A Better Blueprint for Corporate Climate Scenario Analysis

Consultation Draft

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The SustainAbility Institute by ERM

Contents

1. Executive Summary

A Better Blueprint for Corporate Climate Scenario Analysis is a six-step approach to assessing different potential future climate-related risks and opportunities. This blueprint is informed by our roles as climate scenario analysis practitioners for global companies; our extensive experience with, and research into, climate scenario design; our interviews with subject matter experts; and our engagement with participants in a range of climate scenario exercises.

We have identified challenges with current practices in conducting climate scenario analysis, including most prominently concerns about:

- **Leadership:** The entire process is often led by mid-level management, and then it "filters upwards." This can limit the company's strategic response, as well as the overall financial and practical investment in outcomes that might be seen if the process incorporated the highest levels of management.
- **Not all functions engaged:** The exercises are often siloed, with core business functions feeling limited ownership of the process. This can hinder impact and influence across the business.
- **Scenarios used in a limited way**: The scenarios themselves may hinge on assumptions that are not realistic such as assuming the effects of climate change will be linear or predictable. As a result, the company's real risks, such as sudden, non-linear shifts or tipping points, are not accurately incorporated into the exercise.
- **Technical Accessibility:** The outputs of a standard climate scenario exercise can be highly technical, making them unlikely to be read and digested by senior company decision-makers. This hurdle could ultimately limit how deeply the process influences company strategy.

Given the urgency of the climate crisis as well as the regulatory demands in relation to it, these challenges cannot be allowed to remain part of the status quo. As experienced practitioners, we believe that companies need a new and innovative way of understanding and implementing scenario analysis in a manner that engages senior business leaders. We believe this requires a better blueprint that detours around some of the pitfalls and road bumps of the mainstream approach.

To address those concerns, we have injected new ideas into the standard approach to climate scenarios, including deeper stakeholder engagement, the use of narratives, and a clearer articulation of likely 'real-world' business impacts stemming from climate change.

The time is right for a fresh mode of climate scenario analysis that meets growing expectations to improve c-suite engagement on climate topics. Our better blueprint overcomes the limitations of current practice, providing a way forward for decision makers and stakeholders unsatisfied with their experience of climate scenario analyses to date and setting a precedent for how future scenario analysis will be conducted.

A summary of the approach is as follows:

1. **Convene** Identify & Engage Key Stakeholders
2. **Define** Identify Longlist of Issues & Define Scenarios
3. **Prepare** Construct Scenario Narratives & Select Time Horizons
4. **Design** Plan an Exercise to Determine Materiality
5. **Interact** Participate in the Exercise
6. **Respond** Link Results to Strategy & Disclose Results

2. Introduction

Using scenarios during planning helps businesses increase resilience and maximise their potential. Scenarios provide hypothetical, "what if" representations of future states that can give businesses insight to the uncertainty associated with different possible futures. Using scenarios helps corporate decision-makers understand existing risks and opportunities, anticipate those on the horizon, and shape their strategic direction accordingly.

Climate change is immensely complex, and it also brings with it great uncertainty. As an existential threat to all sorts of business processes, climate change has begun to feed into scenario analysis. Since the beginning, the Task Force on Climate-related Financial Disclosures (TCFD) has emphasized the value of scenario analysis, and it has played a leading role in driving their adoption.[1,2] Today, scenario analysis is a widely accepted tool for businesses to envision and disclose potential long-term impacts of climate change alongside other risks and to identify ways to shape responsive strategies to those potential impacts.

Evolving stakeholder expectations around climate action impact companies both internally and externally. Regulations related to climate performance and disclosure, many rooted in TCFD recommendations, are on the rise globally.[3] As a result, companies are rethinking how they assess climate-related risks and opportunities via scenario analysis.

Following the pace set by TCFD, various other climate-focused frameworks, bodies, and directives around the world have also taken the position that climate scenarios are a crucial part of business processes regarding climate, and that they should involve a range of stakeholders including the most senior business leaders. This will help climate scenario analyses generate business-relevant outputs to inform and influence strategy and financial planning.

We agree with this goal, but we have come to believe that current climate scenario activities do not include sufficient stakeholder engagement, which limits the integration of outputs in strategy. This briefing presents a blueprint, based on our team's extensive experience with climate scenarios, of how a revitalized approach can create a more robust and successful process in the future.

This briefing presents an exploration of the new framework we have designed in response to the most commonly used approaches to climate scenario analysis. We intend to follow up this current briefing in the future with an exploration of companies' experiences using the approach outlined in our better blueprint.

3. What is Climate Scenario Analysis For?

Climate scenario analysis has evolved out of the pre-existing practice of scenario analysis, which companies, investors, governments, and other entities have long used to develop approaches to long-term planning of investments and capital outlays and to help anticipate and better manage risk. At its heart, scenario analysis is a formalized practice of examining different possible futures and exploring what those futures might mean for and organization, then developing plans and strategies based on what is learned to limit the chance of being caught by surprise by the impacts of unfolding events. Importantly, a scenarios-based approach to planning steers companies to focus on material risks and opportunities, which avoids wasting energy on topics that are not relevant to the company's future operations.[4] Scenario analysis encourages critical thinking and underpins informed decision making as well as encouraging inputs from different perspectives. Business leaders, although they may not label them as such, often use role-playing techniques to test the potential efficacy of the possible operational plans and strategies developed in response.

Scenario analysis has long been used in academic, government, business, and wider settings to facilitate simulations of many topics including climate change and its impacts.[5,6,7] Royal Dutch Shell, for example, has used scenario analysis-based planning processes for over 50 years to develop responses to a range of potential economic, geopolitical, economic, and environmental developments that could impact the company. Shell, and other companies that recognized the value of scenario-based planning, are among those which have begun incorporating analysis of climate scenarios into their existing scenario planning approaches.[8] The scenario analysis technique enables participants to understand and grapple with the multi-faceted characteristics of climate change and the complexity of decisions needed to manage it.[9]

Climate scenarios help assess plausible futures.

Despite uncertainty about how climate change might impact companies in the future, climate scenario analysis has become essential for evaluating potential futures and shaping business strategy. As part of its overall goal to improve transparency around climate-related risks and opportunities, TCFD recommends that companies conduct exercises in climate scenario analysis which let them be priced back into the economy.[10]

The particular value of scenario analysis within the context of climate is in its ability to create safe-to-fail settings to explore climate change from different perspectives, to assess different ways of managing it, and to consider possible compromises in terms of action and impact.

Climate scenarios help assess plausible futures. The analysis process assists companies with identifying the potential impacts of climate-related risks and opportunities and helps them to mitigate risks and capitalise on opportunities. The process consists of assessing a range of possible risks and opportunities under different time horizons and temperature outcomes that represent future states of the climate.[11]

Climate scenario analysis is also relevant for a range of external stakeholders. Financial regulators, for instance, seek to understand how climate risks and opportunities might cause systemic disruption to the economy. Likewise, lenders value knowing how companies intend to adapt strategies and financial plans to account for climate risks and opportunities. A company's supply chain partners could be interested in understanding how climate change could impact its value chains and customers. Finally, individual corporates may want to understand the climate change risk specific to others in their industries.[12]

> **"We've had a very robust process for scenario analysis, but it hasn't really driven the behaviours that we thought it was going to. We found it difficult to really understand in terms of what that really means to us."**
>
> – Head of Environmental Sustainability at a pharmaceutical company

4. The Need for an Enhanced Approach

4.1 Some of the existing challenges

Many companies operating today have little experience with climate scenario analysis. For these firms, the process is unknown territory.

Even among those companies that have undertaken climate scenario analysis, most have considered it part of their normal business practice for only one or two years.[13] Because of the emerging nature of the field, generating outputs that can adequately inform strategy and financial planning is a daunting challenge.

Some common challenges and their impacts on business practice include:

Challenge	Impact
Exercises may engage teams that are siloed, such as risk or sustainability teams, which can leave some of a company's core business functions, such as finance, on the periphery of the process.	Core business functions may feel limited ownership of the process, outputs, and strategic responses across the business. Climate-related exercises and decisions on "next steps" may not sufficiently root themselves within company organisations, and hence cannot generate impact.
The scenario analysis may not engage decision-makers as it should.	Outputs might focus too much on risks and opportunities, and the event horizon may be too far in the future to be tangible for key decision makers.
The exercise may depend on assumptions of linear or predictable rates of change—often not representative of the real world.	The company's real risks, such as sudden, non-linear shifts or tipping points, are not accurately depicted in the exercise.
Mid-level management often leads the process and then it "filters upwards" rather than being led from the top down.	Senior leaders do not own the process of determining the importance of risks or identifying next steps in response. As a result, overall financial and practical investment in the outcomes and strategic response is limited.

> **"To think about what a possible future could look like for the business is a useful and interesting exercise. To be frank, at this point, we use scenario analysis primarily for disclosure, to meet TCFD-type requirements. When it comes to really shaping our strategy, it's still a bit removed."**
>
> – Director of Sustainability at a utility company

4.2 Increasing corporate demand

Climate change-related factors are no longer merely the responsibility of a specialized sustainability team, but have become top of mind for finance teams, boards, and the c-suite. Climate will now define a significant part of corporate strategies indefinitely. Adapting to the evolving landscapes of climate risk and regulation is likely to require companies to make large financial investments and to fundamentally change strategies and operations. All of these changes will need to be appropriately timed, tested, and internalized by decision-makers.

> **Climate will now define a significant part of corporate strategies indefinitely.**

Today, we are seeing the still-evolving state of climate scenario analysis intersecting with growing calls for mandatory climate-related disclosure requirements. This intersection has inspired a widespread call for enhanced, robust climate scenario analysis methods, ones that have real business value.

> **"From our point of view, it is about trying to educate those top-level people in terms of physical and transition risks. I think they understand the concept, but they really need to understand how it meets the business."**
>
> – Head of Environmental Sustainability at a pharmaceutical company

4.3 Growing regulatory pressure

The need for the change we propose in our blueprint is underscored by the fact that regulators are demanding a shift towards narrative-based scenario analysis. Regulatory bodies have highlighted the importance of narrative-based scenario analysis and of stakeholder engagement and feedback in the exercise.

For example, the UK Department for Business, Energy & Industrial Strategy has emphasized the importance of interactive stakeholder engagement on climate issues,[14] finding that stakeholder feedback improved both the quality and quantity of climate-related financial disclosures. TCFD recommendations point to the importance of consulting senior leadership as a priority stakeholder group and flag failures to ensure top leadership support and/or poor definition of roles and reporting relationships as key pitfalls.[15]

Research conducted by the UK Financial Reporting Council (FRC) further supports the case. Advocating a form of scenario analysis within their guidance, the FRC demonstrates the importance of securing buy-in from senior figures across multiple functions in the process. This has sped the establishment of climate change working groups within companies, which can help ensure that climate action takes root throughout the organisation.[16]

4.4 A better blueprint

We need a new way of understanding and implementing innovative scenario analysis at the most senior levels of companies—one that detours around some of the pitfalls and road bumps of today's mainstream approach. Amidst growing expectations to improve engagement with the c-suite and other senior stakeholders, the time is right to present a blueprint for a new way of conducting climate scenario analysis.

Our blueprint overcomes the limitations of current practice, providing a way forward for decision makers and stakeholders unhappy with their experience of climate scenario analyses and setting a precedent for how future scenario analysis will be conducted.

4.5 Moving climate scenario analysis into the c-suite

Our blueprint suggests a new approach to using climate scenarios within businesses. Our aim is to take our experience of helping businesses prepare for unfamiliar, complex, or uncomfortable situations. Our approach focuses on bringing scenario testing into a senior-level, highly-engaged setting. By doing this, we better inform crucial corporate stakeholders about the potential effectiveness of their current and proposed strategies.

Three characteristics separate this enhanced approach to climate scenario analysis from current practice as depicted in Figure 1 below.

In short: we propose that senior leaders participate more deeply in "what-if" exercises.

Figure 1
Comparison of climate scenario approaches

Scenario Analysis 1.0	Scenario Analysis 2.0
Engages a core client group, with **limited ownership**	Engages c-suite and senior management in a live, interactive, strategy-relevant exercise to achieve **better ownership**
Focuses on long-term climate trends and impacts at a high-level **– technical, academic**	Assesses implications of climate trends across all business-relevant timeframes **– practical, implementable**
Outcomes are linear **– not representative of the real world**	Considers tipping points, step-changes, macro trends, and non-linear outcomes **– more representative of the real world**

These exercises play out climate trends in order to inform business strategy and increase business resilience. This allows businesses to more meaningfully anticipate, understand, and manage uncertainty, which is enormously useful for dealing with the complexities that climate change brings.

Through enacting the blueprint presented here, we envisage a new era of climate scenario analysis, one that establishes an experiential, participatory process allowing businesses to overcome the challenges and capitalize on the opportunities presented by climate uncertainty.

> **“As you have to get through more and more layers, the message starts to get lost. We’re trying to socialise the scenario analysis exercise through workshops directly with the board. At some point we have to try and engage the board in these conversations and stop going up through the filters.”**
>
> – Head of Environmental Sustainability at a pharmaceutical company

5. A Better Blueprint for Corporate Climate Scenario Analysis

To develop this blueprint, we conducted expert interviews and supplemented the learning from those engagements with a review of current research in the field. We selected interviewees that could provide in-depth technical expertise, across sectors and geographies, in conducting TCFD-aligned climate scenario analysis. This two-part development process of interviews and research provided insight into the shortcomings of current practices, the key drivers and expectations for climate-related disclosures, and potential enhancements of climate scenario analysis processes and outputs.

This blueprint is comprised of a six-step process for conducting climate scenario analysis. The process aims to deliver a more impactful experience for the company by assembling the right group of participants and ensuring the time they devote to the exercise is time well spent. The process also aims to ensure that participants' discussion during the exercise is rooted in a broad materiality-based review of the impact of climate-related risks and opportunities to the company's operations and value chain.

Figure 2
A six-step blueprint for an enhanced approach to climate scenario analysis

1. **Convene** Identify & Engage Key Stakeholders
2. **Define** Identify Longlist of Issues & Define Scenarios
3. **Prepare** Construct Scenario Narratives & Select Time Horizons
4. **Design** Plan an Exercise to Determine Materiality
5. **Interact** Participate in the Exercise
6. **Respond** Link Results to Strategy & Disclose Results

5.1 Step 1 – CONVENE:
Identify & Engage Key Stakeholders

GOALS:

To bring an in-depth understanding of the business to the scenario analysis exercise and to harness participants' power to act on the outputs of the process.

Part One: Identify a core group that will drive the scenario analysis process and select key decision-making stakeholders to participate

- Assemble a core group that can own the whole exercise and empower the core group to nominate a single focal point or leader to oversee the process from start to finish.
- A typical core group comprises a cross-functional group including sustainability, risk, investor relations, supply chain, and other relevant functions. Ideally, it has at least one individual representing the board of directors or senior management.
- The core group identifies other senior stakeholders that will be engaged in the climate scenario analysis exercise. To be most effective, this must include additional representatives from the board and/or the executive committee.

> **"The board is accountable for executing the strategies and control measures to protect value, so having them in the same room would be pretty powerful."**
>
> – Climate Resilience Lead at a pharmaceutical company

Part Two: Build the climate scenario analysis business case

- The exercise's leader provides an opportunity for the core group and senior leaders to learn about the process—via a board presentation, a set of focus groups, or series of workshops.
- As part of that process, the leader communicates the linkage between scenario analysis and key strategic decisions or implications for the company. Providing a selection of high-level examples of climate-related business impacts, such as case studies, could demonstrate this.

> **"From a management point of view, the imminent threat in their mind would be the interruption to the business operations, and second of all will be money."**
>
> – Group Risk and Insurance Manager at a fashion company

- The leader or core group can also engage relevant external stakeholders, such as shareholders, for interviews, research, or discussion sessions. These sessions provide an opportunity for those stakeholders to express e.g., how they think the company can disclose its exposure to the climate-related risks and opportunities identified through scenario analysis.

> **"To engage the board, you need to think along the lines of who among them could be more open to discussing climate change, and then get their backing. You can't just go into a board cold with off-the-wall ideas you'd like them to talk about. You have to plant the seed, but organically, and you need someone on the board to incubate it."**
>
> – Head of Health, Safety and Environment at a commodities trader

> **"We have to engage the board, and the only way we can do this is by putting some concern into the system... When they've been led to believe that it's not that impactful, but it is, we need to start changing the behaviours internally by putting some fear into the system."**
>
> – Head of Environmental Sustainability at a pharmaceutical company

5.2 Step 2 – DEFINE:
Identify Longlist of Issues & Define Scenarios

GOALS:

To build a longlist of climate-related issues potentially relevant to the organisation and define the climate scenarios to use in the exercise.

Part One: Use diverse sources to build the longlist

- Drive a high-level, scenario-agnostic process to identify specific physical and transition climate-related risks and opportunities potentially relevant to the business.
- Compile the longlist using sources that may include a range of both internal and external sources. This could include the company's risk register, which can be used to score items on probability of occurrence and severity of impact.

> **"The board and management would want to know that the longlisting exercise has been done by other members of the business. Each risk or opportunity should be articulated in terms of its impact on the company's strategic decisions."**
>
> – Head of Sustainability at a mining company

- Include, in a typical case, 20 to 30 physical and transition risk items on the list.

Companies can use TCFD's taxonomy to build their longlists.[17] Key examples include:

Figure 3
Examples of climate-related risks and opportunities[18]

Examples of climate-related risks

Physical risks

Acute
- Increased severity of extreme weather events

Chronic
- Changing weather patterns and rising mean temperature and sea levels

Transition risks

Policy & legal
- Increased pricing of GHG emissions
- Enhanced emissions-reporting, obligations
- Mandates on and regulation of existing products and services
- Exposure to litigation

Technology
- Substitution of existing products and services with lower emissions options
- Unsuccessful investment in new technologies
- Costs to transition to lower emissions technology

Market
- Changing customer behavior
- Uncertainty in market signals
- Increased cost of raw materials

Reputation
- Shifts in consumer preferences
- Stigmatization of sector
- Increased stakeholder concern or negative stakeholder feedback

Examples of climate-related opportunities

Resource efficiency
- Use of more efficient modes of transport and production and distribution processes
- Use of recycling
- Move to more efficient buildings
- Reduced water usage and consumption

Energy source
- Use of lower-emission sources of energy
- Use of supportive policy incentives
- Use of new technologies
- Participation in carbon market

Products & Services
- Development and/or expansion of low emission goods and services
- Development of climate adaptation and insurance risk solutions
- Development of new products or services through R&D and innovation

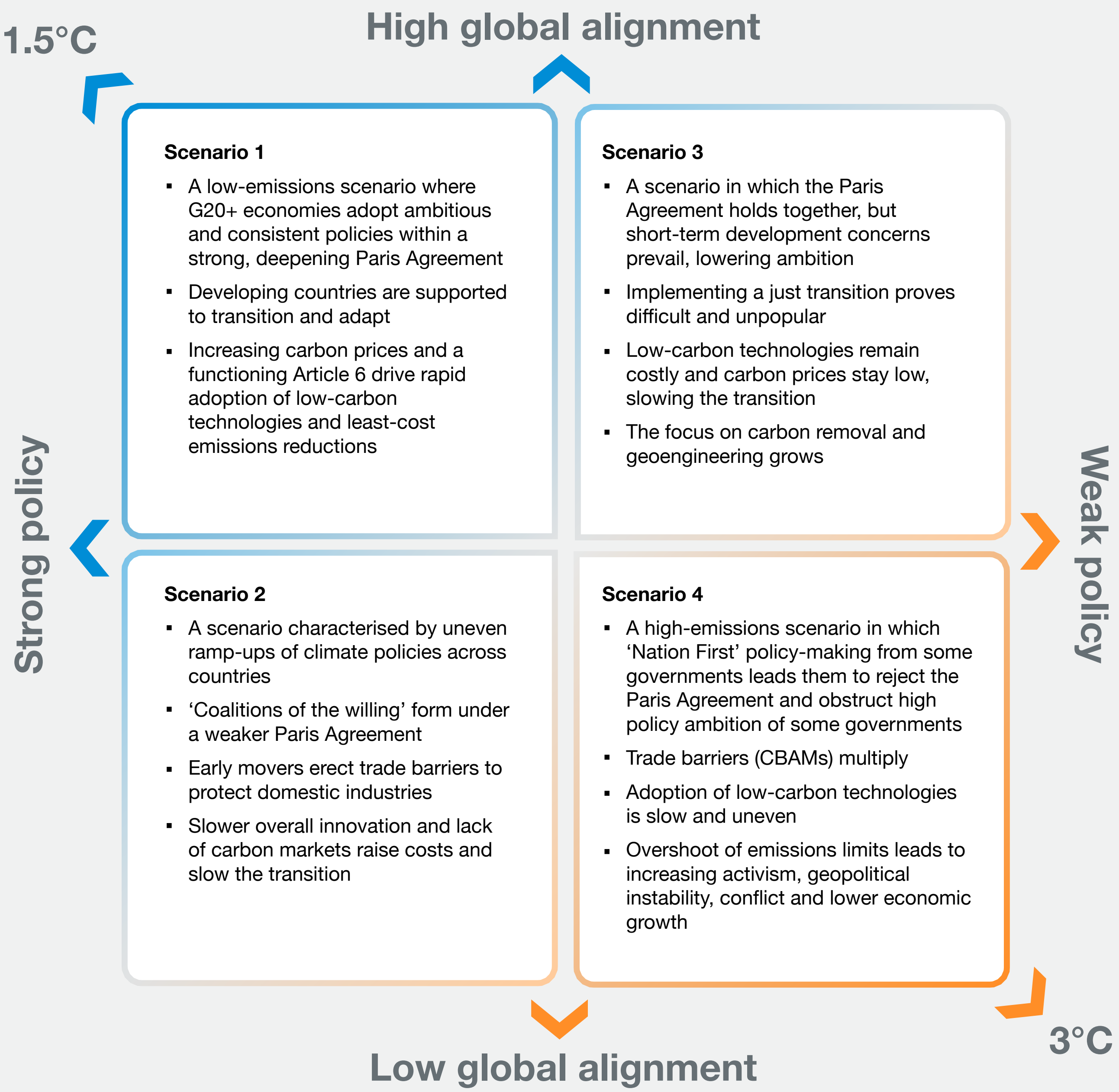
Markets
- Access to new markets
- Use of public-sector incentives
- Access to new assets and locations needing insurance coverage

Resilience
- Participation in renewable energy programs and adoption of energy-efficiency measures
- Resource substitutes/diversification

Part Two: Define scenarios through company-specific insights, and align them to best practices

- Define which scenarios will be used during Step 4. These scenarios each follow a different narrative about the evolution of the business under different climate futures. The set of scenarios can be mapped on a pair of axes representing the company's most relevant driving forces. For example:

Figure 4
Scenario mapping



- **Possible sources include:** the TCFD, Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA), and Network for Greening the Financial System (NGFS).[19,20,21,22] Definitions should incorporate plausible futures and correspond to given emission and temperature outcomes. An important consideration is to ensure that scenarios, as well as the outputs of scenario analysis, are comparable across organisations and sectors. For example, Climate Action 100+ (CA100+) aims to pursue efforts to limit warming further to 1.5 degree Celsius, implying an incentive to conduct scenario analysis under a 1.5°C scenario.[23] TCFD requires companies to assess their resilience against a 2°C or lower scenario, and to 'stress-test' physical risks under a business-as-usual (i.e., high carbon) scenario.[24]

- Companies are encouraged to define scenarios that are relevant to their strategy and direction of travel. However, such definitions should be underpinned by best practice in scenario selection. As a minimum the set of scenarios should cover both:
  - A 2°C or lower temperature outcome (which could include or be additional to a 1.5°C scenario).
  - A higher emissions, business-as-usual scenario.

> **"You've got to go out on a limb when you get to the board and executive levels. They won't entertain off the wall ideas or 'Have you thought about this?' They're looking for cases and justifications, especially around futures or events that they perceive unlikely ever to happen. It would be a difficult sell otherwise."**
>
> – Head of Health, Safety and Environment at a commodities trader

> **"We're seeing this view of scenarios as a source of truth, but it's not a truth in and of itself. Among our senior management, there is an appreciation that scenarios are an input, a sense, a sensitivity test. Whereas I think much of the outside world, like some parts of our investor community, rely on for example the IPCC's 1.5 degree scenario, perhaps in the absence of the capacity to undertake their own analysis or just because of the complexity of this topic. So, they sort of tend to see the scenarios as the source of truth, instead of having a conversation around sensitivity."**
>
> – Head of Sustainability at a commodity and mining company

5.3 Step 3 – PREPARE:
Construct Scenario Narratives & Select Time Horizons

GOALS:

To prepare a set of narratives for each scenario defined during Step 2.

Part One: Create narratives

- Enrich scenarios by grounding them in narrative-based descriptions of both potential trends and data points, which can be derived from publicly available sources.
- Seek out trends for the time horizons most relevant to the organisation. They can be informed by macro-level developments, such as tipping points or step changes in how the world and a sector might evolve under different climate futures. Wherever possible, narratives should be specific to the company and representative of wider macro and sector trends.

Potential narratives to focus on when building scenarios

Narratives can emerge from many places, including the company's supply chain, NGOs, government entities and investors. Examples might include:

- Social, political, and legal trends e.g., social activism, popular opinion, political change, and litigation.
- Policy, technology, and market trends e.g., customer behaviour, demand for products, carbon prices, and technology developments or restrictions.
- Financial sector trends e.g., financial sector requirements to embed climate risk into risk management frameworks and lending rules or to set net zero targets.
- Trends in physical climate e.g., extreme weather events, global climate 'tipping points', or trends in climate change adaptation.

> **"When we think about scenarios, we need to be describing what the world can look like. It's not just about describing the numbers. We should add some more words on our countries and contexts so that we can understand the consequences. This could be related to customers, or regulation, or how societies could be impacted by disease, for example."**
>
> – Climate Resilience Lead at a pharmaceutical company

See Figure 5 below for an example of how social, political, and legal trends might map to scenarios.

Figure 5
Key social, political, and legal trends within climate scenarios

	Scenario 1	Scenario 2	Scenario 3
Popular opinion	Support for action on climate is largely universal. Awareness of climate risk is high, and support for action on climate is maintained across the political spectrum.	High awareness of climate risk & support for climate action. Opposition to climate action in regions with historic connections to fossil fuels and little progress on 'Just Transition'.	The 'climate community' becomes increasingly divided on tactics and targets. Reinforced political divides.
Political change	Climate goes mainstream but there are ongoing political disagreements about how best to decarbonise. Efforts have been made to ensure a 'just transition'.	Radical interventions – often emerging in regional and city governments around the globe – are becoming increasingly common. Capricious operating context.	The 'need' for geoengineering to retain a chance of remaining under 2C has been widely embraced. Complicated multilateral discussions and lack of stable agreement on climate.
Litigation	Activist success in imposing Paris-Aligned targets on high-emitters. Litigation is increasingly directed towards new 'systemic'/supply chain targets.	Campaigns to require companies to commit to phasing out the use of fossil fuels. Conflicting obligations in differing jurisdictions make it increasingly difficult for companies to work globally.	Nations increasingly embracing plans for carbon capture and geoengineering -harder to argue that fossil fuel companies are unaligned. Companies successfully appealing litigation.

> **“Off-the-shelf scenarios are too immature to allow for a real conversation around real business planning. What does that scenario actually tell you? Probably not a hell of a lot, because it doesn’t unpack the how. I mean, you could paint a picture, but you could paint lots of pictures. All that said, there are some jurisdictions where it is more possible, pragmatic, and useful than in others.”**
>
> – Head of Sustainability at a commodity and mining company

> **“A big obstacle for delivering a good scenario analysis is the lack of an in-depth understanding of the organisation. We look for something very detailed, something very tailored to our business. But when the exercise is very generic, it will raise a few questions.”**
>
> – Group Risk and Insurance Manager at a fashion company

> **“A piece that’s often missing is the recognition of the dynamic nature of scenarios, and how they tend to move in time. Their impacts are often converted into truths on a linear basis, which contributes to this view that scenarios are immutable. It would be interesting to see how the energy crisis is being factored into modelling energy supply and demand, for example.”**
>
> – Head of Sustainability at a commodity and mining company

Part Two: Select scenario time horizons appropriate for your business

- Where possible, align the selection of specific time horizons to TCFD guidance on scenario analysis. For example, the TCFD requires organisations to provide "a description of what they consider to be the relevant short-, medium-, and long-term time horizons, taking into consideration the useful life of the organization's assets or infrastructure and the fact that climate-related issues often manifest themselves over the medium and longer terms."[25]
- TCFD's guidance implies that companies, while considering medium and longer terms, should ultimately select time horizons that best represent their business, e.g., for key assets.[26] For example, if an investment into a solar farm is due to occur in 2024, it can be articulated within a "by 2025" time horizon.

Figure 6
Timeline scenario 1 'Global ambition'

	2023	2025	2026	2030
Social, Political, Legal	Investors and activists apply pressure for companies to demonstrate a 'pure' value chain – with previously 'unseen' logistics and B2B companies forced to act.	There is widespread political support for action on climate in all developed and major economies.		Litigation is increasingly directed towards new 'systemic' targets (e.g. O&G and the banks that finance them, to the support/logistics/supply chain companies that 'enable' them).
Policy, Tech & Market		Global oil and coal demand decrease compared to 2020.		Low carbon fuels are 16% of total aviation energy demand. In shipping, low carbon fuels (ammonia, hydrogen and bioenergy) are 17% of the total energy consumption. Increased production of low-carbon hydrogen. Hydrogen electrolysers cost reduced by nearly 70%. Developed economies phase out unabated coal for power generation.
Finance	Many banks have a net zero commitment. A significant number of key banks have a limit on lending to companies getting more than 3% revenue from coal.		All major banks require that loan recipients include a net zero-aligned GHG reduction target as a condition of receiving finance, which includes scope 3.	
Physical	A key asset, e.g. a terminal, gets hit by an extreme event such as a Category 5 hurricane/cyclone. The asset is not prepared and poor headlines follow.		Some key countries are regularly, e.g. every 5-years, seeing financial impacts which rate as material to their economy, i.e. causing more than 3% of annual output to be lost.	The world's first half trillion dollar extreme event happens, causing an economic recession in most global regions.

5.4 Step 4 – DESIGN:
Plan an Exercise to Determine Materiality

GOALS:

To design an interactive exercise to provide a broad materiality-based review of the impact of climate-related risks and opportunities to the company's operations and value chain.*

Part One: Identify a facilitator for the exercise

- Identify an appropriate leader/host with skill and experience in meeting facilitation. Ideally, he or she would be appointed to the role by the board or senior leadership. An expert in scenario analysis should ideally work alongside the facilitator to lead on any technical input required.

> **"When we conducted the risk scoring exercise, we could have built more interactivity into it. We might have skipped the part where we came up with a generic methodology of risk, and instead used our company's risk matrix. The previous understanding of risk wasn't necessarily appropriate for our context."**
>
> – Head of Sustainability at a mining company

Part Two: Define the structure and boundaries of the session

- The core group leads in designing and structuring the exercise. The goal is for stakeholders—including diverse and senior voices and representation from across the business—to assess the materiality of climate-related risks and opportunities under each scenario. The meeting facilitator will prompt these stakeholders to discuss how the organization's strategy and business plans have been, and will continue to be, shaped by the most material climate risks and opportunities.
- Working together, the core group and facilitator define the boundaries of the session. A key and vital rule is to agree upon the method for determining materiality of risks and opportunities along with any required thresholds related to those materiality determinations. ERM's recommendation is to make use of the company's internal approaches wherever possible.
- It is generally recommended that the narratives built in Step 3 are shared with the attendees prior to the exercise.

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* Note that this process can also be used to review specific strategic decisions (e.g., to invest or divest from an asset) against climate trends.

Possible approaches to identifying materiality thresholds

Corporate risk / materiality register	The company's risk registers and matrix are likely to be well recognised at senior levels within the business. They are not always well suited to incorporating opportunity but can often be adapted.
TCFD materiality thresholds	The TCFD provides guidance [27] on setting of materiality using its own approaches. These typically focus on financial and/or strategic importance and can be tailored to the business.[28]
Regulatory or voluntary guidance	Guidance emerging from regulators, voluntary reporting organizations, or even sector groupings/associations can be helpful for setting a threshold of materiality.

Possible approaches to identifying materiality thresholds

CapEx, OpEx, revenue	A relatively simple financial metric, showing how the risk or opportunity could drive impact on day-to-day financial variables.	Climate-related risks and opportunities could increase the need to repair and invest in new infrastructure, for instance after a destructive flood event. Likewise, operating costs could be impacted by climate-related regulation (e.g., relating to carbon pricing or climate-resilient design). Revenue could be impacted by operational downtime due to physical climate risks such as extreme heat, flooding and storms, as well as changing customer demand for low-carbon products.
Impact on EBITDA	A widely-used profitability metric that is slightly more complex than CapEx, OpEx, and revenue in terms of quantity of data and inputs.	Climate-related risks and opportunities could affect companies' profitability and earnings through, for example, unpriced carbon price risk.
Impact on strategic plans	A description of how climate-related risks and opportunities could impact the business's strategy.	Climate-related risks and opportunities could impact a business' strategic direction as it relates to, for example, calculating and reducing carbon emissions, setting net zero targets, and climate-proofing physical infrastructures.opportunities could impact a business' strategic direction as it relates to, for example, calculating and reducing carbon emissions, setting net zero targets, and climate-proofing physical infrastructures.

> **“We absolutely saw that we needed an expert to guide us in scenario analysis, and that we couldn’t do the exercise internally. It quickly became apparent that we didn’t have the expertise, resource, or bandwidth to do it ourselves.”**
>
> – Head of Environmental Sustainability at a pharmaceutical company

> **“Sharing climate data too early meant that stakeholders over-evaluated the detail of the information during workshop sessions. Sometimes stakeholders got stuck in the details instead of seeing directional trends.”**
>
> – Climate Resilience Lead at a pharmaceutical company

5.5 Step 5 – INTERACT:
Participate in the Exercise

GOALS:

To conduct an impactful and effective climate risk and opportunity materiality exercise through a structured discussion.

Part One: Map out the real-world business implications of each shortlisted risk and opportunity

- Participants debate, discuss, and agree upon the level of risk or opportunity associated with the relevant risk and opportunity items under each scenario. All plausible scenarios defined and built during Steps 2 and 3 of the scenario analysis process should be mapped out, and the real-world business implications should be discussed in a "what if" manner.

"What if?" outputs can often read something like *"In scenario X, the world will look like this, and our sector may experience that, which could lead to these implications for our company, translating to an overall level of risk or opportunity that looks like this, which could impact our strategy in that way."*

> **"When it's just a description, people are like "Yeah, we know that, but we don't know what to do about it." When you have a risk or opportunity quantified, then suddenly it comes to mind how significant a carbon tax, for example, would be on the bottom line, and stakeholders would be more likely to do something about it."**
>
> – Senior Sustainability Manager at a utility company

> **"We need to be thinking out loud enough to actually explain impact of risks to management. If you can show some impact to what they are strategizing for the business, it brings value."**
>
> – Group Risk and Insurance Manager at a fashion company

- The resulting structured discussion will yield outputs that enable participants to score the levels of risk or opportunity within each climate scenario. The result may be a risk matrix that looks like this:

Figure 7
Risk matrix

Part Two: Building upon the risk mapping conducted in Part One, explore how the company's business strategy has been, and will be, impacted by material climate-related risks and opportunities.

Participants focus on each risk or opportunity considered material to the business and explore how these strategies have been impacted in the past and future. Participants also explore intended approaches to adapting strategies to mitigate risks and/or capitalise on opportunities. Topics could include:

- Divesting from a particular asset.
- Investing in research and development for low-carbon products.
- Part Two of Step 5 provides the tools and tactics that empower participants to communicate about the scenarios. After that process is completed, participants can share with other relevant stakeholders the impact different outcomes would have on part or all of the business.

Figure 8
Strategic decision matrix

	Scenario 1	Scenario 2	Scenario 3
Strategic Decision A: Acquire new asset	Progress with limited/ no caution	Progress with significant caution	Progress with significant caution
Strategic Decision B: Sell asset	Progress with caution	Progress with limited/ no caution	Progress with caution
Strategic Decision C: Maintain current share of asset	Progress with significant caution	Progress with caution	Progress with limited/ no caution

Figure 9

Risks and opportunities

Risk or opportunity item	2030 Scenario 1	2030 Scenario 2	2030 Scenario 3
As time goes on, our customers might prefer to consume products with a lower carbon footprint, which may impact our sales and revenues.	Low risk	High risk	Moderate risk
Extreme climate events could impact our assets and the ability of our staff to undertake work, particularly at outdoor sites located in the desert and along the coast.	Low risk	Moderate risk	High risk
If we don't keep up with increasing climate-related disclosure requirements, our access to capital may be impacted.	High risk	Low risk	High risk
Financing opportunities may open up for us if we can add a low-carbon angle to projects and products.	Moderate opportunity	Moderate risk	High risk
If we can begin developing low-carbon products, we might see an increase in demand in our products, and therefore increased revenues.	Low risk	Moderate risk	Moderate opportunity
Implementing in ecosystem-based adaptation interventions against physical climate risks at our assets could bring wider community benefits, which may lead to reputational impacts for our company.	Moderate opportunity	High risk	Moderate risk

> **"What I would love to see in the future is an interactive session. These kinds of brainstorming exercises will trigger people to be aware of these risks in a more effective way. Most people don't really sense the risk of climate change threatening business because they are not aware of it. And that's why I think the scenario planning exercise can be more interactive."**
>
> – Group Risk and Insurance Manager at a fashion company

5.6 Step 6 – RESPOND:
Link Results to Strategy & Disclose Results

GOALS:

To synthesise the results of the previous five steps into tangible deliverables focused on supporting the business's strategy and disclosure and to provide clear directions forward.

Part One: Make the link back to the business's strategy for each relevant item identified

- For business strategy purposes, an output should be prepared that focuses on the specific strategic implications of each risk and opportunity and on the decisions the organization should consider in order to adapt to them. This output acts as a summary of the completed exercise and can list any follow up items that the process generated.
- Preparation of an action plan is recommended in order to support the company with implementing the outcomes of exercise. This action plan can run through each risk and opportunity item uncovered, presenting the materiality of each one and the possible next steps for the business.
- Further follow up sessions, either in small groups or with the whole senior leadership re-meeting, are optimal. These sessions allow participants to review and consider the findings of the blueprint exercise, integrate any feedback from stakeholders, and discuss suggested next steps.

Part Two: Include key findings from the exercise within disclosure

- The company's climate-related disclosure will be impacted by the content prepared before, during, and after the exercise. Wherever outputs from the exercise provide information outlining how the business identifies, quantifies, and manages climate-related risks and opportunities should be considered for inclusion within the external-facing reporting. Disclosure of the scenario analysis process should follow all recognized process steps that would be expected for other climate or sustainability disclosures.

> **"The TCFD isn't explicit in terms of how detailed to go, so there is a spectrum of ambition in terms of conducting climate scenario analysis. This points to a need to understand a company's baseline processes, and what level of ambition the company wants to get to with the scenario analysis exercise."**
>
> – Head of Sustainability at a mining company

Part Three: Repeat the exercise, in part or in full, when needed

- The process outlined in these steps can be considered complete at this stage. However, repeating the process when specific circumstances arise can be beneficial, for instance:
- When a decision arises in relation to a significant and/or strategic change in the business. For example, asset divestment or investment in a new asset.
- When there is evidence that the narratives used in the exercise, e.g., in Step 3, have changed in some material fashion, e.g., due to trends in geopolitics or legal requirements.
- In certain circumstances, each of the blueprint's process steps can be repeated, but in most cases the key is to revisit Steps 5 and 6 by reconvening stakeholders and re-running the review of risks and opportunities.

6. Conclusion: Moving From Blueprint to Structure

Scenario analysis enables businesses to determine potential long-term impacts of climate change. At its most impactful, the process ensures companies can identify ways to shape responsive strategies to those potential impacts. Frameworks like TCFD have helped businesses more efficiently conduct scenario analysis in their climate-related risk assessments.

TCFD guidance is clear that climate scenarios should engage stakeholders right up to the most senior level of the business.[29] We have found, however, that current climate scenario activities lack the elements necessary for meaningful stakeholder engagement. In the end, that limits how easily outputs can be integrated into strategy.

In this Better Blueprint for Corporate Climate Scenario Analysis, we present a fresh approach to these undertakings—one that could create a more robust and successful process going forward. We welcome wide and constructive engagement with stakeholders, including those currently conducting climate scenario analyses to test our thinking and our recommendations.

As we advance the process of developing this blueprint into actionable insight for business, we anticipate further input will be invaluable. Our next steps to refine the blueprint include:

- Actively seeking input and engaging with individual companies and sectors through roundtable events, further interviews, and conference sessions.
- Examining companies' experiences using our approach in order to gather practical insights into this methodology for further amends.

We see this paper as the beginning of a process that will let us build upon this blueprint and establish the foundations of a new structure for climate scenario analysis.

Over the longer term, and as the expectations of companies to disclose the outcomes of scenario analysis evolve, so too will ERM's processes for helping companies meet them.

Until then, the team will be available for questions or comments on the content presented in this briefing. For more information, please reach out to primary authors James Hubbard (james.hubbard@erm.com) and Hannah Simon (hannah.simon@erm.com), and explore www.sustainability.com for more thought leadership on sustainability.

7. Endnotes

1 https://www.fsb-tcfd.org

2 TCFD. 2022. *The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://www.tcfdhub.org/scenario-analysis/

3 FCA. 2021. *PS21/24: Enhancing climate-related disclosures by asset managers, life insurers and FCA-regulated pension providers*. Financial Conduct Authority. Online posting. Accessed 20 October 2022. https://https://www.sec.gov/rules/proposed/2022/33-11042.pdf www.fca.org.uk/publications/policy-statements/ps-21-24-climate-related-disclosures-asset-managers-life-insurers-regulated-pensions. https://www.fca.org.uk/publications/policy-statements/ps-21-24-climate-related-disclosures-asset-managers-life-insurers-regulated-pensions

4 Erdman, D., Sichel, B., and Yeung, L. 2015. *Overcoming obstacles to effective scenario planning*. Online posting. McKinsey. Accessed 20 October 2022. https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/overcoming-obstacles-to-effective-scenario-planning

5 UN. 2016. *Climate Role Play: Included in the teaching materials of Plan Sweden: Children's Rights in a Changing Climate*. Online posting. United Nations. Accessed 20 October 2022. https://fn.se/wp-content/uploads/2016/08/climate_role_play.pdf.

6 Center for a New American Security, 2008. *Clout & Climate Change War Game Participant Briefing Book*. Online posting. Center for a New American Security. Accessed 20 October 2022. https://www.files.ethz.ch/isn/100926/2009_06_Clout_and_Climate_Change.pdf.

7 UK Ministry of Defence. 2017. *Wargaming Handbook.* Online posting. Uniked Kingdom Ministry of Defence. Accessed 20 October 2022. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/641040/doctrine_uk_wargaming_handbook.pdf.

8 Kupers, R. and Wilkinson, A. 2013. *Living in the Futures*. Online posting. Harvard Business Review. Accessed 20 October 2022. https://hbr.org/2013/05/living-in-the-futures.

9 A4S. 2021. *TCFD Climate Scenario Analysis*. Online posting. Accounting for Sustainability. Accessed 20 October 2022. https://www.accountingforsustainability.org/en/knowledge-hub/guides/tcfd-climate-scenario-analysis.html. https://www.accountingforsustainability.org/content/dam/a4s/corporate/home/KnowledgeHub/Guide-pdf/A4S Guide to TCFD Climate Scenario Analysis.pdf.downloadasset.pdf

10 TCFD. 2022. *The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://www.tcfdhub.org/scenario-analysis/ https://www.tcfdhub.org/scenario-analysis/

11 A4S. 2021. *TCFD Climate Scenario Analysis*. Online posting. Accounting for Sustainability. Accessed 20 October 2022. https://www.accountingforsustainability.org/en/knowledge-hub/guides/tcfd-climate-scenario-analysis.html.

12 Nathan-King, H. 2021. *For climate scenario analysis to really drive change, stakeholder engagement is essential*. Online posting. CDP. Accessed 20 October 2022. https://www.cdp.net/en/articles/climate/for-climate-scenario-analysis-to-really-drive-change-stakeholder-engagement-is-essential.

13 Tucker, A. 2021. *3 common pitfalls of using scenario analysis – and how to avoid them*. Online posting. CDP. Accessed 20 October 2022. https://www.cdp.net/en/articles/companies/3-common-pitfalls-companies-make-when-using-scenario-analysis-and-how-to-avoid-them.

14 UK Department for Business, Energy & Industrial Strategy. 2021. *Consultation response: Mandatory climate-related financial disclosures by publicly quoted companies, large private companies, and LLPs*. Online posting. United Kingdom Department for Business, Energy & Industrial Strategy. Accessed 20 October 2022. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029354/tcfd-consultation-government-response.pdf.

15 TCFD. 2020. *Guidance on Scenario Analysis for Non-Financial Companies*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.bbhub.io/company/sites/60/2020/09/2020-TCFD_Guidance-Scenario-Analysis-Guidance.pdf

16 FRC & The University of Manchester. 2021. *Climate Scenario Analysis: Current Practice and Disclosure Trends*. Online posting. Financial Reporting Council. Accessed 20 October 2022. https://www.frc.org.uk/getattachment/0d28d5e8-ff89-4028-88a8-49e837db6022/FRC-Climate-Scenario-Analysis-in-Corporate-Reporting_October-2021.pdf

17 TCFD. 2022. *TCFD Recommendations*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://www.fsb-tcfd.org/recommendations/.

18 TCFD. 2020. *Recommendations of the Task Force on Climate-related Financial Disclosures*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf.

19 https://www.fsb-tcfd.org/

20 https://www.ipcc.ch/

21 https://www.iea.org/

22 https://www.ngfs.net/ngfs-scenarios-portal/

23 https://www.climateaction100.org/

24 https://www.fsb-tcfd.org/

25 TCFD. 2020. *Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.bbhub.io/company/sites/60/2020/10/FINAL-TCFD-Annex-Amended-121517.pdf.

26 TCFD. 2022. *TCFD Recommendations*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://www.fsb-tcfd.org/recommendations/.

27 TCFD. 2020. *Guidance on Scenario Analysis for Non-Financial Companies*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029354/tcfd-consultation-government-response.pdf.

28 TCFD. 2020. *Guidance on Scenario Analysis for Non-Financial Companies*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.bbhub.io/company/sites/60/2020/09/2020-TCFD_Guidance-Scenario-Analysis-Guidance.pdf.

29 TCFD. 2020. *Guidance on Scenario Analysis for Non-Financial Companies*. Online posting. The Task Force on Climate-Related Financial Disclosures. Accessed 20 October 2022. https://assets.bbhub.io/company/sites/60/2020/09/2020-TCFD_Guidance-Scenario-Analysis-Guidance.pdf.

Additional References and Resources List:

Bank of Canada (2022). Using Scenario Analysis to Assess Climate Transition Risk.[online] Available at: https://www.bankofcanada.ca/wp-content/uploads/2021/11/BoC-OSFI-Using-Scenario-Analysis-to-Assess-Climate-Transition-Risk.pdf

CFRF (2021). Climate Financial Risk Forum Guide 2021: Scenario Analysis. [online]Financial Conduct Authority. Climate Financial Risk Forum. Available at: https://www.fca.org.uk/publication/corporate/climate-financial-risk-forum-guide-2021-scenario-analysis.pdf

NGFS (2020). Guide to Climate scenario Analysis for Central Banks and Supervisors.[online] Network for Greening the Financial System. Available at: https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_scenario_analysis_final.pdf [Accessed 3 Oct. 2022].

SEC (2022). The Enhancement and Standardization of Climate-Related disclosures for Investors. [online] Available at: https://www.sec.gov/rules/proposed/2022/33

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