

Climate scenarios: preparing for uncertainty

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Baillie Gifford's head of climate change, Caroline Cook, and investment specialist Jonny Greenhill delve into the crucial role of scenario analysis in climate change preparation. Join them as they discuss how adaptation can unlock exciting investment opportunities in resilient companies.

As with any investment, your capital is at risk. Past performance is not a guide to future returns.

Jonny Greenhill (JG): Hello and welcome to this Baillie Gifford webinar on climate scenarios. My name is Jonny Greenhill. I'm an investment specialist in the Long Term Global Growth Strategy. I'm delighted to be joined today by Caroline Cook, Head of Climate Change, who should now magically appear on your screens.

Caroline Cook (CC): Thanks, Jonny. And hello, everybody. Thanks very much for joining us today. Back to you, Jonny.

JG: Thanks, Caroline. Delighted you can join us. And thanks to you, our clients, for joining us today, really from all over the world. And you're invested in a range of different Baillie Gifford strategies. So thanks for dialling in. Thanks also to those of you who have submitted some questions in advance. We're going to address some of those in the next few minutes as we walk through a few slides. But then also straight afterwards, we'll open up to more of a Q&A session after the initial presentation.

And this is perhaps also a good moment just to remind you that at the bottom of the screen there is a button, Q&A, where you can feel free to use that throughout the presentation, throughout this entire session today. And we'll aim to address your questions as we go through. For any questions that we are unable to address today, be assured we've taken note and your Baillie Gifford client contacts will follow up in due course and you'll receive responses via email.

Now, maybe just before I hand over to you, Caroline, I was thinking, why are we doing this webinar? What makes it so timely at this point? And for me, it comes down to a few things.

We now know that last year was the hottest year on record, right? Temperatures rose by 1.5 degrees Celsius above pre-industrial levels. And that's a really important number. I remember when

I was at COP21 a decade ago in Paris, when 190 governments around the world signed the Paris Agreement and agreed that global temperature rise would be limited to 2 degrees by the end of the century, and ideally 1.5 degrees, thinking 85 years later, by the end of the century, it's striking that already the planet is there within a decade. Now, of course, that could be a one-off, it could be an aberration, but it's striking all the same.

The other striking thing, or the other very timely thing, right now, is that this year, those countries that signed the Paris Agreement are resubmitting their latest versions of their nationally determined contributions to set out their plans, their objectives, and really ratchet up their ambitions for achieving net zero by 2050. And all of that is happening at the same time as it seems global politics are pushing back on the climate transition at quite an unprecedented level. And it feels like we're in somewhat of a disorderly transition that's becoming potentially even more disorderly.

So all of that matters for us as long-term investors, if one is thinking and investing in terms of decades as we do at Baillie Gifford, then over that time horizon climate change and climate-related policies and climate-related technologies can have a material bearing on the companies in which we invest on your behalf. And this isn't some sort of niche part of a portfolio. Around 90 per cent of global GDP, global emissions, global populations are subject to some sort of net zero climate commitment or target.

For us, companies that fail to adapt to the transition are more likely to fossilise or fail, and companies that can adapt, that can really thrive, are likely to present us with really fantastic investment opportunities. To identify those few companies and to consider the implications for your Baillie-Gifford portfolio, we need to think about what may happen over the next five years, 10 years, 25 years, and that's where robust scenario analysis is really useful. So on that note, Caroline, maybe I can hand the floor to you to walk through how is Baillie Gifford thinking about climate scenarios?

CC: Sure, thanks very much, Jonny. So yeah, what I want to do today is share how we've been developing and then using working with climate scenarios or scenario thinking to improve the integration of climate-related issues into our investment processes.

So what I'll do is pick up from your lead really, run through the kind of why and what, and then come back, maybe the two of us can talk through how we've actually been using them in practice. So to get started into the meat of it, why does this matter? Well, fundamentally it's because there is no single future, state the obvious. I think the one thing that we all know for sure is that we're not going to get the future that we want or maybe even the one that we expect. But that matters for us in investing, particularly in equity investing because it is all about the future.

The question to us is then how do we prepare for that? How do we get better prepared for it? How do we get as well educated as possible about the possibilities ahead of us? How do we test our embedded beliefs, our preconceptions, and really become just better challenged to come up with better questions to ask of the world, of ourselves, and the companies in which we put into your portfolios.

Now, I think the good news here is it's not rocket science, right? There's a tool we all use in our daily lives for thinking about what we should do next. Working with scenarios is something that we're all familiar with. And it's something that we can use to explore a whole variety of different disruptions, but one that in this niche around climate, I think has particular value. Really, because we're dealing not with one, but with two set of simultaneous transitions.

There's a technology transition for energy, and a completely unparalleled, very unfamiliar set of changes occurring in our physical environment. And while we've all worked through, lived through technology disruptions before, none of us have lived through the extent of physical change that science is now predicting for us.

And our regulators also think this is a good idea. So what we're finding is that increasingly scenario analysis is recommended, required of businesses in the real economy and of us in the financial sector to think through our climate-related risks and opportunities.

But what we've been finding is that there's a big difference between just doing scenarios and actually doing scenarios well. And I think, unfortunately, maybe all too inevitably, the response of us in the financial sector, initially at least, has been to reach for the familiar. And in our case, that's the Excel spreadsheet. And almost overnight, we've created this instant industry of quantitative black boxes into which you can feed your portfolio at one end and out will spit to several decimal places what's going to happen to your portfolio in scenario X, Y, or Z.

But I think that approach is fundamentally weak. It's almost actually misleading. It's pretty ineffectual when actually we're at a point when we don't have much time to waste. And I think it's really weak for two key reasons. And there's a bunch of stuff on this slide around that, but really two key reasons.

One, the answer is itself is almost certainly wrong? A lot of these models, the quant models, are based on pretty old-fashioned, outdated economic theory, the stuff that was in my 1980s economics textbook, not 2020s complexity-level economics. And we know that these models struggle to deal with technology change, with technology innovation, the learning effects, the scaling, the nonlinear gain, the feedback loops which come with technology. They also struggle to incorporate behavioural change, social values, what we as a society are actually willing to pay for value at any particular point in time. But the most important issue that they really struggle with is a very reason that we want them to exist in the first place. And that's they struggle to deal with physical change, physical climate change, both acute and chronic, because in many ways that physical change is very similar, shares many characteristics actually with technology. It's compounding, there's scaling, there's tipping points, there's non-linearity. And if you don't get those physical changes right, you're not going to get the knock-on implications into the overall human economy. So you end up with a set of models which are both underestimating the cost of actual climate change while overestimating the cost of us actually addressing the problem.

And the second reason that just as important reason that I think they don't really work is that they just fail the fundamental test of insight. And that's really the simplest, it's really hard to interact with

an Excel spreadsheet, particularly when it's one that you didn't build yourself. But it's that interaction, it's the debates, it's the questions, it's the consideration of extremes, the new ideas for which scenario work is most important.

And the critical question, the biggest in some ways of all climate questions, which the quant models really struggle to answer, is what scenario are we actually in? What's actually unfolding in the world around us? And those quant models fail at that because they really struggle to deal with questions that exist at the systems level.

And if you take examples from our economic history, you can see that when big change has happened, like, for example, incredibly rapid adoption of the motor car in the early 20th century, where we really went from horse to horseless in less than 20 years, or times when transitions haven't happened, like, for example, our response to the 1973 oil price crisis which didn't lead to a nuclear age, didn't lead to renewables age, but actually led to a doubling down on the oil age, that a critical part, a critical distinguishing feature of when it works and when it doesn't, is it's very much a question of right time, right place is the key to deep transitions.

And these are absolutely deep transitions that we are now facing in our energy system and our physical environment. And the key here, the key to a successful pathway, is that it will need system-wide support. So all of the elements will need to come together in order for the system really to change. But even more importantly, those outcomes themselves will then go on to have system-wide consequences. And that's really where spreadsheets are not going to help us.

So how do we do better? How do we capture that complexity? And I think the good news in some ways, I think it is pretty straightforward. The answers might not be so precise. It might require a little bit more work on our part as individuals. but the very process of going through good scenario work should ultimately be more decision-useful. And the answer for us has been to return to the basics. So take scenarios back to narratives or stories and build out a set of distinct, internally consistent, but plausible views of the future. Use those scenarios then, those narratives to capture the richness and the actual real complexity of the world around us. And you can then play with those, explore them and develop them from there.

So that's what we've spent quite a bit of time doing over the course of the last couple of years. We've not done that alone. I think it's important for us to have reached out because we, at Baillie Gifford, have a certain view of the world, and it's important that we don't necessarily infuse the scenarios with that from the get go. So we've reached out across our partnerships, particularly across our academic network, to partner, in this instance with two in particular, but very much building up from various relationships.

So the two that we work most closely with on this project, Deep Transitions, this is a collaboration between the universities of Utrecht and Sussex. They are specialists, they're socioeconomic historians, specialists in why transitions have occurred in our industrial economy in the past or not. And Independent Economics is a group of, if you like, plain old macroeconomists, but with a lot of experience working at the policy and also working with climate change. So we brought those two

together with our investment teams to come up with a starter set of three scenarios that we can then work with, we can keep alive, we can develop further.

So what I'll do next for a few minutes is just give you a little taste of those, dive into each one of those scenarios and then come back with Johnny and show how we've actually been using them and learning from them in practice.

So our three scenarios, the three climate features. Just to get your head around it, so the way to think about this, I think, is to think about it as two extreme end members. So a hothouse world of climate failure on one end, a very orderly, one would just say almost utopian, orderly transition, which gets to net zero by 2050, keeps temperatures to less than one and a half degrees this century, and then a messy middle.

And I think those two extremes, even though one of them is very hopefully still unlikely, and the other one perhaps unfortunately unlikely, even though they are unlikely, they're very useful because elements of each of those will infuse the disorder that we're probably going to have to invest in and live through. And they help us understand what themes endure through disorder. And they help us understand what sort of disorderly pathway is in fact emerging.

So taking a dive into each one of those, start initially with the hothouse world. So this is a world of climate failure, right? So it's one where we don't manage to stem emissions or temperature rise. The physical impacts become increasingly extreme and unmanageable from an economic and social perspective. It's one in which policy isn't delivered, technology adoption is slow, it's dispersed, and capital, physical capital, becomes increasingly damaged, obviously, by climate change. But just as importantly, monetary, if you like, financial capital increasingly has to be directed towards defensive adaptation, which reduces our ability then as a society to invest in the mitigation or the improvement technologies that we actually need.

So we end up with a world where fossil fuels, high carbon, are sustained higher for longer. The food system itself becomes increasingly stressed. Migration, conflict, inequality all become very challenging. It's a world in which overall GDP is lower. Inflation is higher and tends to be more volatile.

Now, standing back from this and when we've workshopped this, if we take a purely transactional stance on this world as an active concentrated asset manager, we can still find growth opportunities in a hothouse world, but they're occurring, we think, within a much more constrained set and a world in which risks are fundamentally higher.

So move from that to the flip side. So this is the positive world of an orderly transition. So it's a world that's characterised by positive feedback loops. So policy, technology, society are all reinforcing each other to deliver rapid but smooth and pretty unrelenting change. All the benefits of scaling and learning curves come through here. Efficiency and circularity are prioritised. The social and economic benefits, the social and economic trade-offs are managed. Incumbents are relatively weak. We get to net zero by 2050. And we managed to limit warming to less than one and a half degrees. And when we set this up, actually we end up with this being a sort of more equal world.

And we need to think about that in terms of investment opportunities. It's one where the, because the climate is more benign, because we see continuous investment in technology, economic growth continues and tends to occur at a higher level than the hothouse world.

And then the final one sort of set of three sort of outlined scenarios is a disorderly transition. Right now, it's important to recognise that the way we've set up the disorderly transition is it's not a hothouse world, right? It's not a world of failure. It's one that ultimately ends in what we would define as success. Now, initially, disorder looks and feels like hothouse. So there is policy, there is technology, but it's not enough and it's geographically dispersed. The scaling is slow, incumbents are strong, politics are divisive, all sounds very familiar to what we're experiencing at the moment. But at some point, there's a break in that kind of doom loop. There's a shock, and there's plenty of precedent for shock-led change if we look back at how socioeconomic systems have developed in the past.

And the way to think about this, I think, is that while there's an almost infinite range of disorderly pathways, there's actually a very small or finite number of effective successful shocks, because what you need is a shock that's big enough to change the trajectory, but not too big that it causes the whole system to collapse. And the way we've set this up in our base scenario is that a couple of years out, we have a period of intense accumulating physical damage in the developed world that creates the policy space to unlock the transition support that we need. So when the change comes, it's more rapid, it's more disruptive, there's more asset stranding. There's initially a GDP and inflationary shock, but then we move back to growth.

Now, obviously disorder is the most challenging to invest through, but it's the one in which this scenario work is in fact the most useful because it's the one where we try to think, we try to identify the themes that endure regardless. And it's one where the scenarios can help us tell what pathway, what kind of disorder is actually emerging around us.

So that's the quick snapshot. We've got our three scenarios and you can go onto our website where we've published some of the papers that we've used, both from our background partners, but also the ones that we've developed for ourselves now to use amongst the investment teams.

And what we've got is we've got a set of scenarios that build out from a core technology and policies core to include climate and adaptation, society behaviours, and to actually include the finance sector as an actor in its own right, not something that exists outside the system. And because the narratives unfold over time, we can use them to match to our short, medium, and long-term time horizons, whatever they happen to be for our different investment strategies. It's not just a static investment point. So the key thing about the scenarios is they're not going to be right, but we hope they will be helpful and decision useful. So how do we start to use those in practice?

So I'll kick off here, just think about this, kind of think about this top down. So they're useful at the top level when you think about adding macroeconomic indicators to the scenarios. And this is sort of follow on work project that we've done with our multi-asset team, where we actually developed a number of different disorderly pathways. So not just one based on the physical shock, but also a

technology shock and a funds flow shock. So how differently did we think GDP, interest rates, inflation, and so on would unfold across those different disorderly pathways? What did that look like across different geographies? And we can use those macroeconomic indicators to then inform our asset allocation across asset classes and across geographies. You can then come down into portfolio construction. So do you want to consciously tilt your portfolio towards one scenario or another, or do you want to sort of build in more resilience against an uncertainty about which scenario will actually unfold? And then you can take it down into stock selection and the sorts of questions that should infuse our research and engagement with companies. And these are the sorts of questions that we want to be able to explore as active equity investors, existing both at that kind of macro system level, but coming down into the companies.

But I think on reflection, having gone through a lot of this scenario work, across the different investment teams now, one of the most useful outputs from the qualitative scenario work is that our investment teams now have common reference points and a common language to discuss the transitions. What's enduring? What's noise? What's actually unfolding around us? And if we step back a bit, as Jonny was talking about earlier, if we take a view on the Trump world that we're now experiencing for a moment, it feels very hothouse, right? So the US carbon price has now effectively gone to zero. But the enduring themes, we think of increasing physical damage and of energy supply and demand side growth at scale, continuing to tend to new technologies. Those themes remain.

It's a very messy, disjointed world to invest through. It's one in which the risks to the old, I think, be that old geographies threatened by climate change or old energies, are more likely probably just being suppressed or pent up for a larger, later, more dislocating shock than removed in their own right. And that's a key characteristic of this kind of hothouse world and disorderly scenarios.

But what we need to do as investors, not scientists or policymakers, is bring scenarios into the world of value, of investment returns, as well as the scenarios of volume. The scenarios, just to pull a little meat around that, the scenarios help us most with the volumes of the transition. And by that, I mean more low carbon, less high carbon, so more electric vehicles, less combustion engines, more renewables, less oil and gas, more adaptation, less ignorance, more trust in science. But not so much, I think, with the actual investment returns available to us at any point in time. That we have to bring back to the investment team level.

And this cross-plot, I hope, gets that sort of trade-off across in a hopefully helpful visual way. And the way to interpret this is really to think of the volumes of the transition as the vertical axis, up and down, so more green, less black, and left to right across the horizontal axis, to think about that in valuation terms to us as investors.

Now, it would be a lovely world if, you know, where everything that was green and growing also offered high investment returns, if we could just live in that top right-hand corner with volume and values of the transition aligned. But sometimes, as we know, as we've experienced a couple of times in the last decade or so, green volumes will be expensive to us, they're going to be

overbought, or even green tech actually becoming stranded by newer green tech. And sometimes, therefore, the value for us will be below the line, in the black.

But what we need to be very careful about, and I think, again, the scenarios help us with, is not to get caught out by the value traps, that the genuinely stranded assets and managements that have no future. So being able to identify those relative to those over on the right-hand side that can actually transition, or in some cases, actually manage their obsolescence or their decline effectively for shareholders.

And what we're finding, I think, is the more the transitions mature, the more opportunities we're actually finding in that bottom right-hand corner of carbon cash flows, redeploying cash flow to potentially to transition to green. With that, I'll hand back to Johnny, who'll talk through a little bit about how long-term global growth has been using the scenarios.

JG: Thanks, Caroline. Perhaps just before I go there, so just a reminder again that feel free to submit your questions as we go through using the Q&A function. We have actually just received a question, Caroline, that maybe I can just put to you very quickly. It's just a quick one. How our three scenarios relate to the NGFS scenarios? Do you want to just quickly address that before we move on?

CC: Yeah, sure. So we took the NGFS core framework behind the way that we develop the scenario. So they, like us, they have a world of climate failure, they have a world of rapid success, and then a couple of different disorderly transitions in the middle of either delayed transition or delay and ultimately into, too little, too late, ultimately into failure. And we spent a lot of time, particularly with deep transitions, actually taking those NGFS assumptions, if you like, to pieces, and those forming then a wireframe on which we then rebuilt our qualitative view, building in those things around society, around climate and adaptation. But a critical issue that we were keen to overcome, and actually, again, a critical sort of prod to us to do this ourselves, is the NGFS outputs have really struggled to deal with the depth of economic damage and the volatility of inflation caused by future climate change. Those scenarios are getting a lot better now. On the most recent set of outputs from the NGFS, are definitely moving in the right direction. But it was because of that failure almost in those NGFS outputs that we wanted to try and approach this ourselves. But the fundamental framework is pretty much the same.

JG: Thanks for that question. So Caroline, as you mentioned before, it feels like a good time to think about, well, how does all of this apply to a portfolio? And we thought for illustration, it would be good to look to one, which is the one I work on every day, which is the Long Term Global Growth portfolio.

Now, as I mentioned at the outset, we have clients from a range of different strategies at Baillie Gifford in today's call. So for those of you who are less familiar with Long Term Global Growth or LTGG, it has a single objective to generate really exceptional returns for our clients over the long term by investing in a concentrated portfolio of what we believe to be the world's leading growth companies.

And just to be clear here, this is a single objective. This is not a sustainable investing strategy. It's not a climate strategy. It's really all about those long-term returns. But if we're investing with a five-to-ten-year investment horizon and beyond, we can't ignore the potential implications of climate change, where those implications may be material to the investment cases of the companies in which we're investing. So we need to be able to integrate climate analysis and consider the sorts of scenarios that Caroline has just walked us through when we're thinking about investing in companies over the next decade.

How do we think about this then in terms of exposures at the portfolio level? Generally, when we've been thinking in the strategy about portfolio exposures, we've tended to not use sector or country-specific classifications. We found that pretty meaningless. You know, the fact that Hermès, the luxury brand is headquartered in France, tells you very little about its very important revenue source from consumers in Asia, or the fact that Amazon, as classified as a retail business, tells you nothing about AWS, its cloud servicing division, which generates the majority of its operating profits.

So for the past 15 years or so, we've been using this diagram that you see on this slide, to help us think through these exposures in the more subjective way, sure, but it's a way that helps us think about how the companies in the portfolio are positioned in terms of spearheading or disproportionately benefiting from multi-decade structural transformations that we think will materially affect their future growth.

So in the middle there you see a circle on digitally empowered e-commerce, for example. What that's getting at is this displacement of bricks-and-mortar retail by e-commerce. Now, you know that e-commerce is now something like 20 per cent of global retail. That has moved significantly over the past decade, and we believe it's much further to go. If you look at the circle just to the left of that in the red, the cloud, this is getting at the notion that the disruption of on-premise software is increasingly underway and moving to the cloud. And just as another example at the bottom there in green of renewable technologies, the idea that there is this displacement underway of carbon intensive for transportation by electric vehicles, by electric aircraft, and so on.

The question then is how do we think about those multi-decade transformations when we're thinking through those climate scenarios? And it leads us to ask questions in the team, so the investment team really sitting often with Caroline and others from our climate team, but also just questioning in our own stock discussions and asking ourselves, how do we think about those contentions that we have about the future? You know, what does this mean for the fact or our contention that demand for powerful chips for AI, for example, will continue to grow? What does it mean for this idea that computing will increasingly move to the cloud? You know, will those data centres be powered mainly by fossil fuels? And if so, what sort of cost do we attach to that? What would be the implications for innovation and energy intensity in the chips themselves and the energy efficiency gains that we see being pioneered by some companies like NVIDIA? And will those gains potentially be offset by just increasing democratisation of AI, for example, and just the increased demand, therefore, for compute? That's the kind of AI side of this but even if we take luxury goods, which you'll see in the far right of this slide, will the next generation of consumers just shun emissions-intensive luxury, especially, for example, leather goods, which is key to a company

like Hermès, in favour of more sustainable alternatives? And can those luxury brands that have defined their identities in some of those traditional materials, can they retain their allure, their mystique going forward if they're having to adapt in that way?

So those are just some of the questions that we ask ourselves of those big contentions in the portfolio. It is, of course, essential to bear in mind always that stock specifics matter here. You know, if we're looking at the circle there in the bottom, the green one, renewable technologies, you could say, well, for a company in that circle that ostensibly looks really well placed in the carbon transition. But even for those companies, they could be facing physical impacts on their operations that could have material bearing on an investment case. So even Tesla, for example, we commissioned analysis last year from the University of Exeter. And what they did was they mapped Tesla's factories and supply chain over the world and drew on climate science to examine the likelihood of extreme weather events on Tesla's operations. And they estimated that around 70 per cent of Tesla's supply chain is vulnerable to various climate-related shocks over the next five years or so to 2030. And it's striking, you know, bear in mind, this is for Tesla. It's a very vertically integrated company. One can only imagine what the impacts may be for a traditional automaker with thousands upon thousands of different suppliers. One of the most striking findings from that work was around three quarters of Tesla's supply chain appears to be at risk of heat waves, and particularly in the US, wildfires, which can cause all sorts of disruption, damage, and stoppages to production, which again, we need to be able to think about over the next several years. So this is one example. We informed Tesla of the results at the company's request. We put the company in contact also with the academics who did the work so that they are now in touch with each other. But it's a reminder here that stock specifics matter enormously.

Maybe just moving beyond these multi-decade transformations that we see here, we also think about the portfolio through the climate angle in another way. So this is our annual climate assessment.

It's a process that we began a few years ago now, and it's a collaboration between the LTGG investment team – although I should say there are several investment teams that go through this but – a collaboration between the investment team and the climate team led by Caroline, to really examine all the holdings in the portfolio, to analyse their abilities to navigate the transition over the next five to ten years and beyond. And coming back to the points that Caroline was making before, this is not a simple desk-based exercise using data feeds. We all know about the shortcomings in the data. A key feature in this assessment is that we are engaging with companies. We're engaging with them on a prioritised basis to really understand their attitudes and their actions because by better understanding the climate-related aspects of the companies in which we invest, we can then make better informed decisions.

So for example, we can determine the extent to which companies are commercially self-sustaining rather than depending on climate policies, subsidies, taxes. And this comes into our ongoing discussions just now, for example, with the likes of Enphase Energy, Rivian, where they're changing tax rules in the US, what might that mean for their businesses? What might it mean perhaps in terms of long-term competitive advantages for those companies? So again, thinking through all the

different modalities here. And this is where it's so valuable as part of this process that the investment team meets with the climate team led by Caroline every six months or so to determine which companies we should be prioritising for engagement over the coming months.

Now on this slide, on the left-hand side going up the Y-axis, we're asking ourselves basically the question, how compatible is the business model of a company with a net zero world by 2050? So at the top left there, you see Solutions Innovator, okay, companies that are actually enabling decarbonisation. We put there company like Joby Aviation that you see in the top left, which makes electric aircraft.

At the other extreme at the bottom, we're talking about companies that have really environmentally challenged business models, which we think would be likely to really struggle in a net zero world by 2050. And we don't believe that we have any companies in this portfolio in that category.

Most companies seem to find themselves more in the middle here. So they have environmentally challenging business models, maybe like an Amazon, which was engaging in boosting consumption and all the implications that has. Or companies that just happen to be carbon light, such as, say, a Spotify. But still, those companies have opportunities to be part of the solution here.

So that's the vertical axis. And along the x-axis on the bottom, we're assessing the net zero related disclosures and the ambitions being taken by those companies. So for example, is a company disclosing scope one, two, scope three emissions? How is it defining those scope three emissions? Has it articulated targets or ambitions to align its business with net zero by 2050? And we know that a number of holdings in the portfolio still don't disclose any emissions data, and so these companies are priorities for engagement. And you'll see those concentrated on the left here. But then others, do disclose, but perhaps they're facing various physical risks, such as Maotai in China, which makes Chinese liquor and depends on one river basin, and yet they've still not really articulated their net zero alignment. So again, that's something that we want to engage with them on, and that's why that company would find itself towards the left of this page.

And one of the advantages of having done this now over a few years is we can see the direction of travel of some companies over time, which helps us think about how they're adapting and navigating the transition under different scenarios. So those are just a few examples that I just wanted to touch on here of how we're applying some of that scenario work to an investment strategy, how we're thinking about the portfolio, both in terms of overall exposures, but also individual companies.

As Caroline says, it's not just about plugging numbers into a model. It's about building debate, asking questions, challenging some of our contentions, drawing on that external expertise, and engaging with companies. And more on this will be available in our long-term global growth stewardship report that will be shared from the coming months. Caroline, back to you.

CC: Thanks very much, Jonny. So I just wanted to wrap up really just by coming back to a broader point across our net zero aligning strategies and how they've interacted with this scenario work. And that's on this concept of adding resilience.

So we all know now we may not get the net zero aligned or aligning world that we may want. It may be slow to emerge. But what we do know is that adaptation to a changing climate will be needed. And in fact, it's pretty critical to the overall transition, any kind of overall transition success. So we should also look to positive adaptation as well as to emissions reduction when thinking about alignment. And looking at that as growth investors is an area, I think, which has turned out again through the workshops to be one for interesting idea generation. And it's absolutely a cross-economy effect.

And I pick out a couple here to show how it does go beyond the sort of sort of first order adaptation technologies of HVAC and desalination and so on. So areas that we've explored are things like intermediaries, helping us to navigate what's going to become an increasingly complex world. So how do I get insurance? How do I manage my property effectively against physical climate change? How do I upgrade it? Global logistics? How do I move around a more complicated world with different fuel sources? But also in health care, primary health care in particular, around the provision itself, how is that done effectively? And potentially also higher value over time being attributed to base healthcare around vaccination. So it's just a couple of ideas where we're looking more broadly to support adaptation investments.

But I'll leave it there. I want to get to questions just to say very briefly that this is very much ongoing work for us that we're very keen to make useful and to share. And really to leave you, I suppose, with the key message, which is, I think we can do better than quant. It'll be more interesting along the way. And hopefully we'll also make what's quantifiable better at the same time.

And that is a key challenge to leave everybody with is, you know, my challenge to the investment teams has been, you know, use these scenarios and then be able to explain to yourself and your clients how the portfolio performs in these different futures. And that, I suppose, my challenge to you as well, go out to people who are managing money on your behalf and say, you know, explain to me simply how you think my portfolio will perform across these different scenarios. And hopefully that leads to interesting conversations.

With that, maybe Jonny, if you've got some questions.

JG: Yes, we've had a flurry of questions. As I mentioned at the start, I don't know if we'll have time to get through all of them in the next few minutes, but be assured we've taken note of them. We will follow up in due course by email.

I have a provocative, slightly provocative question here, Caroline, that I thought that I'd put to you. If world inaction on climate change is now a proven market failure, why is Baillie Gifford engaging with companies on net zero ambitions and disclosures if it seems their actions are going to be

unprofitable on this front and seemingly just for the public good? So how would you think about that?

CC: Yeah, that's a great question. And I suppose it's actually a bit of a pushback that we get from some of the investment teams here. So it's not an uncommon discussion for us. I absolutely fundamentally agree that we're talking about market failure here, failure to price pollution effectively. But I think for us, engaging on emissions reporting targets is really not primarily about the first order response. It's about how that prepares and enables the system itself to change, because having those conversations, using that as an entry point, sets the ground for the support, and I think the support for the policy interventions that we require. So if you were to suddenly impose a carbon tax on the global economy and nobody was reporting emissions or knew what they were, that's a fundamental shock, right? But actually encouraging engagement with this ahead of that policy change prepares the ground for it to happen. So it is actually, I think, a critical enabler of us actually addressing the market failure. But yeah, again, I would repeat that it is extremely hard for us to deliver the transition on time if we don't price implicitly or explicitly emissions. And that then generates the changes to market structure and policy design. And I think what we're seeing in our engagement with companies is increasingly moving into the area of talking to them about policy, about the policy unlocks they need, rather than just what they themselves are doing in their own area of influence.

JG: Great. OK, thank you. Another question we have here, which I think can segue into yet another question is, how have our models incorporated recent policy risks and exposure when it comes to transition pathways? And I think, Caroline, this maybe segues into the bigger question is, what's next? How are we thinking about potentially adapting some of those scenarios?

CC: Yeah, so we are about actually just preparing at the moment to have another workshop with the two or three academic partners that we used on this, so both Deep Transitions, Independent Economics, and also Doyne Farmer, who works with the Santa Fe Group, does a lot of work on complexity economics. So we're going to have another workshop, including a couple of investment teams as well, at sort of middle of next month, to really re-examine, unfortunately, a hothouse world and to think about what success might look like in a high emissions environment. So if emissions just stay higher for longer, how could we actually conceive of a successful economy in that kind of environment? So that's going on.

Another key area for us, as I mentioned in the talk, was we did a sort of second round with our multi-asset team, where we identified a series of macroeconomic indicators to go with the different scenarios. They've begun to incorporate that into their long-term return expectations, into their asset allocation. But what we're now doing is working with our investment risk team to try and bring those different macroeconomic indicators into the work that they do with our conventional equity portfolios. So that's sort of us attempting to quant some of what we think is quantable, if you like, from here.

And what we should be doing soon as well, hopefully coming across your desk, is just a note out from us, just talking through some of the learnings and experiences that we've had from doing this process so far.

JG: Thank you. Conscious, we're coming up on time, but I'm keen to just ask one final question, which has come through, which is, Caroline, what's perhaps the biggest surprise that's come out of the workshops that you've been doing with the investment teams?

CC: I think for me, one of the most interesting ones on reflection was actually contrasting the conclusions of our China team, so this is the guys that based in Shanghai, with many of the conclusions from sort of our other strategies when we thought about the disorderly transition. And for many of our other strategies issue, a disorder means delay. And very few of them see significant growth in fossil fuel demands. Even if we're delayed, that's not really a growth industry. You still see more growth in newer demand and supply side technologies for energy. But it opens a window for transition solutions for things like biofuels, hybrid cars, rather than fully EV and so on. Whereas the response to the China team was very much around, well, we think we're experiencing in China an orderly transition because of the scale of policy intervention and the framework that's being put around it, the amount of investment that's gone into new technologies. So our opportunity actually is in disorder, is because it comes with a late shock where we suddenly all need globally a lot of renewable technologies. That's a huge opportunity for Chinese companies. So the Chinese companies stepping forward, they're developing in an orderly internal pathway, which then creates subsequent opportunity for them, for the rest of the world, if we get that positive disorderly shock. So it's quite a contrast in approach.

JG: It's a really interesting contrast. Excellent. All right. That's us now at time. Thank you to all clients who have joined the webinar. Really appreciate you joining and also asking your questions. As I mentioned, there are questions that we've not been able to address in the time available, but we will be following up. Your client contacts here at Baillie Gifford will be in touch to answer those questions.

Caroline, thank you very much for joining. And to all of you, thank you for dialling in. Please do stay tuned for further updates from us, as Caroline alluded to, in the coming months. So thanks very much again.

CC: Thanks, Jonny. Thanks, everyone, for joining.

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