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ACHIEVING NET ZERO:

Building Narrative-driven Climate Scenarios

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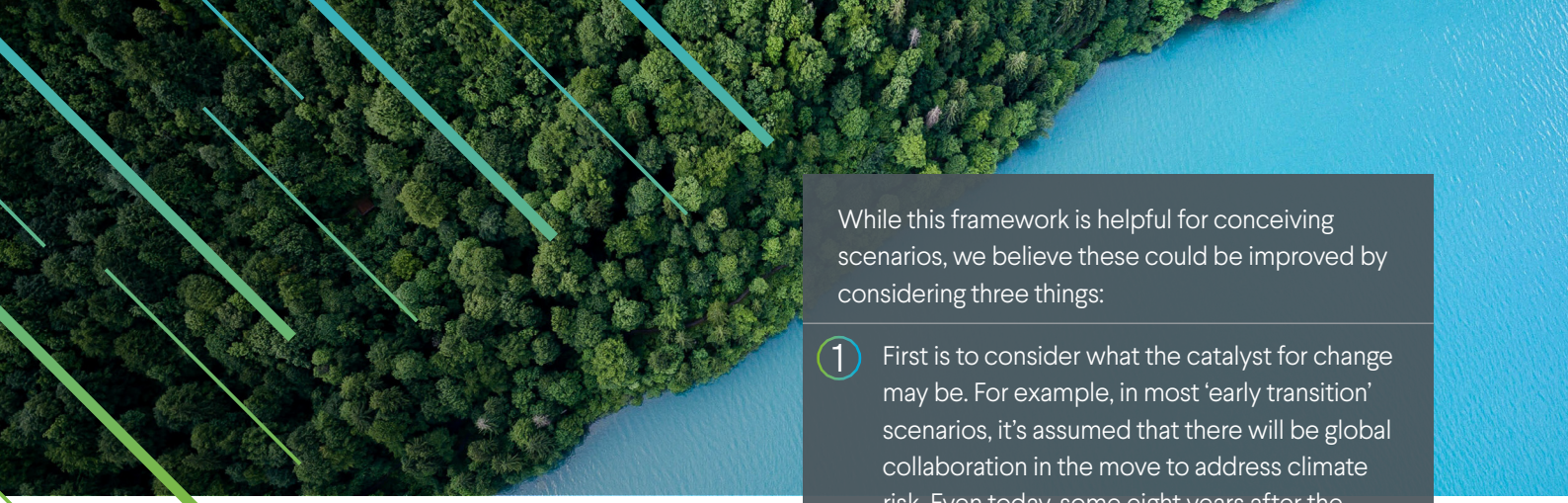
In a world that's subject to climate change and its inherent uncertainties, asset owners still need to make informed decisions. Scenario analysis is a useful way to address such uncertainties, where both the evolution of events and their likelihood is unknown. It allows us to ask 'what if' questions, to ponder potential future states of the world and explore how assets and liabilities may change in these different versions.

When developing climate scenarios, we can't assume that the future is going to be the same as the past or that the traditional relationships between economic variables will hold. Instead, we need to explore how our future economy could be impacted by evolving energy production, how society may change in response, and how our economic and social systems will adapt to the growing physical impacts of a warmer climate as well as associated government policy changes.

Climate scientists have warned that many of the underlying factors and their evolving dynamics are poorly understood, potentially causing their impacts to be understated. They're also concerned that the impact of feedback loops and tipping points may be being ignored – for example, a warming environment may release carbon sequestered in frozen tundra, accelerating the process of climate change. Equally, a climate-related decision by one government may impact the policy decisions of others, creating a cascading effect in markets. This is simply a reflection of the interconnected nature of our world.

We have long been vocal about the importance of interpreting climate scenario modelling with care, recognising that it's an area where both understanding and methodologies will develop through time. Consequently, we've evolved our own approach to climate scenario modelling, which keeps us able to have meaningful dialogue with our clients.

Climate models have often been designed by extrapolating the past based on historical data. In some instances, the futuristic assumptions made were less informed and outputs were based on maturing models. This means they may have understated the frequency and severity of risk from events that happened rarely, or not at all, in the past but which could happen in the future. This understatement or omission applies to both physical risks – how climate change will impact the world, which could also harm asset values – and transition risks, eg policymakers might impose changes to keep humanity safe from climate change, which could have implications for asset values.



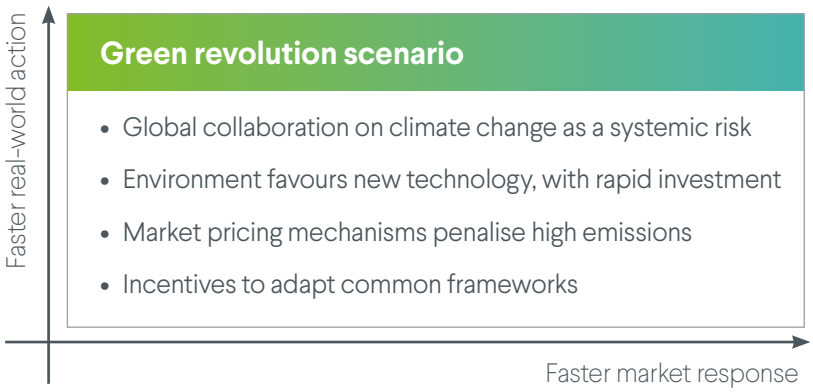
Making better scenarios

Most approaches to climate scenario modelling, including our own, have assumed that the primary drivers of activity on climate will be twofold: (i) 'real world' action, including government policy changes, consumer changes and technological inventions; (ii) the response by markets to these various drivers of change. Such scenarios have tended to focus on transition risks; however, we believe that such models can be improved by:

(a) Recognising that 'real world' action also includes physical risks, which, under certain cascading scenarios, can be globally material.

(b) Adding more nuance to the interplay between the 'real world' action and the market response.

If we focus on real-world action and market response, we can construct different climate scenarios based on the speed and strength of each. This diagram illustrates one of our indicative climate scenarios, 'Green revolution', as one of the quadrants:



While this framework is helpful for conceiving scenarios, we believe these could be improved by considering three things:

1. First is to consider what the catalyst for change may be. For example, in most 'early transition' scenarios, it's assumed that there will be global collaboration in the move to address climate risk. Even today, some eight years after the Paris Agreement, we do not see the collaboration necessary to achieve this. It's therefore helpful to consider scenarios that begin with an initial 'trigger' event.
2. Second is to consider the timeframe over which we're interested in modelling outcomes. While models often look forward to 2050, most decisions are made within shorter timeframes. So, to be useful, climate scenarios need to address a range of time horizons.
3. Third is to recognise that policy pathways can change in response to prevailing events or tipping points. For example, we can envisage multiple potential responses of a country to a single shock event, depending on whether the embedded assumption is one of collaboration or nationalism. By using these inflection points, multiple scenarios can emerge from the consideration of a single initial event.

We're in favour of consciously incorporating these three elements into scenarios. This way, better scenarios can be developed, particularly those that explicitly incorporate physical impacts or catalysts.

Developing the narratives

For a climate scenario narrative to be realistic, one must consider how different actors within our global system respond to stress. This is to add in the human response to environmental or other stimuli, recognising that different entities may not always take decisions that lead to an optimal outcome. We've done this by considering five different risk drivers:

- **Environmental severity and feedback**
- **Energy usage**
- **Technology progression**
- **Social policies and adaptation**
- **Geopolitical tension**

We recognise that there may not be uniform responses by policy-makers in all circumstances. In particular, the actions of global powerhouses such as the EU, China and the US will be influenced by other risk factors and could lead to unexpected outcomes.

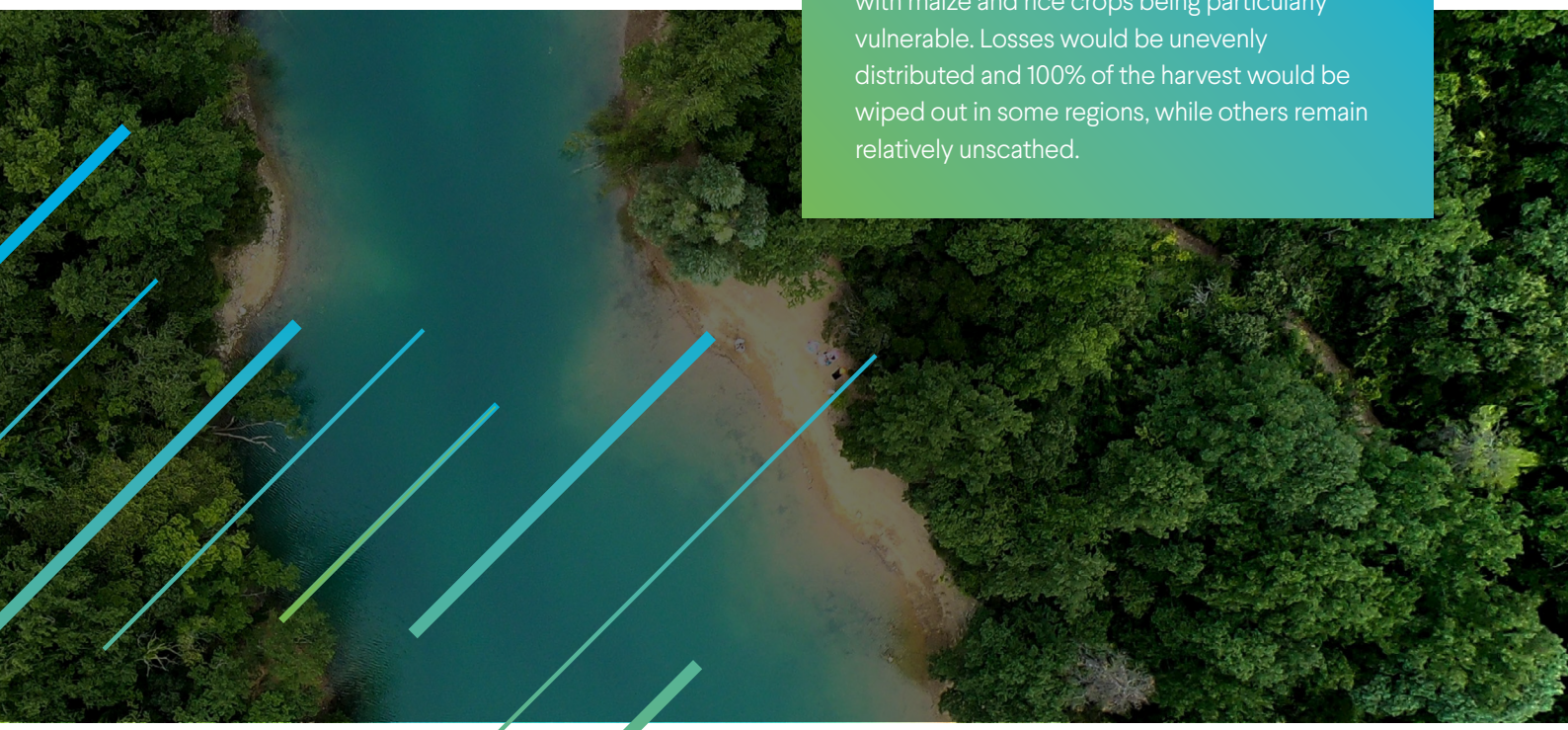
Under our new vision for climate scenarios, these dimensions are not just a footnote or a forgotten comment on how scenarios are constructed. Instead, they help decision-makers get real insight into cascading and tail risks, and genuinely help to bring scenarios to life in a useful, decision-relevant way.

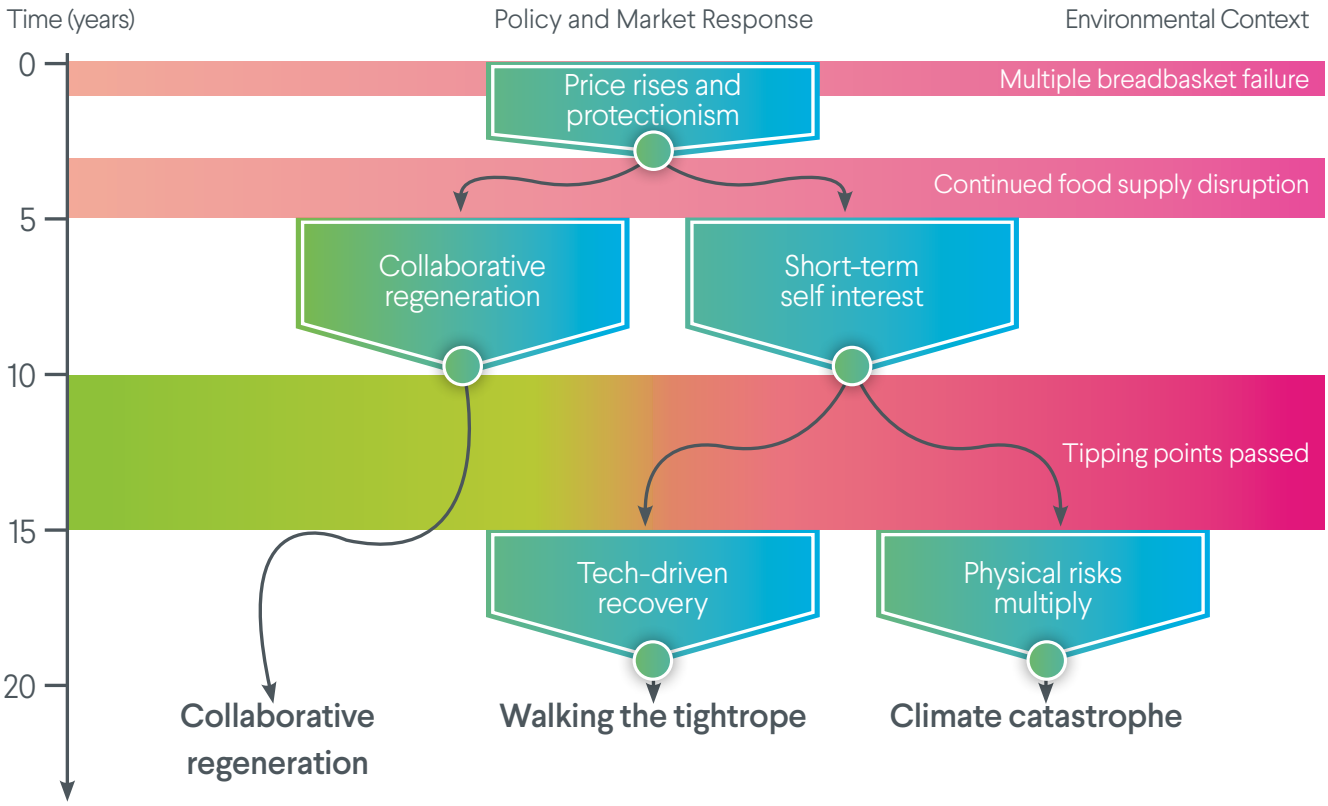
Our approach is therefore to begin with a catalyst that could be driven by environmental considerations, by policy-makers or by technological change. It's easy to conceive of different catalysts and, while many may be negative, positive events may also be considered. The question we're really trying to address is: "What is going to drive a process of change?" Although this catalyst scenario can effectively tell us about different transition pathways, they're also interesting narratives in their own right – for example, such a catalyst may help to illustrate physical risks.

The first catalyst we've considered in detail is a food shock, recognising that this kind of event has been well explored. Countries will generally have some level of preparation for, and therefore resilience against, short-term food shortages. But what if the event persists and their resilience is tested? What will happen then, and how might different countries react?

The food shock

A small number of breadbasket regions produce a disproportionate amount of the world's food, relative to their area. This makes food supply vulnerable to adverse weather in these regions. Cyclical climate events have driven synchronous crop failures in the past, and emerging evidence indicates that the risk of such events is increasing. Research suggests potential reductions in global yield of 17–34%, with maize and rice crops being particularly vulnerable. Losses would be unevenly distributed and 100% of the harvest would be wiped out in some regions, while others remain relatively unscathed.





By considering different responses to an initial catalyst, we create multiple scenario pathways that offer different insight for decision-makers and thus create a much more nuanced discussion of the potential risks and opportunities. Using the approach illustrated above, we outline these pathways below.

1. **Collaborative regeneration:** Several environmental disasters lead to a multiple-breadbasket failure, followed by increasing food prices and protectionism. There is a continued reduction in food supply in the medium term, but cooler heads prevail, and positive collaboration between governments leads to a return to more 'normal' food production and price levels. We cross a geopolitical 'tipping point'.
2. **Walking the tightrope:** As above, but with a lack of a positive collaboration mindset across nations, which leads to longer and more difficult price rises, resulting in deeper economic impacts and crossing 'tipping points.' Eventually, technological innovation leads to a partial recovery from the shortage of food and the geopolitical tensions.
3. **Climate catastrophe:** As above, but without a technological innovation to boost recovery, with negative impacts following the 'tipping points' getting worse as physical risks multiply.

Through our detailed analysis of the potential policy and market responses to these different pathways, we can paint a realistic picture of the outcomes we may expect. This will help meaningful discussions with clients about market drivers while improving their understanding of the actions that can be taken.

It's also useful to try to quantify the potential impacts from these scenarios, particularly in less favourable outcomes. However, while quantifying impacts can play an important role, we have observed some climate modellers get overly caught up in the numbers, to the extent that decision-makers lose sight of what's important. Under our approach, it's paramount to provide genuine insight about the nature of the cascading/tail risks that may be associated with climate change; the numbers play only a supporting role.

How does this help?

Asset owners are increasingly required to undertake climate scenario analysis. However, if the results of this analysis can't be used to inform decision-making, there's a risk that the effects of climate change will be underestimated. A clearer picture of the risks from climate change can help institutional investors make crucial decisions like:

- To what extent they should be impact investors.
- How they should allocate their assets in light of climate risks.

We want our clients to recognise the systemic nature of climate risk and understand that it can only be modelled with significant uncertainty. We're excited about this new approach, because it can allow decision-makers to be better prepared for these systemic risks, which are only going to increase because of climate change. This preparedness comes through not only in systems, such as beliefs statements, investment mandates and strategic asset allocation benchmarks; it also helps with decision-maker mindsets, which is the only thing that can help when the truly unexpected occurs.

Our ask

Having a single way of approaching climate change and not being open to challenge could lead to poorer outcomes. We're therefore sharing our thinking with other stakeholders so it can be properly scrutinised, helping to push forward the development of climate scenario modelling across the financial services industry. It's in our collective interests that we all get better at it.

For more information

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