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Value of Integrating Climate Risk Across the Business

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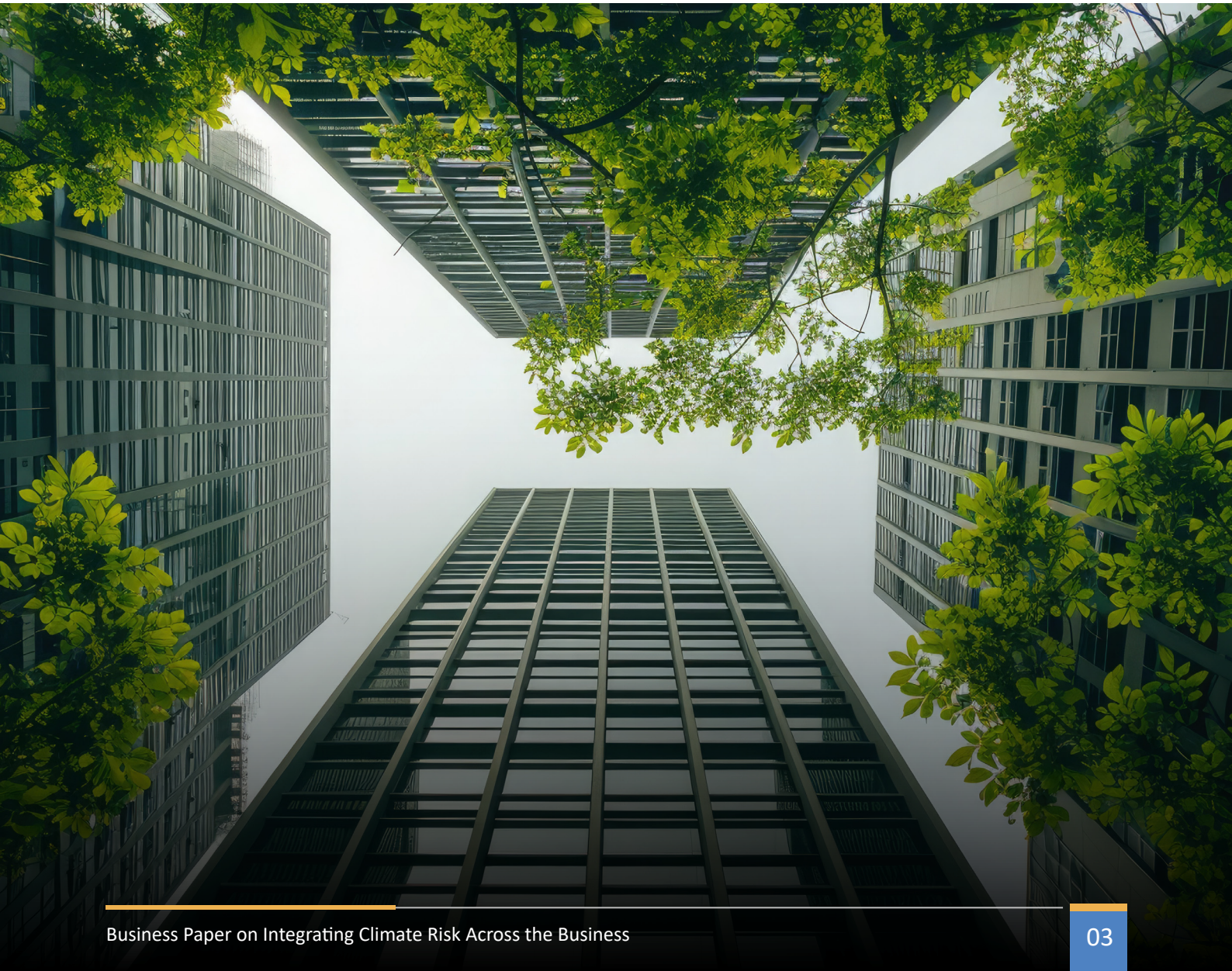
Executive Briefing

Mandatory climate reporting has officially arrived for Australian businesses and with it, a monumental change to the corporate reporting landscape. The introduction of AASB S2 Climate-related Disclosure (AASB S2) to the Australian regulatory landscape from January 2025 provides a catalyst for Australian businesses to ensure climate risk is embedded at the heart of corporate strategies and decision making. In essence, becoming an integral and accepted part of corporate processes and governance.

In response, the TCS GoZero Hub, a collaboration between TCS and Macquarie University, have produced the 'Value Of Integrating Climate Risk In Business' report which helps Australian businesses understand the benefits of viewing climate risk management through a value driven lens rather than focusing on compliance and disclosure in isolation.

The report provides a deep dive into developing a best-in-class climate risk management framework, outlines how to integrate climate risk across all functions of the business to generate improved business outcomes, showcases industry leading best practice case studies, and identifies what the next steps needs to be for your business.



AASB S2 – A catalyst for integration of climate risk across the business

Mandated or not, one of the most powerful actions a company can take today, is to shift its mindset on climate risk from one of compliance and an additional task that sits separate to the business to one of value generation that is fully integrated across all aspects of business decision-making.

Addressing climate risks that are relevant to your business presents a unique opportunity to innovate, adapt, and thrive in a changing world. Physical risks, such as more frequent and severe extreme weather events, and transitional risks, like regulatory changes and shifting market preferences, can serve as catalysts for transformation and resilience.

Armed with the right knowledge, technology and partners, companies can use this moment to build organisational resilience and reputation and drive long-term shareholder value in a world that needs to shift to rapid decarbonisation.

Benefits for a company integrating climate risk into decision making

Long term viability

Identifying which parts of direct operations and the value chain are most vulnerable to climate risks, both physical and transitional, will enable companies to be active rather than reactive. This can ultimately lead to better financial performance and protect the organisation's long-term resilience

Strengthen stakeholder relationships

Building climate change transparency and accountability will cultivate stakeholder trust within the organisation, with suppliers and customers externally through collaboration to introduce climate considerations into related contracts or products, as well as with the community through knowledge sharing engagement and collaboration

Access to capital

Investors are increasingly prioritising climate-conscious companies. Climate-related disclosures inform investors not only on risk and financial impact but also how a company is integrating climate into all aspects of their business (e.g., the details outlined in a Climate Transition Plan). This in turn reduces uncertainty and positively influences a company's investment attractiveness. This level of information also makes it more likely to qualify for sustainable financing which often comes with lower interest rates compared to traditional financing options.

Capitalise on emerging market opportunities

By necessity, companies need to identify the value of climate opportunities when aligning with reporting requirements. This means that by integrating climate risk and opportunities into existing ERM frameworks and business strategies, businesses can identify new markets and growth sectors with increasing demand for sustainable products and services and drive innovation within their products and services. This in turn can help to drive a competitive advantage in the market

Strengthening IT infrastructure

Using climate risk as a driver, businesses can refine existing IT systems to improve the comprehensiveness, rigour and traceability of data for reporting, real-time monitoring and advanced analytics. Businesses can also access specialist tools and external data sets to support the process and decision making, and enhance the effectiveness of climate risk management in an enterprise.

The key to climate-risk integration sits with the Board and C-Suite

If a business holistically shifts the mindset from one of compliance to one of value creation, then addressing climate risk becomes so much more than a compliance tick box exercise and rather creates a unique opportunity for businesses to innovate, adapt, and thrive in a changing world.

A strong governance framework is key to unlocking these opportunities. However, success also depends on recognising and leveraging the unique contributions each C-suite member can make in building a governance structure that effectively addresses the risk requirements.

Board	CEO	CFO	CRO
Governance and Oversight: Ensure compliance with AASB S2 and integrate climate-related risks and opportunities into the company's strategy and forecasts. **Strategic Direction and Resource Allocation:** Set climate-related targets, align them with long-term goals, and allocate necessary resources. **Risk Management and Reporting:** Set the company's risk appetite and oversee the evaluation, monitoring and visibility of climate-related risks, to ensure accurate and timely disclosures The **Directors' Declaration** is a critical part of the AASB S2 disclosure report that must be signed off by the Board. The declaration confirms that the climate-related disclosures (such as the climate statement and notes) comply with AASB S2 and the Corporations Act	**Leadership and Vision:** Set the tone at the top, integrating sustainability into the company's vision and strategy. In essence becoming the climate protagonist fosters a culture of sustainability, and encourages innovation to address sustainable outcomes. **Resource Allocation and Operational Oversight:** Ensure necessary resources are available and oversee the implementation of climate-related initiatives across the organisation. **Stakeholder Engagement and Reporting:** Engage with stakeholders and ensure accurate, timely climate-related disclosures	**Financial Oversight:** Quantifies the financial impact of scenario analysis and climate risks and opportunities on cash flows, access to finance, and cost of capital. **Data Management and Reporting:** Oversees the collection, analysis, and reporting of climate-related financial data, ensuring the completeness and accuracy of disclosures **Collaboration:** The CFO works closely with other executives to align the company's climate-related strategies with its overall business objectives. E.g., setting and monitoring climate-related targets and ensuring that these targets are integrated into the company's financial strategy.	**Risk Identification and Assessment:** Responsible for identifying and assessing both climate-related physical risks (e.g., extreme weather events) and transition risks (e.g., regulatory changes) that could impact the company's operations and financial performance. **Integration into Risk Management Framework:** Developing and implementing strategies to mitigate climate, monitoring their effectiveness through integration into the company's overall risk management framework. **Collaboration:** The CRO collaborates with other executives, such as the CFO and CEO, to ensure that climate-related risks are accurately reported and disclosed E.g., Providing input on the financial implications of climate risks and ensuring that disclosures are comprehensive and transparent

CHRO	CIO	CSO	CXO
Enable Value-Driven Mindset Across the Organisation: Shifts individual and organizational mindsets to prioritise climate risk prevention, preparedness and adaption. Implements measures to protect the workforce from climate risks. And also integrates climate-related goals into performance management systems to encourage active contribution to the company's climate initiatives and reward. **People Strategy:** Embed climate risk literacy across all organisational levels. This can be supported by delivering awareness and training programs to educate stakeholders on climate risks and sustainability goals. **Leadership, people & culture:** In collaboration with the CxO, develop a leadership model that enables organisations to foster the right competencies and align on purpose, values and programs, and extend this ethos to all individuals associated with the company, including contractors and suppliers.	**Data Management and Integration:** Ensures the company's IT systems can effectively collect, manage, and integrate climate-related data from various sources. **Technology Solutions:** Identifies and deploys technology solutions that support the company's climate initiatives. E.g., The integration of AI to analyse climate-related risks and opportunities. **Cybersecurity and Data Privacy:** Ensures that climate-related data is secure and that the company complies with data privacy regulations. **Collaboration:** The CIO collaborates with the CFO, CRO, COO, and CEO to integrate to align IT strategies with the company's climate goals.	**Strategy Development:** Lead the development and implementation of the company's climate strategy. **Stakeholder Engagement:** Engages with internal and external stakeholders, including employees, investors, and regulators, to communicate the company's sustainability efforts and gather feedback. **Data Collection and Reporting:** Will typically oversee the collection, analysis, and reporting of climate-related data. **Collaboration:** The CSO will fostering strategic alignment, through joint planning sessions *We could also think of the CSO as the Chief Enabling Officer. Their role is not to do everything, but rather to develop frameworks, establish appropriate governance and enable the business transformation.*	**Integration Across the Business:** Ensures the company's CTAP and supporting strategies are integrated across the business and communicated effectively to customers, enhancing transparency and building trust. **Experience Integration:** Ensures the integration of climate-risk is a core part of the company's value proposition. **Stakeholder Feedback:** Gathers and analyses feedback from stakeholders regarding how a company is addressing climate risk and uses this information to improve CTAP and other supporting strategies **Collaboration:** The CXO collaborates with the CEO, CFO, COO, and CRO to align customer experience strategies with the company's climate goals, and manages climate-related risks impacting customer experience.

What are the million-dollar climate questions the Board and C-Suite should be able to answer?

As well as understanding the role that the Board and C-Suite need to play it is also important to know what questions they should be able to answer when discussing climate risk. The below questions reflect the type of disclosures that a business will be expected to answer when meeting AASB S2 or other climate-related disclosure requirements:

- How is the board balancing short-term financial results with long-term viability and resilience?
- How has the business aligned climate risk, net zero goals and business strategies?
- What information is supporting the board to evaluate both physical and transition climate-related risks? Is the assessment multi-generational and how are these risks integrated into the organisations?
- Where has the business identified material threats and opportunities for growth because of climate risk process management?
- How has management addressed factors such as inherent climate-related risks in the supply chain?
- How has the business addressed financial implications of emissions pricing?
- How will climate change impact the business' access to capital and insurance?
- What revisions to internal controls and assurance functions has the business made to increase rigour and reduce the increasing threat of greenwashing and litigation given discoverability?
- How has the business, driven development of capability across different roles and different business functions?

Cutting through the noise. Simplifying the integration of climate risk

Understandably, like any topic, climate comes with its fair share of terminology that can feel foreign even to those fluent in the typical language of business. However, when climate risk acronyms and scientific terms are demystified, what is left is a very simple question –

'What impact will a changing climate have on the financial viability of your business, and what are you doing to reduce the risks, take advantage of the opportunities and drive authentic and credible communications for all stakeholders'?

When you realise, that climate risks, such as supply chain disruptions, operational inefficiencies, and market shifts are ultimately familiar financial risks, you understand that addressing climate risk is not about creating entirely new governance structures and risk management frameworks, but rather integrating climate risk into existing frameworks.

That being said, there are undoubtedly challenges that businesses face in truly prioritising climate risk. However, companies can address these by adopting a whole-of-business mindset and approach, embracing a culture of change and innovation to overcome any barriers they face:

Improve climate literacy:

You cannot manage what you do not measure, and you cannot measure what you do not understand. To manage climate risks effectively, it is essential to embed climate literacy across all organisational levels. This means integrating climate knowledge within stakeholders' functional skills, introducing cascading climate KPIs from leadership to business units, incorporating climate risk into daily activities and building the risk culture within the organisation. This can be supported by delivering awareness and training programs to educate stakeholders on climate risks and sustainability goals, and engaging industry experts to provide up-to-date information through seminars, and mentoring support for new board members and leadership.

Determining organisational maturity:

Businesses today recognise climate as a key business risk but their experiences and successes with building a climate related mindset into the business vary significantly. In shaping the next phase of improvement for your organisations journey, we believe assessing organisational maturity across areas such as (but not limited to), governance and capability development, undertaking scenario analysis and building climate transition plans and the extent of integration with ERM and business functions, is a logical next step that will set companies up with a plan to improve the strategic climate based capability and help to prevent a sense of feeling overwhelmed.

Accept progressive enhancement of solutions, not immediate fixes:

Identifying and addressing climate risks requires a multi-pronged approach due to their long-term, evolving, and interconnected nature. Develop short, mid, and long-term time horizons that account for the useful life of assets, align climate risks with existing business risk appetite, and test business resilience against future climate scenarios. It is ok to start this as qualitative, with the goal of shifting to more quantitative analyses as your understanding matures. Set interim milestones to support longer-term targets and continuously update and engage with a broad set of stakeholders to ensure that evolving risks and opportunities are not overlooked.

Embrace flexible strategic leadership:

Uncertainty in climate science should not be ignored but can be managed by embracing the strategic flexibility that allow leaders to remain responsive to new information and reactive to changing conditions. Developing risk leadership from the board level to ensure appropriate capital allocation to achieve climate targets and collaboration internally and externally to ensure comprehensive strategic planning and effective cross functional accountability is established. Aligning a business's purpose and goals, through climate-related insight and transparent communication about uncertainties, showcases a proactive approach to sustainability that creates confidence among both employees and stakeholders.

Understand what a 'good' Climate Transition Action Plan looks like:

A successful Climate Transition Action Plan requires strong climate literacy and leadership among the Board and Executive to drive progress. It needs to have time-bound, verifiable science-based targets (ideally with third-party verification), defined governance structures with clear responsibilities, stakeholder engagement plans, and planned investment that details the cost of the transition strategy. It should also establish mechanisms for monitoring and reporting progress - and where relevant, focus on engaging with policymakers to shape and respond to climate-related policies and regulations.

Effectively use IT systems to empower a data driven approach:

Businesses can significantly enhance climate risk management by leveraging IT systems for precise data integration and AI for advanced predictive insights, while ensuring robust data quality, privacy, and comprehensive ESG disclosures. Having accurate data and predictive functionality enables companies to monitor vulnerabilities and adapt mitigation strategies based on scenario analysis and stress testing.

For a more detailed understanding of the value of integrating climate risk please refer to Section 1 and how to successfully assess, manage and integrate climate risk across the business please refer to Section 3 and 4 of the full report

Where to from here

Climate change is a pressing reality that presents significant opportunities for businesses to innovate, adapt and lead in a sustainable future. However, turning climate risk into a value creation requires strong leadership to drive transformational change.

For the systemic shift for a decarbonised future, collaboration and technology will be vital and no organisation can achieve this alone. The TCS Go Zero Hub is here to provide additional support to help companies at all stages of their journey. By sharing knowledge, generating ideas and collaborating on low-emission solutions, business can create mutually beneficial outcomes.

Purpose Of This Paper

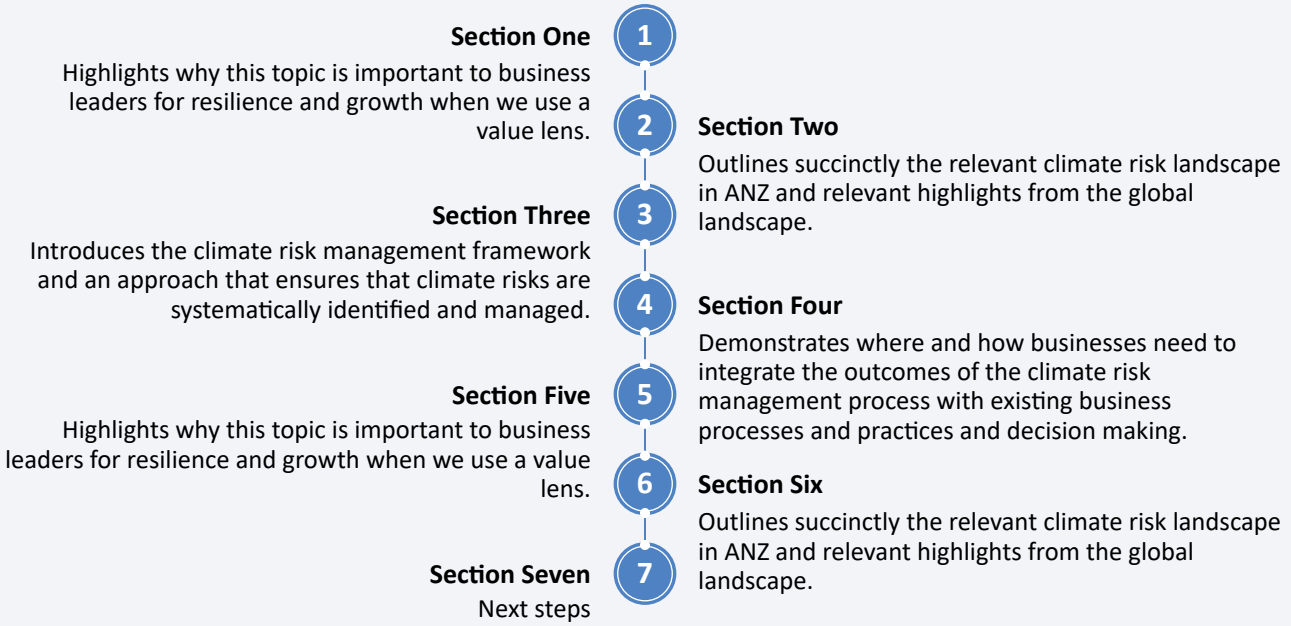
The **Integrating Climate Risk with the Business** initiative is the first collaboration between Tata Consultancy Services Ltd (TCS) and Macquarie University's (MQU). The TCS **Go Zero Hub** (GZH) aims to bring together research, innovation, education and consultancy expertise to support organisations in their journey towards a net zero carbon future. TCS and Macquarie University also acknowledge the engagement of Stockland Corporation Limited, Downer EDI Limited and an Australian electricity generation and retailing company in providing their content and expertise to develop this report.

The introduction of AASB S2 Climate-related Disclosures to the Australian regulatory landscape from January 2025 requires effort across all organisations, even the more advanced, to ensure effective implementation. As a result, the team have collaborated to develop this paper with the aim of demonstrating the benefits of viewing climate risk management through a value driven lens rather than a compliance, disclosure and reporting focused approach.

We believe that approaching climate risk management proactively, using a whole of business approach, will help ensure a more resilient business that is better placed to build long-term stakeholder value in a rapidly decarbonising world.

This paper was written for companies earlier in their Climate Risk Management journey. It will help business executives - CEOs, CRO, CFO, CSO and all CXOs - consider the value of building and integrating a climate risk-adjusted lens to the value that can be created when organisations change from compliance and risk mindset to a risk and opportunity mindset.

The paper has been structured in a manner that will help the audience best navigate those sections relevant to their role and responsibilities.



In closing, it is important to note that while the change in Australian climate risk disclosures triggered the collaboration to develop this paper, the content on why it is important for businesses to integrate, the process, integration and best practices are globally relevant.

NOTE: While Assurance and Scope 3 are part of AASB S2 Climate-related Disclosures requirements they have not been addressed in this document.

1. Valuing Integration Of Climate Risk Into The Business

Executing robust climate risk assessments and developing robust response plans are important actions in managing a resilient business. However, there is much greater value to be harnessed beyond compliance. A proactive approach that builds a 'climate risk lens' into shaping the corporate and business unit strategy will result in benefits ranging from improved decision-making, to Improved financial performance, better access to capital, new opportunities for business growth, the cultivation of stakeholder trust and ultimately enterprise value enhancement.

Climate is reshaping the business landscape of today and tomorrow. Extreme heat, catastrophic flooding, wildfires and droughts have become more certain events, globally and in Australia, and the vulnerability of our businesses, people and future economic value as a nation is becoming increasingly evident.

Role of leadership

Traditionally, the focus of Boards, CEOs and CXOs has been on driving competitive advantage, resilience and growth. Today, there is an increasing need for corporates to address climate change, biodiversity loss and social inequity using a long-term, commercial, multi-stakeholder, purpose-led lens.

The urgency to adapt to, and mitigate for, climate change as business leaders reaches far beyond new regulations for disclosure on climate related risks and financial implications. The most successful and resilient companies look at climate risk management not as a mandatory, compliance-driven, 'tick-the-box' reporting exercise but instead a means to enable the resilience of their business operations and improve investment decisions to address physical and transitional climate risk.

Visionary corporate leaders embrace climate risk in an integrated manner that proactively considers the impact on enterprise revenue, cost, risk profile and ultimately the opportunity to demonstrate how the business will build long-term stakeholder value in a rapidly decarbonising world.

Climate risk

Climate risk is actively considered as both physical risks - extreme weather events, rising sea levels that can impact business continuity and transition risks - regulatory changes, market shifts and evolving consumer choices and each type of risk requires detailed assessment and mitigation. While much has been done globally and regionally to build the momentum towards a low-carbon economy that helps reduce climate change, progress remains slow, and scrutiny of information disclosed is increasing.

Role of government

Effectively arresting the impact of climate change requires systemic change across all stakeholders. Governments play a significant role in providing direction and certainty to enable business commitment along with the transition and transformation required.

In Australia, federal government initiatives such as development of the Net Zero Plan and setting of a 2035 target, the Sustainable Finance Strategy, Sustainable Finance Taxonomy (planned December 2024), and legislation[1] changes have all been recent changes. The later introduction of sustainability reporting standards (AASB S2 Climate-related Disclosures) supporting climate-related disclosures came into effect in September 2024 in Australia, and are in line with the IFRS Foundation's climate-related disclosure standard IFRS S2. The global landscape of Climate and Sustainability disclosure has continued to evolve rapidly and an example of this is the indication from International Accounting Standards Board (IASB) that companies should disclose material emerging environmental risks, such as nature-related, biodiversity risks, in financial statements. Please see Section 2 for further detail.

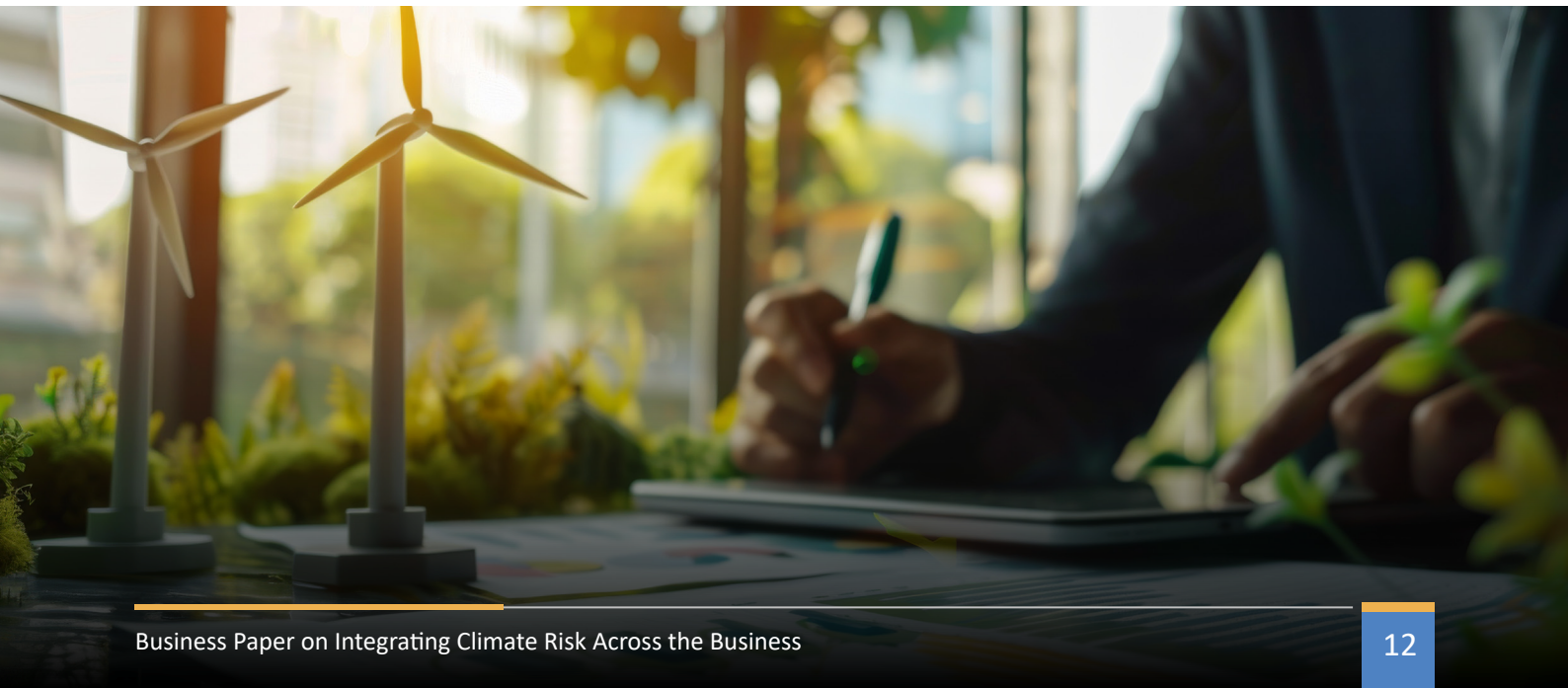
These significant reporting changes help ensure a standardised approach for Australian businesses in communicating how climate change affects their business and financial standing for stakeholders. This transparency will build trustworthiness and possibly competitive advantage at a company level but also has the potential to affect Australia's global positioning and attractiveness for investment and trade partnership.

Material areas of business value

At the **Go Zero Hub**, we believe an integrated approach to Climate Risk Management is imperative to unlocking greater value and opportunity than addressing climate risk in isolation and Section 4 of this paper focuses on some of the detailed areas for attention.

Figure 2 demonstrates how organisations can view climate related risks and opportunities as being centre stage to organisational adaptation and resilience.

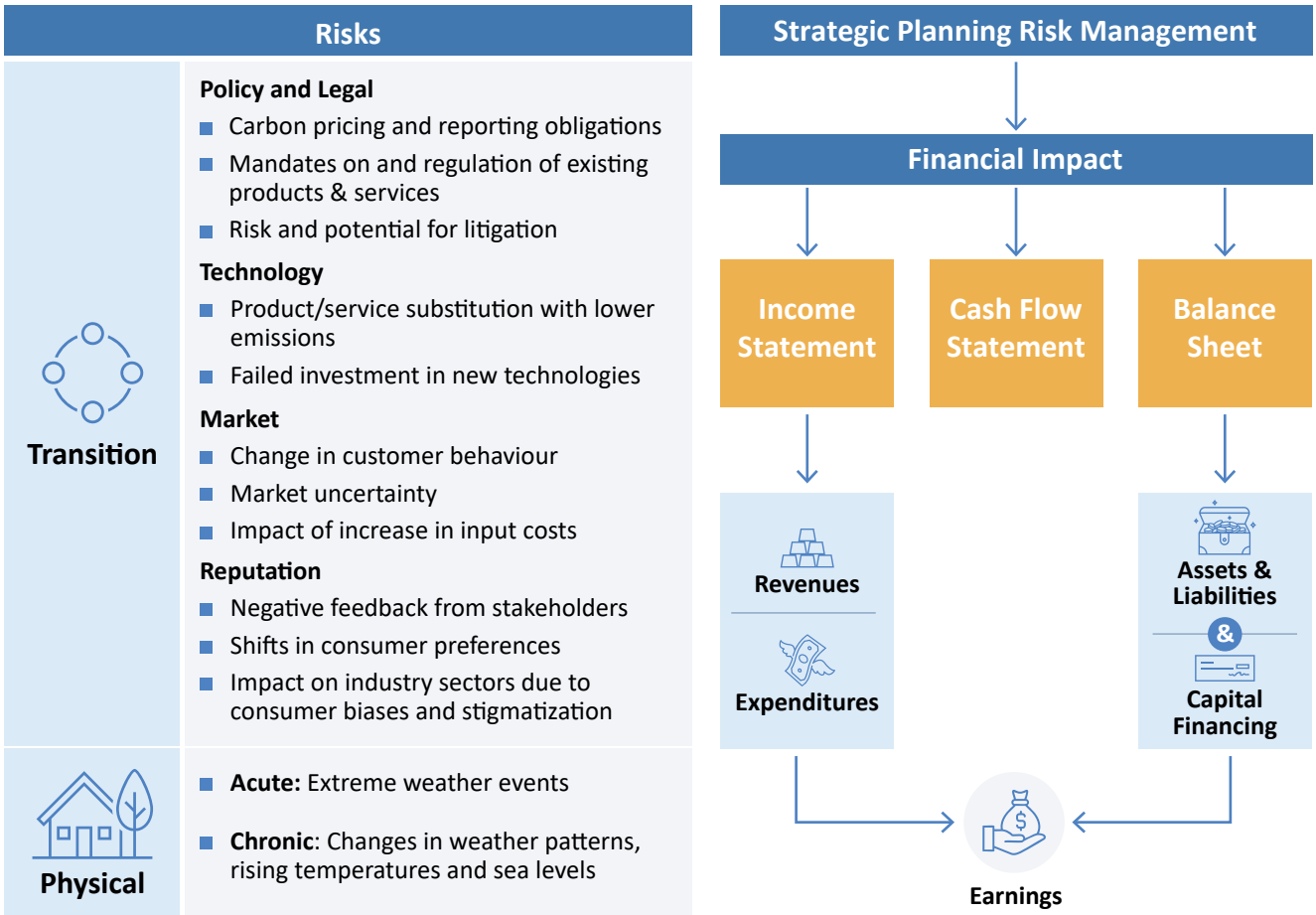
[1]Treasury Laws Amendment (Financial Market Infrastructure & Other Measures) Act 2024



Climate-related risks and opportunities

TCFD has identified several categories of climate related risks and opportunities. These include potential financial impact to assist investors and companies consider longer term strategies and most efficient allocation of capital in light of the potential economic impacts of climate change.

"Climate change presents global markets with risks and opportunities that cannot be ignored, which is why a framework around climate related disclosures is so important. The Task Force brings that framework to the table, helping investors evaluate the potential risks and rewards of a transition to a lower carbon economy."
Michael R. Bloomberg, TCFD Chair and Founder of Bloomberg LP and Bloomberg Philanthropies June 2017



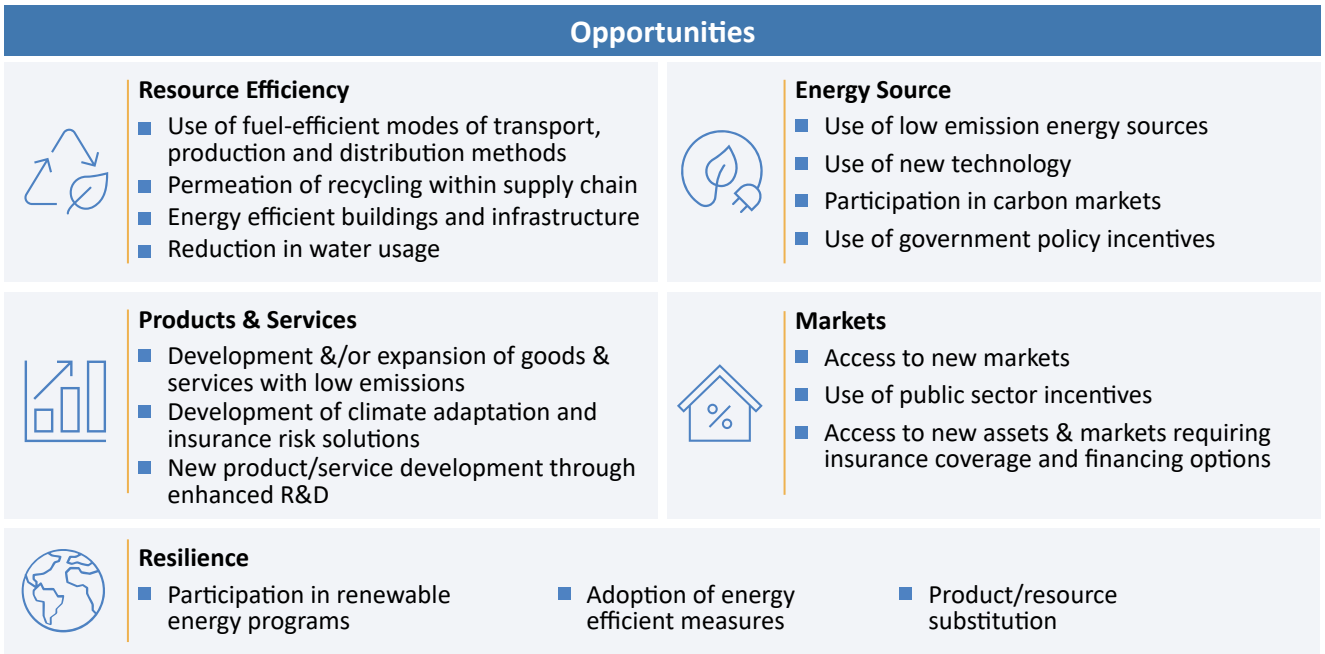


Figure 2: Climate-related risks and opportunities and linkage to business viability

The following outline the key areas of value for the business:

Effective risk mitigation and transition planning:

Embedding climate mitigation and climate adaptation in strategic and operational decision-making processes, as well as in investment prioritisation and decision making will help businesses better prepare for climate events and manage value. Strategies focused on reducing GHG emissions could include transition to a low-carbon economy, adopting renewable energy sources, improving energy efficiency and implementing sustainable practices. They may also include modifications to existing infrastructure, implementing early warning systems, planning alternative land use, building natural ecosystems and promoting community resilience.

Section 3 of this document delves further into climate risk management along with referencing cross-functional approaches that unify business, risk, finance and sustainability functions to effectively address Climate Risk.

Avoidance of compliance issues and liability:

AASB S2 as well as APRA's Prudential Practice Guide (CPG 229 Climate Change Financial Risk) emphasise the requirement for organisations to disclose information about both current and anticipated climate-related impacts on their business model and value chain (para 13, AASB S2), strategy and decision making (para 14, AASB S2) and actual and anticipated effects of those risks and opportunities on financial performance (para 15-21, AASB S2). Disclosure of climate related resilience and scenario analysis is also required as per AASB S2 (para 22).

Disclosure litigation is posing a new threat for enterprises where improper or poor-quality disclosure of climate related risks may result in costly lawsuits for misinformation, negligence, and non-compliance.

The board's ultimate responsibility for sustainability reporting under the Corporations Act 2001 and as required under AASB S2 (paras 10, 22 as well as Appendix B paras B21 and B65, Appendix D para 31).

Robustness of financial position:

Financial implications of material climate-related risks and opportunities for an organisation's financial position include its current and anticipated net earnings, net asset position and cash flows, as they impact the climate transition action plan as well as broader business planning process (AASB S2, paras 15-22). Impacting on enterprise value, the cost and financial implications of mitigating climate-related risks (physical and transition) and ease of mobilising capital through external borrowings potential for organic and inorganic growth, are elements that executives and boards will need to monitor closely.

Informed decision making:

Climate led scenario analysis is a critical tool to ensure informed business decision making at board and executive levels. By understanding the outcomes of different scenarios, decision-makers can make choices more aligned with corporate goals that balance risk, net-zero targets, resilience, growth and value.

Attracting Investor Capital:

The most recent Australian Sustainable Finance Institute (ASFI) report (September 2024) on implementation of the ASF Roadmap highlights assessment of physical risk remains a weakness at asset and portfolio level across ASX200 companies. Similarly, the 2024 Survey undertaken by Investor Group on Climate Change (IGCC) found that only 16% of IGCC's respondents conducted whole-of-portfolio analysis on physical risks with a mere 3% translating analysis into portfolio-wide action. Moreover, only 32% of investors had undertaken scenario analysis, with a quarter publishing their approach and ensuing actions. The report also highlights the work needed to realign Australia's financial system to support a resilient country enabling increased capital flow towards climate adaptation and resilience that will support businesses to build scale and capacity and implement their resilience strategy and prosperity. There is clear support from leading Australian companies that aligning and prioritising sustainability outcomes and proactively integrating Climate Risk in their business will positively engage investors.

Trust & reputation:

Building an understanding of stakeholder expectations through engagement and then clearly and transparently communicating impacts, plans to improve the corporates position through Sustainability reports, climate risk disclosures and Climate Transition Action Plans (CTAPs) along with targets and progress on net-zero goals builds to build stakeholder trust. This approach of collaboration extends to communities and business / ecosystem partners where the benefits of working with an aligned sustainability partner is becoming increasingly important and valued.

Business Opportunity:

Participation in a rapidly decarbonising, low-carbon economy offers business clear opportunities to demonstrate building new, long-term shareholder value through new products/services/sectors. Companies who build a corporate mindset that embraces climate risk and opportunity are better positioned to capitalise on emerging market opportunities such as low-carbon technologies and green financing.

Challenges in Integration

However, despite the obvious value this is a whole-of-business transformation and integrating climate risk within the business is not easy. Leadership from the board and executives is crucial enabled by ownership, climate-linked performance KPIs, upskilling and supporting infrastructure to name a few. While these elements might be addressed in a CTAP further detail can be found in Section 4 of this document.

Key areas that can challenge progress to integrating climate risk within the business might include:

- operational transition related challenges such as supply chain disruptions
- balancing expectations among various stakeholder groups such as shorter-term returns
- financial investments required for technology enablement and training; and
- continuous adaptation to regulatory changes and integrating these changes within the organisations enterprise risk management (ERM) and enterprise resource planning (ERP) systems.

What questions should you be asking

In considering better integration of climate risk for a more sustainability-aligned purpose and set of business outcomes, leadership and boards might consider these questions in reviewing and enhancing their business approach and transition.

How is the board balancing short-term financial results with long-term viability and resilience? How have the business aligned climate risk, net zero goals and business strategies?

What information is supporting the board to evaluate both physical and transition risks? Is the assessment multi-generational and how are these risks integrated into the organisations ERM framework?

How have management addressed factors such as

- inherent climate-related risks in the supply chain?
- financial implications of emissions pricing?
- how will climate change impact access to capital and insurance?
- revisions to internal controls and assurance functions to increase rigour and
- reduce the threat of greenwashing and litigation?
- development of capability across different roles and different business functions?

Does the business understand the expectations across all stakeholders and how to address them? How is the organisation's communication strategy aligned to disclose climate-related issues?

Where has the business identified material threats and opportunities for growth because of climate risk process management?

Subsequent sections will unpack Regulations (Section 2), Climate Risk Management (Section 3), Integration with the Business (Section 4), Examples of how businesses have integrated Climate Risk (Section 5), Assessing Maturity (Section 6) and Next steps (Section 7).

2. Climate Risk Frameworks And Requirements

Global progress on climate risk regulations has advanced rapidly with more recent efforts focused on harmonising frameworks and standards for easier implementation and adoption. Australia is actively mobilising through the AASB to join the global landscape.

2.1 Overview Of Existing Climate-Related Frameworks

Climate regulation has recently become a cornerstone of global governance, with several frameworks and standards designed to specifically help stakeholders address both the physical and transitional risks associated with climate change and translate to action that informs business decisions aligned with the targets set out by the Paris Agreement. These frameworks assist businesses to integrate climate risk into business strategy and operations and promote transparency and accountability in addressing climate change. These include:

> **Task Force on Climate-related Financial Disclosures (TCFD)**: Launched by the Financial Stability Board, the TCFD provides a comprehensive framework for companies to disclose climate-related financial risks. It focuses on four key areas: governance, strategy, risk management and metrics. The TCFD's recommendations have been widely adopted by global regulators, making it a pivotal tool in climate risk reporting.

> **International Sustainability Standards Board (ISSB)**: Under the International Financial Reporting Standards (IFRS) Foundation, the ISSB builds on the TCFD framework to standardise global sustainability reporting, including climate risks. ISSB's standards, particularly IFRS S2, are designed to enhance sustainability-related financial disclosures by closely aligning with TCFD's[2] core recommendations across the four pillars of governance, strategy, risk management and metrics & targets and adding requirements like industry-based metrics and detailed information on carbon credits and financed emissions. This alignment simplifies reporting, making it easier for companies and investors to understand and use the information. Since 2024, the IFRS Foundation monitors the progress of climate-related disclosures, taking over this responsibility from the TCFD. Overall, ISSB standards are anticipated to become the leading global benchmark, providing a comprehensive framework for climate-related financial disclosures.

> CDP (**formerly Carbon Disclosure Project**): The CDP is a widely adopted platform for voluntary climate risk reporting. It encourages companies to disclose their environmental impacts, including climate risks and mitigation strategies, thereby enhancing transparency in climate risk management. IFRS S2 and AASB S2 can significantly enable and complement CDP reporting by aligning their requirements, allowing companies to use the same data and processes for both. This alignment streamlines reporting and reduces the burden on companies, making it easier to fulfill both AASB S2 and CDP requirements efficiently

In addition, the Science Based Targets Initiative (SBTi) is also gaining popularity amongst organisations for target setting and as a validating framework given that its GHG emission reduction pathways are in line with the Paris Agreement and it also supports the TCFD 'Metrics and Targets' pillar.

[2]https://www.ifrs.org/content/dam/ifrs/supporting-implementation/ifrs-s2/ifrs-s2-comparison-tcfd-july2023.pdf

2.2 Australian Sustainability & Climate Related Standards

On 20 September 2024, the Australian Accounting Standards Board (AASB) approved two inaugural standards under the Corporations Act:

- **AASB S1** General Requirements for Disclosure of Sustainability-related Financial Information (Voluntary Standard); and
- **AASB S2** Climate-related Disclosures (Mandatory Standard).

These standards align with international frameworks and standards, particularly the IFRS S1 and IFRS S2 and have been tailored for Australian entities.

> **AASB S1** aligns with the IFRS S1 and focuses on general sustainability-related financial information. This standard's scope is broad and assists entities wanting to voluntarily disclose their sustainability-related risks and opportunities.

> **AASB S2** applies to entities legally required to report on climate-related disclosures, particularly under the *Treasury Laws Amendment (Financial Market Infrastructure and Other Measures) Act 2024.* AASB S2 comes into effect from 1 January 2025. Entities subject to AASB S2 are categorised into three groups based on size[3], ensuring a phased approach to sustainability reporting. This phased approach (as per **Table 1** below) allows large companies to lead the adoption of sustainability reporting standards, with smaller companies needing to ensure mandatory disclosure over time. Entities need to fulfill 2 out of the three criteria outlined.

First annual reporting periods commencing on or after	Criteria 1: Size Threshold Large entities and their controlled entities meeting 2 out of 3 criteria for their financial reporting period:			Criteria 2: National Greenhouse Energy Reporting (NGER) Reporting entities	Criteria 3: Asset Owners
	Consolidated revenue for the financial year	End-of-financial year consolidated gross assets	End-of-financial year employees in the entity and across controlled entities		
Group 1 Entities: 1 January 2025[4]	$500 million or more	$1 billion or more	500 or more	NGER Reporter that meets publication threshold under section 13(1)(a) of NGER Act (50,000 tonnes of CO_2e)[5]	Not Applicable
Group 2 Entities: 1 July 2026[6]	$200 million or more	$500 or more	250 or more	All other NGER Reporters[7]	Entities that are a registered scheme, registrable superannuation entity or retail corporate collective investment vehicle (CCIV) with $5 billion of assets under management or more at the end of the financial year of the entity and the entities it controls
Group 3 Entities: 1 July 2027[8]	$50 million or more	$25 million or more	100 or more	Not Applicable	Not Applicable

Table 1: Phased introduction of sustainability reporting requirements in Australia

Further, entities that are a registered scheme, registrable superannuation entity or retail corporate collective investment vehicle (CCIV) with $5 billion or more in assets under management at the end of its financial year along with that of the entities it controls (if any) will also fall under the Group 2 reporting regime[9].

AASB S2 focuses on disclosures related to climate risks, and covers governance, strategy, risk management and metrics and targets to ensure corporates adequately address climate risks. These four pillars (as outlined in **Figure 3** below) promote transparency and will help Australian businesses integrate climate considerations into their governance, risk management and long-term strategies and position them to meet local and international sustainability expectations.

Figure 3: Four pillars of the disclosure on climate risk

[3]References to '$' are in Australian Dollars
[4]Section [1707]B([2]) of the Corporations Act 2001
[5]Section [1707]B([4]) of the Corporations Act 2001
[6]Section [296]B([2]) of the Corporations Act 2001
[7]Section [296]B([4]) of the Corporations Act 2001
[8]Section [292]A([3]) of the Corporations Act 2001
[9]Section [296]B([5]) of the Corporations Act 2001

However, unlike IFRS S2, AASB S2 omits the requirement for industry-based metrics at this stage. This is intended to simplify the initial reporting for Australian entities. AASB S2 also provides specific guidance for not-for-profit (NFP) entities, modifying certain terminologies to fit the context of NFP reporting, such as defining primary users of financial reports.

For Australian companies that have overseas parents and operations and are part of either Groups 1, 2 or 3, they are not able to rely on referencing their parent entity's financials for climate-related reporting. Instead, they need to prepare a separate sustainability report as per the requirements of Part 2M.3 of the **Corporations Act 2001.**

The Australian Auditing and Assurance Standards Board (AUASB) has proposed an assurance timeline and requirements for disclosures under AASB S2, which will include Directors' Declarations. Initially, directors must issue a Qualified Directors' Declaration, affirming they have taken reasonable steps to comply with the Corporations Act 2001, with full compliance expected in later years. Enforcement will begin in January 2025 and assurance requirements will gradually increase, aiming for comprehensive assurance across all disclosures by July 2030, as outlined in AUASB's draft ASSA 5010.

Note: This paper focuses on AASB S2 requirements, namely climate resilience assessments, incorporation of appropriate risk management responses and the successful integration with the business for Australian companies. Assurance and Scope 3 requirements have not been addressed in this document.

2.3 Global Legislative Updates & Trends

Regions and countries are at varying stages of mandating climate risk reporting and integration, with some surging ahead and others still developing their frameworks. The UK has been a pioneer, with TCFD-aligned disclosures mandatory for large UK-listed companies, pension schemes and asset managers since 2022. This early action has set a benchmark for other nations by demonstrating the importance of embedding climate risk into corporate strategies.

The European Union has introduced the Corporate Sustainability Reporting Directive (CSRD), replacing the Non-Financial Reporting Directive (NFRD) from January 2023. The CSRD mandates comprehensive sustainability reporting, including climate risks, under the EU Taxonomy. This is further supported by the European Green Deal and the Fit for 55 package, which both emphasise the role businesses play in addressing climate risks. The EU's approach reflects its strong commitment to achieving its climate goals and holding companies accountable for their environmental impact.

While the UK and EU lead in proactive regulatory requirements for climate risk reporting, other countries, such as the US and China, are also making meaningful progress. On 6 March 2024, the US Securities and Exchange Commission (the 'SEC') adopted rules requiring publicly listed companies to disclose climate-related risks and opportunities, including Scope 1 and Scope 2 greenhouse gas (GHG) emissions in their SEC filings. This mandatory disclosure requirement signaled growing recognition in the US that climate change poses material risks to businesses.

China has also made notable progress in aligning climate risk management with its national priorities, setting ambitious targets to achieve carbon neutrality by 2060 and gradually rolling out sustainability reporting requirements. In April 2024, China's three major stock exchanges [i.e., the Shanghai Stock Exchange (SSE), Shenzhen Stock Exchange (SZSE), and Beijing Stock Exchange (BSE)] issued guidelines on corporate sustainability reporting, effective from May 1, 2024. These guidelines mandate that certain listed companies disclose information across 21 ESG topics, marking a significant advancement in China's approach to corporate transparency and sustainability. Additionally, China is increasingly aligning with global frameworks such as TCFD and ISSB S1 and S2, enhancing governance, risk management and climate-related reporting to meet international standards.

ASEAN countries, including Hong Kong, Singapore, Malaysia, Indonesia, the Philippines, Taiwan, and India, have progressively implemented mandatory reporting requirements on sustainability. These regulations often encompass disclosures related to environmental, social, and governance (ESG) aspects. Each jurisdiction tailors its approach to fit local contexts and priorities, impacting global firms that need to comply with these diverse standards. The trend is moving towards a standardised approach to increase transparency and accountability, reflecting a growing recognition of the importance of sustainability in corporate strategies.

Figure 4 from the joint report by NUS Centre for Governance and Sustainability (2023)[10] and PWC illustrates adoption of reporting framework and standards across Asia-Pacific. It indicates a growing trend towards mandatory climate-related disclosures within sustainability reporting regulations and highlights the widespread use of GRI (Global Reporting Initiative) and SDG (Sustainable Development Goals) across various jurisdictions.

	GRI	SDG	ISO	TCFD	SASB	UNGC	CDP	IIRC
Overall (2021)	75%	76%	66%	36%	18%	23%	17%	20%
Overall (2022)	81%	78%	69%	57%	36%	28%	20%	20%
Australia	80%	80%	56%	86%	48%	34%	12%	8%
Hong Kong SAR	80%	76%	86%	66%	28%	30%	22%	4%
India	84%	86%	64%	58%	50%	60%	50%	66%
Indonesia	80%	86%	78%	10%	18%	12%	12%	4%
Japan	80%	88%	88%	90%	44%	36%	20%	70%
China	76%	60%	70%	36%	8%	18%	8%	0%
Malaysia	84%	92%	78%	60%	18%	12%	22%	24%
New Zealand	44%	50%	48%	56%	12%	2%	30%	18%
Philippines	90%	94%	60%	36%	52%	18%	12%	16%
Singapore	98%	78%	74%	64%	34%	44%	10%	10%
South Korea	100%	82%	66%	92%	88%	48%	34%	20%
Taiwan	96%	92%	76%	90%	84%	36%	32%	20%
Thailand	86%	90%	68%	60%	22%	36%	22%	12%
Vietnam	50%	32%	54%	0%	2%	0%	0%	10%

Note: The overall percentages are based on 13 jurisdictions last year (2021), excluding South Korea.

0 to 25% of companies | 25% to 50% of companies | 50% to 75% of companies | >75% of companies

Figure 4: Sustainability Standards and Frameworks in the APAC region

New Zealand's climate reporting and disclosure policies are governed by the Climate Change Response (Zero Carbon) Amendment Act 2019 and Financial Sector (Climate-related Disclosures and Other Matters) Amendment Act 2021, making it the first country globally to mandate climate risk reporting. Large financial institutions, including listed companies, insurers and banks, are required to report in line with the TCFD recommendations, with the Financial Markets Authority (FMA) overseeing compliance. This policy promotes transparency and accountability and sustainable finance practices across the economy.

This global regulatory landscape is increasingly shaping expectations for businesses in Australia and New Zealand by pushing companies to align with international standards and better integrate climate risk into their strategies. This ensures companies remain competitive while meeting growing demands from investors and stakeholders for greater transparency and sustainability practices.

Trends

As ESG reporting becomes increasingly standardised globally, notable trends are shaping the landscape. The EU, a leader in ESG regulations, is advancing requirements under the SFDR and the CSRD, setting a high benchmark for other regions. The EU's push toward double materiality—requiring companies to disclose both the financial impact of ESG risks on business and the impact of business on society and the environment—is gaining traction worldwide. A growing trend is the focus on value chain emissions, with companies being encouraged or required to report on Scope 3 emissions to address the full impact of their operations. In addition, digitalisation in ESG reporting is on the rise, with organisations increasingly leveraging technology and data analytics for more accurate, efficient, and transparent reporting.

Alongside these shifts, frameworks like the Taskforce on Nature-related Financial Disclosures (TNFD) are broadening the scope of ESG reporting to include biodiversity and ecosystem impacts, emphasising the intersection of climate and nature risks. Modelled based on the TCFD framework, the Taskforce on Nature-related Financial Disclosures (TNFD) emphasises biodiversity and ecosystem services as crucial for business continuity and resilience. By managing nature-related risks, companies can mitigate disruptions and enhance sustainability. The TNFD framework also promotes transparency and accountability in interactions with natural resources, fostering stakeholder trust[11,12,13].

This deepening focus on transparency and accountability is promoting sustainable finance practices globally and encouraging companies to integrate ESG considerations into core strategies. As regions align more closely with these standards, the global ESG landscape is expected to mature, fostering comparability and driving meaningful change across economies.

Relevance of Nature-related Disclosures in an Australian context

The Australian Government has been actively involved in the development of the TNFD framework and has funded initiatives and been part of the TNFD Stewardship Council since November 2021[14]. TNFD pilots have been commissioned across various Australian businesses and financial institutions to build market readiness[15] across diverse sectors, including critical mineral mining, natural gas extraction, fresh beef and salmon production, property development and cotton cultivation.

Whilst adherence to TNFD recommendations is currently voluntary in Australia, there is increasing pressure on companies to adopt these guidelines due to growing investor and consumer expectations[16]. As of October 2024, 23 Australian companies and financial institutions have committed to voluntary reporting in line with TNFD recommendations[17]. This includes some of Australia's leading ASX-listed companies. **A recent legal opinion suggests that Australian company directors might be legally required to disclose material on nature-related risks under the Corporations Act 2001**.[18]

Australia's evolving policies reflect a current commitment to integrating climate and environmental risks into corporate reporting. This shift would enhance corporate accountability and provide investors with better information to assess climate risks. However, it is unlikely nature-related disclosures will become mandatory in Australia in the short-term given a focus by the AASB on the implementation of AASB S2 and a focus by the ISSB on other Sustainability related projects. As biodiversity loss and ecosystem degradation become more urgent, TNFD is expected to gain global adoption and early adoption TNFD could position Australian and New Zealand firms as leaders in environmental stewardship.

[10] Sustainability Counts II, State of sustainability reporting in Asia Pacific, PwC and NUS (National University of Singapore) Centre for Governance and Sustainability, 19 July 2023

[11] Final TNFD Recommendations on nature related issues published and corporates and financial institutions begin adopting. https://tnfd.global/wp-content/uploads/2023/09/FINAL-18-19-23-TNFD-final-recommendations-release.pdf

[12] The TNFD Nature-Related Risk and Opportunity Management and Disclosure Framework Beta v⁰.² Summary. https://tnfd.global/wp-content/uploads/²³/⁰⁷/TNFD-Framework-Summary-Executive-Summary-Beta-v⁰-²-¹.pdf

[13] Taskforce on Nature-related Financial Disclosures. Standards alignment. Retrieved from https://tnfd.global/standards-alignment/

[14] https://www.dcceew.gov.au/environment/environmental-markets/financing-solutions-for-nature#download

[15] https://www.dcceew.gov.au/about/news/australian-case-study-report-on-piloting-tnfd-framework

[16] https://www.gtlaw.com.au/knowledge/nature-related-disclosures-what-next-australian-companies

[17] https://tnfd.global/number-of-australian-tnfd-adopters-rises-to-²³-including-some-of-australias-leading-asx-listed-companies/

[18] https://pollinationgroup.com/global-perspectives/australian-company-directors-and-nature-related-risk-a-new-legal-opinion/

3. Climate Risk Management Framework

The evolving landscape of climate risks assessment and management is impacting business profitability, success and even the long-term viability of some corporates. Integrated Climate Risk Management (CRM) provides a systematic framework for systematically identifying, avoiding and managing all types of risks including risks from extreme weather events as well as slow-onset ecosystem changes.

Climate risk is sustainability amplifier for organisations and their boards. In addition to physical risks from climate change, companies also face transition risks. These might include policy or regulatory changes, competitive and investor pressures and shifts in consumer preferences.

> The electric utilities business model, for example, was based on the generation and transmission of electricity from fossil fuels. This has substituted by renewable technologies that are now cheaper than fossil fuel-based electricity. The automobile sector is also preparing for a wave of technological disruption – from electric vehicles, autonomous vehicles and shared mobility platforms – which offers lower emissions and greater efficiency.

Climate change affects all economic sectors, all stakeholders, all countries. The exposure to, and the impact of, climate-related risks differ by sector, industry, geography and organisation type. The impacts of climate-related issues on businesses are not always clear or direct, and this is particularly the case when we try to understand the financial implications. For the majority of businesses, identifying issues, assessing impacts and disclosing material information in their financial filings may prove challenging.

This can be due to:

- limited knowledge of climate-related issues which may inhibit the identification of relevant risks
- a greater focus on near-term risks without adequate attention to risks that may arise in the longer term
- the challenges associated with quantification of climate-related risks (magnitude as well as financial and non-financial impact of risk); and
- a lack of data analysis capability required for conducting robust climate risk analysis and progressive updates and reviews.

The subsequent sections outline the model for a Climate Risk Management process in line with ERM framework. Understanding the inputs required for climate risk management is important to successful adoption and integration of CRM across all relevant levels and functions in any organisation. While the overall approach may be similar to any risk management process, the following section highlights the nuanced specificities which are unique to climate risk management.

Climate Risk Management Process

Climate-related risks are often characterised as evolving, interconnected, longer-term or unfamiliar to an organisation and therefore, difficult to manage effectively. While the process of managing these risks is no different than any other business risk, Climate Risk management can be challenging and many organisations that have less experience in managing the end-to-end process and integrating with existing ERM systems as highlighted above.

Successful integration of CRM is based on the robustness of the inputs which inform the climate risk assessment and management process. **Figure 5** outlines the different inputs which must be considered for CRM integration. An example of an input is the company's risk appetite set by upper management or board which is communicated throughout the organisation and reflected in the company's vision, purpose, objectives, goals and through the actions of all employees.

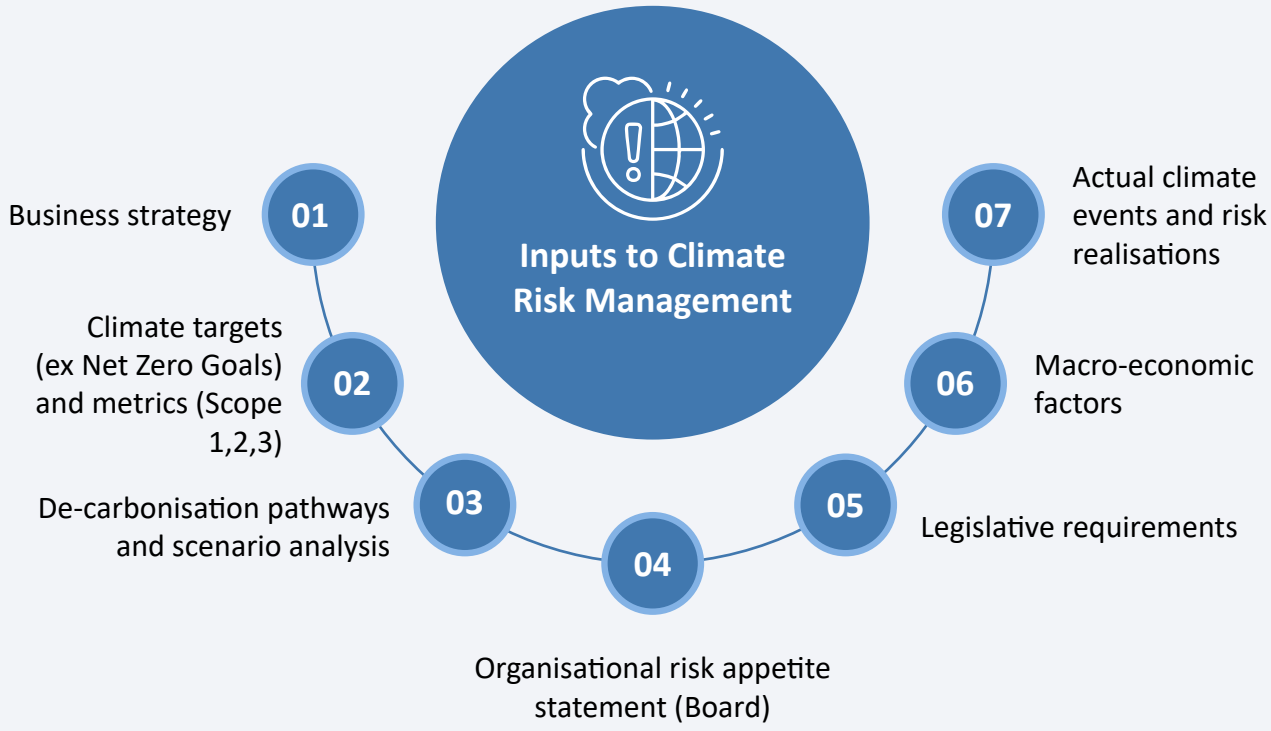


Figure 5: Climate risk assessment inputs

The basic steps of the climate risk assessment process include:

As well as understanding the role that the Board and C-Suite need to play it is also important to know what questions they should be able to answer when discussing climate risk. The below questions reflect the type of disclosures that a business will be expected to answer when meeting AASB S2 or other climate-related disclosure requirements:

Risk Identification:

Multiple approaches are available to identify climate-related risks, i.e., megatrend analysis, SWOT analysis, impact and dependency mapping, stakeholder engagement and climate materiality assessments. These tools can help identify and outline climate-related issues in terms of how a risk threatens achievement of a business's strategy and business objectives. Applying these methods through collaboration between risk management and sustainability practitioners elevates climate-related risks to the risk inventory and positions them for appropriate assessment and response.

Risk Analysis:

Companies cannot respond equally to all risks identified and hence prioritisation is necessary for effective resource allocation. Applying ERM methods to climate-related risks includes assessing risk severity in language that management understand. Leveraging subject-matter expertise is critical to ensuring emerging or longer-term risks are assessed and prioritised appropriately.

Risk Response:

A business response to prioritised risks is based on the businesses risk appetite and will determine how effectively it preserves or creates value over the long term. The response for Climate based risks is often captured in a Climate Transition Action Plan (CTAP).

Risk Monitoring:

Reviewing ERM activities is important to evaluate their effectiveness and to improve response. Organisations establish specific indicators to alert internal stakeholders to changes that must trigger an update to risk identification, assessment and/or response. Applying ERM to climate-related risks supports risk-informed decision-making at strategic as well as operational levels and ensures monitoring through an institutionalised approach. Further integration with ERM is addressed in Section 4.

Figure 6 below outlines how climate risk should be embedded within an ERM system.

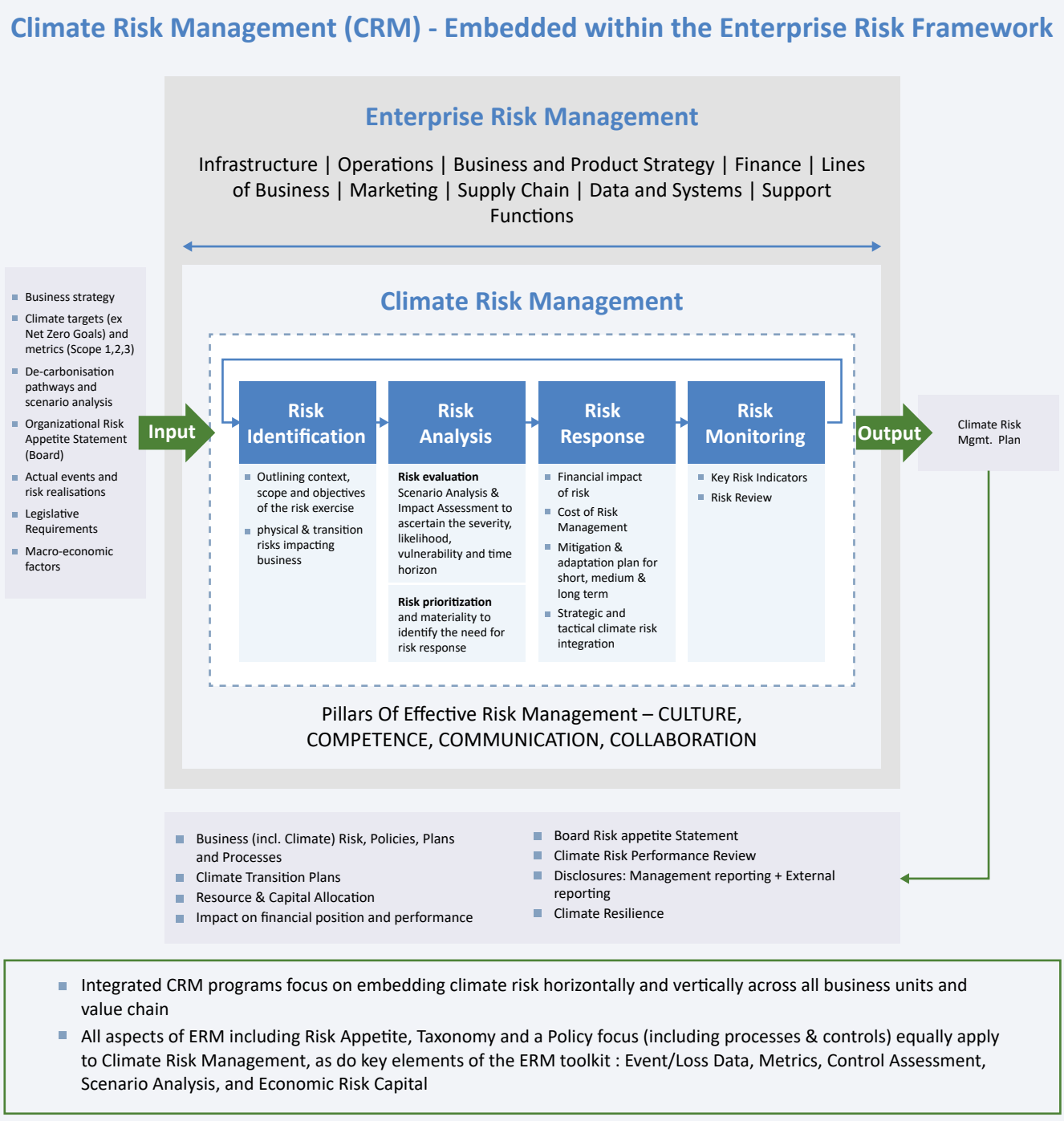


Figure 6: Overview of the GZH Climate Risk Management Framework

Examples of processes and policies used by a business to identify, assess, prioritise and monitor climate-related risks and opportunities can include (but may not be limited to):

- business inputs and parameters, such as stakeholder expectations, data sources and scope of operations
- how climate-related scenario analysis informs identification and analysis of climate-related risks
- how the nature, likelihood and magnitude of the effects of those risks are assessed – for example, whether the business considers qualitative factors, quantitative thresholds or other criteria
- how climate-related risks are prioritised relative to other types of business risks
- how climate-related risks are monitored; and
- how processes are changed compared with the previous reporting period.

With this context, the following sections will expand further on each of the steps outlined above.

3.1 Risk Identification

Risks are present in all business activities. They often come into focus due to changes in business strategy, objectives, business context and ecosystem or risk appetite.

As defined in the TCFD guidance, climate issues can be categorised into:

Transition risks:
Risks related to the transition to a lower-carbon economy such as enhanced emissions reporting obligations, exposure to litigation, policy changes, technological advancement, changing customer behaviour and increased cost of raw materials.

Physical risks:
Risks related to the physical impacts of climate change. These can be acute such as cyclones, bushfires or floods or chronic – such as sea level rise or rising temperatures.

Climate-related opportunities:
opportunities related to efforts to mitigate and adapt to climate change, such as resource efficiencies and cost savings, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain.

More information about physical and transition risks and opportunities may be found in the TCFD Implementation Guidance on the Recommendations of the TCFD (2021), the TCFD Guidance on Risk Management Integration & Disclosure (2020), IFRS S2 Climate-related Disclosures and AASB S2 Climate-related Disclosures.

Outlined below are some of the unique characteristics of climate-related risks **(Table 2)**.

Unique characteristics of climate-related risks

Correlation with geography and activities	Climate change impacts and climate-related risks occur on local, regional and global scales with different implications for different businesses, products and services, markets, operations and value chains, among others.
Longer time horizons and long-lived effects	Some climate-related risks play out over time horizons that stretch beyond traditional business planning and investment cycles. These risks and related impacts may occur as a result of decades-long changes in driving forces, such as greenhouse gas concentrations in the atmosphere, leading to climate-related physical or transition risk changes over the short, medium and long term.
Novel and uncertain	Many of the impacts of climate change have no precedent, limiting the use of historical data in statistical and trend analysis. Climate change is a dynamic and uncertain phenomenon and possible mitigation responses are also complex, with many unknowns. These include the development and deployment of critical technologies and adaptation strategies as well as changing market and consumer behaviours.
Changing magnitude and nonlinear dynamics	Climate-related risks may manifest at different scales over time, with increasing severity and scope of impacts. Climate systems may exhibit thresholds and tipping points that result in large, long-term, abrupt and possibly irreversible changes. Understanding the sensitivities of tipping points in the physical climate system, as well as in ecosystems and society, is essential to understanding climate-related risks
Complex relationships and systemic effects	Risks associated with climate change are interconnected across socioeconomic and financial systems. Such interconnected risks are often characterised by knock-on and systemic effects, requiring a multidimensional perspective to assess the short-, medium-, and long-term implications for a company.

Table 2: Unique characteristics of climate-related risks

Most businesses have ERM processes in place to identify risks that impact business strategy and include them in their risk inventory. These processes include surveys, workshops and interviews with risk owners and executives to confirm existing risks or understand new or emerging risks. For businesses with mature ERM processes, quantitative and in-depth analytical approaches may also be used. In addition, activities and processes performed by the sustainability function, corporate strategy function or risk owners can support the identification of climate-related risks.

Ways to identify risk[19]	■ Internal and external audit, from which findings may be ESG related (for example, environmental health and safety, greenhouse gas emissions, certification audits performed by third parties) ■ Due diligence activities from new product or market assessments ■ ESG analyses performed for investment and M&A decisions (particularly for the financial services and manufacturing sectors) ■ Project management activities (particularly for the construction, information, technology and communication and professional services sectors) ■ Supply chain due diligence ■ Media monitoring, web scraping ■ Data tracking and analysis of events or issues faced in the past ■ Monitoring regulatory changes ■ Megatrend analysis ■ SWOT analysis ■ Impact and dependency mapping ■ ESG materiality assessment ■ Double materiality assessment ■ Stakeholder engagement
Questions to ask when identifying and defining climate-related risks[20]	What is the nature of the risk? What is the source of the risk? What is the root cause of the risk? Why is the issue relevant to the business? What is the correlation between financial and climate-related risks? What is the business case for addressing the risk? Which business decisions may be impacted by the risk? What will be improved or enhanced by addressing the risk?

[19]COSO & WBCSD Applying Enterprise Risk Management to ESG related risks, October 2018
[20]COSO & WBCSD Applying Enterprise Risk Management to ESG related risks, October 2018

The tools outlined above can help identify and express climate-related issues which threaten achievement of business strategy and objectives. Applying these risk identification approaches, through collaboration between risk management and sustainability practitioners, within context of the business ERM approach elevates climate-related risks to the enterprise risk inventory and positions them for appropriate assessment, response and management.

Typical business risk categories include strategic, operational, financial, compliance and reputational. Some organisations include a separate category for 'sustainability' or 'climate-related' risks. However, this practice is not recommended as these should be aligned with the business risk categories due to their potential to compound a risk's impact or its likelihood of materialising. For example, climate change may increase the risk of raw material cost fluctuations, which is an existing financial risk for business.

Not all climate-related issues identified by a business's materiality assessment or megatrend analysis should be included in the enterprise-level risk inventory. For some issues, it may be appropriate to perform ongoing monitoring and an evaluation as to whether these risks should be elevated to an enterprise level and included in the risk inventory in the future. Regardless of whether a risk is included in the enterprise risk inventory, once a risk has been identified, it should be managed as a part of the risk management within the business.

Below is an example (**Figure 7**) of the relationship between business risks and the climate risk categories. Establishing this correlation is integral to effective climate risk identification.

Climate Risk Management (CRM) - Embedded within the Enterprise Risk Framework

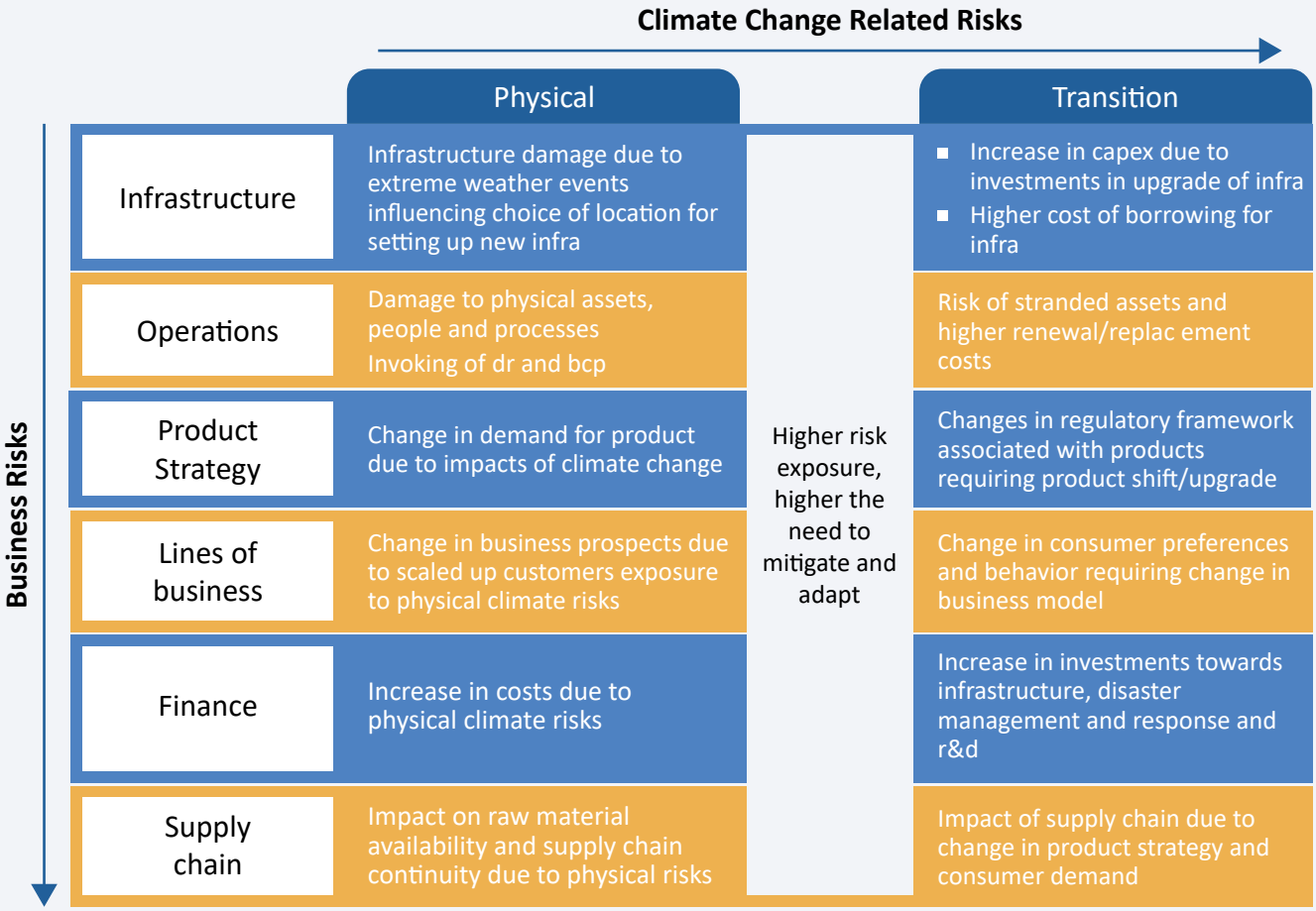


Figure 7: Relationship between business and climate-related risks

3.2 Risk Analysis

Climate-related risks can be challenging to assess and prioritise. By nature, the financial and business implications of a climate-related risk may not be immediately clear or measurable. These challenges may be amplified due to the organisation's

A. limited knowledge of climate-related risks by business leaders

B. tendency to focus on near-term risks without sight on longer term impacts

C. absence of standard methods to quantify climate-related risks

D. Uncertainty associated with the outcome of these risks

Many organisations recognise the importance of considering climate-related risks alongside financial and operational risks to achieve a comprehensive view of their risk landscape. Double materiality assessment can help to better understand the strong correlation between these financial and climate-related risks.

Organisational awareness and engagement are key to successful adoption of the materiality assessment into the climate risk management process. Risk management departments will likely need to be trained in relation to the importance of climate-related risks and the assessment and quantification of their impacts while collaboration and knowledge sharing will need to be fostered across departments to address them.

Once a risk has been identified, understanding potential business impacts allows leaders to prioritise risks and allocate resources to respond to the risk and monitor it over time. Employing a common language that captures risk severity will facilitate prioritisation, with a range of qualitative and quantitative measures used to estimate the severity of risks. Risk severity is commonly expressed in terms of likelihood and impact/consequence. **Figure 8** provides an example of how an organisation can define likelihood and impact criteria to analyse climate risks.

Sample matrix to determine likelihood and impact of climate - risks

Risk rating	Definition (indicative example for reference)	
Very High	Once a year or more frequent	>90% chance of realising
High	Occurs every 1-3 years	75-90% chance of realising
Medium	Occurs once every 3-6 years	50-74% chance of realising
Low	Occurs once every 6-10 years	10-49% chance of realising
No Risk	Occurs once >10 years	0-9% chance of realising

Risk rating	Parameters for determining the risk rating to ascertain impact
Catastrophic	■ Negative media coverage that persists for over 6 months and impacts brand value directly impacting revenue - % Loss of revenue ■ Compliance risk exposure with risk of fines or prosecution - % Increase in expenses ■ Impact on key customer/consumers - % Loss of revenue
High	
Medium	
Low	

Figure 8: Sample likelihood and definition criteria for climate risks

Scenario analysis is a well-established tool for assessing the potential implications of a range of long-term future states under conditions of uncertainty. It is an effective tool for assessing climate-related risks, as it can reduce the extent to which managers need to predict possible outcomes by providing a range of scenarios to consider and use in planning a response. For example, will the supply chain be disrupted due to climate change and to what extent under the different warming scenarios? Which regions will experience an increase or decrease in extreme weather events under the different warming scenarios?

Many leading organisations and investors already use climate-linked scenario analysis to anticipate future states as part of their risk management and strategic planning processes. Both AASB S2 and TCFD guidance specify the use of scenario analysis to identify and prioritise material climate-related risks. Australian companies need to use at least two climate scenarios whereas New Zealand entities are required to use at least three (refer to section 4.5).

Organisations need to give due consideration to the following parameters in relation to developing their climate scenario analysis:

- The time horizons across which these risks could impact the business (short, medium or long term)
- The identification and ranking of driving forces external to the organisation (using pest analysis)
- Forming a baseline for scenarios using high-impact and low-uncertainty drivers
- Drafting narratives for each identified scenario, including cause-effect relationships between drivers
- Quantifying aspects of scenarios where possible and necessary
- Checking scenario quality
- Reviewing, revising (where needed) and finalising the scenarios
- Drawing conclusions with strategic options for each scenario
- Using selected strategy options to inform strategic planning and plans, including identification of signpost metrics to monitor future performance
- Periodically iterating and evaluating scenario analysis.

AASB S2 (para B4 in Appendix B) identifies when an organisation needs to undertake quantitative scenario analysis. For example, if an organisation has a high exposure to climate-related risks, a quantitative approach to scenario analysis would benefit both the organisation and users of general-purpose financial statements. A similar approach helps quantify the financial effects of climate-related risks and opportunities for organisations that lack the skills, capabilities or resources to quantify information or are uncertain about how risks will affect their business (paras 19-20, AASB S2).

More information on scenario analysis can be found in TCFD Guidance on Scenario Analysis for Non-Financial Companies (2020), as well as paras 22 and 24 and Appendix B to AASB S2.

Other tools that support an evidence-based approach to risk analysis include competitor analysis, stakeholder assessments and peer benchmarking, as well as data-driven approaches supported by technology and big data.

Prioritising risks determines the urgency required, the types of action necessary and the level of investment in the risk response. To support better decision making, when identifying, assessing and prioritising climate-related risks, acknowledging and challenging bias caused by the following is critical:

- an overreliance on numeric metrics, financial performance or historical data for decision-making
- anchoring to a particular risk event outcome or response including possible disproportionate weighting of recent events or short-term financial risks
- a tendency either toward risk avoidance or risk taking.

3.3 Risk Response

A risk response plan needs to be developed for all prioritised risks a(established in Sections 3.1 and 3.2). Different risk responses are outlined in **Figure 9** below:

Accept: Take no action to change the severity of the risk

This response is appropriate when risks to business strategy and objectives are within the risk appetite and unlikely to become more severe. For example, a manufacturer may accept potential for human rights-related risk in the supply chain if the business has no high-risk suppliers and has not received any public pressure on the issue. The risk may be seen as too low to justify the cost of a program beyond requesting supplier compliance statements. However, accepting a risk can require close monitoring of the assumptions that led the organisation to accept it in the first place. If these assumptions change, a different response may be needed.

Avoid: Remove the risk

Organisations may have zero tolerance for certain climate-related risks, leading them to avoid the risk entirely or at least reduce its likelihood. For example, in 2018 Swiss Re announced that it would not provide reinsurance to businesses with more than 30 per cent exposure to thermal coal across all lines of business. Similarly, a business that supplies services to government may cease doing business in high-risk countries to avoid links to corrupt business activities.

Pursue: Convert risks into opportunities

Risk responses often focus on preserving value, but in many cases responding to climate-related risks can unlock value. The Business and Sustainable Development Commission reported in 2017 that the United Nations Sustainable Development Goals (SDGs) could unlock more than USD$12 trillion in business opportunities by 2030.

Reduce: Take action to reduce the severity of the risk

Organisations typically take this action when risk severity is higher than risk appetite. They may accept some level of ESG risk, then implement mitigation activities to reduce any residual risk to within the risk appetite.

Share: Transfer a portion of the risk or collaborate externally

Sharing climate-related risks, which may be too large or complex for one business to manage, may eliminate some risk to individual companies.

Risk Responses to Climate-related Risks

Accept

Chosen when the severity is within the risk appetite

No action to change the severity

E.g.: Low supply chain risk associated with extreme weather events in service sector

Avoid

Zero tolerance towards certain risks

Removal of the risk to reduce likelihood of occurrence

E.g.: Businesses taking operations away from regions with very high likelihood of extreme weather events

Pursue

Converting issues into opportunities

Potential for value creation

E.g.: Use of digital technology and spatial sciences to predict disaster occurrence and impacts.

Reduce

Reducing the risk severity by taking action

Chosen when severity is higher than risk appetite

E.g.: BCP and Disaster Management for extreme weather events.

Share

To transfer a part of the risk

Complex risks can be shared to eliminate individual company exposure

E.g.: Insurance companies transferring physical risks due to extreme weather events to reinsurers.

Figure 9: Risk Responses to Climate-related Risks

Table 3 below outlines some considerations to be explored when designing a risk response.

Business context	Risk responses are selected or tailored to the business context, which includes the industry, geographic footprint, regulatory environment, operating structure and risk appetite. For climate-related risks, questions may include: ■ How will the risk response minimise or exacerbate climate-related impacts and dependencies? ■ Which controls and business processes are in place to address this risk? ■ How will the risk response make it easier or more difficult to meet organisational objectives?
Costs and benefits	Capturing anticipated climate risk-associated costs and benefits is particularly important to demonstrate the business case and obtain buy-in. Societal costs and benefits may also be considered when assessing potential response options.
Obligations and expectations	Responses should align with generally accepted industry standards, stakeholder expectations on climate-related issues and performance (particularly for NGOs, customers and employees) and the business's mission, vision and core values.
Risk appetite	Risk responses should consider the organisational risk appetite and develop action plans that reduce residual risk severity to within the risk appetite. If risk severity is within appetite, management may choose to accept the risk.

Table 3: Considerations for designing a risk response approach

The key output from this exercise is a **climate risk management plan**, which in turn influences and informs business strategy by giving inputs for:

- business risk and climate policies, plans and processes
- climate transition plans
- resource and capital allocation
- board risk appetite determination
- climate risk performance review
- disclosures, including management reporting and external reporting (including impacts on financial position and performance)
- climate resilience.

The climate risk management plan influences the climate transition action plan (Refer section 4.2), which in turn integrates with ERM, business strategy and sustainability strategy. This integration and alignment help ensure successful adoption of climate risk management by strategically positioning climate risks within the organisation for action and monitoring. Embedding climate risk management within ERM helps leverage organisational systems and processes for the effective implementation of climate risk management.

3.4 Risk Review Reporting And Monitoring

Risk management is a dynamic process that requires ongoing review and revision of both individual risks and the risk management process. In many regions, monitoring the effectiveness of an organisation's internal controls and governance around risk management is regulated by legislation. Business change is constant, both in relation to internal priorities and external environments. As a result, new risks may arise, or risk responses may be rendered ineffective. By establishing indicators (key risk indicators) to review climate risk related activities, businesses can more easily recognise these changes and take timely action before there is a negative impact on the business. An organisation may select key risk indicators to monitor performance for climate-related risks and set thresholds when tolerances are exceeded, and additional decision-making is required.

Risk responses should be reviewed by leaders to understand their effectiveness in addressing climate-related risks, including whether the response brings the risk to an acceptable level.

Reviewing climate risks internally occurs at various levels and is strengthened through reporting and monitoring.

- Risk governance structure with Board oversight and regular reviews
- Three Lines of defence model (Refer Section 4.3 for more details) for effective internal control
- Higher periodicity of review at ground level
- More frequent review, on need basis, may also be undertaken depending upon internal and external factors such as physical and transition impacts as well as assumptions and scenarios.
- Management shall assess risks on an annual basis, however significant changes may warrant interim action
- Although climate change is not expected to impact organisations in the short term, frequent reviews of the anticipated physical and transitional impacts, as well as assumptions and scenarios, are warranted, as these are not necessarily predictable.

Some concepts for business risk managers to consider include:

- Ensuring any reliance on carbon credits (for example, the Clean Energy Regulator's Australian Carbon Credit Unit Scheme) is clearly shown in the climate metrics.
- A comparable efficiency measure would show actual progress comparable across organisations and not be masked by business nuances. For example IEA's common criteria for sustainable fuels under its Net Zero Emissions by 2050 (NZE) Scenario.

4. Climate Risk Integration With The Business

Once material climate-related risks have been identified and prioritised, responses planned and monitoring implemented, business executives and the Board have an understanding of the direct and indirect effect of climate change across their business along with the relevance of climate change for business resilience, growth and future value for all stakeholders.

The outputs of the climate risk management process now need to be integrated with an organisation's broader decision-making processes, strategy development, climate related targets, policies, planned investment, capital allocation and capability development along with many other areas. Bringing the knowledge and outputs to inform, align and update planning, execution and governance helps ensure climate related impacts become considerations and are part of the mindset, when executives and the Board make short, medium and longer term decisions.

Climate related risks have been clearly identified as critical business risks. The integration and management of residual climate risk in the business builds shared responsibility across executives for their appropriate contributions, rather than the responsibility remaining with the Sustainability and Risk teams.ntegration of climate risk outcomes helps flip Climate Risk Management from a compliance and disclosure activity focused on process and mitigation towards a mindset of prevention, preparedness adaptation and opportunity that will help build a more sustainable and valuable business.

Integrating climate risk outputs across the business should be evidenced in several key areas, such as:

- including climate related risks with enterprise ERM processes and governance
- integrating risks into a wide range of business unit strategies and plans, financial plans, financial systems, projects and other planning instruments – redirection of resources and changing behaviours are critical
- informing sustainability and climate related strategies
- focusing on areas with potential multiplier effects, such as supply chain policies and resilience, and possible climate driven opportunities to build a diversified and resilient portfolio of products or services
- transitioning to a greener asset operating model (infrastructure, fleet management, energy usage / optimisation and asset management), which will enable transition to a cleaner and greener ecosystem
- considering and analysing synergies and trade-offs within an organisation's policy objectives to support the Australian Government's Sustainable Finance Strategy and Roadmap, the Australian Government's Net Zero Plan and policy coherence agenda at national and international levels to reach SDG and climate targets.

In this section, we focus on where, how and why enterprises should integrate climate risk within their business as outlined in **Figure 10** below.

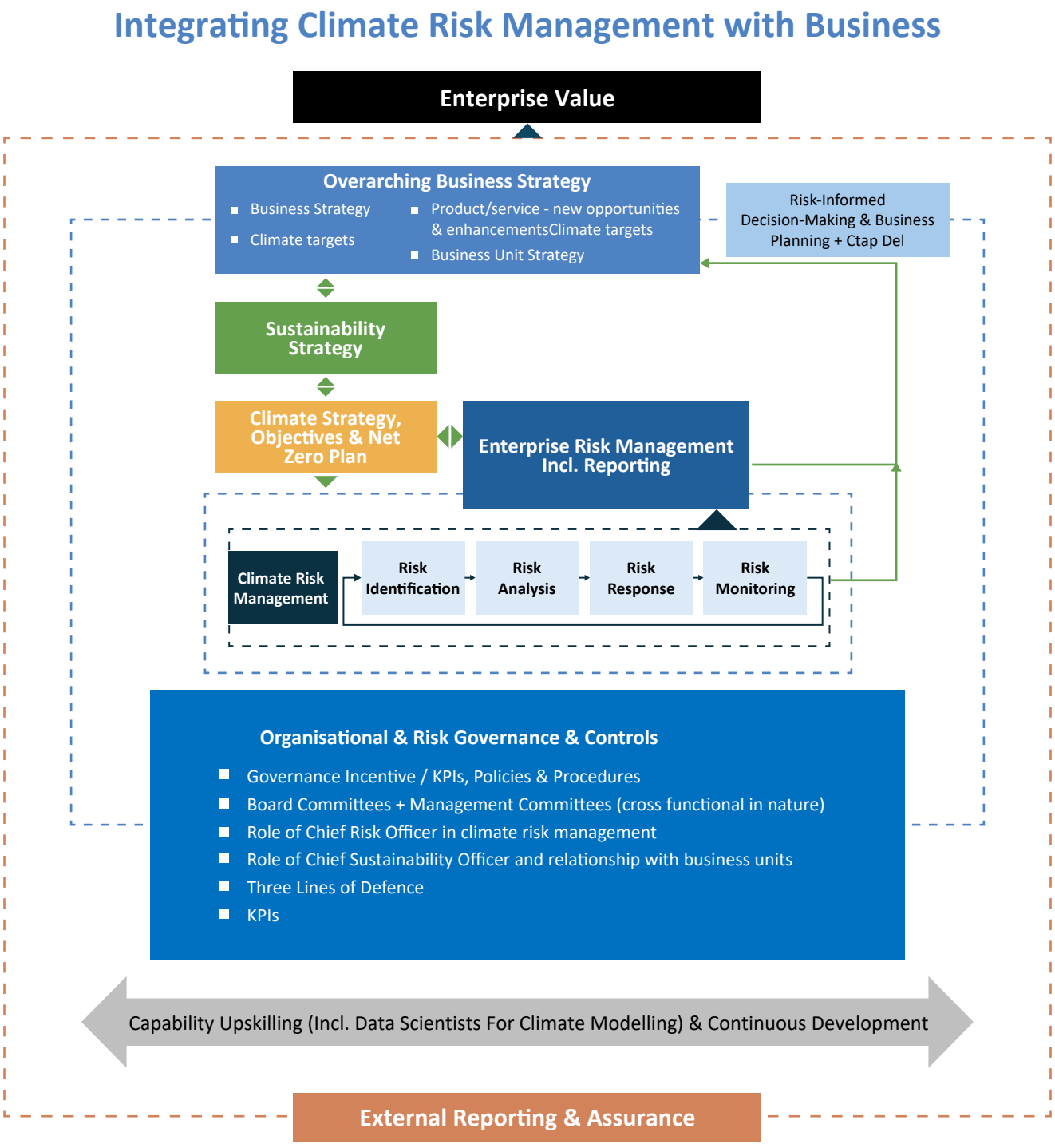


Figure 10: Integrating Climate Risk Management within the business

4.1 Integration With ERM

Although climate risk is a material business risk, the decarbonsation journey, associated processes and investment needed is complex. Climate-related risks span the short, medium and long term, with entities needing to define expected impacts across these horizons (per para 10(d), AASB S2), often resulting in climate metrics moving at a slower pace than 'normal' transactions and strategic decisions. Adjustments for climate risk time horizons, materiality assessments (both financial and environmental) and megatrend analysis will help ensure that climate risks are integrated within an ERM system.

All aspects of ERM, including risk appetite, taxonomy and policy (including processes and controls) apply equally to climate risk management, as do key elements of the ERM toolkit, such as event/loss data, metrics, control assessment, scenario analysis (outlined in Section 3.2) and economic risk capital. Embedding material climate-related business risks within the ERM framework is key to enabling individual business units to take appropriate risk mitigation measures while enabling the Board and executive management to review and provide management recommendations. These residual material climate related risks are then managed within the overall ERM and part of the existing governance process, albeit with a climate lens. Consideration needs to be given to both capability as well as appropriate tools (covered in section 4.6) in integrating climate risks within business processes.

The risk management function of listed organisations normally sets internal target metrics that align with external commitments, whether the commitment is earnings guidance or other financial performance, or climate goals (be it GHG emissions per the GHG Protocol or the NGER regime or climate related metrics and targets as outlined in the TCFD Guidance on Metrics, Targets and Transition Plans). Risk management teams should champion thoughtful metrics, thresholds and reviews to ensure real progress is made towards reducing climate risk, in alignment with the overarching strategic plan.

Figure 11 below demonstrates as to how climate risk (a material business risk) can be integrated within an organisation's ERM system with adjustments as to boundaries and time frames.

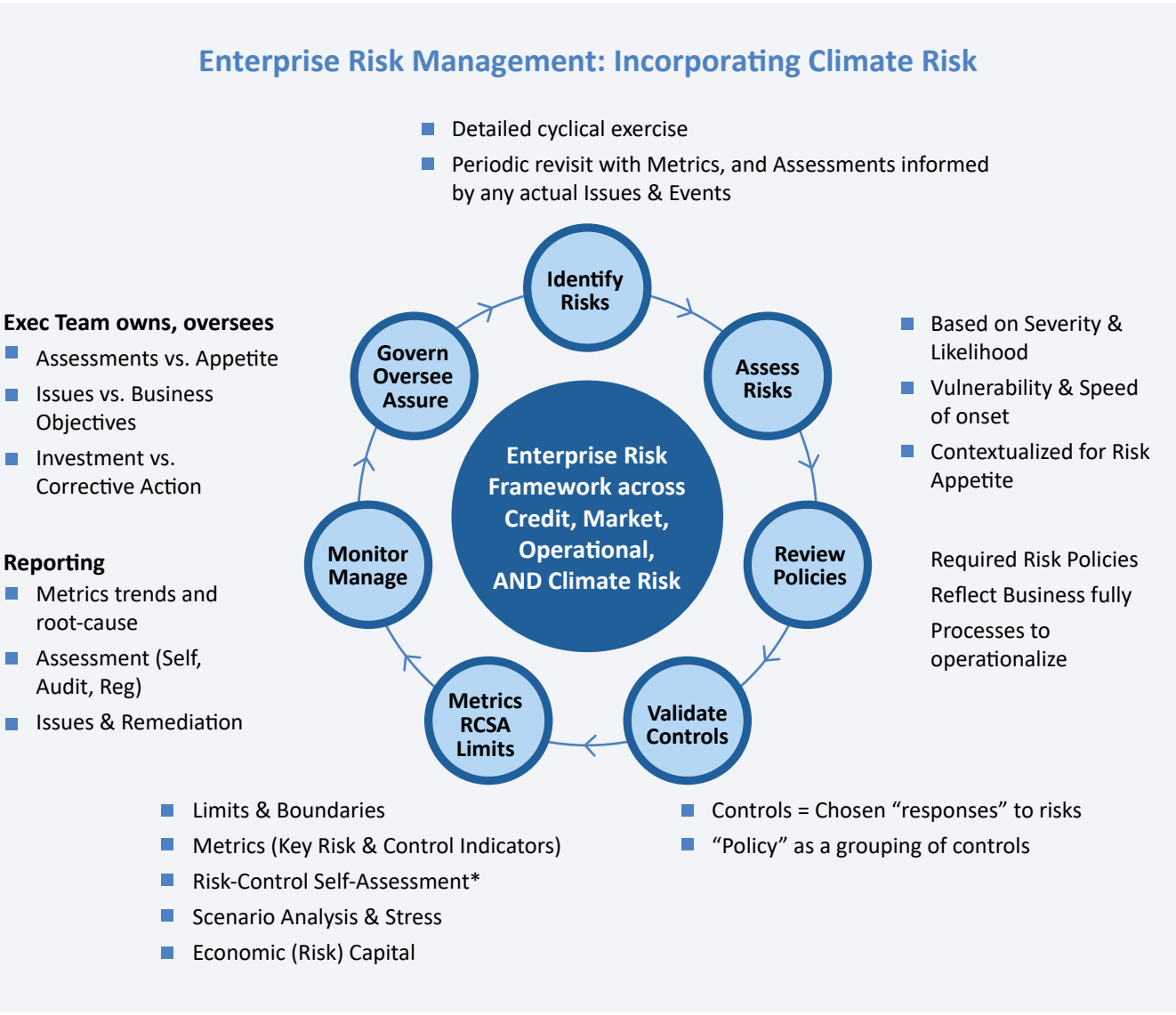


Figure 11: Incorporating climate risk into enterprise risk management

Risk ownership

In most organisations, responsibility for reducing risk reaches across the business. Climate-related risk is no different. However, given assessment and management of climate risk can be a new capability in some organisations the Sustainability and Risk functions may provide initial support for the process during the initial cycles. However, the responsibilities need to be owned by the business. By including climate and sustainability within business unit strategy and plans, organisations help ensure that risks are managed at their source and responsibility for executing any plans lies with the area most able to operationalise the action required and control the outcome.

By integrating the risks into ERM and the climate risk actions into business unit planning and management the board and executive management are able to maintain oversight and responsibility for governance of effective climate risk strategy formulation, governance and decision making (paras 5-6, AASB S2).

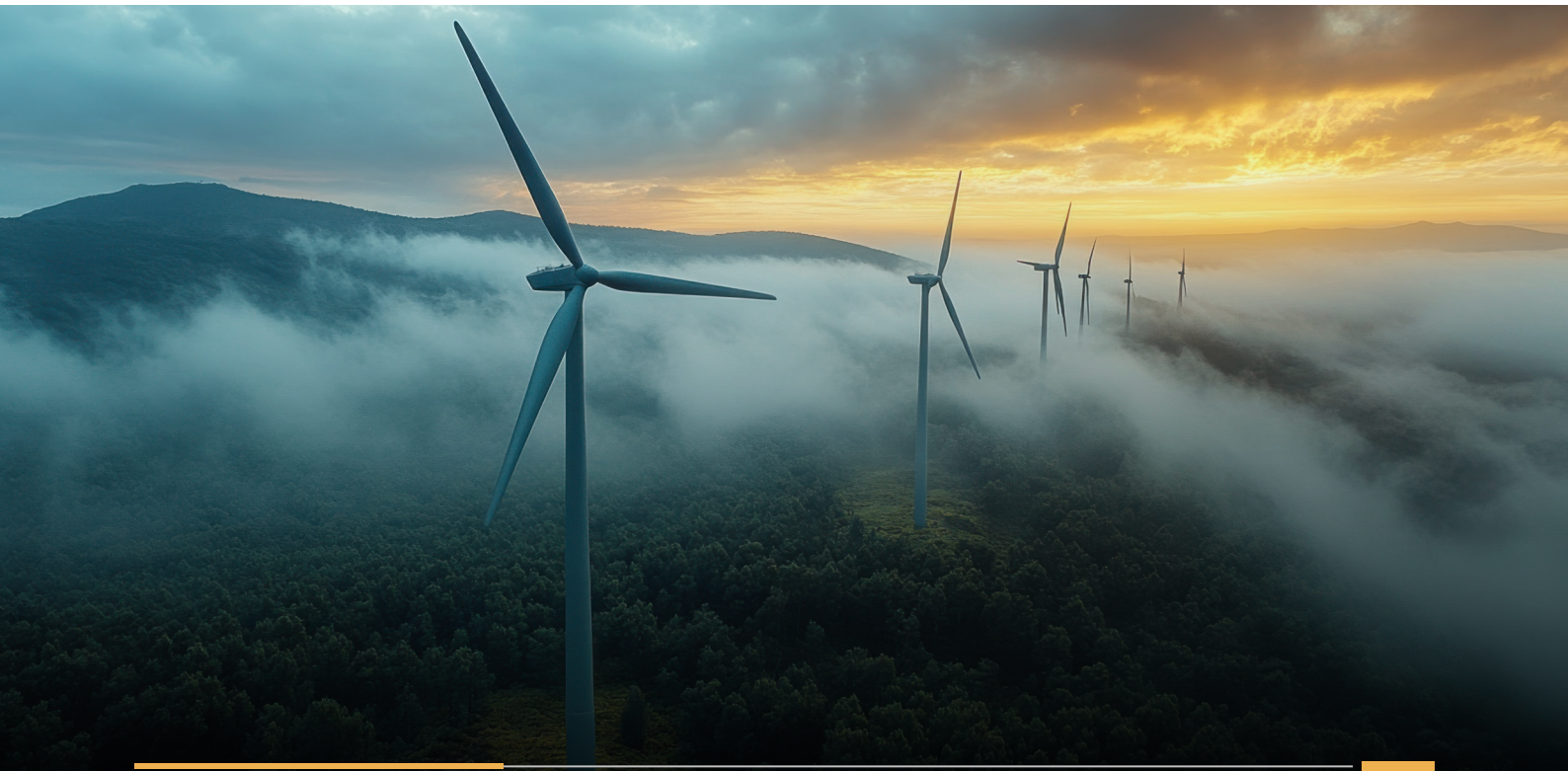
Importance of risk culture

Risk culture, a subset of organisational culture, combines beliefs, values and behaviours to shape the collective approach to managing risk and making decisions. The risk culture of an organisation will greatly affect its approach to risk-taking, innovation and resilience. A positive risk culture is one where employees across all levels within an organisation are engaged and actively manage risk as part of their daily activities. Instilling a risk culture supports meaningful discussion on the impacts of various activities on the long-term viability of a business and its resilience. A mature risk culture entails clear and consistent communication from the Board to encourage organisational awareness.

Both TCFD and AASB S2 emphasise the need for businesses to build in organisational resilience as part of the risk and opportunity management process (paras 22, 24-25 of AASB S2). The impact of climate risk on an organisation's long-term viability and enterprise value means the board, management and employees must understand and acknowledge the long-term risks that climate change poses to the viability and growth of a business. All stakeholders must also understand the opportunities climate risk entails through potential new revenue streams and collaboration with other industry and ecosystem members, such as government and regulatory agencies.

Disclosure and compliance

Risk management teams should champion thoughtful metrics, thresholds and reviews to ensure real progress is made towards reducing climate risk, in alignment with the overarching strategic plan. Boards and executive managers should ensure that key metrics and targets are regularly measured and monitored, to ensure compliance with reporting (paras 27-31, 33-36, AASB S2) and regulatory requirements such as National Greenhouse and Energy Reporting (NGER). To manage climate-related risks, executive managers should monitor appropriate metrics and targets on a monthly basis as part of the management reporting framework. (Refer to Section 4.4)



4.2 Integration With Business Strategy

With climate risk increasingly recognised as a material factor affecting a company's financial performance and future resilience, leaders need to consider the deep connections to achieving corporate goals, executing business strategies along with the relationship to other business risks, including supply chain disruptions, operational inefficiencies and transitions and market shifts in demand. Assessing climate risk as a standalone activity will likely result in missed opportunities for value creation through mitigation, cost savings, innovation and growth.

a) Alignment of climate risks and opportunities with business planning

Building a 'climate risk lens' into shaping the corporate and business unit strategy, will result in numerous benefits ranging from ensuring regulatory compliance to value enhancement to risk mitigation and the cultivation of stakeholder trust. In addition, inclusion not only minimises potential financial losses from climate-related disruptions but also enhances a firm's access to capital and overall value[21,22,23,24]. By embedding climate risk and opportunity considerations in investment decision making and new product/service development, companies are better positioned to capitalise on emerging market opportunities such as low-carbon technologies, green financing and attracting eco-conscious consumers.

Strategic integration of climate risk enhances a firm's environmental credentials and strengthens relationships with stakeholders, including investors, customers and employees. This approach meets stakeholder demand for meaningful climate action and demonstrates a commitment to sustainability, fostering trust and loyalty. Moreover, firms that integrate climate risks into their strategic planning tend to have lower capital costs[25]. Investors and financial institutions increasingly favour companies with strong climate risk management practices, as they are perceived to be more resilient.

Scenario Analysis, Targets and Metrics

Both AASB S2 and IFRS S2 require companies to use climate-related scenario analysis to assess their climate resilience. This involves evaluating how different climate scenarios could impact the company's strategy and operations, helping to identify potential risks and opportunities. The mandatory requirements also stipulate statements on setting and disclosing climate related targets, metrics and KPIs (See section 4.3). By incorporating scenario analysis, climate specific targets (including Scope 1, Scope 2 and Scope 3 greenhouse gas emissions) and metrics, companies can better understand the resilience of their business models and strategies under various climate conditions, enabling more informed decision-making and strategic planning. A range of publicly available scenarios are available, such as those published by IPCC, IEA and NGFS. They are based on macro-economic variables such as future population levels, economic activity, social values and patterns of technological change. Hence, these can be used as meta-scenarios to provide overall context and sets of macro trends, which can then be adapted to reflect company or sector-specific considerations. Companies can also opt to develop their own scenarios or use a combination of both.

[21]Choi, B., Luo, L., & Shrestha, P. (2021). The value relevance of carbon emissions information from Australian-listed companies. Australian Journal of Management, 46(1), 3-23. https://doi.org/10.1177/0312896220918642

[22]Choi, B., & Luo, L. (2021). Does the market value greenhouse gas emissions? Evidence from multi-country firm data. British Accounting Review, 53(1), Article 100909. https://doi.org/10.1016/j.bar.2020.100909

[23]Shrestha, P., Choi, B., & Luo, L. (2022). Does a carbon management system mitigate the consequences of carbon emissions on firm value? An international study. Journal of International Accounting Research, 21(3), 147-167. https://doi.org/10.2308/JIAR-2021-019

[24]Shrestha, P., Choi, B., & Luo, L. (2023). Carbon management system quality and corporate financial performance. The International Journal of Accounting, 58(1), 2350001-1-2350001-52. Article 2350001. https://doi.org/10.1142/S1094406023500014

[25]Shen, H., Wu, H., Long, W., & Luo, L. (2021). Environmental performance of firms and access to bank loans. The International Journal of Accounting, 56(2), 2150007-1-2150007-37. Article 2150007. https://doi.org/10.1142/S1094406021500074

b) Development of a climate transition action plan

Integrating a Climate Action Transition Plan (CTAP) into business strategy is vital for managing climate risks, ensuring compliance, and enhancing investor confidence. A credible CTAP shows commitment to a 1.5 degree pathway and net-zero economy. IFRS S2 aligns with TCFD (2017) in stressing incorporating climate risks into financial planning and budgeting. This approach boosts operational efficiency, opens new market opportunities, and strengthens reputation, fostering sustainable growth and competitive advantage.

A CTAP involves several key components:

01 **Risk and opportunity assessment:**

Identifying and evaluating climate-related risks and opportunities across the organisation, including physical risks such as extreme weather events and transition risks such as regulatory changes. [See Section 3.1 and Section 3.3]

02 **Strategic initiatives:**

Developing and implementing initiatives to achieve climate goals, such as investing in renewable energy projects and improving energy efficiency. (See Section 4.2)

03 **Governance and accountability:**

Establishing robust governance structures and assigning responsibilities to senior executives and the board of directors to oversee climate-related initiatives. (See Section 4.3)

04 **Vision and goals – time-bound, verifiable science-based targets and metrics:**

Setting ambitious, science-based targets for emissions reductions, conducting annual emissions inventories and ensuring third-party verification. [See Section 4.1 and Section 4.4]

05 **Policy engagement:**

Engaging with policymakers and regulatory bodies to shape and respond to climate-related policies and regulations. [See Section 4.4]

06 **Monitoring and reporting:**

Establishing metrics to track progress and regularly reporting on performance to ensure transparency and accountability. [See Section 4.1 and Section 4.4]

These elements backed with continuous monitoring, assessment and improvement (section 3) ensure that climate goals are ambitious, achievable and aligned with the latest climate science and foster long-term resilience and sustainability. The AASB, ISSB, GFANZ and UK Transition Plan Task Force provide guidelines to include CTAPs to guide corporate strategies towards achieving net zero.

c) Updating emission reduction targets

Updating emission reduction targets requires alignment with science-based frameworks and regularly reviewing targets. Specifically, AASB S2 highlights the need for SMART targets, disclosure of both gross and net emissions, transparent carbon credits and regular progress reporting. These practices collectively help organisations transparently report progress and align with global climate goals.

d) Investment in climate to enhance enterprise value

Investing in climate resilience is crucial for long-term business sustainability and mitigating climate change impacts. By strategically allocating resources, companies can protect operations, enhance stakeholder trust, and capitalise on opportunities. This investment can be Transitional, Operational or Strategic to the business.

Transition:

Investment in resilient infrastructure to withstand extreme weather and other climate impacts, reducing business disruption costs. Financial instruments like green bonds and green insurance products can create positive impacts. Supporting local communities to build climate resilience enhances reputation and stakeholder relationships.

Operations:

Mitigation strategies such as investing in renewable energy projects and on-site generation enhance resilience. Improving operational efficiency lowers energy consumption, costs, and GHG emissions. Reducing supply chain environmental impact includes sourcing renewable materials, reducing waste, and minimising transportation emissions. Implementing circular economy principles enhances resource efficiency, reduces costs, and creates new business opportunities.

Strategic:

Strategic investments in green technologies and low-carbon solutions open new market opportunities and attract eco-conscious consumers. This approach minimises financial losses from climate disruptions and enhances access to capital and overall value.

Capital Allocation

Effective capital allocation underpins the alignment of financial strategies with climate risk objectives. Integrating climate risk into investment decisions mitigates financial exposure and enables businesses to capitalise on opportunities during the transition to a low-carbon, climate-resilient economy. Businesses who demonstrate redirection of investment to support climate related transition including operational enhancement enabling a move to a low carbon economy and strategic business risks and opportunities as part of their business strategy, communicate a level of transparency and alignment that builds confidence and trust.

This proactive approach to prioritising capital allocation enhances a company's ability to navigate evolving market trends, regulatory changes and stakeholder expectations while contributing to sustainable development and strengthening a business's financial position.

e) Stakeholder engagement

Investing in climate resilience is crucial for long-term business sustainability and mitigating climate change impacts. By strategically allocating resources, companies can protect operations, enhance stakeholder trust, and capitalise on opportunities. This investment can be Transitional, Operational or Strategic to the business.

Engaging stakeholders and gathering their feedback helps organisations understand the real-world impact of their strategies and identifies the material issues and expectations of their stakeholders. Creating an engagement and feedback loop, often as part of sustainability strategy reviews, is crucial to gather insights and inform and prioritise strategies. Ongoing engagement builds support by ensuring the plan aligns with their expectations and concerns. Maintaining ongoing dialogue throughout the implementation phase, with regular updates and opportunities for feedback, keeps stakeholders engaged and supportive.

Leveraging public-private partnerships is also crucial. By partnering with governments, NGOs and other organisations, companies can share knowledge and resources, enhance the effectiveness of climate initiatives and demonstrate a commitment to collaborative action. For example, implementing community training programs to enhance resilience to climate impacts which builds local capacity and goodwill and strengthens relationships with community stakeholders.

Investing in transparent reporting and communication further builds trust. Public engagement campaigns that communicate the organisation's climate strategies and achievements while openly addressing challenges can enhance stakeholder confidence and support. Corporations have started to make their CTAP public as part of their transparent public reporting. By integrating these practices, companies can ensure their climate strategies are robust, transparent and aligned with stakeholder expectations.

4.3 Role Of Governance

Effective governance will ensure that climate risk impact and plans are embedded across business functions and decision-making processes. This section outlines how the business can merge the requirements for effective climate management into existing governance structures and the responsibilities of board and management committees, key executives, and governance tools like performance management, KPIs, internal controls and assurance.

According to AASB S2 guidelines (paras 5-6), reporting entities must:

- identify the governance bodies or individuals responsible for overseeing climate-related risks and opportunities, including their roles, responsibilities and how informed they are about these risks
- provide information on how these governance bodies integrate climate-related considerations into their strategic oversight, decision-making and risk management processes
- disclose management's role in these governance processes, including any specific positions or committees responsible for climate-related oversight and how these roles are integrated with other internal functions.

a) Role of the board

In 2019, the World Economic Forum released the Principles for Effective Climate Governance to provide guidance for board directors on integrating climate risks and opportunities into corporate governance frameworks. The principles emphasise the need for board directors to set clear objectives for carbon reduction, have adequate climate-related knowledge and skills, to embed climate considerations into decision-making processes, and to ensure that the company's strategy aligns with long-term climate goals and evolving regulations. Similarly, the Principles for Responsible Investment (PRI) encourage boards to adopt a proactive stance on climate risk, viewing it as a fiduciary duty to safeguard long-term shareholder value. In Australia, the Corporations Act reinforces this responsibility by mandating that directors exercise care and diligence, which increasingly includes managing climate-related financial risks.

The board of directors plays a crucial role in overseeing and guiding a firm's approach to climate risk management by ensuring climate-related risks are integrated into the organisation's governance framework. Given growing regulatory and market pressures to mitigate carbon emissions and transition to sustainable operations, the board must take an active and strategic stance to manage these risks.

By integrating climate considerations into the overall business strategy, the board helps the organisation navigate regulatory requirements, enhance resilience and capitalise on emerging opportunities. Effective management requires that boards regularly evaluate the company's exposure to regulatory, market and climate-based physical risks. By instituting these newer requirements as part of existing rigorous oversight mechanisms, the board ensures accountability for meeting emission reduction targets and aligns these goals with shareholder interests and corporate growth strategies.

b) Board Committees

Majority of companies have risk committees, and many companies have established sustainability or ESG or environment committees to handle climate-related issues. These committees, overseen by the board, are tasked with reviewing climate risk assessments, setting emissions targets, and ensuring the integration of climate risk management into all areas of the business[26]. However, to overcome a common bias positioning climate risk as a sustainability issue rather than a financial issue, clear ownership of climate risk management must be established. This ensures that climate risk is managed holistically, with close collaboration between risk management and sustainability functions. The presence of a board-level environmental committee can help balance a firm's financial and non-financial objectives, particularly when resources are constrained, and manage and moderate conflicting stakeholder expectations. Firms with such a committee are more likely to demonstrate higher levels of environmental responsibility and transparency, and to align ecological goals with corporate governance and stakeholder engagement.

c) Executive management committees, the Office of the Chief Risk Officer, Chief Financial Officer and Chief Sustainability Officer

Senior management plays a crucial role in ensuring that climate-related risks and opportunities are actively addressed at the operational level[27,28]. Key executives, such as the Chief Risk Officer (CRO), Chief Financial Officer (CFO) and Chief Sustainability Officer (CSO), are particularly instrumental in embedding climate risk into the firm's overall strategic and operational framework.

- By treating climate risk as a strategic concern, the CRO leads the assessment and management of climate risks within the broader ERM framework.
- The CFO evaluates how climate risks can impact capital costs, asset valuations and long-term value creation, and is responsible for embedding climate risk into financial planning, budgeting and forecasting.
- The CSO ensures that climate risk management is embedded into sustainability reporting and operational practices, fostering transparency and accountability in how the company addresses environmental challenges[29].

Together, these executive roles create a holistic approach that not only manages climate risk but also drives the organisation's transition, embedding it into strategic and operational activities to align with both financial and sustainability goals.

d) Skills and capability for effective climate governance

Organisations can better navigate the complexities of climate risk by ensuring that the board composition reflects a command of climate issues and the ability to turn potential threats into opportunities. Boards that embrace diverse skills, experience, and perspectives are better positioned to address the evolving nature of climate-related risks and opportunities by approaching challenges from multiple angles and guiding more innovative approaches.

Boards must also invest in continuous education to keep up with new developments in climate science, policy, economics and regulations. Measures may include bringing in external experts to provide advice and guidance on emerging climate risks, regularly reviewing and assessing the board's collective climate competence and ensuring that there is no loss of climate knowledge during leadership transitions by embedding climate expertise into succession planning.

[26]Tang, Q., & Luo, L. (2014). Carbon management systems and carbon mitigation. Australian Accounting Review, 24(1), 84-98. https://doi.org/10.1111/auar.12010

[27]Thun, T. W., & Zülch, H. (2023). The effect of chief sustainability officers on sustainability reporting—A management perspective. Business Strategy and the Environment, 32(4), 2093–2110. https://doi.org/10.1002/bse.3238

[28]Henry LA, Buyl T, Jansen RJG. (2019) Leading corporate sustainability: The role of top management team composition for triple bottom line performance. Bus Strat Env, 28: 173–184. https://doi.org/10.1002/bse.2247

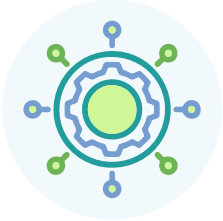
[29]Kanashiro, P., & Rivera, J. (2019). Do chief sustainability officers make companies greener? The moderating role of regulatory pressures. Journal of Business Ethics, 155, 687-701. https://doi.org/10.1007/s10551-017-3461-2

e) Using the 'Three Lines of Defence' model

The conventional 'Three Lines of Defence' model provides a structured approach to effective management of climate-related risks. The first line of defence involves operational management, where business units are responsible for identifying, assessing and managing climate-related risks within their daily operations. This includes integrating climate risk considerations into business strategies and decision-making processes. For instance, portfolio managers might incorporate climate risk assessments into their investment decisions, ensuring that these risks are considered alongside traditional financial risks.

The second line of defence consists of risk management and compliance functions, which provide oversight and support by developing and implementing climate risk management frameworks, policies and procedures. They also monitor compliance with these frameworks and ensure that climate risks are appropriately managed across the organisation. This layer acts as a check and balance, ensuring that operational actions align with the organisation's overall risk management strategy.

The third line of defence is internal audit, which provides independent assurance of the effectiveness of the climate risk management framework and its implementation. Internal auditors review and evaluate the processes and controls established by the first and second lines, ensuring they are robust and effective in managing climate-related risks. This comprehensive approach ensures that climate-related risks are identified, assessed, and mitigated effectively at all levels.



Internal control framework

Boards will also do well to consider the Internal Control-Integrated Framework (ICIF), developed by the Committee of Sponsoring Organisations of the Treadway Commission (COSO), which provides a comprehensive framework for designing, implementing and evaluating internal control systems. It helps identify and assess climate risks, integrate them into risk management and ensure accurate and consistent reporting. Applying these principles enhances the credibility and transparency of climate risk disclosures, meeting regulatory requirements and stakeholder expectations. Guidance issued in March 2023 builds on the ICIF to help companies establish strong internal ESG reporting controls and highlights the role of internal audit in sustainability reporting.

f) KPIs and board and executive performance management

Effective climate governance best practice aligns executive performance expectations and compensation with the company's climate-related objectives. This ensures a clear linkage and motivation for executives to prioritise and drive the transition to a low-carbon economy and mitigate climate-related risks[30,31]. Research studies[32], have shown that linking executive compensation to climate-related performance can drive meaningful behavioural changes and improve corporate climate governance. Integrating these metrics also sends a strong signal to stakeholders about the firm's commitment to achieving its climate objectives.

Companies in carbon-intensive industries are increasingly incorporating climate-related metrics into their Short-Term Incentive Plans (STIPs) and Long-Term Incentive Plans (LTIPs)[33]. For instance, companies like Shell and BP have implemented such practices by embedding climate-related targets, such as reducing emissions intensity, into their annual bonuses and long-term stock compensation plans.

To fully integrate climate risk into governance processes, boards should incorporate climate-related metrics into executive scorecards, balancing financial performance with sustainability goals. Climate-related metrics, such as emissions reduction and sustainability initiatives, should be incorporated into Balanced Scorecards used for performance reviews and linked to executive compensation. This helps ensures that executives are rewarded for advancing the company's climate objectives.

By aligning executive incentives with climate risk management, companies can ensure that their leadership remains focused on reducing the company's climate risk exposure and capitalising on opportunities related to the low-carbon transition. These compensation structures foster accountability, enhance climate transparency, and support the company's long-term sustainability and financial performance[34]. This alignment is key to integrating climate risk into corporate governance and driving strategic actions that mitigate climate-related risks.

4.4 Reporting And Disclosure Rigour

Following completion of climate risk assessments, one of the next steps is integrating the findings and related action plans into the disclosures required by existing reporting frameworks, such as the AASB S2. A well-structured disclosure and reporting process allows stakeholders to understand a company's climate risk profile, mitigation efforts and the financial implications of these risks. Additionally, integrating climate risk into financial disclosures provides stakeholders with a clear understanding of the potential material impacts on a company's financial health and performance. Companies should disclose how climate risks affect earnings, assets, liabilities and operating expenses (see section 4.3 & 4.5).

This section outlines the specific actions required for transparent reporting, the necessary periodic disclosures, and the internal and external assurance processes needed to ensure rigour in climate-related reporting.

Assurance is also a requirement of ASRS. Following approval of ISSA 5000 by the International Auditing & Assurance Standards Board (IAASB) in September 2024, and the Australian Auditing and Assurance Standards Board's proposed Standard on Sustainability Assurance (ASSA 5010), organisations will be required to progressively assure their sustainability reports.

[30]Simic, S., Luo, L., & Datt, R. (2024). Compensation and carbon assurance: Evidence from the United Kingdom. International Journal of Auditing, 28(2), 307-327. https://doi.org/10.1111/ijau.12332

[31]World Economic Forum. (2019). How to set up effective climate governance on corporate boards guiding principles and questions insight report, available on the internet at https://www3.weforum.org/docs/WEF_Creating_effective_climate_governance_on_corporate_boards.pdf

[32]Bose, S., Burns, N., Minnick, K., & Shams, S. (2023). Climate-linked compensation, societal values, and climate change impact: International evidence. Corporate Governance: An International Review, 31(5), 759–785. https://doi.org/10.1111/corg.12504

[33]Ritz, R. A. (2022). Linking Executive Compensation to Climate Performance. California Management Review, 64(3), 124-140. https://doi.org/10.1177/00081256221077470

[34]COHEN, S., KADACH, I., ORMAZABAL, G. and REICHELSTEIN, S. (2023), Executive Compensation Tied to ESG Performance: International Evidence. Journal of Accounting Research, 61: 805-853. https://doi.org/10.1111/1475-679X.12481

a) Periodic disclosure with mitigation plans

To effectively integrate climate risk into corporate reporting, companies must provide comprehensive and transparent disclosures covering climate-related performance, risks, opportunities and mitigation action plans. These disclosures should regularly update stakeholders on key climate metrics, including reductions in GHG emissions, improvements in energy efficiency and progress toward long-term sustainability goals. It is crucial that companies clearly outline both physical and transition risks as well as opportunities arising from these risks, such as investments in green technologies and innovative low-carbon solutions. Several Australian companies (some since 2018), such as Commonwealth Bank of Australia, BHP, Telstra, Woolworths Group and Rio Tinto, have already started voluntary climate reporting. This proactive approach not only prepares them for upcoming mandatory requirements but also enhances their transparency and accountability to stakeholders.

Equally important is offering a detailed account of planned risk mitigation strategies and plans, including adaptation strategies, targeted investments and operational adjustments that align with long-term climate risk management objectives. Consistent, periodic disclosures, whether quarterly or annually, are essential for maintaining transparency and demonstrating the company's ongoing commitment to effectively managing climate risks. This proactive and structured approach to reporting and additional stakeholder engagement (Section 4.2) will build trust and ensure the firm remains aligned with evolving regulatory standards and investor expectations.

b) Reporting rigour: assurance, greenwashing and implications

Greenwashing – the misrepresentation of a company's environmental credentials – can result in reputational damage, regulatory penalties and legal consequences. Companies that provide inaccurate or exaggerated claims about their decarbonisation efforts also risk undermining investor trust.[35] Adopting thorough internal and external assurance practices mitigates these risks and ensures that climate-related disclosures are both credible and trustworthy[36,37].

On the one hand, companies should implement robust internal controls over climate risk data to ensure the accuracy of their reporting, by following established frameworks like COSO's Internal Control-Integrated Framework for sustainability reporting as discussed in section 4.3[38]. Internal auditing teams should regularly review the effectiveness of these controls and ensure that climate risk data is integrated into broader financial reporting. On the other hand, independent third-party assurance is critical for verifying the credibility of climate-related disclosures, with these providers reviewing reported risks, performance metrics and mitigation strategies to ensure compliance with reporting frameworks and the accuracy of reported data. This external validation builds stakeholder confidence and may result in lower cost of equity capital compared to non-assured firms[39] and underscores the role of external assurance in boosting investor confidence.

[35]https://asic.gov.au/about-asic/news-centre/speeches/greenwashing-a-view-from-the-regulator/

[36]Bui, B., Houqe, M. N., & Zaman, M. (2021). Climate change mitigation: Carbon assurance and reporting integrity. Business Strategy and the Environment, 30 (8), 3839-3853.

[37]Luo, L., & Zhang, J. (2024). A global study of climate uncertainty and carbon assurance. The British Accounting Review, 101425.

[38]In March 2023, COSO issued guidance on how its Internal Control-Integrated Framework (ICIF) can be applied to sustainability reporting. This guidance highlights that the same principles used for financial reporting controls can be adapted to ensure the reliability, accuracy, and consistency of sustainability-related data, promoting robust and transparent sustainability reporting.

[39]Datt, R., Luo, L., & Segara, R. (2024). Voluntary carbon assurance and the cost of equity capital: International evidence. Australian Journal of Management, 0 (0), 03128962241251498.

4.5 Integration With The Office Of The CFO

As sustainability and climate related information is increasingly connected to financial disclosures, sustainability and reporting teams are working more closely with finance teams to quantify the impacts of climate change on an organisation's business operations and future performance. Key areas where finance teams can make significant contributions are on the impact of climate related risk activities such as assessing the materiality of climate risks, building robust financials behind scenario planning and building business cases for climate related investments.

a) Assisting materiality assessment of climate-related risks

In Section 3.2, we outlined the approach for Climate Risk Analysis - as part of this process organisations need to prioritise their climate risk exposures based on materiality. Factors include short, medium and long-term impacts on the business, geographic location, the organisation's position in the supply chain, its target markets, business model and stakeholders' expectations.

In providing inputs on the possible financial implications of climate risks over time and finance teams can:

- provide relevant financial data to support materiality assessments
- assess the evolution and probability of risks
- analyse possible outcomes in different operational areas
- ensure that assumptions align with other financial processes, such as long-term forecasts or viability statements, so that the outcomes are aligned with business drivers and strategy.

b) Embedding scenario analysis outcomes in business planning and strategy

Scenario planning helps companies assess their vulnerabilities to climate change. Developing in-house scenarios require multi-year commitment, external expertise and transparency into the process and content of the scenarios to satisfy investor and regulatory needs. Most companies opt to use publicly available scenarios in the first instance, tailoring them to individual organisational needs over time. Best practice involves using scenarios that are relevant to both the industry and organisation, with Australian companies needing to use at least two scenarios[40] and New Zealand companies needing to use three[41].

Finance teams can assist by:

- validating the integrity of the underlying inputs to the model.
- assessing scenario sources before committing to publicly available scenarios or undertaking in-house development. In the latter case, the development process naturally fits within the finance team's remit, given their regular interaction with modelling exercises. If publicly available scenarios are chosen, the finance team can play a role in analysing the assumptions and their respective impacts to enable the right selection.
- ensuring that assumptions and parameters used in the modelling activity are aligned with other financial processes, such as long-term forecasts or viability statements. This alignment is key to integrating the outcomes of the scenario analysis process into an organisation's financial planning and forecasting.

[40] As per Section 296D(2B) of the Corporations Act 2001
[41] As per para 13 of NZ Climate Standard 1 Climate-related Disclosures (NZ CS 1)

- data availability being a key consideration, in the absence of appropriate data, gap filling may be required based on logical extrapolation techniques using realistic assumptions.
- aligning scenario analysis with the viability assessment process to ensure stress-testing techniques and assumptions are consistent. In addition, by incorporating mitigation and strategic actions into business plans within the financial reporting cycles, finance teams ensure that scenario analysis results can influence the strategic direction of the organisation.

c) Evaluating financial implications

Following scenario analysis, the results of each scenario need to be analysed. Scenario modelling at the individual organisational level may be preferred as climate risks impact organisations within the same sector differently. Results of scenario analysis should be shared across business units within an organisation to enable translation into clear strategic responses / actions.

The Australian Government is also in the process of evaluating a Carbon Border Adjustment Mechanism (CBAM) similar to the EU. This is to curb the potential carbon leakage, i.e., where businesses relocate production to countries with less stringent emissions regulations, resulting in higher overall emissions. Should the initiative come into effect, Australian businesses (with assistance from their finance teams) should keep abreast of the latest developments and consider assessing exposure and potential impacts, including identification of goods and services that could be impacted, estimating the financial implications, evaluating trade relationships and engaging in dialogues with key stakeholders.

Finance teams can assist by:

- capturing the impacts of scenario analysis on revenues, operating costs, earnings and cash flows as part of the regular financial processes, such as capital allocation, budgeting and forecasting, financial reporting, business interruption and disaster recovery planning. Note these teams will also have contributed to the development of appropriate mitigation responses outlined in the climate transition action plan.
- considering the impacts of climate-related risks and opportunities on financial statements such as impairment of physical and intangible assets [including impairment indicators for cash generating units (CGUs) or particular assets]; impacts on the useful lives of assets and changes in their fair value; recognition of provisions for liabilities such as insurance, asset retirement obligations, lease abandonment obligations and onerous contracts; and viability of 'going concern' assumptions.

d) Focus on documentation and reporting

Disclosing the financial impacts of climate-related risks and opportunities is identified in AASB S2 (paras 15-21, 28-Aus 37.1). The disclosure of financial implications should be approached from two perspectives, i.e., potential financial implications of the various scenarios and financial implications for the company's strategy and related plans, including changes to alleviate risks and/or capitalise on opportunity.

Finance teams can assist by:

- drafting scenario analysis process and result disclosures. They should also consider integrating results within other areas of the financial statements outlined in section 4.5(c) above. The process should follow the same rigour and discipline as for financial reporting.
- use internal audit expertise to validate whether processes are in line with the internal control framework necessary for other established financial processes, using the COSO Guidance on Internal Control over Sustainability Reporting as a framework which will support accuracy and completeness assertions in both the internal audit and external assurance process.

4.6 Other Areas Of Integration

Following the completion of a climate risk assessment, businesses must integrate the insights gained into broader operational and strategic areas of the business to ensure they address climate risks holistically. **Figure 12** highlights other areas where enterprises should integrate climate risk within their business such as Finance, IT, Organisational Capability, Supply Chain & Procurement and Internal Controls. Whilst Finance has been covered in section 4.5 above, this section focusses on the other aspects of integration.

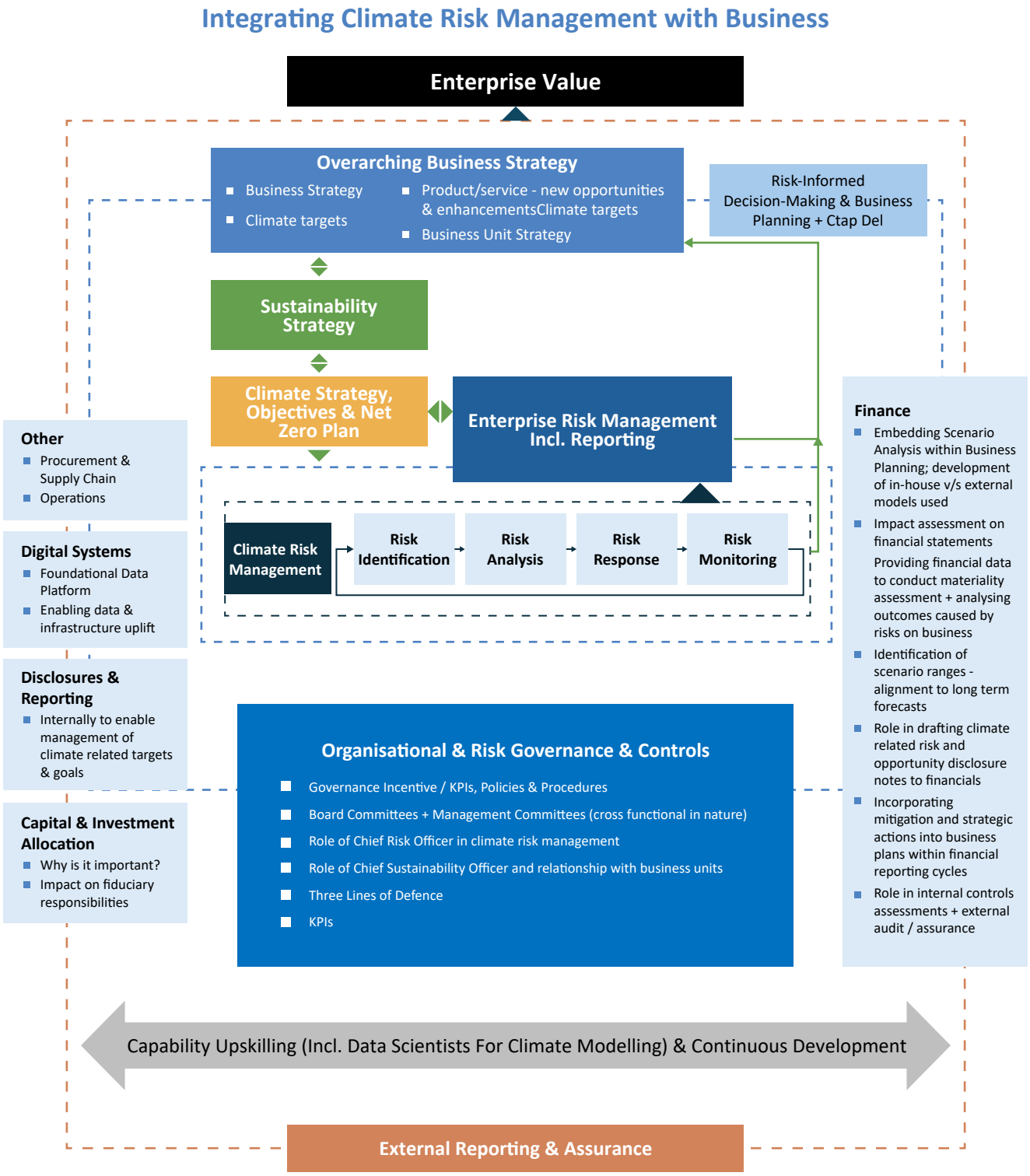


Figure 12: Integrating Climate Risk Management within the business - extension

a) Leveraging IT & Data Platforms

Businesses need to leverage IT and data platforms to support integration and scaling of climate risk assessment and reporting requirements. Utilising digital infrastructure to standardise and simplify use of data for reporting, real-time monitoring and advanced analytics, along with specialist tools to support process and external data sets will support the process and decision making and enhance the effectiveness of climate risk management in an enterprise.

Key areas for consideration when designing a digital strategy for climate risk management include data architecture; enterprise platforms; and specialist toolsets & external data.

Foundational Data Architecture & Management

In most enterprises climate-related data remains largely disaggregated with representation in the desktops or SharePoint sites of specialist teams (often in excel format), in ERP systems, ERM platforms and many more. There needs to be a single source of truth and formal data governance established over ownership, access, accuracy, completeness, timeliness, modification and storage.

Data Standardisation:

Establish consistent data definitions and taxonomies to ensure data comparability and alignment across reporting frameworks (e.g., TCFD, ISSB).

Data Quality and Integrity:

Implement rigorous data validation and cleansing processes to ensure data accuracy and reliability, especially for regulatory compliance.

Data Privacy and Security:

Ensure compliance with data protection regulations and implement security measures to protect sensitive information.

Scalability:

Build a flexible data architecture that can scale to accommodate growing data volumes and types from internal and external sources.

With regulatory compliance reporting sustainability reports and climate action transition plans and the associated data (financial and non-financial) are discoverable assets and need clear traceability and assurance of accuracy and robust reporting mechanisms for transparency and standards adherence to frameworks like AASB S2.

Enterprise / Climate Risk Management Systems and Specialist Toolsets and External Data

Business and IT stakeholders need to consider the complexity of risk management data and activities for each specific business – how material is climate risk to the resilience and growth of the business and how important is scenario planning and business modelling.

These things along with frequency of reviews will help inform the need to invest in toolsets for scenario modelling; stress testing and impact analysis; AI climate forecasting; and near real time modelling to track climate-related metrics and indicators, aiding timely decisions and CTAP adjustments. Sourcing and integration of external geospatial and environmental data from sources like CLIMADA or WRI also need consideration to enhance risk analysis accuracy.

Enterprise Systems

Climate related considerations touch nearly every area and hence many enterprise platforms need consideration in the alignment and integration of climate related activities in the business. Some of these are outlined below:

- ERP and Financial System Integration – connecting climate, financial management and contract management data to integrate climate risks into financial planning, budgeting, and reporting. This may extend to utilisation of carbon accounting software to tracking and report on GHG emissions, energy use, and other climate-related metrics.
- Supply Chain Management and Operations - risk mapping and monitoring for supply chain vulnerabilities. Scope 3 tracking and traceability are increasingly more relevant and critical as organisations seek to progress low-carbon models.
- HR / Performance Management and incentive Metrics management for climate-related goals. Also learning systems for climate risk and sustainability education programs.

By uplifting these platforms, businesses can improve decision-making, enhance collaboration, and ensure compliance with regulatory requirements. This approach strengthens financial resilience, demonstrates commitment to environmental responsibility, and positions the business as a leader in sustainable development.

AI and Automation

AI can revolutionise climate risk management by providing advanced predictive capabilities and data-driven insights, significantly enhancing decision-making processes in scenario planning and analysis and stress testing. AI allows organisations to analyse vast datasets, including real-time environmental data, to forecast climate risks more accurately. AI models can identify patterns and trends and simulate multiple future pathways, enabling companies to better anticipate climate-related impacts and disruptions on the business and take proactive measures to mitigate risks across their assets, supply chains and operations. This leads to more resilient business strategies, developing robust adaptation and mitigation strategies and improved compliance with evolving climate-related reporting standards, such as AASB S2, IFRS S2.

Project Gaia[42], is an example of a collaboration between the BIS Innovation Hub and several central banks, leveraging generative AI to facilitate climate risk analysis.

AI and LLMs present an opportunity to streamline reporting processes, ensuring compliance with frameworks like AASB S2 and IFRS S2, reducing administrative burden, and enhancing disclosure accuracy.

By considering these elements, businesses can develop a robust digital strategy that enhances climate risk management, supports sustainable practices, and ensures regulatory compliance.

[42]https://www.bis.org/publ/othp84.pdf

b) Organisational Capability

Future value creation will be increasingly linked to the effective integration of climate risk into the business, and employees with the relevant skills and capabilities across the organisation are essential to this integration and successful progress toward net zero goals.

The majority of companies climate and net zero journeys start with a small team, led by executive-level sponsorship, working on climate risk as a sustainability priority. These core teams generally need individuals with a mix of four broad skill sets and capabilities.

Sustainability

skills specific to themes such as climate or carbon accounting, and the regulation and framework landscape.

Functional

skills that reflect knowledge of the core business tasks most material as well as horizontal functions such as risk, finance, operations and legal – understanding of climate related risks, assessments, and implications are essential to grounding climate assessment and actions in the reality of the business.

Transformational

change management skills to help navigate the inherent ambiguity of the complex, evolving climate landscape and change required.

Data and digital

skills for capturing, managing and analysing data, measuring and reporting progress and devising solutions. In the context of ASRS for example, translating climate data into financial reporting information will require close collaboration and integration between the climate (sustainability) and finance teams (see Section 4.5).

Successfully integrating climate risk needs leaders and individuals throughout a company to embed climate and sustainability linked consideration as an inherent component of their everyday work. Sustainability and Climate capability development is following a path very similar to Digital where the specialist capability was developed but then became part of everyone's role. Today, the importance of a sustainability mindset that considers climate along with other related business priorities is crucial for business resilience and longevity.

To do this, employees within functions and business units need to build general climate and sustainability and understand how their existing roles and functions will contribute to achieving the organisations. Some new specialist roles will be required but many roles will be augmented to include new information and consideration as part of decision making and prioritisation. For example, merging climate skills with procurement skills will help organisations move towards achieving Scope 3 reduction goals in the course of supplier relationship management.

While each business needs to work with HR to adopt and invest in an informed, inclusive approach to upskilling and building sustainability and climate related capability, an engaged executive to champion the initial program will be help ensure accelerated outcomes. Access might involve online training opportunities and digital platforms that build a common climate understanding at scale and provide a springboard for more specific learning thereafter.

The climate risk profile of the company should guide which functions or business units need to prioritise upskilling and training.

Cascading climate KPIs from executive leadership into business units as outlined in earlier sections, coupled with upskilling, will enable business units to develop their own plans that embed climate risk into day-to-day activities to meet organisational climate objectives and increase sense of ownership.

Some leading companies have created a centre of excellence model, where new climate/low carbon business models and processes – and the skills and capabilities that go with them – can be incubated in collaboration with ecosystem partners until they are ready to be deployed in business units.

c) Supply chain and procurement

Supply-chain risk represents a significant operational risk for firms[43]. Increasing social awareness and regulatory pressure compel corporations to address the environmental, social, and governance (ESG) risks associated with their suppliers. For instance, regulations like the The Australian Modern Slavery Act 2018 that came into force on 1 January 2019 requiring larger companies and other entities in Australia to report on how they are preventing and addressing modern slavery risks in their operations and supply chains. Additionally, directives such as the European Corporate Sustainability Reporting Directive (CSRD) require corporations to provide transparency on their supply chain practices, ensuring they align with ESG standards. Business cases further illustrate this shift, for example, Walmart's Project Gigaton and Unilever's Sustainable Living Plan exemplify proactive corporate initiatives aimed at reducing environmental impact and enhancing supply chain sustainability.

Integrating climate risk assessments into supply chain and procurement strategies helps businesses navigate both climate change and regulatory demands. Engaging suppliers in climate risk management through collaborative initiatives and adaptive procurement strategies also helps ensure suppliers are prepared to manage and reduce carbon emissions. This approach not only aligns procurement decisions with sustainability targets but also enhances the overall resilience and competitiveness of the supply chain.

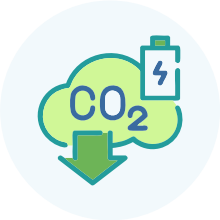
For example, in sectors like green construction materials, it is crucial for managing business risks. These materials, crucial for sustainable building projects, often face fluctuations in availability and price competitiveness. By adopting robust sustainability standards and lifecycle analysis in procurement policies, companies can ensure a reliable supply of these materials at competitive prices. Additionally, aligning Scope 3 emissions data with transparency and reduction goals enhances stakeholder trust and supports a company's sustainability targets. This strategic approach not only mitigates risks associated with climate impacts but also positions the company for growth and innovation in the low-carbon economy.

[43]Ersahin, N., M. Giannetti, and R. Huang. 2024. Trade Credit and the Stability of Supply Chains. Journal of Financial Economics 155, 103830.

Incorporating robust sustainability standards and lifecycle analysis into procurement policies helps monitor and reduce environmental impacts, while geographic diversification of suppliers mitigates risks associated with climate impacts. Real-time data systems and transparent reporting on climate risks further support quick responses to disruption and build stakeholder trust. By adopting these comprehensive risk management practices, companies can protect themselves against environmental risks and capitalise on opportunities for growth and innovation in a sustainable, low-carbon economy.

Adoption of internal mechanisms

In addition to a thorough climate risk assessment and CTAP, several internal mechanisms can be used to support climate action and emission reduction by organisations.



Carbon pricing as a decision-making tool

Internal carbon pricing drives emission reductions within the organisation and ensures that capital is directed towards projects that align with long-term sustainability goals. Businesses can allocate internal costs to carbon emissions, factoring these into project evaluations and financial decisions. By accounting for the cost of carbon emissions, low-emission projects and technologies can be prioritised and financial risks associated with future regulatory changes such as carbon taxes and emissions trading reduced.

Integrating climate risk into investment portfolios

Integrating climate risk assessments into the investment portfolio requires evaluating investments based on their financial returns and exposure to both physical and transition risks. Investment portfolios that consider climate risks are better positioned to avoid stranded assets and capitalise on opportunities in sectors such as renewable energy, energy efficiency and sustainable infrastructure. Businesses demonstrating strong climate risk management practices are more likely to attract investment and secure favourable financing terms from climate-conscious investors.

4.7 Integration Challenges & Levers

Climate risk management adoption within organisations varies with size, sector and region. Evolving regulatory landscapes have driven organisations to start the journey in most geographies, but challenges to effective implementation of climate risk management remain. Compliance-based challenges to climate risks that inhibit firms from fully capturing their climate risk landscape include:

- specific data requirements, analyses and capabilities that many firms lack
- funding shortfalls for climate risk response
- uncertainty in carbon target setting and net zero pathways
- the absence of ecosystems that encourage cross-industry knowledge sharing and support
- lack of internal synergy between teams on climate response
- varying level of senior management focus on climate risks.

Embedding climate risks into ERM frameworks will help leverage their strengths and accelerate the adoption of climate risk management. **Figure 13** outlines the levers for effective climate risk integration.

Figure 13: The levers to effective integration on climate risks into ERM

5. Case Studies

To illustrate how some Australian ASX listed organisations have integrated climate risk as part of their business, outlined herein below are case studies / case lets of these organisations based on our engagement with them for this Business White Paper and other engagements.

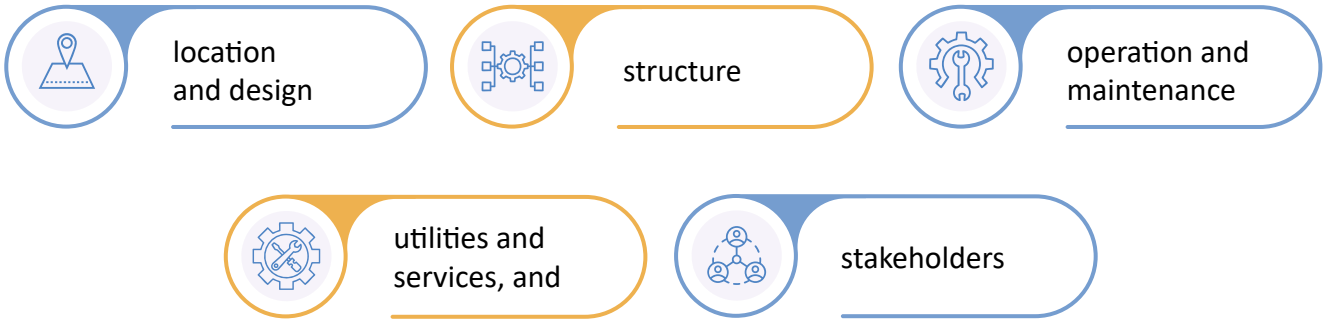
- **Stockland:** How Stockland builds Climate Risk & Resilience into its Asset Portfolio (Partner)
- **Downer EDI:** How Downer EDI integrates climate risk within business (Partner)

a) How Stockland Builds Climate Risk And Resilience Into Its Asset Portfolio: An Illustrative Case Study

Climate-related risks are embedded within the decision-making process of Stockland Corporation Limited ('Stockland'). Stockland has been conducting portfolio level exposure mapping and detailed asset-based climate resilience assessments since 2011.

With its bespoke climate resilience assessment methodology that sets out the criteria to assess the resilience of individual properties and their communities across all types of properties within its portfolio, Stockland conducts a national mapping exercise based on the projected changes to climate variables. This helps the organisation identify exposure levels for all assets within its portfolio, including those under development.

Stockland's climate resilience assessment methodology focuses on an asset's vulnerability to climate change, with reference to its ability to endure severe weather impacts and operate without disruption (impact of acute physical risks). The methodology defines key resilience criteria, with a particular focus on attributes such as:



These attributes are assessed for their exposure to future climate effects, property elements and climate risk:

Future Climate Effects

Degree of exposure a building has to adverse weather events based on geographic location. (For example, in Northern Queensland, which has high exposure to cyclones and potential for flooding.

Property Elements

Physical and operational attributes of buildings that make them vulnerable or resilient to climate effects. (For example, the condition of box gutters or structural integrity of roofing and their ability to cope with high volumes of water at a given point in time)

Climate Risk

Potential impacts of weather-related events on buildings based on its location and attributes. For example, loss of trade due to flooding or bushfires, or breakdown of air conditioning on days with higher than average temperatures.

Asset level assessments have been conducted for Stockland's entire portfolio applying the Intergovernmental Panel on Climate Change's (IPCC) Representative Concentration Pathway (RCP) 8.5 projections to 2030 and 2090. All acquisitions are subject to a climate risk exposure assessment. A more detailed climate risk assessment is performed, at a minimum, by the design stage of a project to identify mitigation opportunities. These asset level assessments provide some key benefits, i.e.,

- Project teams **consider climate-related risks and opportunities in asset design** by including principles-based criteria in design guidelines and minimum standards. Improving resilience mitigates the potential future costs associated with maintenance, upgrade and emergency response initiatives.
- **Asset specific insights** allow the business units to **identify and accurately measure cost** to mitigate any high risks and to **align capital expenditure programs** to deliver them.

Outcomes of assessments are discussed with project and asset teams to help **inform asset design and management together with resilience measures**. Climate resilience assessments are consolidated in a Group Resilience Assessment Tool[44] to help us understand physical climate risk at a portfolio level. Identified resilience measures for each asset are integrated into capital plans.

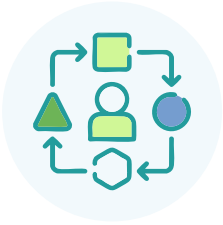
B) How Downer EDI Integrates Climate Risk Within Business – An Illustrative Case Study

Downer EDI ('Downer') integrates climate risk into its business practices by assessing, incorporating and managing both physical and transition risks at various levels. Downer aims to evaluate physical risks like flooding, bushfires, and sea level rise when making decisions on new work, long-term contracts, acquisitions, and property leases. Downer's key transition risk, being exposure to carbon-related liability, is integrated into Downer's short-term incentive (STI) scheme where each business unit has emissions reduction targets which contribute to Downer's corporate level commitments. To integrate these risks, Downer includes climate-related factors in its strategic risk process, which is governed by its Board Audit and Risk Committee. Climate risks are considered in project governance, tender assessments and investment decisions. The integration also involves detailed planning sessions across business units, specifically aimed at aligning forecasts and budgets with climate-related goals, particularly decarbonisation efforts.

[44]This tool provides results that can be benchmarked across Stockland's assets and portfolios in a centralised system. It now stores more than 10 years of climate resilience data, which is used for analytics across its portfolio to support decision making and investment.

Integrating climate-related risks and opportunities into Downer's risk management framework across diverse business units has been challenging due to the wide-ranging nature of Downer's operations, geographic spread, and varying levels of exposure to physical and transition risks. However, the organisation has embedded climate-related risks and opportunities within each business unit's Climate Change and Decarbonisation Plan and elevated these to the enterprise risk management framework. An educational approach has been adopted to provide business stakeholders with information on climate risk, and this continues to evolve.

Illustratively, several business units within Downer have initiated climate resilience strategies, to manage physical and transition risks. A few examples of how the organisation has integrated climate risk within its business, is on the mitigation strategy for its chronic physical risk and market related transition risk.



(i) Physical Risk Adaptation:

Downer focuses on the implementation of environmental and land use planning approvals, as a minimum, to mitigate location-specific environmental risks and hazards (chronic physical risks). For example, considerations such as resilient site planning and infrastructure design have been integrated into several of Downer's projects, including the Queensland Train Manufacturing Program (QTMP) which includes a new maintenance facility at Ormeau and manufacturing facility at Torbanlea, as well as the Te Ara Tupua Project in Wellington, New Zealand. On the Te Ara Tupua Project, Downer implemented an interlocking sea wall to protect a nearby rail network from climate-induced threats like sea level rise and flooding. This is part of a broader approach to adapt to location-specific hazards, including implementing land use practices such as bushfire buffer zones.

(ii) Transition Risk Management:

Downer's decarbonisation pathway is designed to reduce its exposure to carbon-related liability, considering commercially viable options. The organisation has considered embodied carbon within its value chain in a bid to produce products that have lower embodied carbon and are more climate resilient, using 'reuse and recycling' measures that limit the procurement of virgin materials (for example, Reconophalt™ and Bio Bind). These translated into short-term, medium-term and long-term opportunities for the business, which equated to 0.68% of Downer's revenue for the financial year ended June 30, 2024 (FY 2024) from asphalt production being generated utilising Reconophalt™ and Bio Bind.

- Reconophalt™ utilises recycled components such as used printer toner cartridges, soft plastics, glass bottles and reclaimed asphalt product. As an example, in FY 2024, Downer delivered a road made entirely from recycled material, in tandem with Mount Barker District Council in the Adelaide Hills.
- The research, development and production of the innovative Bio Bind product is an alternative to petroleum-based bitumen which is a significant component of embodied carbon in asphalt production. Downer's Road Science business has joined with New Plymouth District Council (NPDC) to launch the first full-scale trial of its Bio Bind product, with the product having been laid on a section of Smart Road, between Colson and Alberta roads in NPDC, as an alternative to traditional bitumen-based asphaltic concrete.

Capital Deployment

In FY 2024, Downer budgeted for AUD3.5 million in initiatives as part of its Decarbonisation Fund, designed to address its key transition risk, being exposure to direct carbon. AUD1.4 million was allocated to approved projects.

These initiatives have, among other benefits, enhanced resilience to physical climate threats, created safer work environments, and supported progress toward long-term emissions reduction goals.

Call out for businesses as they look to integrate climate risk within business:

Consider your business' unique circumstances before deciding on an approach. For some, a top-down approach may be more beneficial, while for others, a bottom-up approach of risk management and opportunities management may be most beneficial. *Disclosure should be driven by strategy, not the other way around*.

6. Leading Australian Practices In Climate Risk

This section outlines some of the best climate risk management practices being followed across key industries, including built environment, utilities, minerals and mining, retail and financial services to help companies embarking on their journey.[45]

Whilst details on the way businesses might integrate the key elements of the governance, strategy and risk management have been incorporated in earlier sections of this document, this section incorporates the leading practices evidenced in the Australian landscape.

a) Governance

Climate change must feature in board and management agendas. Some of the businesses reviewed demonstrated clarity and transparency in the practices being leveraged for resilience, compliance, competitive advantage and growth.

01 Ensuring active **involvement of the board** of directors in the oversight of climate risk management through the establishment of dedicated board committee(s) to address climate-related risk and compliance matters is crucial. Not only will a good governance structure enable setting the tone from the top for a robust risk culture (outlined in section 4.1 and section 4.3), but also enable the Board to make informed decisions on setting of organisational risk appetite.

02 **Developing climate-related expertise and capabilities** across board and executive management (either internally or through external professional assistance) will equip the organisation to address regulatory requirements and decision making.

03 **Establishing cross functional executive committee for oversight** and the delegation of operational matters of climate risk and sustainability - such as climate-related initiatives, prioritisation and co-ordination of efforts across the organisation and ensuring effective implementation of climate strategies - are best addressed through the establishment of a management committee led by the CEO, with business unit representatives and heads of finance, risk, sustainability, legal and operations.

[45]**Note**: Best practices would incorporate TCFD Implementation Guidance (2021), TCFD Guidance on Risk Management Integration & Disclosure (2020), TCFD Guidance on Scenario Analysis for Fon-Financial Companies (2020), TCFD Guidance on Metrics, Targets and Transition Plans (2021), TCFD Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-related Risks & Opportunities (2017), as incorporated into the requirements of paras 5-7 of AASB S2 on governance, paras 8-11, 13-22 of AASB S2 on strategy, paras 25-26 of AASB S2 on risk management, paras 29-31, 33-37 of AASB S2 on metrics and targets, together with Appendix B to AASB S2 on Scenario Analysis and Appendix D to AASB S2 on General Requirements for Disclosure of climate-related financial information).

b) Strategy

As outlined in Section 4, alignment of climate related risk responses with business strategy is important to delivering resilience and value. Leaders have **developed resilience strategies** that mitigate climate change impacts in their operations such as relocating operations, investing in climate resilient-infrastructure, water and energy conservation technology and robust emergency response plans. Other best practice leadership has been demonstrated in the following areas:

01 Identifying and **investing in decarbonisation pathways** that measure, set targets and analyse future scenarios. The pathways could include move to renewable energy, energy efficient fleets, energy efficient infrastructure and facilities, waste management and recycling, based on the materiality and criticality of such investments to organisational adaptation.

02 **Developing climate-resilient business models** that take proactive measures to adapt and mitigate climate change impacts in their operations such as relocating operations, investing in climate resilient-infrastructure, water and energy conservation technology and robust emergency response plan demonstrate commitment and leadership. Capital allocation to support pathway transitions can include funding research and development of low-carbon technologies, investing in renewable energy projects, improving energy efficiency in infrastructure or investing in innovative products that reduce waste. Leading business are also leveraging sustainable finance solutions that provide financial incentives to form transition success.

03 **Integrating internal carbon pricing** as part of the investment evaluation process to guide decision-making in relation to climate change impacts, risks and opportunities.

04 **Collaborating** upstream and downstream **within industry and outside** an organisation's industry across the supply chain to address climate-related concerns, ensuring adaptation and mitigation strategies are relevant and effective. Also asking suppliers to include climate-related metrics will help support achievement of climate-related goals. These actions taken by leading corporates are enabling better planning, assessment, decisions and financial robustness.

c) Risk management

Developing and integrating comprehensive climate risk assessment frameworks as part of ERM frameworks and systems help ensure appropriate management of climate-related risks (both physical and transition). Key elements that organisations need to keep in mind are:

01 **Selection of appropriate scenarios to identify climate-related risks and opportunities** and scenario planning to identify risks that account for the geographies in which an organisation operates. Australian legislation requires a minimum of two climate scenarios and New Zealand three, over short, medium and long-term planning periods (each period being defined be the organisation's circumstances). These scenarios are aligned to either the IPCC, IEA or International Renewable Energy Agency (IREA) scenarios.

02 **Identifying and prioritising critical risks** based on their likelihood and potential impact on the business and **evaluating the vulnerability** of assets, operations and supply chains to climate-related hazards.

d) Metrics, targets and reporting

Australian entities that have commenced reporting voluntarily on climate-related initiatives will need to ensure alignment to the legislative requirements under Part 2M.3 of the Corporations Act 2001 as well as AASB S2. Whilst some organisations have begun publishing integrated financial reports, amendments to the *Corporations Act 2001* will entail them needing to publish separate sustainability reports in addition to the directors' report, financial statements and accompanying notes together with the auditors' report. Sustainability reports will progressively require assurance in line with ASSA 5010 Timeline for Audits and Reviews of Information in Sustainability Reports. Besides the TCFD Framework and AASB S2, some key aspects for organisations to consider are:

01 **Aligning GHG emissions reduction targets with global climate goals,** including plans to invest in renewable energy, energy efficiency measures and low-carbon technologies over the short-medium and long term and setting carbon pricing mechanisms to effectively evaluate future investments.

02 **Disclosing financial impacts of climate-related risks** and opportunities in their financial statements as outlined in section 4.5(c) and disclosing reliance on Australian Carbon Credit Units (ACCU) in climate related metrics.

03 **Aligning targets to the Science Based Targets Initiative (SBTi)** for Scope 1, 2 and 3 emissions.

04 **Development of proprietary tools vs. purchasing off the shelf tools,** given the mix of strategy adopted by organisations to either created their own internal tools to quantity and manage climate-related financial risks and assess the potential impact of climate change on asset values, cash flows and credit ratings or invest in off the shelf platforms.

e) Organisational maturity

Businesses today recognise climate as a key business risk but their experiences and successes with building a climate related mindset into the business vary significantly. In shaping the next phase of improvement for your organisations journey, we believe assessing organisational maturity across these activities is an important step and will assist in the implementation of AASB S2 / IFRS S2 requirements across their business functions.

Maturity Levers	Purpose
Policy & Governance	Rigour of policy definition and delegation of ownership and responsibility for climate risk + risk culture
Integration with Enterprise Risk	Level of integration of climate risk within the existing ERM framework to facilitate informed risk analysis, reporting and management
Integration with Business & Organisational Resilience	Robustness of plans and pervasiveness of climate risk management (CRM) within business strategy, financial decision making and processes to adapt and react to adverse events
Capability Development	Building people capabilities and facilitating organisational learning across teams
Scenario Analysis	Level of maturity of conducting scenario analysis (move from qualitative to quantitative – depth, breadth, frequency)
Transition Plans	Depth and granularity of transition plans across the business units and operations and performance monitoring
Process Depth	Depth and maturity of process and techniques to assess and manage climate risks
Use of Systems & Tools	Depth and granularity of transition plans across the business units and operations and performance monitoring
Monitoring & Reporting	Level of maturity to measure and monitor climate related metrics for internal and external reporting with alignment to KPIs
Controls	Prevalence of systems and process controls across the business to enable management to satisfy 'accuracy' and 'completeness' financial statement assertions

Table 4: Overview of Maturity Levers

7. Next Steps

As outlined at the commencement of this report, climate change is no longer a distant threat but a present reality that demands immediate attention as a business imperative. The Go Zero Hub believes that approaching climate risk management proactively, using a whole of business approach, will help ensure a more resilient business that is better placed to build long-term stakeholder value in a rapidly decarbonising world.

This report was written for CXOs building their climate risk maturity and focused on unpacking relevant regulations, detailing climate risk management processes, outlining recommended integration with the business and providing examples of what good looks like. While each organisation is at a different stage of its climate risk journey, we are confident there is still a lot to be done by all. These suggested next steps capture the recommendations around where to start.

01

Build a value-driven, climate-linked mindset

Leading businesses have moved beyond compliance and disclosure to integrating climate-risk into their corporate strategy and decision-making. This approach delivers additional value by increasing the robustness of their financial position, attracting investor capital, building trust & reputation and opening business opportunity. This progress has been possible by ensuring the right resources and skilled, accountable teams are enabled to lead change across the whole of the business. Structured incentive plans that include climate related KPIs reinforce accountability for climate related business action that creates a risk aware culture and builds enterprise value.

02

Assess current climate risk processes and level of business integration

Businesses earlier in their climate risk adoption journey will benefit from reviewing the current state climate risk management processes to understand the actions required to better execute assessments and integrate climate risk actions with existing processes, upskill leaders and improve digital enablement. Completing a maturity assessment across business functions will help businesses take stock of current capabilities and the actions required to close the gaps that are inhibiting realisation of their climate and business drive ambitions.

Effective climate risk management will advance to more granular, contextual management based on the complexity of the business across materiality of the sector(s), geography(s) and the products and services delivered. Deepening materiality analysis with more granularity across areas such as biodiversity, water and marine resources, pollution, climate change will bring more clarity when assessing criticality.

Alongside these two actions, equipping decision makers with the required skills supplemented with tools across the business is critical.

03

Review digital enablement of Climate-Risk decision making and reporting

Risk Management strategies will be more data driven through advanced technology like Gen AI Forecasting models to incorporate multitude of external and internal parameters with more accurate assessment and scenario analysis, building heat maps, concentration analysis and quantification of risks for example. Third party assurances on risk management KPIs that reach across supply chains (e.g. Scope 3 emissions) will require digital interventions to ensure a single source of truth.

Assessing the climate data architecture, integration with core ERP systems, specialist models/tools and external data sources to enable more informed and effective decision making with robust disclosure infrastructure is an important next step. Depending upon the place along the maturity curve, an organisation would need to address the level of investment required to uplift its technology to enable informed decision making supported by complete and accurate reporting and analytics.

04

Develop stronger collaboration for improved outcomes

Engaging stakeholders across enterprise value chains and supply chains on material issues to share knowledge, ideate and collaborate on building solutions towards lower emissions is a win-win. While many solutions are available today, innovation is also key to accelerating and scaling net zero outcomes; extending the reach of ecosystem engagement will give business team access to the latest thinking and opportunity.

We believe the nature of relationships with these stakeholders is evolving to demonstrate shared action and value that also meet climate and sustainability challenges. Collaboration around advocacy and campaigning to highlight risks and steer policy formulation at regional and national levels is also being seen in leading organisations and multi-stakeholder partnerships with aligned sustainability and climate goals and values will be prioritised.

05

Actively explore climate-related opportunities

Participation in a rapidly decarbonising, low-carbon economy offers business clear opportunities to demonstrate building new, long-term shareholder value through new products/services/sectors. Building a mindset that embraces climate risk and opportunity will be more open to capitalise on emerging opportunities in our transition and adaptation to a cleaner and greener economy.

Green Mortgages with retrofit options for investments, Renewable Investments and REC trading platforms, are some examples. Wealth out of waste, involving affected communities in business partnerships might become a reality. Initiatives such as consolidation of supply chains, partners in circularity, establishment of bio economies, and aligning to geopolitical goals of the regions might also opportunities to be pursued. As businesses explore these new opportunities it is valuable to note the nature of business relationships and partnerships is also evolving as business seek to align with others focused on solving similar challenges and targeting aspirational outcomes.

Transitioning to a low-carbon economy is not easy. The **Go Zero Hub** team welcome discussions as you consider your next steps.

We need scaled momentum for accelerate outcomes and opportunity has been proven repeatedly to motivate action well beyond risk.

Authors

Author		Brief Profile
Michele Lemmens APAC Head of Business Sustainability & CTO **Tata Consultancy Services Ltd**		Michele is responsible for championing the intersection of sustainability, innovation and digital initiatives with stakeholders across our ecosystem. A senior executive with experience in creating and implementing sustainability and ESG pathways, forging digital transformation and innovation pathways across APAC, Singapore, Hong Kong, Saudi Arabia, UK, Australia and NZ. Michele is an initiatives architect who shapes vision and brings clarity to business models and value propositions. Her experience in business model strategy and transformation is often driven by mergers & acquisitions, joint ventures, start-ups and strategic alliance initiatives. She volunteers, advises, co-chairs and contributes to Sustainability for several businesses, a foundation, accelerators and academic institutions and speaks regularly at external forums about Sustainability, Innovation, Start-ups, Diversity and Leadership. She is passionate about both the need, and the opportunity, for businesses to embrace Sustainability in the way they operate and champion change for today and the future.
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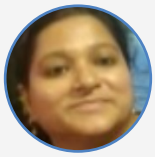
Richa Chowdhary Shah Domain Consultant, Sustainable Banking, Finance & Investments **Tata Consultancy Services Ltd**		Richa has vast experience in core sustainability domain and oversees consulting and solution development for various Banking and financial services customers. She is also a key member in shaping and driving TCS' Global environmental sustainability strategy and Carbon strategy (NetZero and SBTI). She has been a key member in driving carbon accounting for global TCS operations, climate and HSE risk analysis, ESG disclosures (CDP, DJSI, Ecovadis, BRSR, etc.) and management systems process design, development and automation.
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ABOUT The TCS Go Zero Hub in partnership with Macquarie University

The TCS Go Zero Hub is a collaboration between Tata Consultancy Services Ltd (TCS) and Macquarie University that aims to bring together research, innovation, education and consultancy expertise to support organisations in their journey towards a net zero emissions future.

The TCS Go Zero Hub is here to provide additional support to help companies at all stages of their journey. By sharing knowledge, generating ideas, and collaborating on low-emission solutions, businesses can create mutually beneficial outcomes.

To learn more
https://www.tcs.com/who-we-are/worldwide/anz/gozero-hub-achieving-net-zero-goals