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Climate Change Scenario Analysis—A Practical Guide for Equity Investors

Australian Equities Research

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The Climate-Investing Future Has Arrived

Late 2020 through early 2021 may come to be seen as a milestone period in the world's evolving response to climate change. In September 2020, China announced that it would aim for carbon neutrality by 2060. The following month, Japan said it would target net-zero carbon dioxide emissions by 2050. A month later, South Korea committed to the same goal.

Shortly after his inauguration in January 2021, US president Joe Biden committed the country to rejoining the Paris Climate Accord. The following April, before hosting a climate summit, he pledged a minimum 50% reduction in greenhouse gas emissions by 2030—more than double the nation's previous commitment under the accord. Japan and Canada followed with more ambitious reduction targets, while Brazil vowed to end illegal deforestation by 2030 and achieve carbon neutrality by 2050.

While these commitments are significant, we expect uneven progress in reducing the effects of climate change—with strides of progress followed by setbacks and more strides forward. The scale of the challenge

and the frustrations it can create were visible in the outcomes of the UN Climate Change Conference (COP26) in Glasgow in November 2021.

The key point, however, is that government actions on climate change are gaining momentum and forcing companies to reassess and refine their climate resilience strategies. For investors, assessing the impact of climate change on equity valuations to enhance risk-adjusted returns has become a more pressing need. Effective climate scenario analysis must be part of this effort. This paper provides practical guidance on developing these scenarios and applying them within a comprehensive equities research framework.

Scenario Analysis: A Four-Step Approach

The foremost principle of climate change equities research is to understand that the future will be different. One consequence is that a basic technique of investment forecasting—the extrapolation of future trends from past events—will become harder to apply.

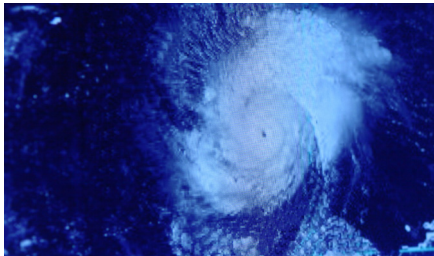
That's partly because climate change is complex, nonlinear and accelerating—characteristics highlighted in an August 2021 report by the Intergovernmental Panel on Climate Change (IPCC).¹ Climate change creates risks and opportunities that are difficult for markets to price correctly (*Display 1*).

Add to this challenge the secondary effects of climate change—rapid, reactive developments in government policy and corporate strategies, as well as investors' efforts to decarbonise portfolios—and it's easy to see how climate change may affect asset prices faster than many expect.

DISPLAY 1: CLIMATE CHANGE IS COMPLEX, NONLINEAR AND ACCELERATING

Climate May Affect Asset Prices More Quickly than Expected

Tropical cyclones could hit Sydney in next five to 10 years, with property and communities not yet prepared



Cyclone Oma nearly hit Brisbane in 2019. Tropical cyclones can occur when water is 26°C. IAG forecasts line to move south 100–200 km a year.

Extreme heat waves to strike India, Pakistan and Bangladesh. Healthy adults in the shade at risk of death



McKinsey forecasts by 2050 up to 500 million people across India, Pakistan and Bangladesh could be exposed to deadly heat waves.

Green hydrogen will be a disruptive technology to multiple industries. Investment is growing rapidly



Europe targeting 80 GW of renewables to make green hydrogen by 2030. It will disrupt energy, transport, chemicals and steel.

As of November 10, 2021

Source: AB

¹ Richard P. Allan, et al., "Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change" (Intergovernmental Panel on Climate Change, 2021).

Climate change means disruption and discontinuity, and acknowledging that point is critical to appreciating its investment implications.

From this perspective, the longstanding investment disclaimer “past performance does not guarantee future results” takes on a new and deeper significance.

Climate change means disruption and discontinuity, and acknowledging that point is critical to appreciating the investment implications—particularly in research, where long time scales and uncertainties create huge complexity. For many investors, analysing the impact of climate change could be the most challenging research they ever conduct.

But it can be done. The key lies in developing an appropriate methodology and applying it effectively. We’ve developed a four-step approach that, we believe, can help investors meet the climate-investing challenge:

1. Develop robust scenarios that integrate climate science and fundamental research
2. Quantify a company’s climate value at risk (CVaR) for each scenario based on long-term discounted cash-flow forecasts
3. Engage with companies to deepen CVaR insights and encourage better climate strategies
4. Embed CVaR into the investment process and determine the portfolio implications

This approach combines the simplifying effect of a clear conceptual framework with the rigour of fundamental analysis and the ability to capture, process and respond to changing information. That ability is necessary in a dynamic and evolving climate environment.



Step One: Developing Robust Scenarios

Scenario planning is widely used in business, especially when the outlook is uncertain and requires more than one forecast. Given the uncertainty in climate forecasting, scenarios are the logical starting point for a climate-investing research methodology.²

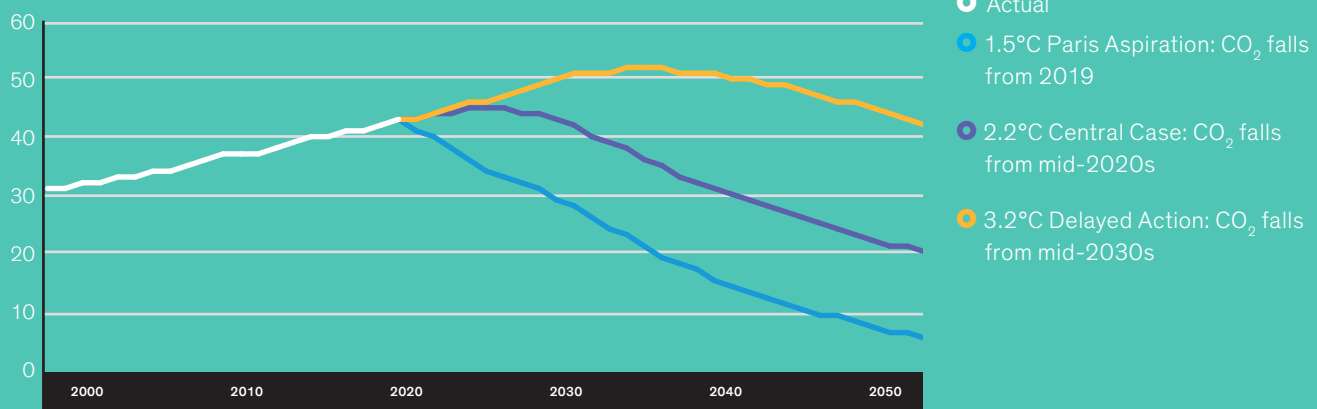
The overarching uncertainty is the rate of global decarbonisation and its effect on global temperatures, so the first task is to develop scenarios for different decarbonisation outcomes. This requires expert climate research data, which can be sourced from agencies such as the Commonwealth Scientific and Industrial Research Organisation, International Energy Agency, IPCC, and Massachusetts Institute of Technology (MIT).³ We've drawn on all of these resources, as well as on **our collaboration with Columbia Climate School**.

Display 2 shows our three proprietary climate scenarios of temperature outcomes for given declines in carbon emissions: the Paris Agreement's goal⁴ of 1.5°C by 2050, our central case of 2.2°C and our high-temperature scenario of 3.2°C.

DISPLAY 2: AB'S PROPRIETARY CLIMATE SCENARIOS

From Paris Aspiration to Delayed Action

CO₂ Emissions in Billion Tonnes Per Year



As of November 10, 2021

Numbers may not sum due to rounding.

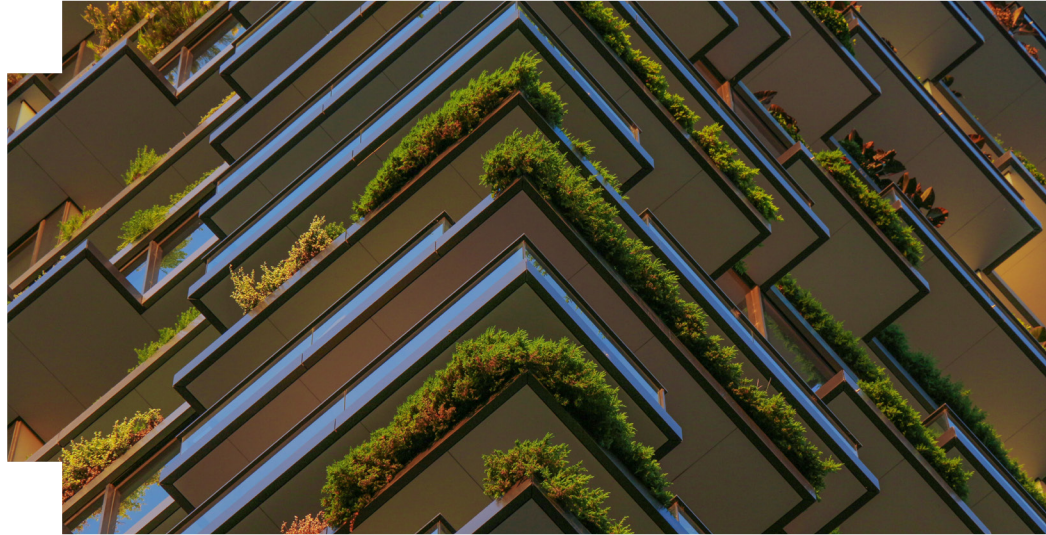
Source: MIT and AB

² Our approach may also help investors and corporates prepare financial reports consistent with the recommendations of the Taskforce for Climate-Related Financial Disclosures (TCFD), which include using scenarios to assess and disclose how climate risks might affect a reporting entity's business.

³ Investors should be aware that climate data sets may have limitations from an investment-research perspective. For example, data series might be discontinued or data may not reflect a fundamental view of the world (such as the potential for gas as a transition fuel) or may not provide enough detail.

⁴ Adopted at COP21 in Paris, December 12, 2015. The goal is to limit global warming to well below 2°C, preferably 1.5°C, compared with preindustrial levels.

By combining these inputs and collating them using MIT's En-ROADS climate change simulator, we have created proprietary scenarios for a range of micro and macro risks.



Using these paths as guidelines, we can develop more-detailed scenarios to assess climate-related investment risks. Given the number and variety of risks, these scenarios need to be robust, and we have developed comprehensive scenarios as a key input to our CVaR analysis.

Comprehensive scenarios should incorporate fundamental insights, such as the evolution of energy markets and the impact of new technologies, which climate data alone might not reflect. They should also forecast transition-risk pathways for industries moving to a low-carbon economy, the physical impacts of climate change (including those on weather and oceans) and potential business opportunities.

Scenarios also need to include frameworks that are sufficiently detailed to forecast company-specific implications. They must remain relevant for several years, rather than needing replacement annually, and be flexible enough to evolve over time as new information and research become available.

To achieve these objectives, scenarios must integrate climate science with macro research and micro fundamentals.

Climate science, as in our climate scenarios above, forecasts the dynamics among emissions, temperature and other physical indicators such as sea levels. Macro forecasts cover potential developments in government climate policy and their implications for economic growth by geography and climate scenario.

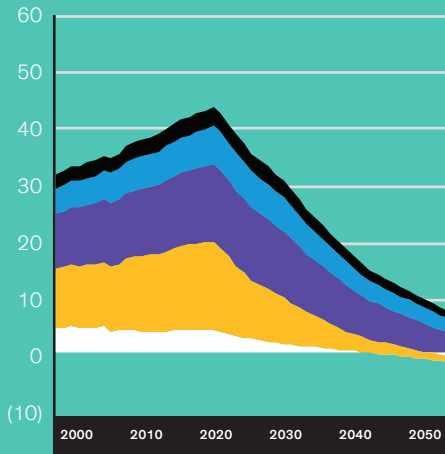
Micro forecasts enable views on how the world may decarbonise—for example, how fossil fuels interact with renewables and how that interaction varies by geography, the rate of emissions reductions in hard-to-decarbonise industries such as steel, chemicals and construction, and the likely success of new technologies, such as hydrogen-fuelled heavy transport.

By combining these inputs and collating them using MIT's En-ROADS climate change simulator, we have created proprietary scenarios for a range of micro and macro risks. *Display 3, page 5*, for example, profiles transition risks for fossil fuel industries within each of our climate scenarios. In each case (based on the current outlook for global geopolitics), global emissions are likely to fall but at different rates, according to the projected temperature outcome.

DISPLAY 3: TRANSITION RISK—FOSSIL FUELS EMISSIONS

Billion Tonnes of CO₂ Emissions

1.5°C Scenario—Paris Aspiration

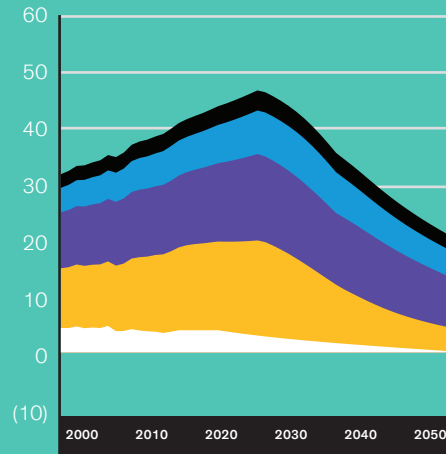


● Land Use ● Coal ● Oil ● Gas ● Bioenergy

2050 emissions vs. 2019

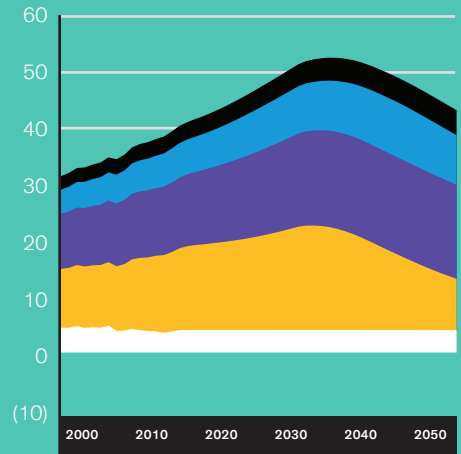
- Coal (94)%
 - Oil (69)%
 - Gas (61)%
- (By 2050, Land Use emissions negative)

2.2°C Scenario—Central Case



- Coal (74)%
- Oil (35)%
- Gas (29)%

3.2°C Scenario—Delayed Action



- Coal (41)%
- Oil +24%
- Gas +35%

As of November 10, 2021

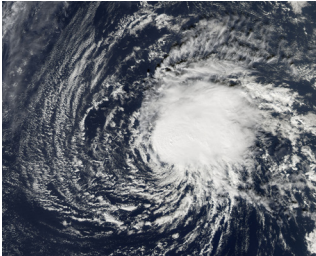







Source: En-ROADS and AB

The implications of transition risk for fossil fuel industries, shown above on a global scale, will vary geographically—even within countries. In Australia, for example, risks will be significant for New South Wales, given its dependence on the thermal coal industry and plans by many of the industry’s international customers to decarbonise rapidly.

Display 4, page 6, shows examples of physical risks under a 3.2°C scenario, in four categories. Weather risks include acute and chronic impacts from heat and storms; ocean risks feature rising sea levels and coastal flooding; risks related to health and biodiversity include the impact of heat and humidity on labour productivity and crop yields; economic impacts include reduced GDP and the potential for climate refugees.

DISPLAY 4: PHYSICAL RISKS—IMPACTS OF 3.2°C SCENARIO

Potential Impact of Physical Risks on GDP Is Often Underrated

Weather		Oceans	
			
Tropical cyclones hit Sydney and Melbourne for the first time	Droughts affect agriculture, cities and increase fire risks	Coastal regions flooded (e.g., Florida, Shanghai, Pacific islands)	Great Barrier Reef loss 99%; changes to Queensland economy
Health and Biodiversity		Global Economy	
			
Heat and humidity affect labour productivity and diseases spread	Crop yields fall; some ecosystems are materially impacted	Potentially hundreds of millions of climate refugees affect societies	Global growth slows due to disruption, but impact is uneven

As of November 10, 2021

Source: AB

In our experience of engaging with corporates, management teams often underappreciate the potential effect of physical climate risks on GDP. These impacts have been outlined in a report⁵ by Swiss Re Institute, which estimates that global GDP could fall by 18% by 2050 under a 3.2°C scenario. China would lose 24% of its GDP, the US nearly 10%, Europe almost 11% and Australia more than 16%.

Our forecasts also consider four opportunity categories likely to be created by climate change: new products and services (for example, carbon-neutral consumer products and electric vehicles); new markets for existing products (such as lithium for batteries); enhanced competitive advantage (such as steelmakers preferring electric arc furnaces, which have lower emissions, to blast furnaces); and branding and intangibles (for example, the marketing and employee-retention advantages that might result from carbon-neutral products and policies).

By developing a suite of scenarios forecasting the interaction between climate change and micro and macro fundamentals for different emissions-reduction paths, we create the basis for assessing the impact of climate change on individual companies.

⁵ Jessie Guo, Daniel Kubli, Patrick Saner, "[The Economics of Climate Change: No Action Not an Option](#)" (Swiss Re Institute, Zurich, Switzerland, 2021).

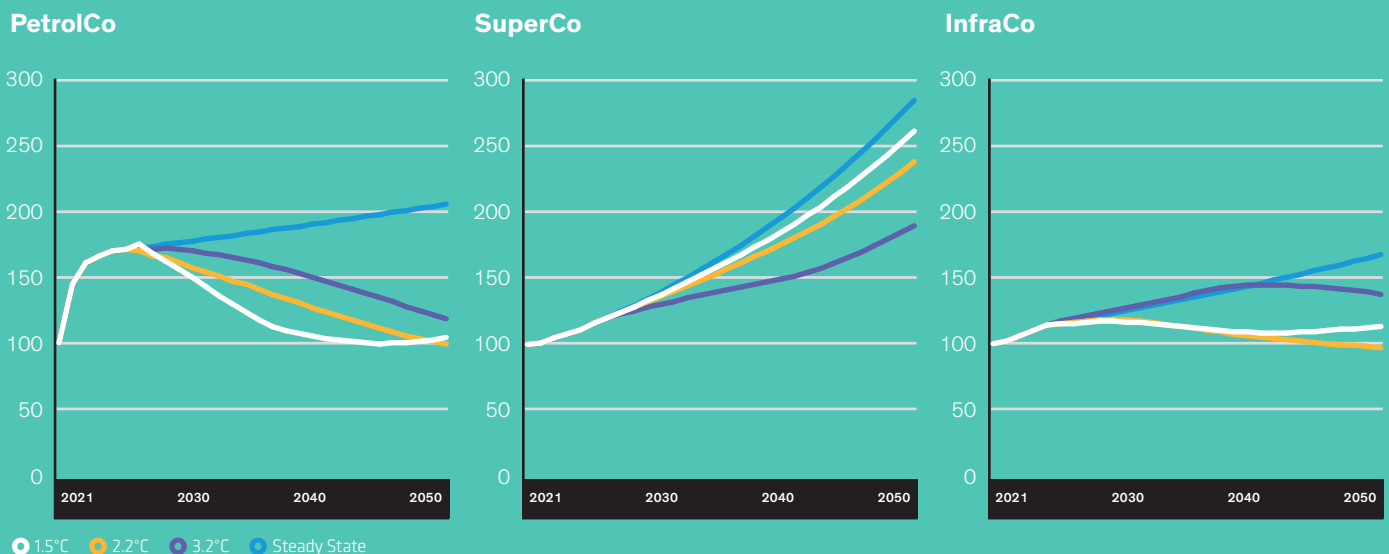
Step Two: Assessing Climate Impacts on Companies

To understand a company's CVaR, we assess the impact of a given climate change scenario on the net present value of its discounted cash flows, then compare that result to the theoretical result if all climate change stopped today (a "steady state" climate scenario).

The free-cash-flow model, in our view, should forecast the company's financials to at least 2050 so as to include long-term climate change impacts, and it should segment the data in ways relevant to climate change (these could differ from the way a company segments data in its annual report).

DISPLAY 5: COMPANY EARNINGS DIFFER DEPENDING ON CLIMATE SCENARIOS

Forecast Earnings Before Interest and Tax (EBIT)



Based on AB global research on electric vehicle production and demand, and a climate working session with PetrolCo management team.

Physical impacts on food and economy greater in Australia than New Zealand. SuperCo's nonfood business exposed mostly to weaker economy.

Leveraged global AB research on hydrogen. Engaged InfraCo on analysis and ability of renewables and hydrogen to lift EBIT for 1.5°C.

As of November 10, 2021

Index Year 2021 = 100

Forecast EBIT is based on a number of assumptions, which may or may not eventuate, and does not predict future prices or the value of the relevant security. It is used only to illustrate the potential impact of a number of climate scenarios.

Source: Company reports and AB

The model should enable key assumptions to be easily updated as new information becomes available over time—for example, policy changes affecting the relevant carbon price.

The model should also reduce complexity by focusing segment forecasts on key drivers, such as growth in invested capital, the return on invested capital, and the impact of one-off factors such as the stranding of assets or chronic weather events. And it should enable key assumptions to be easily updated as new information becomes available over time—for example, policy changes affecting the relevant carbon price.

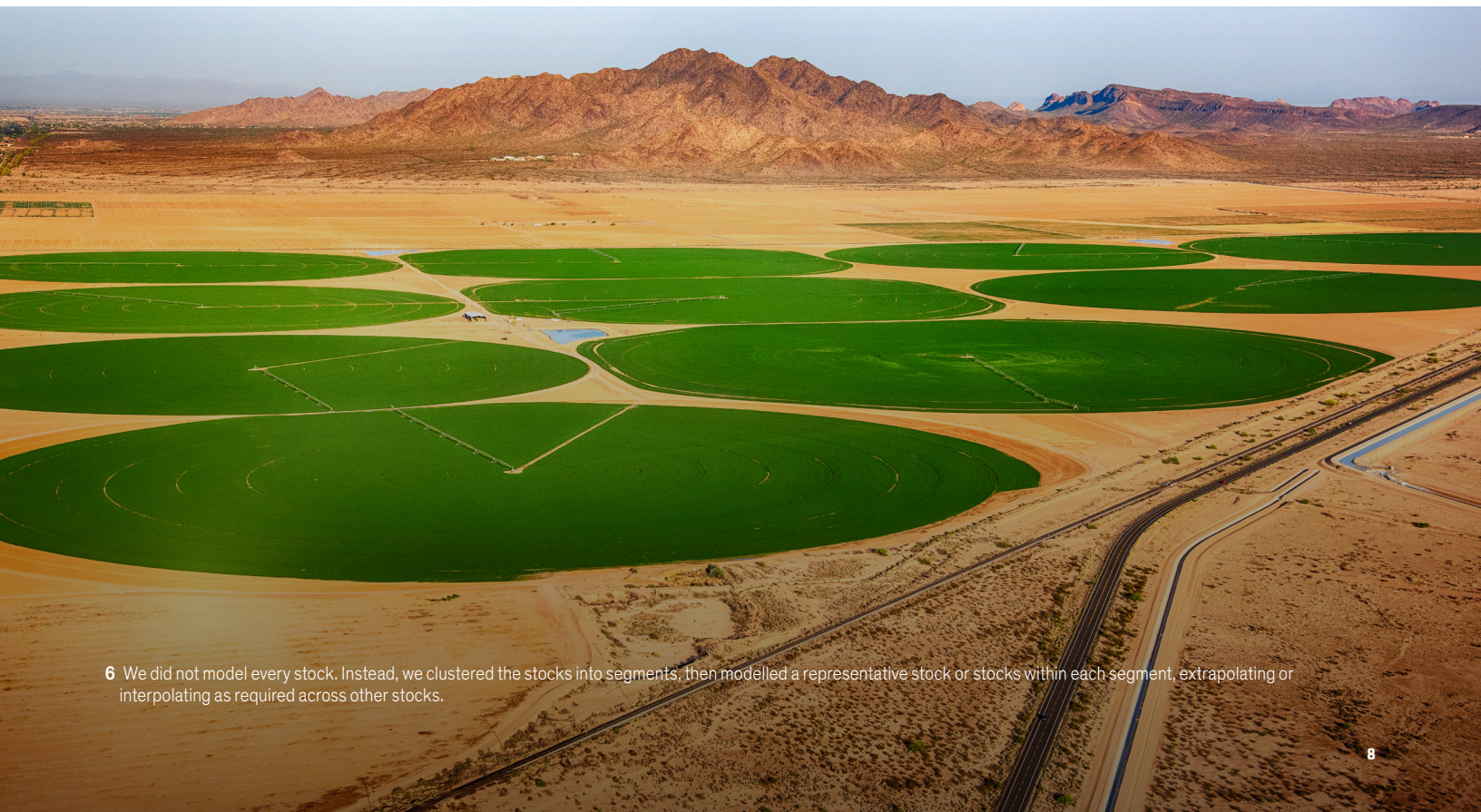
We show three examples of how earnings before interest and taxes of three companies are affected in each of our climate scenarios (*Display 5, page 7*). Each company's earnings profile can differ markedly across the climate scenarios, and effects on the three companies also differ depending on the nature of the business and the relevant climate risk.

PetrolCo, a petrol retailer, performs worst in a low-temperature scenario, because of the impact a low-emissions regime would have on demand for its products. This result is in line with the transition risk that the fossil-fuel industry generally would face from the move to a green economy.

SuperCo, a supermarket chain, performs worst in a high-temperature scenario, reflecting the physical impacts of warming on agricultural output and the economics of food production, as well as on economic growth generally.

InfraCo, an energy infrastructure company, presents a more nuanced story. Its earnings tail off sharply in both our central-case and (initially) our low-temperature scenarios, reflecting the impact on its business of a low-emissions regime. But its earnings begin to recover under the low-temperature scenario, because of two potential developments: the use of gas as a transition fuel in a decarbonising economy and the possibility that the company will adapt its capabilities to the green hydrogen economy.

By applying the CVaR approach across stocks in the S&P/ASX 200 Index,⁶ we can gain insights into how climate change is likely to affect the Australian equity universe (*Display 6, page 9*).



⁶ We did not model every stock. Instead, we clustered the stocks into segments, then modelled a representative stock or stocks within each segment, extrapolating or interpolating as required across other stocks.

DISPLAY 6: CLIMATE CHANGE AND THE AUSTRALIAN EQUITY UNIVERSE

Climate Value at Risk: S&P/ASX 200 (Percent)

	Sectors	Index	1.5°C Scenario				2.2°C Scenario				3.2°C Scenario			
			Transition	Physical	Opportunity	Total	Transition	Physical	Opportunity	Total	Transition	Physical	Opportunity	Total
Businesses with high emissions and transition risks	Fossil Fuels	9	(16)	0	2	(15)	(11)	(3)	1	(13)	(3)	(8)	0	(11)
	Heavy Industry	2	(9)	(1)	3	(7)	(5)	(4)	1	(8)	(2)	(10)	2	(10)
	Transport	5	(8)	0	1	(8)	(3)	(2)	0	(5)	(1)	(6)	0	(6)
	Utilities	1	(21)	0	6	(15)	(12)	0	1	(11)	(4)	(1)	0	(5)
Businesses exposed to climate risks and opportunities	Finance	31	(2)	(3)	2	(3)	(1)	(7)	1	(7)	(1)	(16)	1	(17)
	Food and Agriculture	5	(4)	(2)	1	(4)	(1)	(5)	1	(6)	0	(14)	0	(14)
	Industrials	5	(3)	0	2	(1)	(1)	(2)	1	(2)	0	(7)	0	(7)
	Mining	8	(5)	(1)	4	(1)	(1)	(4)	2	(3)	0	(9)	0	(9)
Businesses affected by economy, physical risks and green trends	Consumer	9	(3)	(2)	1	(4)	(1)	(5)	0	(6)	0	(9)	0	(9)
	Healthcare	10	0	(1)	0	(1)	0	(2)	0	(2)	0	(4)	0	(4)
	Property	7	(1)	0	0	(1)	0	(3)	0	(3)	0	(6)	0	(6)
	Technology	8	0	(2)	0	(2)	0	(4)	0	(4)	0	(8)	0	(8)
	Index Weighted	100	(4)	(2)	2	(4)	(2)	(5)	1	(6)	(1)	(10)	0	(11)

As of November 10, 2021

Current analysis does not guarantee future results.

Source: Company reports and AB

While the scale and complexity of climate change and the related risks and opportunities might seem daunting, engaging with corporates presents investors with an opportunity to deepen their CVaR insights and encourage climate-resilient strategies.



The first observation is that total CVaR is greatest under high-temperature scenarios, indicating that the Australian equities market is generally likely to perform better in a low-temperature environment.

The sectors most exposed to climate change differ depending on the scenario. In a low-temperature scenario, businesses with high emissions and transition risks, such as fossil fuels, heavy industry, transport and utilities, are the most negatively affected. In high-temperature scenarios, physical risks dominate: the most affected sectors include finance, food and agriculture, industrials, and mining companies that are highly leveraged to economic growth.

The number of opportunities is low in each of the scenarios, partly because, at the current stage of climate change, it's easier to identify the risks created than the opportunities. There are obvious winners—such as the beneficiaries of greater lithium demand created by the switch to electric vehicles. But beyond those, it's difficult to say who the winners will be.

Physical and transition risks can be identified, but they are hard to quantify given major uncertainties. For instance, high-emissions industries and businesses could fall victim to climate risk or they could help lead the transition to a low-emissions future. To what extent will incumbents in airlines, chemicals, gasoline retail, steel and utilities adapt or be replaced by newcomers untroubled by the costs of stranding assets? The question is analogous, in our view, to whether Ford Motor or Tesla will win in the automotive sector. Similar races are taking place across many other industries.⁷

While the scale and complexity of climate change and the related risks and opportunities might seem daunting, engaging with corporates presents investors with an opportunity to deepen their CVaR insights and encourage climate-resilient strategies—potentially mitigating CVaR risk.









⁷ When considering these observations, investors should bear in mind that low interest rates together with the long-dated nature of climate change increase the net present value of climate-related risks and opportunities. In other words, CVaR for many stocks will be high for as long as interest rates are expected to remain below their long-run averages.

Step Three: Adding Investment Value Through Engagement

Corporate engagement is an essential part of our climate-related investment research. Many companies are bringing their climate reporting capabilities in line with TCFD recommendations, and they welcome the opportunity to learn how investors are considering climate risks and opportunities. Such meetings tend to initiate continuing, open-ended discussions with company boards and management teams about climate change implications.

Corporate engagement offers investors two benefits. One is the opportunity to gain new research insights. *Display 7* summarises how direct engagement has enhanced our insight on key CVaR issues for eight companies: retail and industrial conglomerate Wesfarmers, mining and metals company South32, Woodside Petroleum, Fletcher Building, telecom company Telstra, poultry producer Ingham's, gas pipeline company APA Group, and insurer Suncorp Group.

DISPLAY 7: HOW CORPORATE ENGAGEMENT CAN DEEPEN CVaR INSIGHTS

Low-Cost Options for the Future	Business Portfolio Realignment
 <p>Wesfarmers has applied a price on carbon for a number of years, and this has resulted in the company deciding to divest its thermal coal assets and, more recently, invest in new lithium projects.</p>  <p>Fletcher Building is exploring a range of technologies to decarbonise its production processes and to benefit from future demand for low-carbon building materials.</p>	 <p>Woodside Petroleum is investing in hydrogen facilities to power heavy trucks, and investigating economical ways of generating carbon offsets from agricultural assets in Australia.</p>  <p>South 32 has divested its South African thermal coal assets and is no longer proceeding with coking coal at Eagle Downs in Queensland, three years after acquiring a stake in the project.</p>
New Green Businesses	Managing Stakeholder Interests
 <p>Telstra's positioning of its low-cost Belong mobile offering as fully carbon neutral has resonated strongly with the brand's younger demographic and forced competitors to take similar action.</p>  <p>Ingham's is exploring ways to add value to its brands, including selling carbon-neutral chicken, which is likely to enhance its margins.</p>	 <p>APA Group is tied to the fortunes of the natural gas industry. A case can be made, however, to prolong the life of gas as a transition fuel if it is paired with renewable energy and the emissions are offset with agricultural projects.</p>  <p>Suncorp Group is exposed, as an insurer, to risks of intensifying bushfires and floods. Consumers (voters) are likely to resist sharp increases in premiums. Will the company or government cover the cost?</p>

As of November 10, 2021

Current analysis does not guarantee future results.

Source: AB

Among the companies not shown are Westpac Banking and supermarket giant Coles Group: the CVaR issues revealed in those engagements apply to their respective industries as much as to the companies themselves. As noted earlier, the potential for physical risks to impair the economy under high-temperature scenarios—not just slower GDP growth but potentially lower GDP—are often underappreciated.

Banks are vulnerable because of their high leverage to the economy: lower credit growth would almost certainly translate into lower returns on capital. Supermarkets are exposed to physical risks through their dependence on farmers. Australia's agricultural system is one of the most vulnerable in the world to climate change, and supply disruptions and production-cost increases would flow through to supermarkets. Another risk arises from the high profitability of Australia's supermarkets: they might feel obliged—and perhaps pressured by consumers and the government—to assist farmers and absorb those costs.

The second benefit of corporate engagement is the opportunity to encourage companies to develop climate-resilient strategies, helping improve the companies' investment value and make a positive contribution to the global effort to limit temperature rises.

Constructive Engagement, Positive Impact

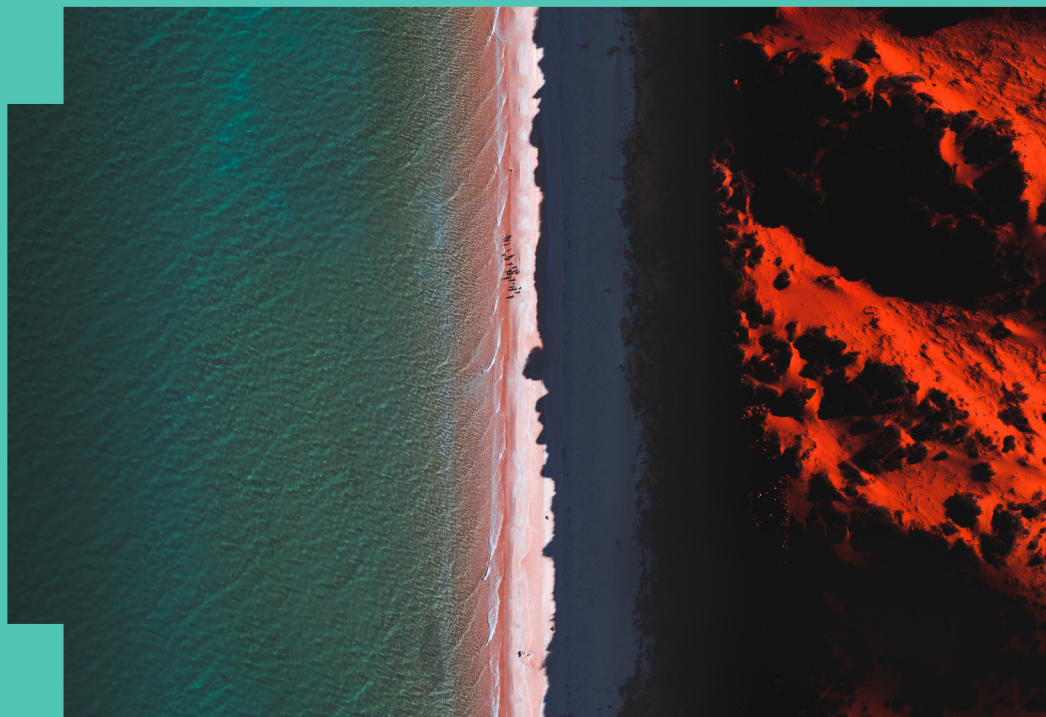
“AllianceBernstein has consistently provided us with valuable perspectives and constructive challenge on ESG and climate change, during our regular shareholder meetings and through engagement with our senior executives, board and sustainability teams. The insights they provided supported our decision to commit to a net-zero carbon emissions by 2040 ambition (Scope 1 and 2⁸) across all Amatil operations, including an additional goal to reach 100% renewable electricity for Australia and New Zealand by 2025.”

—Alison Watkins, Group Managing Director, Coca-Cola Amatil.⁹

⁸ Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company. Scope 3 includes all other indirect emissions that occur in a company's value chain. “[Briefing: What are Scope 3 emissions?](#),” The Carbon Trust (website), accessed November 10, 2021.

⁹ March 17, 2021. The company has since changed its name to Coca-Cola Europacific Partners.

We pointed out to one industry-leading company that its goal of halving its emissions by 2050 fell short of the full carbon-neutrality commitment of one of its major international competitors by that same year.



Our engagement with companies has had notable effects (see *Constructive Engagement, Positive Impact, page 12*). For example, we pointed out to one industry-leading company that its goal of halving its emissions by 2050 fell short of the full carbon-neutrality commitment of one of its major international competitors by that same year. The chief executive of the Australian company considered our views and, shortly thereafter, announced that his company would aim for carbon neutrality by 2050.

With the breadth and depth of our corporate engagement, backed by our global in-house research resources, we are able to keep Australian companies up to date on best practices for climate risk management in other countries and industries.

During a workshop with a basic materials company, we discussed different frameworks used by overseas companies when applying a carbon price to new investments and existing operations. The chief financial officer of the Australian company was impressed with the approach taken by a multinational technology company and declared that she would adopt it.

In other examples, we've encouraged an Australian supermarket chain to introduce carbon-neutral products into its home brand range and provided training to an industrial company on developing scenario analysis to meet TCFD reporting recommendations.

Step Four: Quantifying, Not Sidestepping, Climate Risk

Banks are exposed to material climate-related physical and macroeconomic risks in the long term, but markets don't yet appear concerned.

The final stage in our four-step approach is to integrate CVaR into the investment process and determine its portfolio implications. This integration is helped by the fact that CVaR is itself a process: although it was undertaken initially as a project, it's not a one-off event; it's applied continuously in determining stock valuations, investment time horizons and portfolio construction.

CVaR is a valuation discipline and methodology, which sets our approach apart from rules-based approaches that exclude stocks because of the underlying companies' emissions levels or membership of particular industries. In our view, the exclusion method causes problems that may not help mitigate climate-related investment risk, because it's hard to draw a line between "good" and "bad" companies. For example, is a gas company that owns a renewables business bad? Such issues are, in our experience, challenging for asset owners and their boards.

The CVaR approach aims instead to quantify the implications of climate change by adjusting a stock valuation in order to determine whether or not the investment is attractive. Valuation-based methodologies are traditionally helpful in determining the time horizon for investments. Because climate change is a long-term proposition, the ability to time its impact on share prices is critical—hence the advantage of a climate-related valuation tool. Investors need to assess when climate risks will be priced into stock valuations—timing that will likely vary from one stock to another and be based on how market perceptions of climate risk evolve over time.

For example, banks are exposed to material climate-related physical and macroeconomic risks in the long term, but markets don't yet appear concerned. It could be many years before banks' CVaR is reflected in their share prices (or it could happen sooner if, for instance, a regulator were to announce its concerns publicly). Conversely, thermal coal producers are at the forefront of climate risk, and the prospect of a low-temperature scenario could be rapidly reflected in their share prices. *Display 8, page 15*, highlights some of these themes from the perspective of climate-related risks and opportunities.

DISPLAY 8: MARKETS ARE NOT YET PRICING ALL CLIMATE RISKS EFFICIENTLY

Transition Risks



- We believe that CVaR is beginning to be priced into businesses most exposed to transition risk, such as thermal coal.
- These stocks could continue to derate, and may trade at even lower multiples in the future.
- Conversely, while companies that produce components for internal combustion engines are derating in climate-aware regions such as Europe, we have yet to see such trends in other markets, including Australia's.

Physical Risks



- Physical risks are often priced into share prices when events are immediately obvious such as bush fires, droughts or floods.
- For longer-term trends, however, we are seeing less evidence.
- This is true, for example, for mortgage providers in flood-prone areas or agricultural producers in regions that would be at risk in high-climate scenarios.

Opportunities



- Climate-aware investors are crowding global equity market niches such as lithium producers or utilities that are focused on renewable energy sources.
- But we see limited impacts in, for example, green premiums for eco-friendly commodities, including aluminium or ammonium nitrate.
- As markets focus on value chain emissions, producers with structurally lower emissions will be advantaged.

As of November 10, 2021

Current analysis does not guarantee future results.

Source: AB

One way in which CVaR can help determine an investment time horizon is through continually adjusting a stock's value by changing its exit multiple. If, for example, an investor needs to calculate the internal rate of return for investing in a coal stock for five years, and believes that climate risks are likely to be fully priced in over that period, the exit multiple should be lowered to reflect the CVaR. In effect, this forecasts that the stock will trade on a structurally lower multiple in the future compared with the past.¹⁰

Portfolio construction should reflect climate risks and opportunities. Because CVaR can be calculated for portfolios in both absolute terms and relative to an index (see *Display 6, page 9*), it can help identify areas of risk within portfolios and the actions needed to manage them. These actions could include preventing a value portfolio from having too large a share of its risk budget in correlated climate risks, or identifying potential trades in a core portfolio to retain attractive portfolio characteristics while improving climate resilience.

¹⁰ As a more detailed example, suppose an investor's research suggests that a stock that has historically traded on a price-earnings ratio (PER) of 10 could potentially lose 20% of its value over the investment period. The stock would become worth considering as an investment if its PER fell to 8, the risk being effectively priced in by the lower multiple.

A Competitive Advantage Anchored in Sustainability

In all of these cases, investors will need to understand how climate change could enhance or destroy the value of their stocks.

From an investment perspective, we think the challenge of climate change is too complex for strategies based on simple rules.

At a very minimum, strategies need deep fundamental research to deliver appropriate insights and impact. They should also incorporate a climate risk-aware stock valuation process and a commitment to positive, constructive corporate engagement. These can produce not only more climate-resilient portfolios but also positive real-world outcomes that benefit the environment and society.

Such an approach, in our view, can be a potential source of competitive advantage for investors, regardless of investment style. There is a debate, for example, about which investment strategies will perform best in the coming decades—growth versus value, developed versus developing markets, large-cap stocks versus small-caps, and so on.

In all of these cases, investors will need to understand how climate change could enhance or destroy the value of their stocks. Climate-aware investing, in other words, is not an investment theme: it is a structural shift that will permanently affect the investment industry and all investors who want climate-resilient portfolios.

The future will be different and there are no road maps from the past. To get there, we believe that it's important to start the journey now and to keep going, staying ahead of the market with research-driven, investable insights.



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