TCFD Reporting

A guidance for high quality disclosures

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FOREWORD

The world is at the verge of a climate emergency. Apart from the risk to society at-large, businesses across the world are facing climate change risks – both physical and financial. Estimates suggest that between 2017 to 2019, natural catastrophes intensified by climate change caused ~640 billion USD of losses. By 2100, for manageable assets, a whopping 43 trillion USD of value is at risk due to climate change.

Systemic transformations are required to restrict global warming to less than 2°C but these would require unprecedented scale of investments. Investors are willing to invest but require better transparency regarding how companies are managing their climate risks. Some of the questions they are asking include –

- How are companies identifying the various types of risks posed by climate change?
- Do companies have a robust governance at Board level to formulate proper strategies to mitigate climate risks related to mitigation and adaptation?
- How are companies calculating the financial impact of various climate risks in medium and long term given the uncertainty associated with future climate?
- What are the climate targets set by companies and what metrics are being used for tracking progress?

This information gap was filled by The Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures (TCFD) which developed voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers and other stakeholders.

Given the pressing investors expectation around climate related risks and opportunities, Tata Sustainability Group has attempted to demystify TCFD recommendations with practical insights on implementation to prepare Tata companies to start on this journey of climate related financial disclosure.

Siddharth Sharma,
Group Chief Sustainability Officer, Tata Sons

PURPOSE OF THIS DOCUMENT

This document provides practical guidance that Tata companies can use to improve the way they report on their climate performance using the recommendations made by the Task Force on Climate-related Financial Disclosures (TCFD). Having scanned the climate disclosures of various global companies, we have tried to highlight good practices in disclosures on each of the TCFD's 11 recommendations.

- The TCFD does not prescribe the appropriate reporting and implementation. In reality, quality varies dramatically across companies when it comes to both. This document focuses on reporting, where even among the leaders, no single best approach has emerged – there are many good examples.
- The TCFD's principles-based recommendations are nuanced and complex. They differ from many non-financial reporting frameworks in that they have a strong forward-looking component. They also require multi-layered thinking – they overlay many facets of climate related risks and opportunities onto the company's governance, strategy, risk-management and metrics and targets. It is due to this complexity, the need for creating a practical guidance was felt.
- Through examples based on TCFD disclosures by companies, this guidance identifies the key elements that contribute to the quality of disclosures on each of the TCFD's 11 recommendations. It also highlights the main considerations on the reporting process and formatting of disclosures. This guidance should help companies enhance the quality and consistency of their TCFD implementation.

Overview of **TCFD** recommendations

Overview

The FSB established the Task Force on Climate-related Financial Disclosures (TCFD) in December 2015 to develop recommendations for more effective climate-related disclosures that:

- could **"promote more informed investment, credit, and insurance underwriting decisions"** and
- in turn, "would enable stakeholders to **understand better** the concentrations of **carbon-related assets in the financial sector** and the financial system's **exposures to climate-related risks**."

Industry Led and Geographically Diverse Task Force

The Task Force's 31 international members, led by Michael Bloomberg, include providers of capital, insurers, large non-financial companies, accounting and counsulting firms and credit rating agencies.

16
Experts from the Financial Sector

8
Experts from Non-financial Sectors

8
Other Experts

TCFD recommendations across four disclosure categories

Governance

Organisations should make clear disclosures around the governance of climate-related risks and opportunities. Investors and other stakeholders are interested in understanding the role an organisation's board plays in overseeing climate-related issues as well as management's role in assessing and managing those issues. Such information supports evaluations of whether climate-related issues receive appropriate board and management attention.

Strategy

Climate-related issues often impact an organisation's businesses, strategy, and financial planning over the short, medium, and long term. Investors use this to assess the future performance of an organisation. Company should disclose the various risks/opportunities and their impact on strategy and financial planning. It is also important that the company communicates the resilience of its strategy under various climate scenarios.

Risk management

Investors also want to know how the organisation's climate-related risks are identified, assessed and managed, and whether those processes are integrated into existing risk management processes. Such information supports users of climate-related financial disclosures in evaluating the organisation's overall risk profile and risk management activities.

Metrics and Targets

It is important for investors to know how companies are measuring and tracking climate risks and opportunities. Metrics and targets used by an organisation allows investors to assess the organisation's potential risk-adjusted returns, ability to meet financial obligations, general exposure to climate-related issues and progress in managing or adapting to those issues. They also provide a basis upon which investors and other stakeholders can compare organisations within a sector or industry.

The TCFD climate related risks and opportunities

The TCFD encourages companies to consider the climate related risks and opportunities while implementing these recommendations.

RISKS

Transition Risks

- **Policy & Legal**
  (regulation of products & services)
- **Technology**
  (e.g. create low emission options)
- **Market**
  (e.g. increased cost of raw materials)
- **Reputation**
  (e.g. changing consumer preferences)

Physical Risks

- **Acute** (e.g. extreme weather events)
- **Chronic** (e.g. changing weather patterns, rising sea levels)

OPPORTUNITIES

- **Resource efficiency** (e.g. recycling, reducing use and wastages, more efficient transport)
- **Clean energy** (e.g. use of renewable/low carbon energy, participate in carbon markets)
- **Products & Services** (low emission goods & services, climate change adaptation)
- **Markets** (e.g. access to new markets)
- **Resilience** (e.g. resource substitutes, make operations and supply chains resilient)

Strategic Planning Risk Management

Financial Impact

TCFD recommendations are based on 7 principles

- Disclosures should represent **relevant** information – any potential risk that can impact a company's markets, businesses, corporate or investment strategy and future cash flows should be disclosed. Information which is immaterial/ redundant may be avoided.
- Disclosures should be **specific** and **complete** – all possible risks/opportunities should be included along with their historical and future implications. Any scenario analyses should be based on data or other information used by the organisation for investment decision making and risk management.
- Disclosures should be **clear, balanced** and **understandable** – The disclosures should go beyond compliance and be sufficiently granular to inform sophisticated users, but also concise for the less specialised. Report should have a balance in terms of the qualitative and quantitative information supported by a balanced narrative and clear explanations wherever required.
- Disclosures should be **consistent** over time to enable users to understand the evolution of the impact on organisation's business. Consistent formats should be used to facilitate inter-period comparisons and any deviations should be clearly explained.
- Disclosures should be **comparable** among companies within a sector, industry or portfolio.
- Disclosures should be **reliable, verifiable** and **objective** – investors expect high quality reliable info which is bias-free. All assumptions and sources of data should be made available for interested parties.
- Disclosures should be provided on a **timely** basis – while companies may follow the prescribed norms for timely reporting, in case of any disruptive event which can potentially have a material financial impact, the companies should come out with supplementary publications with this information.

Good practices around TCFD Disclosure

A. Preparing for Climate Disclosures

Before meaningful climate related information can be reported, an organisation must first integrate climate related risks and opportunity assessment, monitoring and management into its routine business activities. This may, for example, involve establishing or refining priorities, policies and processes related to measuring and reporting climate related information from strategic planning and enterprise risk management to integration into external reporting cycles.

Collaborate and Communicate

- Secure support of Board of Directors and Executive Leadership Team
- Have clarity of roles and clear ownership by colleagues from Sustainability, finance, legal, accounts etc.

Assess Materiality

- Evaluate the financial impact of climate change and how it relates to revenues, expenses, assets/ liabilities
- Seek inputs from investors as to what climate-related financial risks do they consider as most material

Calculate impact

- Devise and assess business against at least 2 plausible climate scenarios (e.g. 1.5°C, 2°C and 4°C)
- Evaluate the financial impact of climate change and how it relates to revenues, expenses, assets/liabilities
- Initially assess the impact of these scenarios on a single asset and then widen the scope to include all assets
- Integrate climate discussions into governance, enhancing board-level oversight through audit/risk committees

Align reporting

- Work towards incorporating risk management and governance elements in annual reports/ other filings
- Ideally use the same quality assurance and timelines for climate related financial info as for other disclosures
- Align information across all reporting frameworks for coherency and consistency – be it CDP, CDSB, TCFD

B. Climate Report Formatting

After having integrated climate related assessments, monitoring and management processes into its business, it is important to convey the impacts effectively through a reporting format that gives the intended readers information that will facilitate decision-making. Here are some suggestions:

Reporting Structure

- Ascertain where the disclosures should appear in the company filings
- You may choose to publish a standalone sustainability report or an Integrated Report [IR] with Sustainability and Financial results
- Endeavour should be to move towards IR in the long run to encourage integrated thinking by management

Disclosure Accessibility

- Presenting TCFD disclosures alongside other material topics gives them proper weightage but can make these disclosures hard to find by the end user. An appendix can be provided to signpost these for a truly integrated reporting
- Alternatively, this info can be given in a dedicated section to help the investors find it in one place

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Report Timelines

- If climate risks are truly material they should ideally be released alongside or integrated into other financial filings
- This puts environmental and governance metrics on same pedestal like financial information and ensures that they get board-level review

Presentation Format

- Tables of illustrative financial and operational metrics and organograms are an effective way to document compliance with the disclosures
- Tables and other graphical illustrations can help benchmark disclosures with other companies

Ease of Data Extraction

- Many investors prefer easy and quick access to key data
- Several investors now rely on data providers who use Artificial Intelligence machines to extract and present comparative data
- It is thus important to clearly label and structure data and preferably standardise it for a particular industry type

C. Content

1. GOVERNANCE

TCFD Recommendation	A good quality response should have…
Describe the board's oversight of climate-related risks and opportunities	• Clear outline of the board's oversight of climate-related issues • Description of associated organisational structures (audit/risk committees), composition, frequency of meetings, credentials of the board members in handling climate risks • Whether the board and/or board committees consider climate-related issues when reviewing and guiding strategy, action, risk management policies, annual budgets, and business plans as well as overseeing major capital expenditures, acquisitions, and divestitures • Process of keeping the board informed on climate-related issues and how it monitors progress against goals and targets
Describe management's role in assessing and managing climate- related risks and opportunities	• Clear delineation of climate-related responsibilities assigned by boards across various management roles • Description of associated organisational structures and how management monitors climate-related issues • Overview of management involvement in climate-related financial issues

1. Governance – Leading Examples

TCFD recommendation: Disclose the role of board of the organisation in overseeing climate-related issues

SOLVAY

Process by which management is informed about climate-related issues

- Board consideration of climate-related issues is facilitated through strategic business review (e.g. CSR risks integral to the risk management process) and direct control over sustainability related decisions (e.g. approving targets)

Solvay's disclosure clearly outlines the board's oversight of climate-related issues

- The charter of Corporate Governance describes how the board manages sustainability-related aspects and is available on the Solvay website. The Board devotes at least 1 meeting/year on global sustainable development issues, including climate change risks and opportunities

Identification of associated organisation structure and individuals

- Climate Risks Officer has been appointed at Executive Committee level. He is in charge of ensuring that climate-related aspects are considered in the Group's strategy and operations

https://annualreports.solvay.com/2019/en/servicepages/search.php?q=TCFD&pageID=98016#accordion1

TCFD recommendation: Describe the management role in assessing and managing climate-related risks and opportunities

DSM

Clear delineation of climate-related responsibilities

- DSM indicates that Sustainability Committee is responsible for assessing and managing climate change. The disclosure mentions the frequency of their meetings and outlines how their findings are reviewed

Associated organisation structure

- The Supervisory board reviews the recommendation of Sustainability Committee. They also take decision on audit of Sustainability section of IR

Overview of management involvement

- The Chair of Supervisory board attends all Sustainability Committee meetings and this ensures the interface between board and management

https://annualreport.dsm.com/ar2019/corporate-governance-and-risk-management/introduction

C. Content

2. STRATEGY

TCFD Recommendation	A good quality response should have…
Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long-term	• Consideration of the short, medium and long-term risks over the useful life of assets across geographies • Processes to determine specific risks and opportunities which can have material financial impact on the organisation • Process to track progress
Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning	• Impact on products/services, operations and value chains, R&D investments, choice of locations • Both mitigation and adaption information should be reported • How climate-related issues impact financial planning process and how these risks and opportunities are prioritised • Aligning these impacts with scenario analysis
Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	• Use of climate scenarios and associated time horizons • Consideration of how company strategy may have to evolve • Implications of different policy assumptions, macro-economic trends and technology assumptions

2A. Strategy – Leading Examples

TCFD recommendation: Disclose climate-related risks and opportunities over short, medium and long-term

Consideration of the short, medium and long-term risks

- General Motors (GM) explains how risks are incorporated into its strategic priorities. Because it may take 3-5 years to design and develop a vehicle before it is launched in the market and then it has to remain competitive and compliant for another 4-7 years, GM prioritises a long-term approach to regulatory risks to determine material financial impact

Process to determine risks and opportunities

- GM clearly identifies what could have material financial impact on the company. Included are mechanisms such as focusing on total carbon footprint, introduction of carbon reduction goals and commitment to launch new electric vehicles

Ways to track progress

- The company talks about dedicated fund for energy saving projects of 20 million USD and invested 7.8 billion USD in R&D. One of the disclosure drawbacks is that it is unclear how the budget is distributed by department and geography

https://www.gmsustainability.com/tcfd.html

2B. Strategy – Leading Examples

Ørsted

TCFD recommendation: Disclose the impact of climate-related risks and opportunities on the organisations strategy and financial planning

Orsted has undergone a decade-long transformation from a fossil-fuel based energy company to the world's largest offshore wind developer, with a portfolio of offshore and onshore wind farms, solar PV and energy storage in Europe, Asia Pacific and the US

Impact on products/services	Impact on financial planning	How impacts identified through scenario analysis feed into planning
• Orsted has described the impact of climate related risks and opportunities on the company's products (green technologies), operations (specifically with relation to the weather) and infrastructure (reference to the risk of stranded assets)	• The impact of climate-related risks and opportunities on the financial planning is taken into account when preparing business cases for investments in new assets or activities, in terms of operating costs (energy price) and capital expenditures (price development of components)	• Orsted conducted climate scenario analysis for Offshore Wind business which accounts for the 87% of their EBITDA. Two scenarios were considered, 1.5-2.0°C and 3-4°C. In both the scenarios, Orsted is well positioned to manage potential physical impacts such as wind patterns, sea conditions or precipitation and extreme temperature. This is because Orsted has started factoring climate change resilience into the engineering design of each project

https://orsted.com/-/media/annual2019/Annual-report-2019.pdf (Page 61- Risk and Risk Management)

https://orstedcdn.azureedge.net/-/media/annual2019/sustainability_report_2019_print-version.ashx?la=en&rev=b3a498c521534ac6a72628 4ee4ae43ca&hash=36BD5D9DBFF02025216753440B5BE08B (Page 39)

2C. Strategy – Leading Examples

TCFD recommendation: Disclose the resilience of the organisation's strategy, considering different climate-related scenarios including 1.5/2.0° Celsius

TOYOTA

Use of climate scenarios and associated time horizons

- In order to reconcile if Toyota's 2030 Milestone is a valid and resilient strategy for addressing the effects of climate change, it conducted scenario analysis by picturing multiple future scenarios in 2030. These climate scenarios were developed by referencing scenarios equivalent to "2°C (2DS)" and "Beyond 2°C (B2DS)" in the International Energy Agency (IEA) reports and other

Resilience of the organisation's strategy, taking into consideration different climate-related scenarios

- The company used these scenarios to identify various issues which will be crucial in 2030 and revisit their 2030 targets in order to understand the resilience provided by achieving these targets

https://global.toyota/pages/global_toyota/sustainability/report/sdb/sdb19_en.pdf#page=54

Additional guidance on Scenario Analysis is provided in Appendix section of this document

Unilever

Use of climate scenarios and associated time horizons

- To further understand the impact that climate change could have on Unilever's business in the future, it performed a high level assessment of the impact of 2° and 4°C global warming scenarios for their business in 2030

Consideration of how company strategy may have to evolve

- Their analysis showed both scenarios present financial risks to Unilever by 2030 predominantly due to increased costs. The most significant impacts of both scenarios are on supply chain where costs of raw materials and packaging rise, due to carbon pricing and rapid shift to sustainable agriculture in 2°C scenario and due to chronic water stress and extreme weather in 4°C scenario

- Unilever has developed and piloted an approach to assess the impact of climate change on key commodities including soy and black tea

https://www.unilever.com/Images/unilever-annual-report-and-accounts-2019_tcm244-547893_en.pdf

Good practices – Content related

3. RISK MANAGEMENT

TCFD Recommendation	A good quality response should have…
Describe the organisation's processes for identifying and assessing climate-related risks.	• Processes to identify and assess climate risks • Determination of the relative significance of these risks • Identification of risks not identified by the processes in place
Describe the organisation's processes for managing climate-related risks.	• Leadership-level involvement in climate-related decision making (risk mitigation, transfer) • Integration of climate-related issues into strategy and risk management policies • A clear format to match up management processes with their corresponding risks
Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management.	• Outline of a structured approach to risk management • Key management positions charged with climate-related issues • Fluid prioritisation of top and emerging climate-related issues

3A. Risk Management – Leading Examples

EnBW

TCFD recommendation: Describe the organisation's processes for identifying and assessing climate-related risks

Enbw lays out its approach to identifying risks in a structured and logical format.

Processes to identify and assess climate risks

- The integrated opportunity and risk management system (iRM) is based on COSO II framework that spans entire company. The central risk management and ICS functional unit is responsible for specifying processes and systems for the whole group. For the purpose of evaluation, all opportunities and risks are first assessed with the help of the iRM relevance filter

Determination of the relative significance of these risks

- Any opportunities and risks with a probability of occurrence of over 50% are taken into the planning process and appropriate accounting measures are taken in consolidated financial statements in accordance with IFRS

Identification of risks not identified by the processes in place

- There are two additional round of checks in place to ensure that risk assessment is accurate as possible. By involving two other bodies not involved in core processes, these checks hopefully help catch previously unidentified risks – the 'unknown unknowns'

https://www.enbw.com/company/sustainability/reporting-and-ratings/tcfd.html
https://www.enbw.com/media/bericht/bericht_2019/downloads/integrated-annual-report-2019.pdf

3B. Risk Management – Leading Examples

Unilever

TCFD recommendation: Describe the organisation's processes managing climate-related risks

Leadership-level involvement in climate-related decision making (risk mitigation, transfer)

- The board takes overall accountability for the management of all risks and opportunities, including climate change. The CEO is responsible for oversight of climate change agenda. Remuneration linked to achievement of sustainability and climate change target is a key part of the governance

Integration of climate-related issues into strategy and risk management policies

- In 2019, Unilever Sustainable Living Plan (USLP) Steering Team was fully integrated into main ULE agenda to reflect integration of sustainability into business strategy. During 2019, there were a number of agenda items on topics related to climate change on Unilever Leadership Executive (ULE) monthly meet which discusses key strategic matters. In addition, a number of specialist governance groups are in place to support climate agenda including: Energy Board, Sustainable Sourcing Steering Group, Water Board

A clear format to match up management processes with their corresponding risks

- The Boards have established a clear organisational structure with well-defined accountabilities for the principal risks that Unilever faces in the short, medium and long-term. The organisational structure and distribution of accountabilities and responsibilities ensure that every country in which they operate has specific resources and processes for risks reviews and risk mitigation

https://www.unilever.com/Images/unilever-annual-report-and-accounts-2019_tcm244-547893_en.pdf

3C. Risk Management – Leading Examples

RBC Royal Bank

TCFD recommendation: Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisation's overall risk management

Outline of a structured approach to risk management

- Royal Bank of Canada shows how top and emerging material risks, such as climate change, fit within its organisational risk management framework using a risk pyramid. The risk pyramid identifies principal risks the organisation faces and provides a common language and discipline for identification and assessment of risk in existing business, new businesses, products, acquisitions and alliances

Key management positions charged with climate related issues

- In recognising that risk management is an evolving not static process, it has adapted its management process to address this and enable "forward-looking risk assessment." Royal Bank of Canada also assigns risk owners, which relates back to TCFD "Governance disclosure (b)" on management's role

Fluid prioritisation of top and emerging climate related issues

- The risk pyramid is maintained by GRM and reviewed regularly to ensure all key risks are reflected and ranked appropriately. The placement of principle risks within the risk pyramid is a function of two primary criteria – risk drivers and level of control and influence. Those risks at the base are the ones over which the bank has the greatest level of control and influence, and those at the top are the least controllable

Good practices – Content related

4. METRICS & TARGETS

TCFD Recommendation	A good quality response should have…
Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.	• Metrics to assess and manage financially material climate-related risks and opportunities • Disclosures that support the company's scenario analysis and risk management • Details of the assumptions that have influenced metric choices
Disclose Scope 1, Scope 2 and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	• GHG Protocol alignment • Clear methodologies • Inclusion of historical trends
Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.	• Metrics and the company strategy are linked • Target aligned with anticipatory regulatory/market requirement • Metrics support the company's scenario analysis and risk management processes

4A. Metrics and Targets – Leading Examples

TCFD recommendation: Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy

Metrics aligned to scenario analysis and risk management	Disclosures that support the company's scenario analysis and risk management	Details of the assumptions that have influenced metric choices
• Unilever Sustainable Living Plan (USLP) includes a number of stretched targets which relate to climate risks and opportunities across their value chain. They have also identified action plans to achieve them e.g. two of their GHG reduction targets are recognised as science based: Halve the GHG impact of their products across the lifecycle by 2030 and Reduce scope 1 and 2 GHG by 100% from their own operations by 2030	• Unilever voluntarily comply with the UK government's streamlined Energy and Carbon Reporting, TCFD related climate change disclosures (part of the annual report) and CDP Climate reporting	• Metrics are chosen to align with USLP full lifecycle value chain and to their ambition of becoming carbon positive in their manufacturing by 2030

Further information can be found on
https://www.unilever.com/Images/unilever-annual-report-and-accounts-2019_tcm244-547893_en.pdf

4B. Metrics and Targets – Leading Examples

TCFD recommendation: Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks

Alignment to international protocol

- BASF estimates its greenhouse gas emissions in accordance with the Greenhouse Gas Protocol as well as the sector-specific standard for the chemical industry

Clear methodologies

- The emissions of BASF SE subsidiaries that are fully consolidated in the Group financial statements in which BASF holds an interest of less than 100% are included in full in emissions reporting (previously: emissions included on a pro rata basis). The emissions of proportionally consolidated joint operations continue to be disclosed pro rata according to their interest
- They use the market-based approach (previously: location-based approach) to report on greenhouse gas emissions from purchased energy (Scope 2) for the purpose of their climate protection target. Both approaches continue to be presented in the overview of greenhouse gas emissions in accordance with the Greenhouse Gas Protocol

Inclusion of historical trends

- In 2019, BASF changed the method used to calculate the relevant environmental indicators. The figures for 2018 have been adjusted according to the new method

Further information can be found on the BASF Online Report 2019.

4C. Metrics and Targets – Leading Examples

TCFD recommendation: Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets

Targets aligned with anticipatory regulatory requirement

- It has reaffirmed its commitment of science based target based on UN's Business ambition of 1.5°C

Metrics and the company strategy are linked

- Climate Change has been identified as one of principal risks by Unilever. It has identified two GHG reduction targets – halving the impact of GHG impact of their products across the lifecycle of products and reducing scope 1 and scope 2 emission by 100% from their operations by 2030

REFERENCES

References

Leading Company Examples	Other Resources
Solvay Annual Report 2019	WBCSD – Redefining Value Program – TCFD Resources
DSM Annual Report 2019	TCFD Hub Online
General Motors Online Sustainability Report 2018	TCFD Learning Hub
Orsted Annual Report 2019	SASB Knowledge Hub – TCFD Implementation Guide
Toyota Sustainability Repot 2019	SASB Knowledge Hub – TCFD Good Practice Handbook
Unilever Annual Report 2019	Converging on climate risk – CDSB, the SASB and TCFD
ENBW Annual Integrated Report 2019	TCFD Hub – Scenario Analysis
Royal Bank of Canada Annual Report 2018 BASF	UNPRI – Climate Scenario Analysis
Online Report 2019	Japanese Ministry of Environment – Practical guide for Scenario Analysis in line with TCFD recommendations
	Centre for Climate and Energy Solutions – Using scenarios to assess and report climate-related financial risk
	CDP Technical Note on Scenario Analysis

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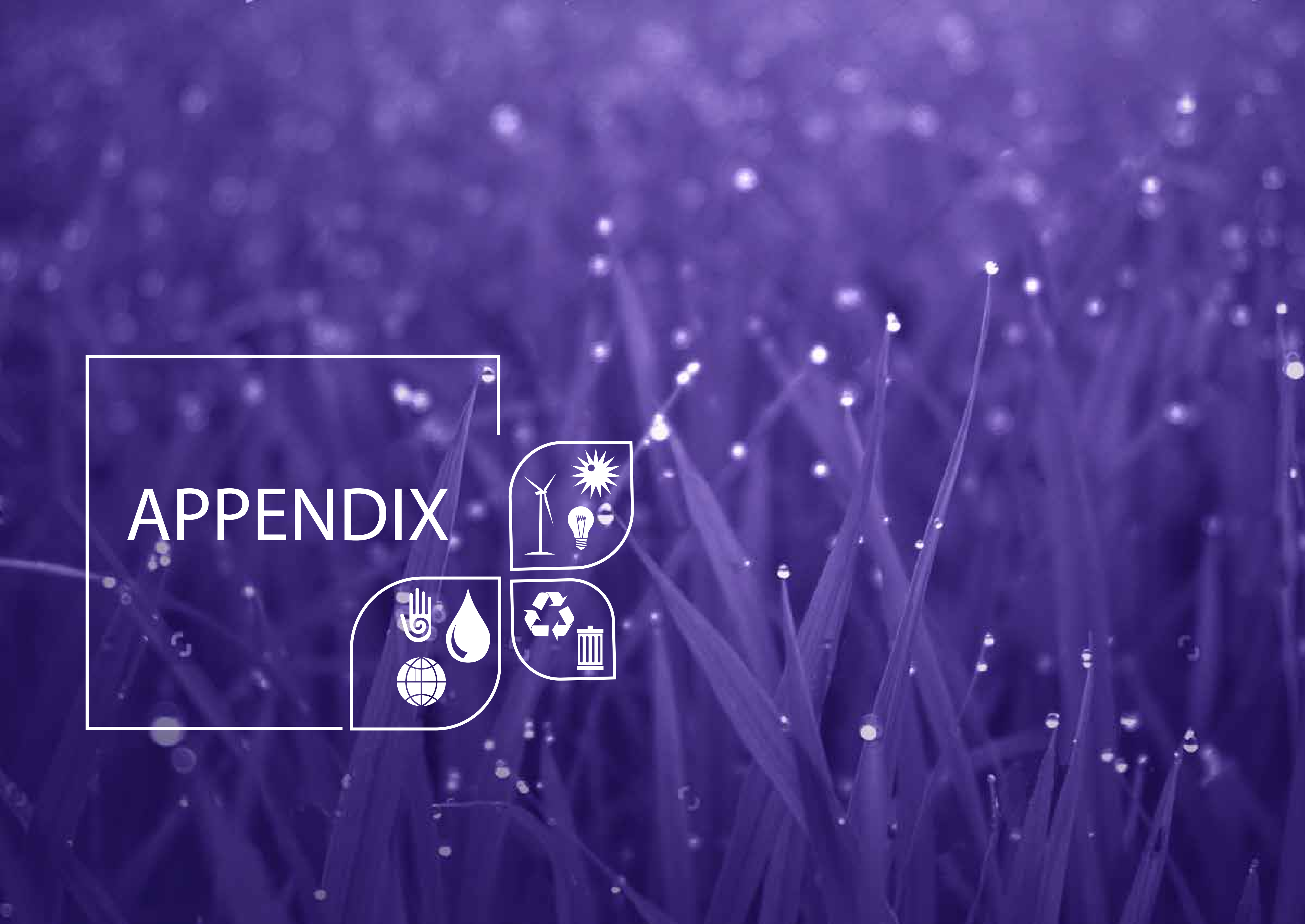
We wish to acknowledge the contribution of **Dr Aniruddha Agnihotri**, Head – Safety, Health & Environment, Tata Consultancy Services in reviewing this guidance.

APPENDIX



Appendix 1
Alignment of TCFD-CDSB and SASB Principles

TCFD	CDSB	SASB
Principles for Effective Disclosures Intended to "help achieve high-quality and decision-useful disclosures that enable users to understand the impact of climate change on organisations".	Guiding Principles and Reporting Requirements Principles [P] designed to ensure that environmental information in mainstream reports is useful to investors, is correct and complete and supports assurance activities. Requirements [REQ] designed to encourage standardised disclosure of environmental information that complements and supplements other information in mainstream reports.	SASB Criteria for Accounting Metrics Designed to ensure the delivery of material, decision-useful information to the capital markets in a way that is cost-effective.
Disclosures should represent relevant information	[P1] Environmental information shall be prepared applying the principles of relevance and materiality	SASB metrics are applicable to most companies in the industry
Disclosures should be specific and complete	[P2] Disclosures shall be faithfully represented	SASB metrics are complete, capturing a fair representation of performance
Disclosures should be clear, balanced and understandable	[P5] Disclosures shall be clear and understandable [P3] Disclosures shall be connected with other information in the mainstream report	SASB metrics are useful to decision-makers and neutral (free from bias)

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Alignment of TCFD-CDSB and SASB Principles (Cont.)

TCFD	CDSB	SASB
Disclosures shall be consistent over time	[P4] Disclosures shall be consistent and comparable	SASB metrics are comparable over time
Disclosures shall be comparable among companies within a sector, industry or portfolio	[P4] Disclosures shall be consistent and comparable	SASB metrics are comparable across peers within an industry
Disclosures shall be reliable, verifiable and objective	[P6] Disclosures shall be verifiable	SASB metrics are verifiable
Disclosures shall be provided on a timely basis	[REQ 9] Disclosures shall be provided on an annual basis	SASB metrics are useful to decision-makers

Appendix 2
Mapping of SASB Climate Framework to TCFD Framework

SASB Climate Bulletin

TCFD Risks and Opportunities			Physical Effects	Transition to Low-Carbon Resilient Economy	Climate Regulations
Risk	Transition Risk	Policy and Legal Risk			
		Technology Risk			
		Market Risk			
		Reputation Risk			
	Physical Risk	Acute Risk			
		Chronic Risk			
Opportunities		Resource Efficiency			
		Energy Source			
		Products and Services			
		Markets			
		Resilience			

Appendix 3
What is Scenario Analysis?

- TCFD strongly recommends that companies assess the resilience of their strategies to climate risks and opportunities taking into consideration different climate-related scenarios.
- Scenario analysis is a tool for forward-looking assessment of risks and opportunities.
- A scenario describes a potential path of development that will lead to a particular outcome or goal. Scenarios are not predictions; rather, they are descriptions of plausible future states of the world. These may be quantitative, qualitative or have elements of both.
- Scenario analysis describes a process of assessing how an organisation might perform in different future states, in order to understand key drivers and possible outcomes. Scenario analysis is a tool to enhance critical strategic thinking by challenging 'business-as-usual' assumptions and instead exploring alternatives based on their relative impact and likelihood of occurrence (i.e. critical uncertainties).
- The idea of using scenario analysis is well-established as a method of forward-looking analysis for organisational strategy but its application to climate change and investment is relatively recent.

Guidance for companies planning to initiate their scenario analysis exercise

- Scenario exercises should be considered part of the strategic management process and should be organised on a regular basis. A top-down scenario analysis approach is recommended as it is more effective in identifying and assessing substantive risks.
- Companies may begin their scenario exercises by initially focusing on transition risks, but they should keep in mind that assessing physical risk is equally important and overtime evolve their scenario planning exercise.
- As a first step, companies can leverage existing scenarios (like IPCC or IEA scenarios) and adapt them for company specific risk factors, focusing in on a few key variables, and utilising a range of scenarios when conducting scenario-based risk analysis.
- To keep the complexity low, they can begin with scenario analysis exercise for one asset in one geography using few variables and then overtime expand the scope to include more assets across more geographies using multiple variables.
- Organisations may choose to start with qualitative scenario narratives or storylines to help management explore the potential range of climate change implications. As they become experienced, they can create more intricate scenarios with quantitative analyses.
- Companies should understand the sensitivity of their variables through the scenario exercise and they should also identify the range of uncertainty considered and describe how the outcomes inform strategic decision making.
- Companies should be transparent about how they are using scenarios to analyse climate risks and adjusting their methodology over time.

Process for applying Scenario Analysis

The TCFD recommends a 6 step process for applying scenario analysis to climate-related risks and opportunities

- **Ensure governance is in place:** Integrate scenario analysis into strategic planning and/or enterprise risk management processes. Assign oversight to relevant board committees/sub-committees. Identify which internal (and external) stakeholders to involve and how.
- **Assess materiality of climate-related risks:** What are the current and anticipated organisational exposures to climate-related risks and opportunities?
  Do these have the potential to be material in the future? Are organisational stakeholders concerned?
- **Identify and define range of scenarios:** What scenarios (and narratives) are appropriate, given the organisation's exposures? Consider input parameters, assumptions and analytical choices. What reference scenario(s) should be used?
- **Evaluate business impacts:** Evaluate the potential effects on the organisation's strategic and financial position under each of the defined scenarios. Identify key sensitivities.
- **Identify potential responses:** Use the results to identify applicable, realistic decisions to manage the identified risks and opportunities. What adjustments to strategic/financial plans would be needed?
- **Document and disclose:** Document the process; communicate to relevant parties; be prepared to disclose key inputs, assumptions, analytical methods, outputs, and potential management responses.

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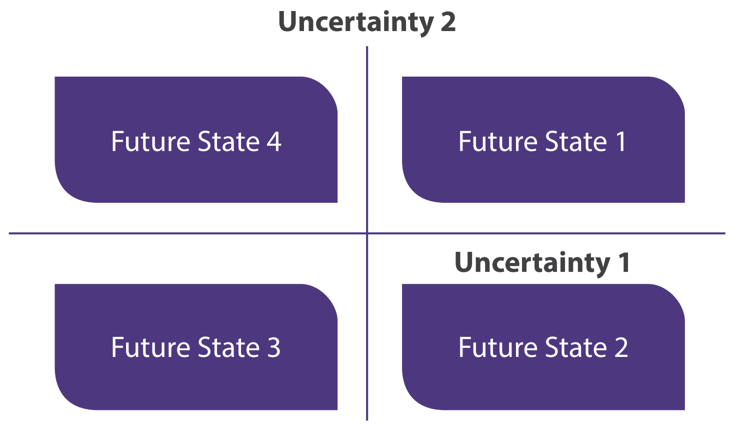
Process for applying Scenario Analysis (cont.)

Another simplistic but effective way to conduct scenario analysis is to select two business-critical sources of uncertainties like -

- Regulatory regimes
- Technological developments
- Change in consumer behaviour/preferences, etc.

Using these 2 business-critical uncertainty sources, companies can create a 2x2 scenario matrix. This scenario matrix will provide four distinct future states/ scenarios to explore. The company can analyse multiple factors as a part of its scenario analysis.



A range of publicly available scenarios are available for organisations to explore. Institutions using various assumptions on future political, economic, social, technological and environmental conditions developed these scenarios. Despite not providing the level of transparency, range of data outputs and functionality in tools required by businesses, these scenarios and their assumptions present a contextual and methodological starting point for organisations in developing their own organisational and business-specific scenarios. These publicly available scenarios meet the following criteria – Peer-reviewed, Used/referenced and issued by an independent body and are supported by publicly available data sets wherever possible.

Publicly available scenarios

Organisation	Scenario Name	Key characteristic
Intergovernmental Panel on Climate Change (IPCC) – physical risk scenarios	RCP 8.5	Projected to generate warming > 4°C
	RCP 6.0	Projected warming > 2°C but < 4°C
	RCP 4.5	Projected warming ~ 2°C
	RCP 2.6	Limited warming > 1.5°C but < 2°C
International Energy Agency (IEA) – transition risk scenarios	IEA WEO Current Policies	Projected to generate warming of 6°C
	IEA WEO New Policies	Projected to generate warming of 4°C
	IEA INDC Paris Agreement	Projected to limit warming to 2.6°C
	IEA ETP 2DS	Projected to limit warming to 2°C
	IEA WEO 450ppm	Projected to limit warming to 2°C
	IEA Bridge Scenario	Limit warming to 2°C, but more needed after 2025
International Renewable Energy Agency (IRENA)	REmap (2016)	Tech pathways to double the share of renewables in world's energy mix by 2030
Bloomberg	BNEF reference scenario	Power sector pathway scenario

Private sector companies that have published their climate scenarios

Sector by TCFD definition	Company, Country	Published as part of
Energy	Royal Dutch Shell, Netherlands	Shell Scenarios Sky Report
Energy	INPEX, Japan	Sustainability Report 2018
Energy	Mitsubishi Corp., Japan	ESG Data Book 2018
Metals and Mining	BHP, Australia	Climate Change: Portfolio Analysis Report
Metals and Mining	Glencore, Switzerland	Report: Climate Change Considerations for Our Business 2017
Transportation	Aurizon, Australia	Sustainability Report 2017
Transportation	Toyota Motor, Japan	Sustainability Data Book 2018
Food/Staples	Unilever, UK	Annual Report and Accounts 2017

Potential input parameters to be considered during a scenario analysis

Here are some high-level factors a company could consider when starting scenario analysis of climate change impacts. Given the sectoral and circumstantial diversity, this is a non-exhaustive and indicative list.

- **Market and technology shifts:**
  - Oil price
  - New technologies; and
  - Old technologies to be phased out.
- **Policy and legal:**
  - Country's Nationally Determined Contribution (NDC)
  - Environmental legislations
  - New/different reporting demands
  - Bans and restrictions of combusting or emitting specific substances.
- **Physical risks:**
  - Physical changes in weather patterns, both extreme (acute) and climatic shifts (chronic) in areas where: operations are located; production of raw materials; customers or end users are situated
  - Changes in transportation possibilities (e.g. new water passages, closed or damaged infrastructure such as railway lines, key highways, etc.).

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