 Fiscal crises	2015 Water crises	2016 Failure of climate- change mitigation and adaptation	2017 Weapons of mass destruction	2018 Weapons of mass destruction
	2008 Asset price	2009 Asset price	2010 Asset price		Major systemic	Major systemic	Section 19	North Co.	Failure of climate- change mitigation	Weapons of mass	Weapons of mass
1st	Asset price collapse Retrenchment from globalization	Asset price collapse Retrenchment from globalization	Asset price collapse Retrenchment from globalization	Fiscal crises	Major systemic financial failure Water supply	Major systemic financial failure Water supply	Fiscal crises	Water crises Rapid and massive spread of	Failure of climate- change mitigation and adaptation	Weapons of mass destruction	Weapons of mass destruction
1st 2nd	Asset price collapse Retrenchment from globalization (developed) Slowing Chinese	Asset price collapse Retrenchment from globalization (developed) Oil and gas	Asset price collapse Retrenchment from globalization (developed)	Fiscal crises Climate change	Major systemic financial failure Water supply crises Food shortage	Major systemic financial failure Water supply crises Chronic fiscal	Fiscal crises Climate change	Water crises Rapid and massive spread of infectious diseases Weapons of mass	Failure of climate- change mitigation and adaptation Weapons of mass destruction	Weapons of mass destruction Extreme weather events	Weapons of mass destruction Extreme weather events
1st 2nd 3rd	Asset price collapse Retrenchment from globalization (developed) Slowing Chinese economy (-6%) Oil and gas	Asset price collapse Retrenchment from globalization (developed) Oil and gas price spike	Asset price collapse Retrenchment from globalization (developed) Oil price spikes	Fiscal crises Climate change Geopolitical conflict Asset price	Major systemic financial failure Water supply crises Food shortage crises Chronic fiscal	Major systemic financial failure Water supply crises Chronic fiscal imbalances Diffusion of weapons of mass	Climate change Water crises Unemployment and	Rapid and massive spread of infectious diseases Weapons of mass destruction Interstate conflict with regional	Failure of climate- change mitigation and adaptation Weapons of mass destruction Water crises Large-scale involuntary	Weapons of mass destruction Extreme weather events Water crises	Weapons of mass destruction Extreme weather events Natural disasters Failure of climate-change mitigation



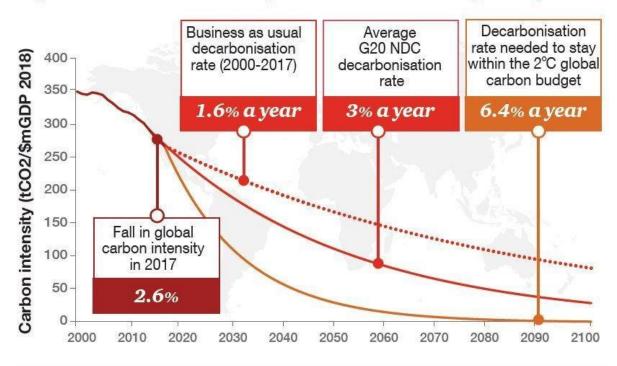
Global temperature trends by 2100





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 Southern Africa

+1.5°C

+2°C

+3°C

Frequency of warm extremes over land

Average drought length (in months)

Population exposed to water scarcity

+208%

+4

+5mn (+0-+10mn) +596%

+6

+10mn (+3-+17mn) +19





Environmental sources of risk in South Africa

- In the western parts of the country, the observed rate of warming has been 2°C per century, twice the rate of global warming.
- In 2017, drought featured as the number one reported risk by companies, in line with previous reporting years (CDP, 2017).
- The slowdown of South Africa's GDP growth to 1.3 per cent in 2015 was driven by a severe drought resulting in contraction of the agriculture industry by 8.4 per cent (the largest drop in production since 1995) (DEA, 2018).
- Further, transition to low carbon future can create financial risks.



Embedding environmental scenario analysis in financial decisionmaking

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

Project partners in South Africa: University of Cambridge Institute for Sustainability Leadership, GIZ, National Treasury.

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

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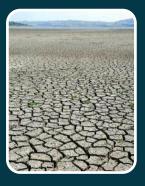


The link between environmental sources of risk and financial risks

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



Priority physical sources of risk for South Africa



Climatic

- Windstorm
- Drought/flooding
- Climate Warming
- Sea rise



Ecosystem

- Air pollution
- Water pollution
- Ecosystem loss



Transition sources of risk for South Africa



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



Environmental scenario analysis

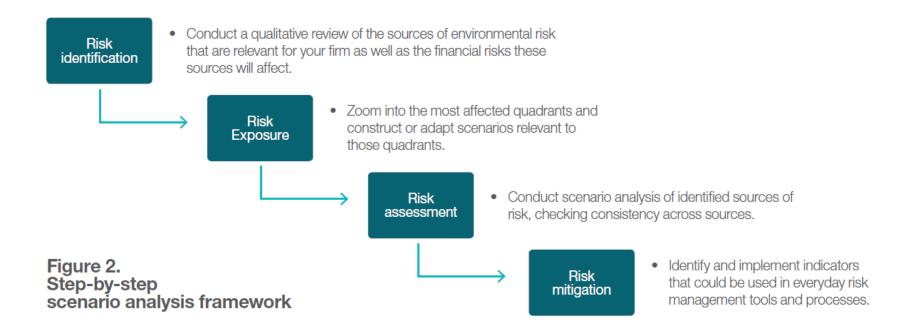
New scale, likelihood and interconnectedness of environmental sources of risk.

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

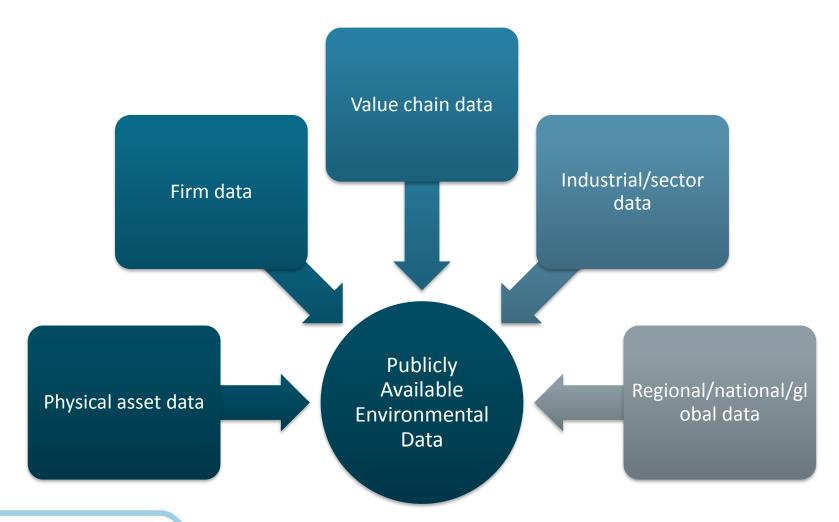


Scenario analysis framework





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

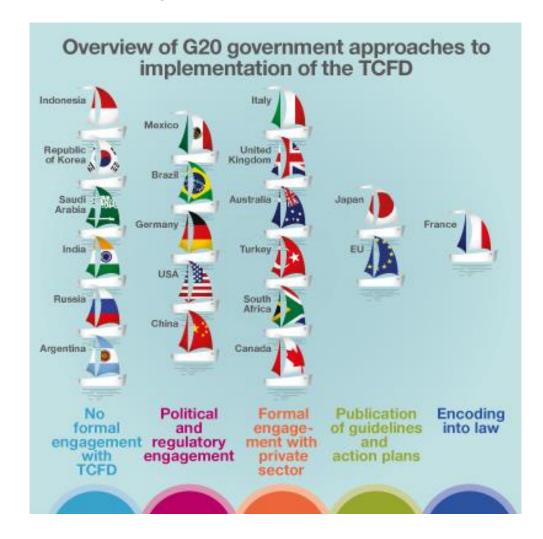
The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets

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



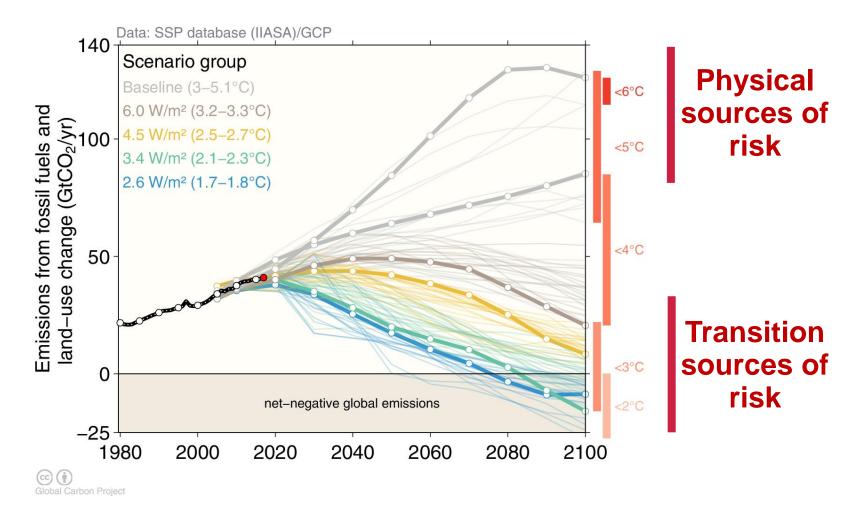
G20 approaches to TCFD implementation





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





Tools for understanding environmental sources of risk

assets Market risk Credit risk **Underwriting risk** Other risks Discounted cash flow Credit rating OpVAR Individual Average annual loss (DCF) valuation (Business risk) (in CAT) Expected loss (loans) Relative performance Legal risk Valuation (DCF-More aggregate based) **Underwriting risk Market risk** Credit risk Portfolio Value at Risk Exp. loss (portfolio) Damage factor thresholds (in RDS) Portfolio value under Rating factor for industry various scenarios Rating for securitised assets Systemic Financial system **Economy-wide** Financial firms' exposure Impact on GDP, consumption, size & concentration financial conditions (scenarios + macro models and model based) System-wide losses under different scenarios



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.

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.



Recommendations for the way forward

- 3. Financial regulatory authorities to introduce a clear position and agenda on the environmental sources of risk.
- 4. Financial regulatory authorities to signal that environmental scenario analysis is a mainstream issue by adding priority environmental sources of risk into the risk register for prudential supervisory activities.
- 5. Financial regulatory authorities to supplement this with regular in-person Board-level roundtables to discuss recent developments.



Recommendations for the way forward

6. Convene a multi-stakeholder group (including industry practitioners, regulators and academic experts) to create repository of existing risk data, scenarios and tools that industry could be using and provide recommendations that would address existing gaps, such as in the area of disclosure.



Panel discussion



Introduction to group work

14.15 – 14.30 Introductions and brief discussion on two priority environmental sources of financial risk

14.30 – 14.45 Check in with the group



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			
Far-reaching in breadth and magnitude Uncertain and extended	Deepening understanding of the financial risks from climate change 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			
time horizons	Agreeing a board level firm-wide strategic response			
Foreseeable nature	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			
Dependency on short- term actions	Considering how decisions today affect future financial risks Beginning to integrate climate-related risk factors into forward-looking assessments Developing a comprehensive, firm-wide framework for climate-related risk management			



Group work on case studies

14.45 – 15.00 Read through the case study materials

15.00 - 15.30 Discuss the case study with the group answering the following questions:

- 1. What is the methodology of this study?
- 2. How is this case relevant to my work?
- 3. What do I need to conduct this assessment at my firm?

15.30 – 15.45 Prepare a 5 minute presentation to the rest of the group on

- 1. A brief summary of the case
- 2. Its application to the South African context

15.45 – 16.00 Presentations and whole group discussion



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Thank you

