Climate change risk & opportunity: Assessment, management & disclosure

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Agenda

1. Global momentum for improved disclosure of climate risks and opportunities
2. Introducing Acclimatise
3. Assessing and managing physical risks and opportunities from climate change
4. Discussion

Global momentum for improved disclosure of climate risks & opportunities

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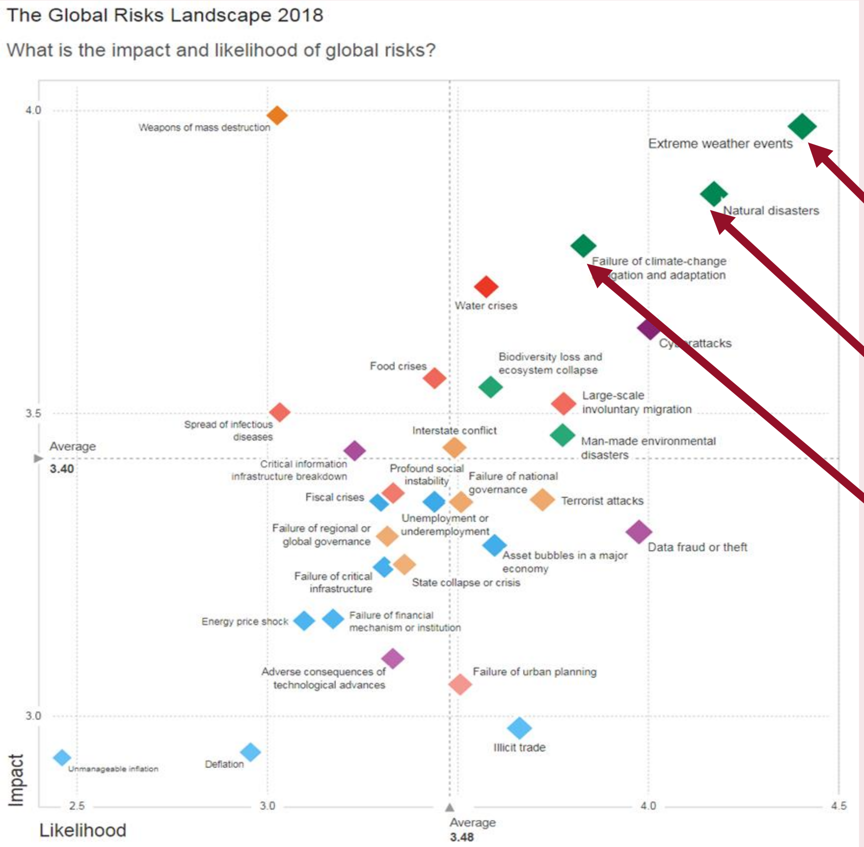
Climate-related risks are listed as top risks by the World Economic Forum Global Risk Landscape report

Climate-related risks are among the top risks facing the world for the third year in a row - both in terms of impact and likelihood



Extreme weather events

Natural disasters

Failure of climate change mitigation and adaptation

http://reports.weforum.org/global-risks-2018/global-risks-landscape-2018/?doing_wp_cron=1556278074.0718679428100585937500#landscape

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G20 Financial Stability Board (FSB) sees climate risks as *financial* risks and set up the Task Force on Climate-related Financial Disclosures (TCFD) in 2015

- **TCFD published recommendations** for voluntary reporting of climate-related risks and opportunities, that stem from 'transition' and 'physical' climate risks (July 2017)
- Recommendations are aimed at **financial institutions** and **companies in the real economy**
- Includes specific guidance for **energy, transport, material & building, agriculture, food & forest products**
- **Financial institutions will use disclosures** – they are intended to be included in annual financial filings

FSB Chairman and Bank of England Governor, Mark Carney

TCFD Chairman, Michael Bloomberg

Material & Building = Mining, Chemicals, Construction Material, Capital Goods, Real Estate

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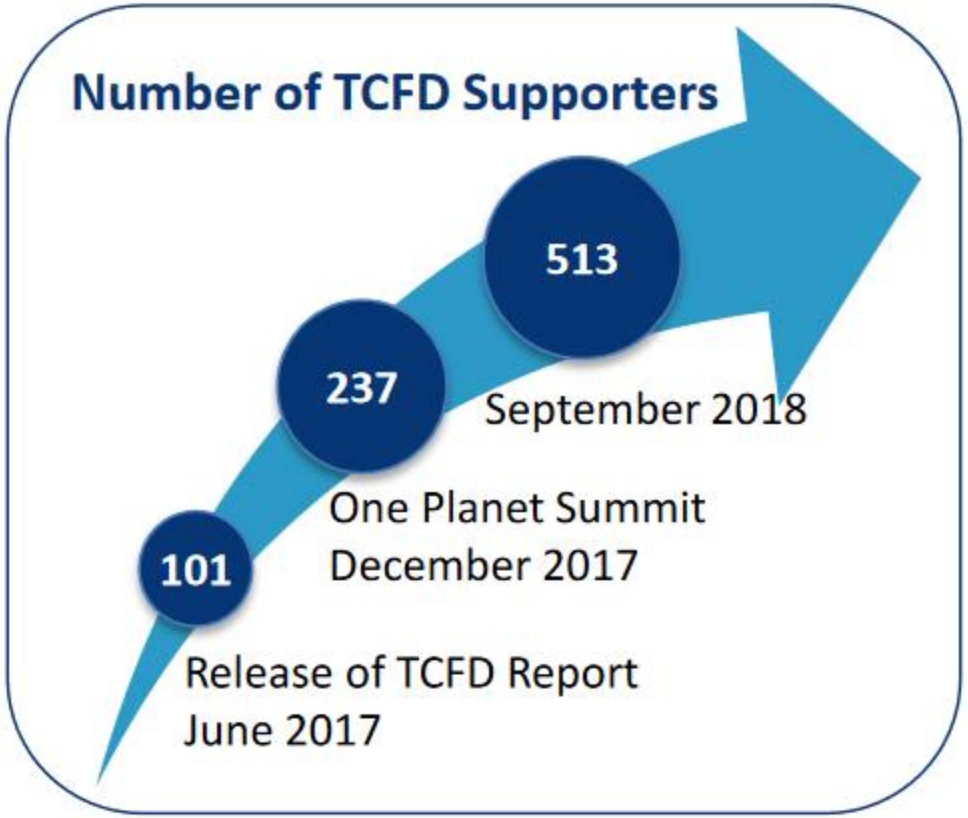
The TCFD recommendations are now widely recognised as the authoritative guidance on the reporting of financially material climate-related information

- As of September 2018, the TCFD has more than 500 official supporters across a broad range of sectors:
  - 457 companies
  - 56 other organizations (e.g., industry associations, governments)
- TCFD supporters have a combined market capitalization of over $7.9 trillion
- Supporters include over 287 financial firms, responsible for assets of nearly $100 trillion
- More than 580 organizations are supporting the TCFD as of February 2019



https://www.fsb-tcfd.org/publications/tcfd-2018-status-report/#; https://www.fsb-tcfd.org/wp-content/uploads/2018/08/TCFD-2018-Report-Slides-092418.pdf

Financial institutions are actively engaging with the TCFD recommendations

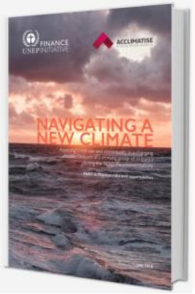
Groups of investors, banks, insurers are undertaking pilots on implementing the TCFD recommendations across their portfolios

FINANCE
UNEP INITIATIVE

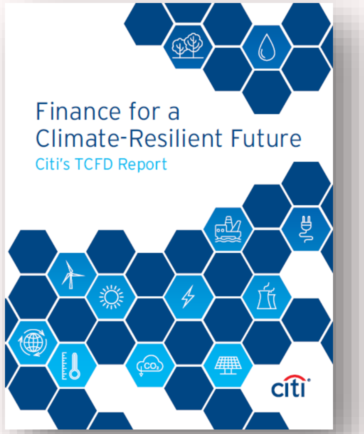
2017-18 TCFD pilot with 16 commercial banks

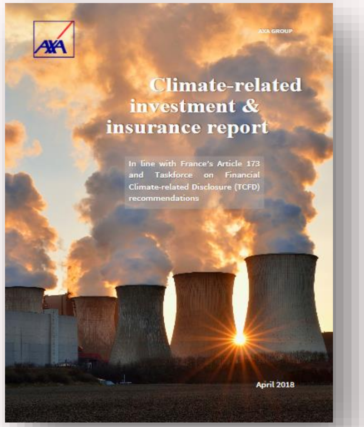
ANZ, Barclays, BBVA, BNP Paribas, Bradesco, Citi, DNB, Itaú, nab, Rabobank, RBC, Santander, Societe Generale, Standard Chartered, TD, UBS

Acclimatise developed the physical climate risk & opportunity methodologies



Banks, insurers and investors are issuing TCFD-aligned disclosures





http://www.acclimatise.uk.com/2018/07/17/16-of-the-worlds-leading-banks-collaborate-to-tackle-physical-risks-of-climate-change/

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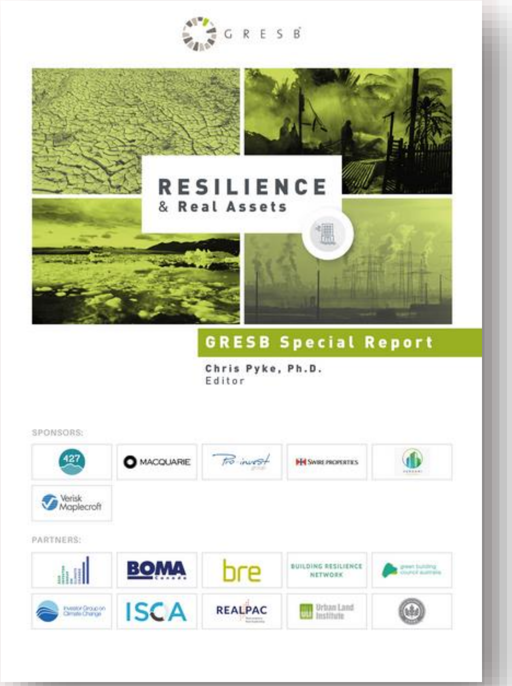
Actors in the real economy are also responding to TCFD

2018 World Business Council for Sustainable Development (WBCSD) report explores in depth look at climate-related financial disclosure across four major oil and gas companies

2018 Global Real Estate Sustainability Benchmark (GRESB) special report shares actions from 125 property and infrastructure companies and funds

- 90% have assigned responsibility on climate resilience to senior member of staff
- 80% have analysed physical climate risks
- A small number have started scenario-based analysis in line with TCFD



TCFD has led to a groundswell of action on improved management of financial risks and opportunities from climate change

Following TCFD, there are significant moves towards regulation of the financial system to manage financial risks from climate change, and drive capital towards sustainable investments

Central Banks and Supervisors Network for Greening the Financial System (NGFS):

- Group of 34 Central Banks and Supervisors committed to better understand and manage financial risks and opportunity of climate change
- 2019 NGFS report issued six recommendations; four for central banks and supervisors, aimed at enhancing their role in greening the financial system, and a further two recommendations for policymakers aimed at facilitating the work of central banks and supervisors

2018 European Commission Action Plan for a Sustainable Finance System:

- Sustainability taxonomy is under development to facilitate sustainable investment
- EU directives will be amended to clarify how asset managers, insurance companies, and investment or insurance advisors should integrate sustainability risks or other sustainability factors into their activities

Other climate and environmental disclosure frameworks and guidance have now aligned with the TCFD recommendations

New European Commission guidelines on non-financial reporting - the Non-Financial Reporting Directive (NFRD) will integrate TCFD recommendations in 2019

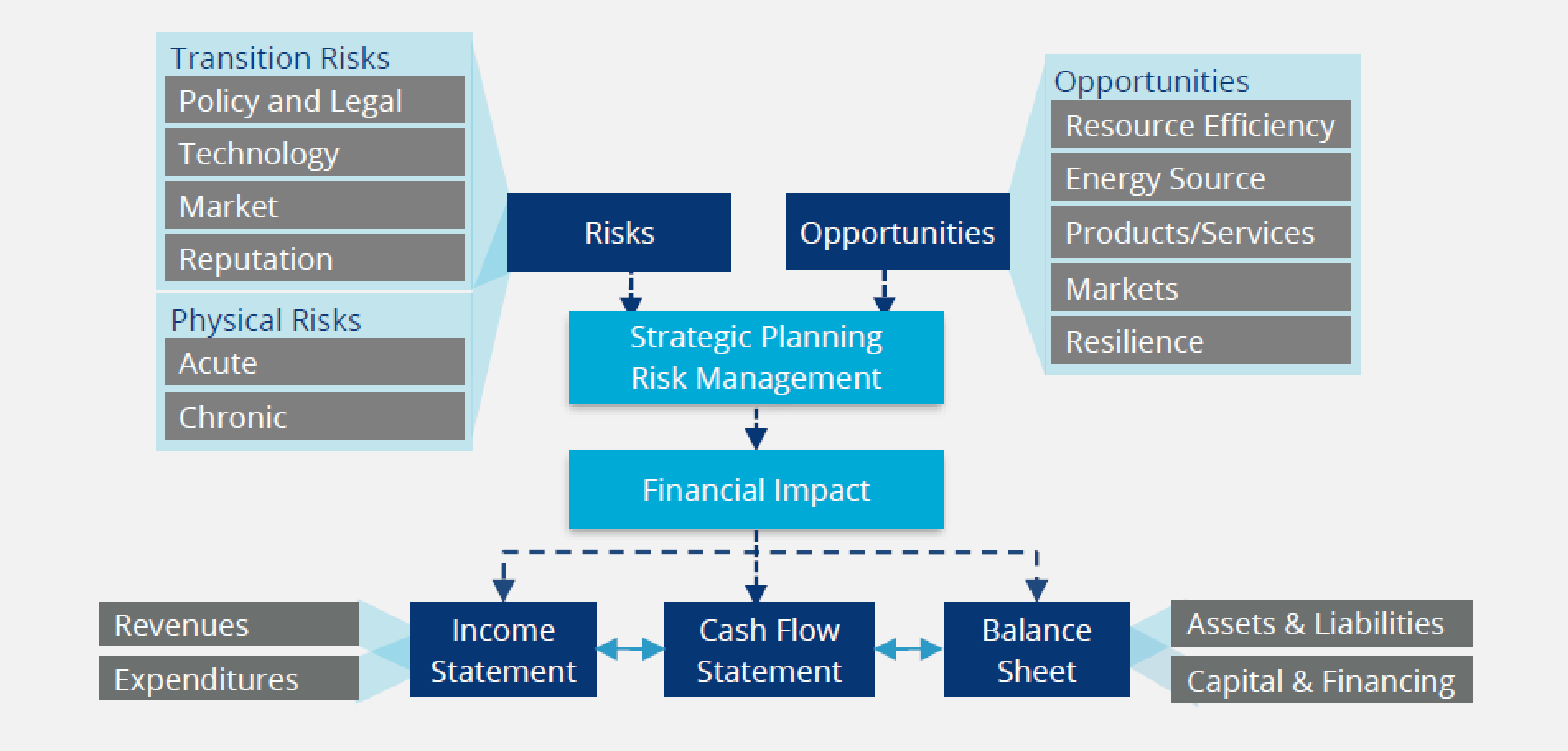
Principles for Responsible Investing (PRI) introduced TCFD-aligned indicators to its Reporting Framework in 2018

Carbon Disclosure Project (CDP) reporting has aligned with TCFD recommendations, effective in 2019

> *"CDP has committed to align its information requests with the TCFD's recommendations, alongside introducing a sectoral focus and adopting a forward-looking approach to climate-risk disclosure. This harmonization will help to drive the adoption of TCFD recommendations by reporting companies, optimize the reporting burden and speed-up the generation of decision-useful information for data users."*

The TCFD's goal is to encourage improved disclosure of the financial impacts of climate-related risks and opportunities on an organisation

Climate-related risks and opportunities may affect an organization's current and future financial positions



https://www.fsb-tcfd.org/publications/final-recommendations-report/

TCFD recommends disclosures in four key areas that will allow more informed financial decisions

Investors, lenders, and insurance underwriters need to understand how climate-related risks and opportunities are likely to impact an organization

The recommendations are structured around four thematic areas that represent core elements of how organizations operate:

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

Introducing Acclimatise

Introducing Acclimatise

Established in 2004, Acclimatise is a specialist advisory and analytics company providing world-class expertise in physical climate risk assessment and climate change adaptation

We are leading providers of advisory services and analytical tools that help financial institutions, corporates and governments to identify, quantify, manage and disclose physical climate risks and opportunities

- Climate adaptation planning
- Climate finance & sustainable finance flows
- Communicating climate resilience
- Vulnerability analysis
- Identifying investment opportunities
- Mainstreaming resilience into decision-making

400+ assignments | **120+ clients** | **70+ countries**

Assessing and managing physical risks and opportunities from climate change

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Our Climate Hazard Scenarios provide data based on the latest science on extreme weather events and chronic changes in climate

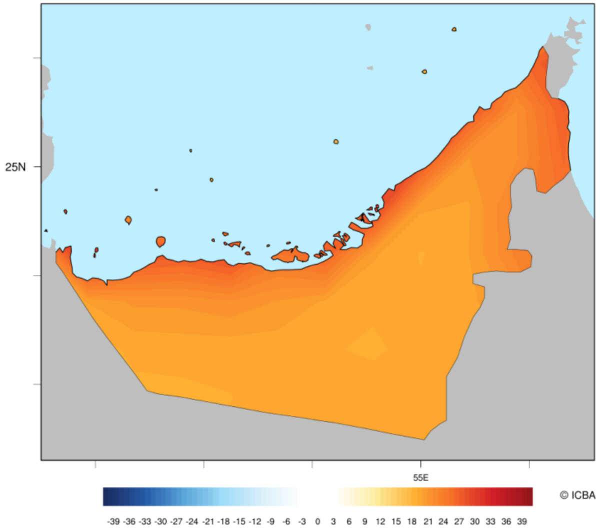
Robust science	e.g. IPCC, NASA, NOAA, UNEP, World Bank
14 hazards	Including both chronic (incremental) changes and extreme weather events
40+ climate models	Over forty climate models used to provide comprehensive view of hazards
Diverse GHG scenarios	Corresponding to 2°C and 4°C warming by end of the 21st century
Three time periods	Present-day, 2030s and 2050s

Hazards

Temperature increase	Wind speed increase/decrease
Wildfire	Cyclones / storms
Precipitation increase	Sea level rise
Flood	Solar radiation change
Landslide	Snow loading
Precipitation decrease	Sea ice
Drought / water stress	Permafrost

Example

Projected change in no. of days in UAE with temperature >35°C for 2050s compared to baseline period, under RCP4.5 scenario, modelled at 50 x 50 km resolution. (Source: ICBA)



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Our Climate Hazard Scenarios are linked in our system to relevant Sector Vulnerability Indicators and are applied to a portfolio

Acclimatise's Sector Vulnerability Indicators describe the vulnerability of sectors and sub-sectors to physical impacts

19 sectors

134 sub-sectors

8 Indicators

Sectors		
Agriculture, forestry & fishing	Information and communication	Construction
Mining and quarrying	Financial and insurance activities	Public administration and defence
Manufacturing	Real estate activities	Wholesale and retail trade
Electricity, gas, steam and A/C supply	Professional, scientific and technical activities	Education
Water supply; sewerage; waste management	Administrative and support service activities	Transporting and storage
Human health and social work activities	Arts, entertainment and recreation	Accommodation and food service activities
Other services activities	...	...

Example indicator scores for Agribusiness and Food

Vulnerability indicators	Sub-sectors: Animal production	Beverages	Crop production	Fishing	Food Manufacture
Natural resources	High	High	High	High	High
Energy supply	Med	High	Med	Low	High
Climate sensitive supplies	High	High	High	Med	High
Transport routes	Med	Med	Med	Med	Med
Assets & processes	Med	Med	Low	Med	Med
Market demand	Low	Med	Med	Low	Low
Environment & social impact	Med	Med	Med	Med	Med
Labour health & productivity	Med	Low	Med	High	Low

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Heat-maps are generated to provide institutions with a portfolio-wide assessment of physical risk, to focus on areas for more detailed analysis

			Geography				Total sector risk
			Greater China & North Asia	ASEAN & South Asia	Africa & Middle East	Europe & Americas	
		Portfolio share:	41%	28%	20%	12%	
Industry sector / retail products	Retail mortgages	28%					
	Finance, insurance, non-banking	16%					
	Manufacturing	8%					
	Energy	6%					
	Transport, telecoms & utilities	6%					
	etc						-
Total region risk							

ILLUSTRATIVE

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Following portfolio-wide assessment, the effects of climate change can be quantified using economy-wide models, hazard models and financial modelling

Scenario

Economic scenario
- Growth
- Population
- Technology
- Policy
- …

Emissions scenario
- CO_2
- Other greenhouse gases

Climatic scenario

Climatic hazards

Chronic changes
- Temperature
- Sea level
- Water stress
- Precipitation patterns
- Permafrost
- …

Extreme weather
- Hurricanes
- Floods
- Wildfire
- Landslide
- …

Model

Economy-wide model
- GDP effects
- Inflation or exchange rate
- Sectoral shifts
- Price changes

Hazard models
- Damage to real assets
- Business interruptions

Financial effects

Real assets
- Value corrections
- Cash flow changes
- Insurance costs

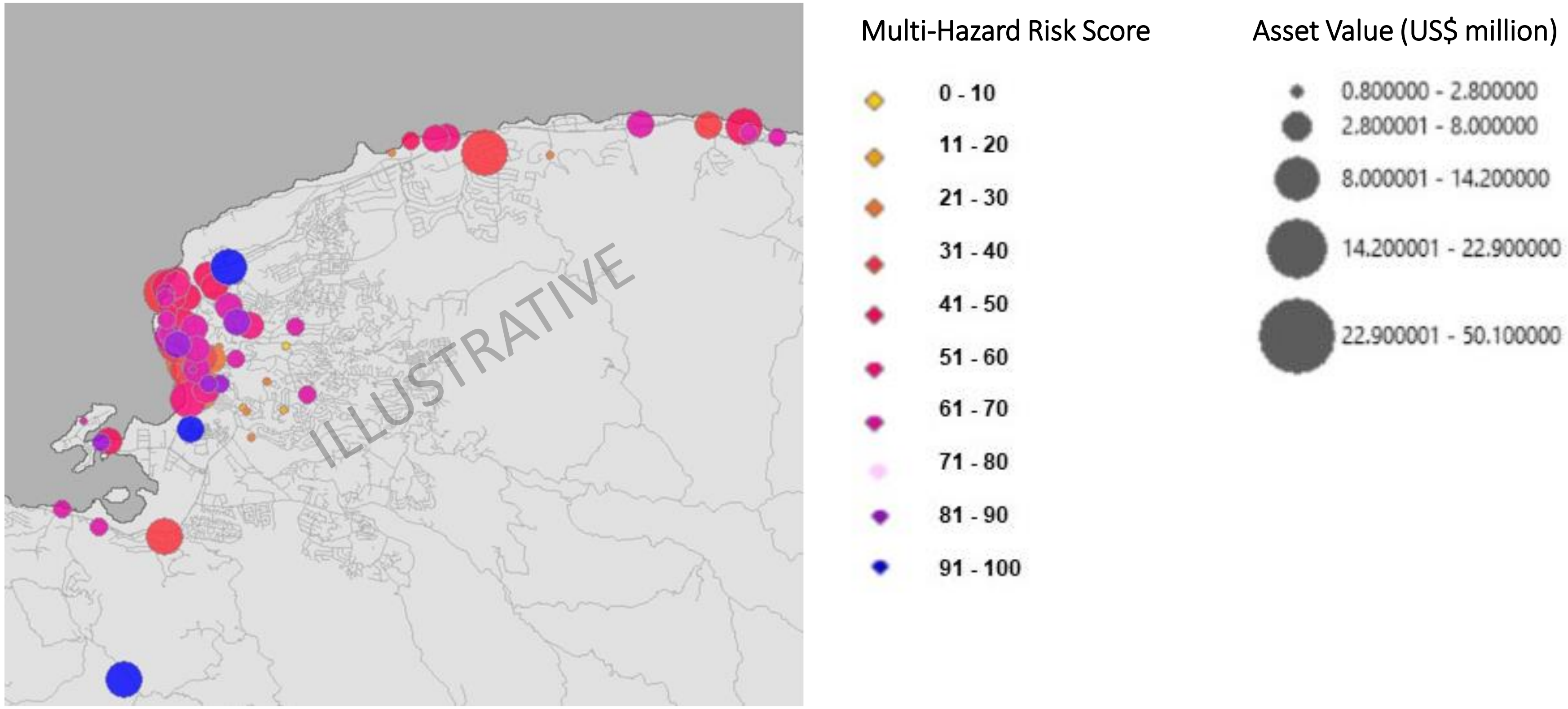
Financial assets
- Value corrections
- Default risk changes

Portfolios
- Absolute exposure
- Decomposition of impacts

Example deep dive: Commercial real estate physical risks can be evaluated at asset & portfolio level for lending, acquisition, underwriting & portfolio management

Our climate hazard scenarios are applied to real estate assets and portfolios to quantify physical risks
Data can be mapped and aggregated / disaggregated by hazard type, asset type, portfolio segments etc.

Risk scores for a portfolio of hotels and resorts covering multiple climate hazards
(coastal flooding, river flooding, cyclone risk, extreme heat, water stress)



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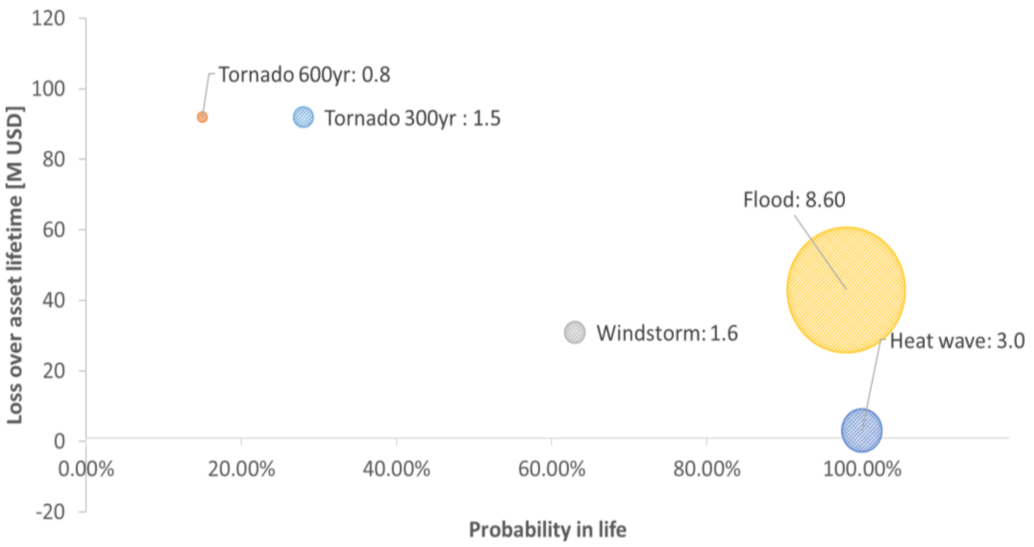
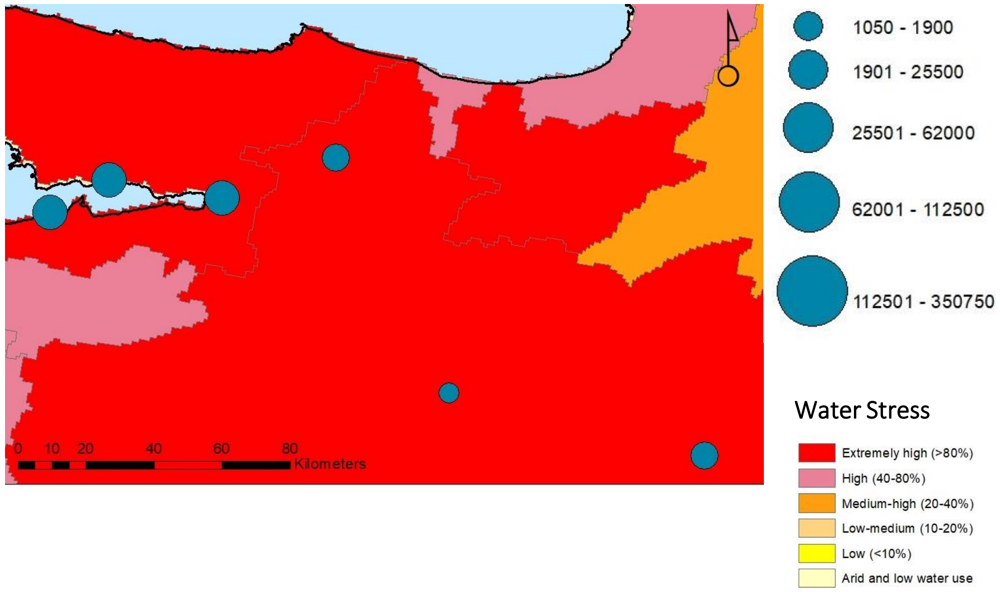
<u>Example deep-dive</u>: We quantified annual revenue loss to ports and power generation assets from climate hazards

Financial risk for a port facility under physical climate hazard scenarios (US$ million)



Size of circle represents annual average expected loss in 2030

Annual revenue loss in 2030 for power generation assets due to water stress



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Opportunities: Our framework for strategic market analysis enables institutions to evaluate opportunities from physical impacts of climate change

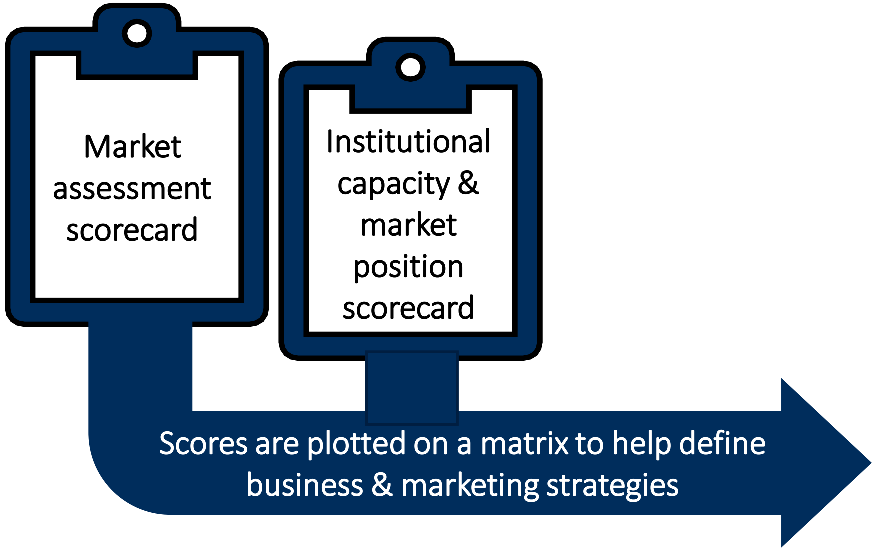
‘Opportunity’ is defined as the potential increase in demand driven by the physical impacts of a changing climate on clients and their adaptation responses

New opportunities will develop for institutions to support growth in horizontal and vertical adaptation solution providers

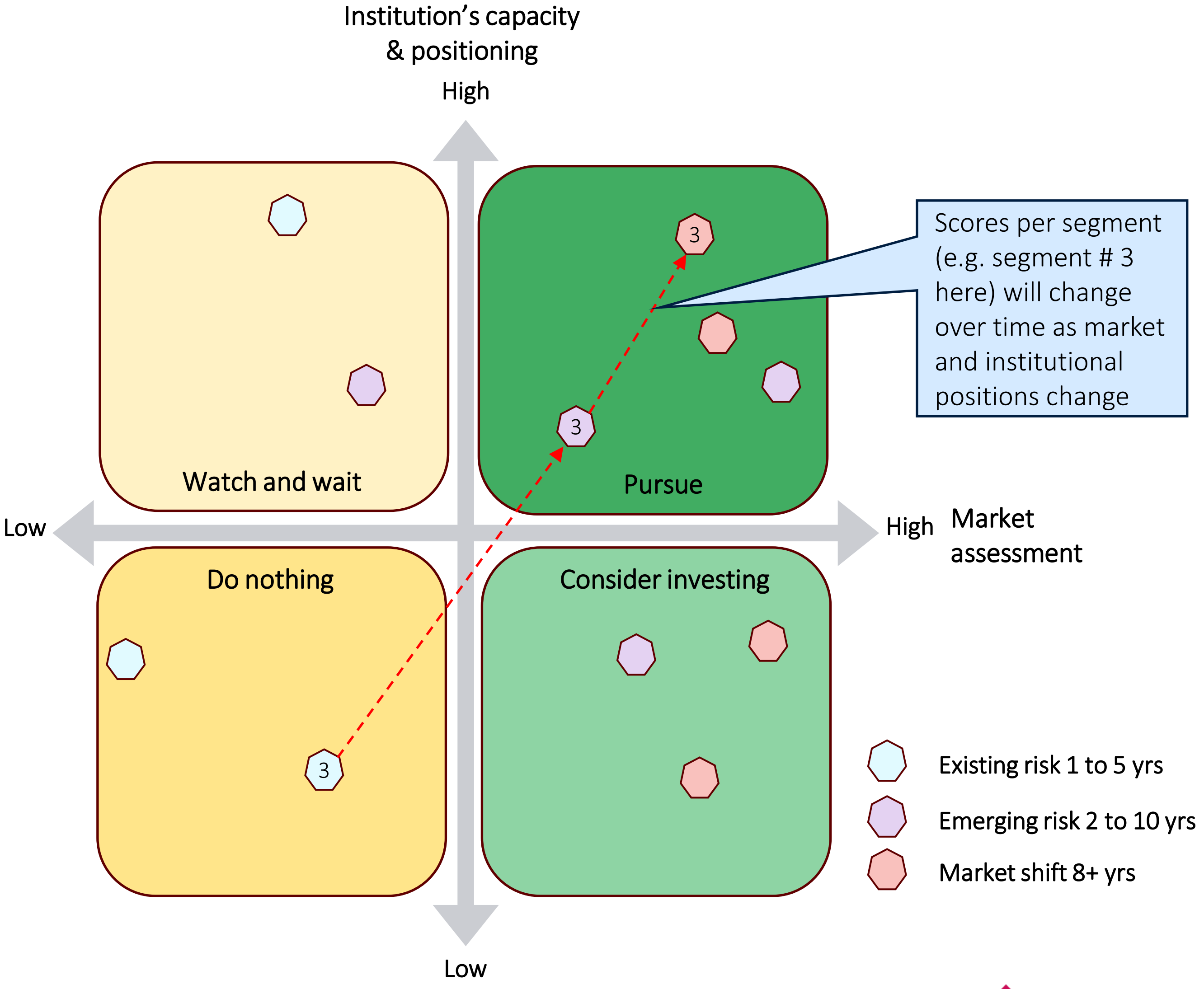
Opportunity assessment framework

	Activity	Task	Objective
1	**Taxonomy of opportunities**	Define opportunity categories	Agree how opportunities can be defined
2	**Market assessment**	Complete scorecard for demand for market segments	Estimate future demand by segment (e.g. sector and country) arising from a changing climate Identify segments with most significant opportunities
3	**Institutional capacity and positioning**	Complete scorecard for institutional capacity and market positioning to capture opportunities	Assess capacity and positioning of the institution to take advantage of market opportunities and how they may change over time
4	**Opportunity evaluation**	Combine market assessment with institutional capacity and positioning	Identifying segments with highest potential opportunities for the institution

Results of opportunities analysis can guide institutions on their business and marketing strategies

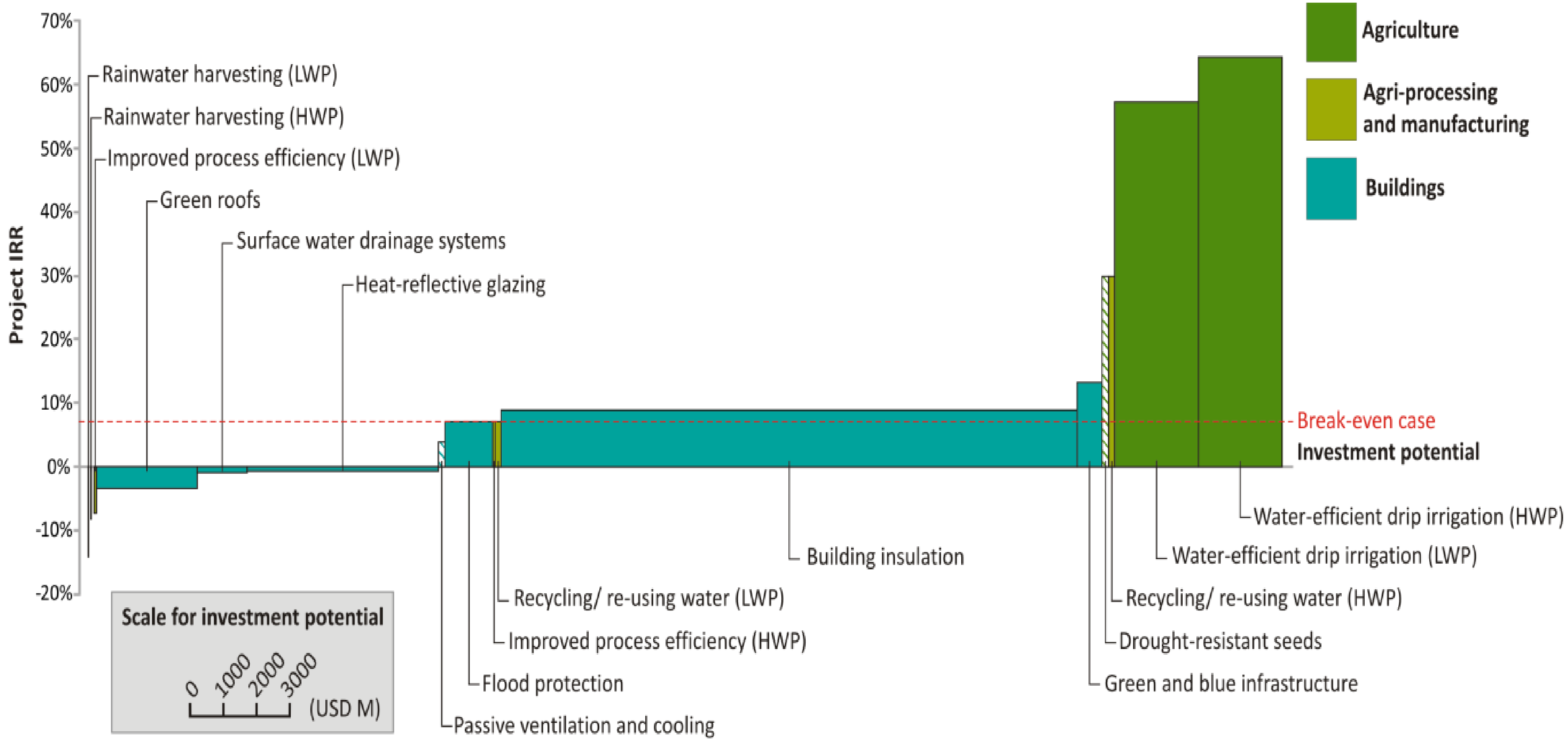


Strategy	Description / rationale
Pursue	The institution may choose to pursue and increase investment
Consider investing	The institution may consider the need for internal investment to take advantage of the market opportunities
Watch and wait	Where the institution has high capacity and positioning but the market indicates low potential, watching and waiting to see how the market evolves may be appropriate
Do nothing	Where the institution's capacity and positioning and the market assessment are low, choosing the do nothing option may be appropriate



Example opportunities deep-dive: Market assessment of adaptation investment opportunities in Turkey

For the European Bank for Reconstruction & Development and the International Finance Corporation we modelled the investment potential for adaptation in 3 sectors (agriculture, agro-processing & buildings) in Turkey, estimated at more than US$ 22bn



<u>The end-point</u>: Mainstreaming of climate resilience

To deliver change effectively and efficiently, climate resilience can be mainstreamed within business processes

<u>Example</u>: Our clients in the real economy are integrating physical climate risk and resilience into existing decisions and processes across the asset life cycle:

- Future investments
- Acquisitions
- Design & permitting
- Stakeholder engagement
- Operations
- Emergency and contingency planning
- Energy management
- Water management
- Supply chains and transportation
- Decommissioning
- Marketing strategies

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Discussion

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Discussion topics

1. How prepared is your organisation for climate change?
   - *The Task Force on Climate-related Financial Disclosures recommends four thematic areas for progress*
2. What are the biggest challenges you face in making progress on climate change?
3. How do you think these can be overcome?

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