

September 2020

Climate change and business: key concepts

Part 1

Climate change and business

In this year alone, unprecedented bushfires have ravaged Australia, while Antarctica has recorded temperatures over an alarming 20°C. With tangible changes to the environment becoming more evident, it is clear that this is already impacting businesses, with implications for investments. In the first of this two-part series, we outline key details on the ways in which climate change presents risks and opportunities for business, how such risks can be mitigated, and other factors driving climate risk management. The second part will explore the implications for investments and detail ways in which to invest in a climate-aware manner.



Contents

Introduction

What is the Paris Agreement?

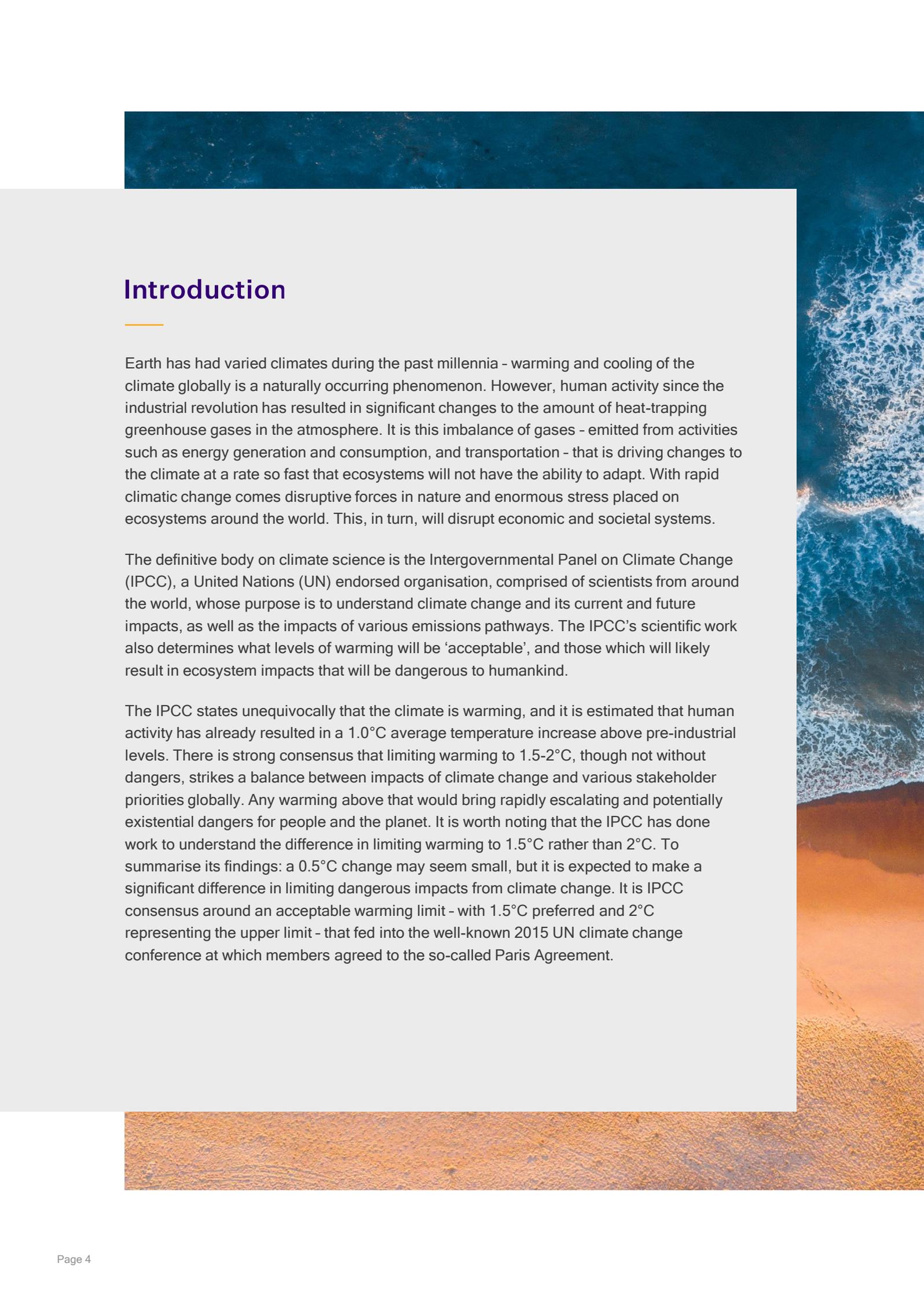
Physical impacts of climate change

Transition risks

How physical and transition risks
impact business

Managing climate-related risks

Additional factors driving companies
to manage climate risk

An aerial photograph of a beach. The top half shows the dark blue ocean with white foam from waves crashing onto the shore. The bottom half shows the golden-brown sand of the beach, with some footprints visible. The image is split vertically, with the ocean on the right and the sand on the left.

Introduction

Earth has had varied climates during the past millennia - warming and cooling of the climate globally is a naturally occurring phenomenon. However, human activity since the industrial revolution has resulted in significant changes to the amount of heat-trapping greenhouse gases in the atmosphere. It is this imbalance of gases - emitted from activities such as energy generation and consumption, and transportation - that is driving changes to the climate at a rate so fast that ecosystems will not have the ability to adapt. With rapid climatic change comes disruptive forces in nature and enormous stress placed on ecosystems around the world. This, in turn, will disrupt economic and societal systems.

The definitive body on climate science is the Intergovernmental Panel on Climate Change (IPCC), a United Nations (UN) endorsed organisation, comprised of scientists from around the world, whose purpose is to understand climate change and its current and future impacts, as well as the impacts of various emissions pathways. The IPCC's scientific work also determines what levels of warming will be 'acceptable', and those which will likely result in ecosystem impacts that will be dangerous to humankind.

The IPCC states unequivocally that the climate is warming, and it is estimated that human activity has already resulted in a 1.0°C average temperature increase above pre-industrial levels. There is strong consensus that limiting warming to 1.5-2°C, though not without dangers, strikes a balance between impacts of climate change and various stakeholder priorities globally. Any warming above that would bring rapidly escalating and potentially existential dangers for people and the planet. It is worth noting that the IPCC has done work to understand the difference in limiting warming to 1.5°C rather than 2°C. To summarise its findings: a 0.5°C change may seem small, but it is expected to make a significant difference in limiting dangerous impacts from climate change. It is IPCC consensus around an acceptable warming limit - with 1.5°C preferred and 2°C representing the upper limit - that fed into the well-known 2015 UN climate change conference at which members agreed to the so-called Paris Agreement.



What is the Paris Agreement?

The Paris Agreement is the key global agreement reached by 195 countries to guide efforts on climate action, including emissions reduction, mitigation and adaptation. It was negotiated in 2015 at the annual UN climate change conference and established a goal to limit global warming to “well below” 2°C. The parties also agreed to pursue efforts to limit the increase to a more ambitious 1.5°C of warming.

In addition to setting out the technical detail for member countries’ commitments to reduce carbon (greenhouse gas) emissions, the Agreement also sets out the timeframe by which the global economy should be releasing ‘net zero’ emissions into the atmosphere. That is, whereby efforts are made to reduce total carbon emissions, and any ‘necessary’ or unavoidable emissions are balanced out by having equal amounts of carbon removed from the atmosphere, such as through re-forestation or new carbon storage technologies. It states that this should occur “in the second half of this century” - better practice considers this to refer to the year 2050. It is common to hear this goal as ‘net zero by 2050’ in shorthand.

Physical impacts of climate change

Climate change is caused by greater heat being trapped in the atmosphere. The ways in which the natural environment will respond to this is multi varied. Many of what are known as 'acute physical impacts' are the headline-grabbing extreme effects that might initially come to mind: ranging from more intense cyclones and snowstorms; coastal flooding and storm surges; and more severe bushfires.¹ The frequency and severity of these acute physical impacts are forecast to increase.

Other physical impacts are less readily visible and can occur more steadily. These are known as 'chronic impacts' and include sea level rise, heat stress, and changes in rainfall and snowfall patterns (decreases in some regions and increases in others).

It is also important to understand that the global climate system is dynamic, with a highly interactive series of feedback loops. A positive feedback loop amplifies effects, while a negative feedback loop diminishes effects.

When it comes to climate change, a number of positive feedback loops in the system are accelerating global warming. For example, warming is causing the ice sheets to melt which is contributing to rising sea levels. Ice naturally reflects heat, so as it melts it exposes greater areas of ocean. The ocean absorbs rather than reflects heat, causing even more ice to melt, and so the cycle intensifies.

Limiting these kinds of physical impacts requires us to drastically reduce heat-trapping carbon (greenhouse gas) emissions. The scientific consensus is that we ultimately need to get to net zero emissions in order to limit warming to no more than 2°C. Re-orienting or transitioning the global economy to one that emits much less carbon brings with it so-called 'transition risks'.

¹ Bureau of Meteorology and CSIRO, State of the Climate 2018 [Available: <http://www.bom.gov.au/state-of-the-climate/index.shtml>]

Key impact: biodiversity loss

The physical impacts of climate change are expected to accelerate biodiversity loss, in particular, species extinction and loss of natural habitats. Coral bleaching events and reduced marine life in the Great Barrier Reef highlights the fragility of biodiversity in the face of acute and chronic physical impacts.

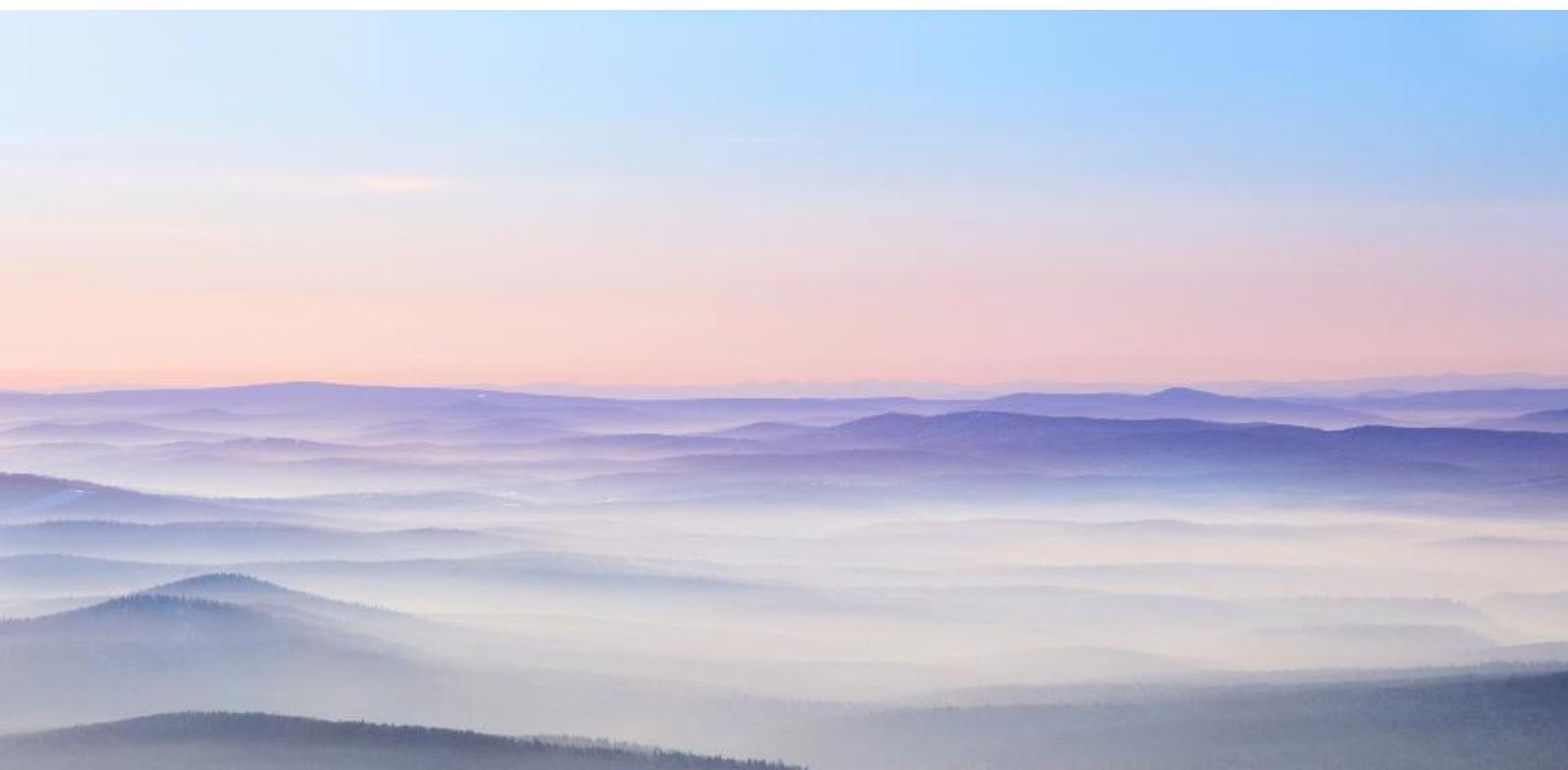
Transition risks

The transition to a low carbon-emitting economy will be achieved through a range of activities which are likely to be deployed differently in different jurisdictions. These centre around regulatory and policy changes; technological developments; and changing market dynamics such as consumer preferences. These elements will pose a varying degree of risk, depending on their nature, speed and focus, and are collectively known as 'transition risks'.

This transition needs to consider the amount of carbon that can be emitted globally before causing dangerous climate change, known as the 'carbon budget', and the period over which

it can be emitted. To limit disruption to the global economy, it is preferable that the carbon budget is consumed in a measured and orderly way over this period. If an orderly transition is not achieved, and the carbon budget is largely consumed earlier in the period, it is highly likely that stronger policy responses will need to be enacted and market forces will react accordingly. Such an outcome, forcing rapid change, will place greater pressure on global financial stability.²

²'Too late, too sudden: Transition to a low-carbon economy and systemic risk', European Systemic Risk Board Advisory Scientific Committee, No. 6, February 2016



How physical and transition risks impact business

Physical risks

The physical impacts of a changing climate can have many and varied direct and indirect implications for business. As our company research has shown, extreme weather events can disrupt business operations and thus affect the bottom line - cyclones may halt mining production, extreme heat can cause data centre outages, or a severe snowstorm can shut down an airport for days. However, many examples of physical climate-related impacts are less immediately visible.

Longer term shifts in the climate can often present risks that are more challenging to mitigate against. Past research undertaken by our specialist ESG team Regnan has found that permanent changes in rainfall patterns and increased temperatures, for example, have significant impacts on agricultural productivity. Those businesses which doesn't inform strategy with climate-informed adaption options, including geographic and product diversification, may see a permanent decline in profits. Conversely, those which can adapt will be better placed competitively. A changing climate also impacts consumer demand - those businesses that don't pay attention to emergent trends from changing seasons and weather patterns may risk being caught out. For example, shorter winters can leave retail businesses with surplus winter stock, while wetter summers may reduce demand for outdoor entertainment.

Past Regnan research has also shown that these exposures can also occur indirectly through supply chains, insurance affordability or lending and investment activity. A supermarket operator, for example, may not be forced to close stores due to a cyclone, but transport access for its suppliers may be impacted. A bank may be carrying a high exposure to mortgages for properties on flood plains, creating a greater credit risk as large scale events become more frequent, especially if insurance were to become cost prohibitive.

Physical impacts of climate change will also impact human health and wellbeing in a number of ways. This, in turn, will impact the economy. Extreme weather events from floods to bushfires can result in loss of life, which is often publicised. Heatwaves will increase as climate change progresses: already heatwaves have caused more fatalities than any other natural hazard in Australia over the past 100 years.³ Other threats to human health and wellbeing include but are not limited to: climate-driven changes in the patterns of infectious disease transmission; lower air and water quality; and impacts on mental health (e.g. we know that prolonged drought can impact the mental health of those in agriculture-dependent areas).

³ Department of Agriculture, Water and the Environment, 'Climate change impacts in Australia', [Available: <https://www.environment.gov.au/climate-change/climate-science-data/climate-science/impacts>]





Real world examples

- Flooding in North Queensland in 2019 impacted the rail supplier for chemical company **Incitec Pivot**, resulting in \$115m of lost sales. With no means to transport product out of its Phosphate Hill facility, operations were shut for 3 months.*
- **Huon Aquaculture**, a Tasmanian salmon farming business, reported in FY2019 an 11% reduction in revenue largely due to its salmon harvest being reduced by 1/5th caused by a marine heatwave and resultant negative impact to fish health and growth rates. The company has invested in farming pens further offshore in cooler waters.#
- For **Suncorp Group**, the record-breaking bushfire season over summer 2019/20 after a prolonged drought resulted in more than 2,600 bushfire-related claims, costing the insurer well over \$300 million. This, in part, contributed to group revenue falling 6% in the second half of 2019.^

* Incitec Pivot Limited Annual Report 2019

Huon Aquaculture Annual Report FY2019

^ Suncorp Group bushfire and natural hazard update, 9 January 2020; Suncorp Group HY20 Results Announcement

Transition risks

Transition risks are particularly relevant to companies that are more carbon-intensive or, in other words, that contribute to relatively higher carbon emissions, either directly or indirectly. There are three categories, or scopes, of emissions relevant to business - Scope 1, 2 and 3. Scope 1 emissions are direct emissions from their operations (e.g. from energy production or manufacturing), Scope 2 emissions are the indirect emissions from purchased energy, while Scope 3 refers to all other indirect emissions (from purchased goods through to transportation). Note that one company's Scope 3 emissions will also be the Scope 1 or 2 emissions of other entities.

Companies with higher Scope 1 emissions, for example energy generators or airlines, have a greater medium term exposure to regulatory and litigation risks due to having direct liabilities. They would be most affected by mechanisms such as a carbon tax and, as they have direct operational control of emissions, any harm caused by their business activity can be more readily traced. It is this same operational control, though, that means these companies have a greater ability to mitigate these risks.

For those that are heavy users of purchased energy - Scope 2 emitters - some risk mitigation may be achieved through securing green power sources or improving energy efficiency. Regulatory risks remain, with a high likelihood of carbon pricing and any such costs likely to be passed through.

Scope 1 and 2 emissions can often provide a limited view of a company's contribution and exposure to climate change. For some, the most significant emissions come through indirect Scope 3 emissions - those produced, for example, over the lifecycle of a product, from shipping a supplier's materials, from turning iron ore into steel, or the emissions associated with lending to emissions-intensive industries.

These can be either upstream or downstream and there is often limited ability for a company to control such emissions. As carbon pricing takes hold around the world, the company in question may face impacts such as their suppliers passing through costs or customer demand changing in response to cost increases.

A low carbon economy will not be achieved without technological developments. Advances in clean energy generation, energy efficiency, lower-carbon product alternatives and carbon capture and storage (CCS) are just some of the ways technology will be used in the transition. These developments will leave some businesses vulnerable to disruption and loss of market share. Take, for example, the automotive industry - the rise of electric vehicles (EVs) is disrupting the conventional internal combustion engine car, creating risks for those who are slow to respond.

Changes in regulatory settings and market dynamics associated with this transition are expected to increase the risk of 'stranded assets'.

Stranded assets are those assets (e.g. equipment or resources) that at some time prior to the end of their expected economic life are no longer able to earn an acceptable (or any) return, and are subject to premature write-down or conversion to liabilities.

This may be due to changes in technology, policy and/or market dynamics. In the case of a thermal coal producer, for example, advances in technology making greener alternatives more cost effective, combined with the government introducing tougher emissions standards, and/or changing consumer preferences for low-carbon energy, would likely make the producer's assets stranded. It is worth noting that physical impacts may also result in stranded assets, for example, if an asset is in proximity to a low-lying coastal area subject to rising sea levels.

Another consideration of growing importance for businesses as climate change progresses is reputation risk, or the concept of 'social licence to operate'. Those companies that are seen to be contributing to climate change, and not reducing emissions in a manner commensurate with their impact to support the energy transition, will be exposed to reputational risks. This is also true for companies which facilitate high-emitting industries, even if their own direct contribution to emissions is low. For example, Greyhound Buses faced a swift and forceful activist campaign after it announced a contract to transport workers to support the development of the Adani coal mine in Queensland. It subsequently announced that the contract would not be extended. Further, this includes companies that are seen to be deliberately blocking climate action, either directly or via lobbying activities undertaken by industry associations of which they are a member.

Opportunities for business

Climate change is not all downside risk. For some businesses, there will be opportunities created in transitioning to a low carbon economy, or where their products or services assist in adapting to climate change.

Companies which support energy efficiency, renewable energy generation and other solutions to support the transition will be well positioned to capitalise on increased demand. Those businesses whose goods or services support others to enhance resilience and climate change adaptation will also be likely to benefit financially. This may be, for example, responding to emerging community needs for buildings and infrastructure better able to withstand extreme weather, or agricultural companies which effectively adapt to climate change and are better placed than competitors.

In some cases, climatic shifts might make some regions more conducive to economic activities which previously were not viable. For example, some subarctic regions which are becoming more temperate are unlocking increased agricultural opportunities in the short term.

Real world examples

- With end of life approaching for the aging coal plants that produce the bulk of its electricity, **AGL Energy** must secure new sources of low carbon energy to meet future customer demand. Renewables projects are typically on a much smaller scale than traditional forms of generation, so many new projects will be required - both directly funded and power purchase agreements. At the same time customers are seeking smart, affordable energy offers with green options. Transforming from a set-and-forget utility to a customer centric innovation culture is key for AGL.
- **BHP Group** has diversified and refocused the minerals it produces to those well placed for a carbon-constrained future. Despite its remaining coal assets being low cost and high quality, negative stakeholder sentiment to thermal coal and thus stranded asset risk remains. Full divestment is under consideration following peer Rio Tinto's full exit from coal in 2018.
- Most of **Fortescue's (FMG)** iron ore is consumed alongside large amounts of coal in steel making. The resulting high emissions of FMG's customers could present risks to future demand for its iron ore under a carbon-constrained future, especially if alternative products or steel making technologies emerge. It's not surprising then to see FMG turn its attention to the emergent technologies for green hydrogen production - hydrogen suits the company's own operations (it can be used as a fuel for mining machinery and shipping) as well as having potential to displace coal in steel making and reduce its customers' emissions.

Managing climate-related risks

There are a number of tools at the disposal of both companies and investors when it comes to managing climate-related risks. The first, and perhaps most obvious, element of managing such risk is to properly understand them and how they will apply to each organisation, including how this might change over time. Identifying and analysing these risks to identify those most material will in many cases require capabilities and information sources not previously necessary in business and investment management.

Useful to understanding where exposures lie and supporting more informed decision making is scenario analysis and stress testing. While not new to businesses, especially lenders and insurers, here scenarios and stress testing look at potential transition pathways, and differing trajectories of temperature change and the associated physical risks from climate change. Well known organisations such as the International Energy Agency (IEA) and IPCC have developed scenarios to help in modelling future conditions.

Assessments can be undertaken on a granular level, such as stress testing individual assets. For example, a company might consider the worst natural disaster which impacted its operations and model what it would mean for the bottom line if that kind of extreme event happened more regularly. Also, a company may model for an expected increase in levels of water inundation from storm surge at a specific site as a result of sea level rise and increased intensity of storms. As climate change progresses, though, future weather events may be worse and so historical data is unlikely to be sufficient.

Companies can also support risk management by utilising 'shadow' or internal carbon pricing. This can support more informed business decision making as, for example, capital allocation decisions factor in likely future price changes. This applies whether or not regulation is currently in place to price carbon - it is likely that today's prices will be too low over the life of an asset. Internal carbon pricing gives business an incentive to shift to lower-carbon alternatives and to prepare for tightening emissions regulation.



It's especially important for more carbon-intensive companies to find ways to reduce emissions or 'decarbonise'. Whether this is done via greener energy sources, reorienting the business towards lower-carbon activities, or investing in meaningful carbon offsetting, will depend on the company's individual operating environment.

To address the physical risks of climate change, companies will need to consider their resilience, implementing measures to mitigate exposures and/or to support adaptation. For some, this might be about expanding their operations to diversify the climatic zones and geographies in which they operate, or taking steps to secure future water supplies. For others, it could relate to diversifying the supply chain in a manner that is climate-aware, or retrofitting real assets so they can better withstand extreme weather events.

Additional factors driving companies to manage climate risk

Regulatory scrutiny

Regulators around the world are rapidly increasing their scrutiny of climate-related risk management, both within business and investments. Australia is no exception, with all financial regulators having stepped up activity and public commentary on climate risk in recent years, including clarification on application of existing guidance when it comes to climate change. All local financial regulators come together as the Financial Council of Regulators, which has formed a climate risk working group, in addition to work being undertaken separately by each regulator.

Legal developments

Well known lawyers and legal commentators in Australia have signalled climate change will not only increasingly be seen as a foreseeable financial risk under the Corporations Act, but climate-focused litigation will be on the rise.

The most well-known legal opinion released locally to date was authored by Noel Hutley SC and Sebastian Hartford-Davis; it focuses on climate change and the duties of company directors as contained in the Corporations Act. Most notably, they argue, company directors can, and in some cases should, be considering the impact on their business from climate change risks, which they argue would be considered foreseeable in the eyes of a court. Further, directors who fail to consider such risks now could be found liable for breaching their duty of care and diligence in the future.

Push for disclosures

A wide variety of stakeholders are increasingly seeking greater detail from companies in their public disclosures on both their impact on climate change as well as how they are managing the risks (or opportunities) they face. Stakeholders include investors, regulators and environmental groups, with each often seeking disclosures for different ends.

Investors in particular seek decision-useful, forward-looking information on the expected financial impacts of a changing climate on a company. The 2017 recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) - a Financial Stability Board-affiliated organisation - provide a framework for companies (and investors) to do just that. The recommendations of the TCFD have rapidly become the 'global standard' for voluntary climate disclosures, endorsed by many regulators around the world.



While the framework focuses on guidance for financial risk and opportunity reporting, the intention is for the disclosure process to support enhanced risk management and incorporation of climate considerations in company strategy and other decision-making.

Environmental groups, on the other hand, focus on disclosures which detail companies' contribution to climate change, such as emissions or involvement in deforestation. This information sought feeds into public policy lobbying as well as environmental activism, such as social media campaigning. A subset of these groups are so-called shareholder activists, which have increasingly been using forums such as annual general meetings (AGMs) and other corporate governance mechanisms to get climate change on the agenda.

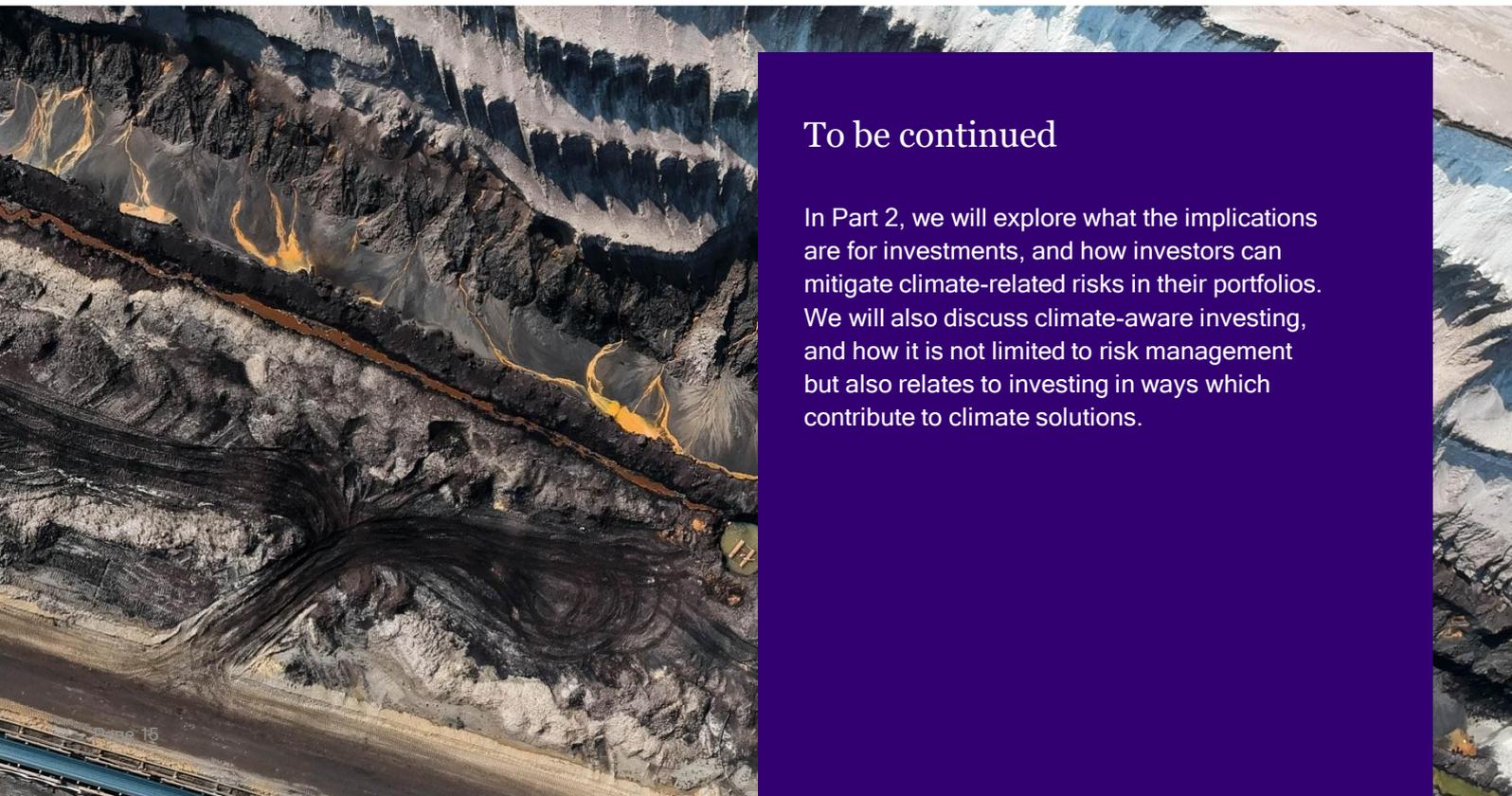
Finance sector collaboration

Around the world, coalitions of financial market participants and other industry initiatives have steadily put climate change on the agenda over the past decade or so. This has helped raise awareness of the financial materiality of climate change, and helped create forums for knowledge sharing and capacity building to enable better management of climate-related risks.

Some focus more generally on all ESG risks, of which climate change is one, such as the Principles for Responsible Investment (PRI), while other initiatives have targeted climate change specifically, such as Climate Action 100+ which is a global engagement program focused on the world's most significant carbon emitters, and the Australian Investor Group on Climate Change (IGCC) which advocates for government policies and investment practices to address climate change.

To be continued

In Part 2, we will explore what the implications are for investments, and how investors can mitigate climate-related risks in their portfolios. We will also discuss climate-aware investing, and how it is not limited to risk management but also relates to investing in ways which contribute to climate solutions.



Responsible investing at Pental

Responsible investing is part of our heritage and is a natural extension of our active approach to investments. Today, investors entrust us with \$3.2 billion in dedicated ethical, sustainable and impact strategies.

Pental has a proud 35-year heritage in responsible investing, extending back to the launch of the Pental Sustainable Balanced Fund in 1984.⁴ Since then we have progressively enhanced our consideration of ESG issues in both fundamental analysis as well as specific strategies.

Supporting our responsible investment capabilities is our specialist ESG team, Regnan. After a long history together, Pental assumed full ownership of Regnan in 2019, bringing the team under the Pental Group umbrella as an independent business. Regnan continues to provide ESG services to some external parties.

Today, Regnan's team of highly experienced ESG research and engagement experts supports Pental through tailored research, analysis and advisory services, as well as representing Pental in its collective engagement program.

Regnan is now core to responsible investing at Pental. Not only does the team support our existing ethical and sustainable funds, as well as our ESG integration needs, it is now launching products with Pental under the Regnan brand.



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⁴ This fund was launched by the Bankers Trust group in 1984 as the BT Australia Charities Trust. Pental Fund Services Limited (previously known as BT Investment Management (Fund Services) Limited) became the responsible entity of this fund in 2007.