

WaveStone ESG Report

Quarter ending June 2025

ESG Quarterly: Physical Climate Risk - Knowing the Unknown Peril

Physical Climate Risk: Materiality for Australian Equity Portfolios

ASX companies are increasingly acknowledging the financial impacts of extreme weather events, with physical climate risks becoming more frequent and impacting various sectors. The rising frequency and severity of these events have prompted boards, management teams, investors, and regulators to focus on how to assess and adapt to these unforeseen risks. Below are some recent (2025 calendar year) ASX company examples of reported financial implications of physical risks.

Woolworths (WOW) Faces Flood-Related Costs

The recent east coast floods in Australia led to additional costs of **\$20-25 million** due to higher stock losses, transportation expenses, and damage to the Hervey Bay supermarket.¹

Rio Tinto's (RIO) Cyclone Disruptions Impact Iron Ore Production

RIO announced² that its 2025 iron ore output is likely to be at the lower end of its forecast due to the disruption caused by four cyclones in the Pilbara region. The storms resulted in a **13-million-tonne** production loss, with the company investing an additional **\$150 million** to recover production through mitigation plans and rectification works.

Incitec Pivot Limited (IPL) – Weather Conditions Affecting Operations

IPL's 2024 Annual Report states that *"seasonal conditions (particularly rainfall) are a key factor for determining demand and sales of explosives and fertilisers. Any prolonged change in weather patterns and severity of adverse weather conditions, as well as changes to growing regions in the Fertiliser business, could impact the future profitability and prospects of IPL"*.

Further, the company announced to the market that significant rainfall experienced in Queensland during the first half of FY25 has **impacted volumes** for the Dyno Nobel Asia Pacific business³

Earlier this year, IPL also revealed that weather disruptions and sulphuric acid supply interruptions at their Phosphate Hill plant in Queensland are expected to **affect full-year production**.

As responsible investors, we are closely monitoring how companies and their supply chains are increasingly exposed to disruption and damage risks from extreme weather events. In this report, we aim to highlight the investment relevance of physical climate risks, explore how corporate disclosures can help investors better understand these risks, and discuss the significant opportunity presented by the upcoming mandatory climate disclosures.

Through our ongoing dialogue with companies as they prepare for these mandatory disclosures, we seek to identify best practices and advanced disclosures, setting a high standard for others to follow. To that end, we have also highlighted international examples of corporate disclosures in this report, drawing on global best practices to illustrate what is achievable and leading in this space.

¹ <https://www.woolworthsgroup.com.au/content/dam/wwg/investors/reports/f25/q3/2884770.pdf>

² <https://www.aspecthuntley.com.au/asxdata/20250416/pdf/02937001.pdf>

³ <https://www.aspecthuntley.com.au/asxdata/20250328/pdf/02929659.pdf>

Our key observation is that a critical gap remains in the availability of granular, actionable data on physical climate risks. Many current disclosures lack the specificity and quantitative rigor necessary for effective investment analysis. However, as we engage with companies and continue our own ESG research, we remain optimistic about driving positive change. Through constructive feedback with our portfolio companies, we aim to foster enhanced risk identification, transparent reporting, and robust strategic adaptation measures.

At WaveStone Capital, the integration of climate considerations is central to our investment process. This research note on physical climate risks is part of our ongoing effort to share our climate expertise with clients, building on our previous publications related to Scope 3 emissions, sector decarbonisation, and other key climate topics.

Regulatory Guidance: Physical Risks

The regulatory environment is evolving rapidly, with new climate-related financial disclosures and reporting obligations coming into effect. We outline a key summary as below:

Australian Accounting Standards Board (AASB)

AASB S2 Standard⁴ describes climate related physical risks as follows:

- Risks resulting from climate change that can be event-driven (**acute physical risk**) or from longer-term shifts in climatic patterns (**chronic physical risk**).
- Acute physical risks arise from weather-related events such as storms, floods, drought or heatwaves, which are increasing in severity and frequency.
- Chronic physical risks arise from longer-term shifts in climatic patterns including changes in precipitation and temperature which could lead to sea level rise, reduced water availability, biodiversity loss and changes in soil productivity.

These risks could carry financial implications for an entity, such as costs resulting from direct damage to assets or indirect effects of supply-chain disruption. The entity's financial performance could also be affected by changes in water availability, sourcing and quality; and extreme temperature changes affecting the entity's premises, operations, supply chains, transportation needs and employee health and safety.

In regards climate metrics AASB standard outlines the following disclosure guidance for companies on physical risks:

- the amount and percentage of assets or business activities vulnerable to climate related physical risks;
- costs arising from physical damage to assets from climate events; and expenses associated with climate adaptation or mitigation.

Australian Prudential Regulation Authority (APRA)

APRA takes the view that climate risks and opportunities “can and should be managed within an institution’s overall business strategy and risk appetite”⁵. The onus is on Boards to evidence ongoing oversight and adjust risk appetite accordingly. Suggested scenario analyses should include a short-term assessment following current business planning cycles as well as a longer-term assessment. They suggest using one scenario of well below 2°C by 2100 and alternatively one where there are no mitigating actions and policies and global warming of 3°C or more is the consequence.

⁴ https://standards.aasb.gov.au/sites/default/files/2025-01/AASBS2_09-24.pdf

⁵ [Final Prudential Practice Guide CPG 229 Climate Change Financial Risks](#)

Their suggestions for best practice include:

- The importance of seasonal data for some risks (compared to annual / decadal data for others)
- Impacts of concurrent and multiple extreme events
- Detail to capture geographic specificity
- Broad range of emissions pathways

Physical Climate Risk Disclosure – Investor Perspective

As responsible investors, we are closely monitoring how companies and their supply chains are increasingly exposed to disruption and damage risks from extreme weather events. In this report, we aim to highlight the investment relevance of physical climate risks, explore how corporate disclosures can help investors better understand these risks, and discuss the significant opportunity presented by the upcoming mandatory climate disclosures.

Key Overall observations on Physical climate risk disclosure

- **Scenario analysis:** Most companies now disclose climate modelling across a range of scenarios, including under 2°C Paris-aligned low emissions (RCP⁶ 2.6) and higher emissions scenarios (RCP 8.5), along with time horizons extending from short to long-term (even beyond 2050 to 2100). This approach is a positive step, as it helps assess a broad spectrum of climate outcomes, risks, and opportunities. However, while scenario analysis is common across corporate sustainability disclosures, the modelling tools, methods, and assumptions vary significantly between companies, making it difficult for investors to easily compare and contrast results.
- Specific to physical risks, the RCP 8.5 scenario, which reflects a high-emissions pathway and greater warming potential, is frequently used by ASX companies. We view this as beneficial, as it forces companies to analyse a 'worst-case' scenario where higher temperature ranges exacerbate global warming and its associated physical impacts. This practice provides a more comprehensive view of long-term risk exposure.
- **Asset level exposure assessment:** One notable gap in many corporate disclosures is the asset-level vulnerability assessments. These assessments are either lacking or still in progress, making it challenging for investors to meaningfully assess financial risks associated with physical climate impacts at the asset level. Detailed assessments are critical for understanding how specific assets—whether physical infrastructure or supply chains—will be affected by extreme weather events. Without these disclosures, investors are left without the granularity needed to accurately gauge the full scope of risk.
- **Quantification of risk/ linking to financial impacts:** Even if physical risks, system level risks and vulnerabilities to certain physical risks is adequately understood and outlined within corporate climate disclosures, specific translation of these to financial impacts seems a challenge for corporates. For instance, estimating the cost of a flood event could depend on the severity of the event, the value of the affected assets, insurance coverage, and the time to recovery. This requires sophisticated modelling that not all companies are equipped to undertake pre-event.

⁶ Representative Concentration Pathways : <https://www.climatechangeinaustralia.gov.au/en/changing-climate/future-climate-scenarios/greenhouse-gas-scenarios/>

Examples of Physical Climate Risk Disclosures from ASX Companies

Below, we summarize examples from ASX companies highlighting their approaches to physical climate risk disclosure. These disclosures have been sourced from the companies' most recent sustainability reports, including Annual Reports or standalone climate disclosures.

Insurance Australia Group Limited (IAG)

Sector: Insurance

In regards its physical climate risk disclosure, IAG at the outset states that “*exposure to extreme weather events in Australia and New Zealand has the potential for material financial impact on Group performance*”. The disclosure goes on to outline key risks, such as the cost and availability of reinsurance, as well as opportunities like building community resilience, specific to physical climate impacts.

In regards its risk management, the company mentions incorporating climate-related scenarios into its Internal Capital Adequacy Assessment Process (ICAAP), enhancing its ability to identify and understand potential physical climate risks.

Further, in June 2024, the company secured a five-year strategic reinsurance arrangement to provide over \$4 billion of volatility protection for natural perils losses, in addition to its long-term quota share reinsurance cover.

Key disclosure positives:

Identifies financial materiality of physical climate risk	Yes
Outlines risks and opportunities specific to physical climate risk	Yes
Links physical risk to business strategy	Yes

Rio Tinto (RIO)

Sector: Materials

Rio Tinto has identified several key physical climate risks across its operations, including flooding, water scarcity, heat stress, and extreme weather events that could disrupt mining activities. To address these, the company has conducted asset-level resilience assessments at several assets including Pilbara, Weipa, and Simandou, focusing on vulnerabilities to water availability, flooding, and temperature extremes; as well as 14 very high and extreme tailings storage facilities across the Group with remainder to be completed later this year. Rio discloses it has completed flood risk screening for all of its managed and non-managed assets.

Additionally, the company has operationalised analytics to provide real-time natural hazard impacts on 50% of its tier 1–3 goods suppliers.

Key disclosure positives:

Identifies key physical risks	Yes
Asset level resilience assessments	Yes
Addresses Supply Chain Resilience	Yes







GPT Group (GPT)

Sector: Real Estate

From outlining climate scenarios associated with physical risks to asset level adaptation plans, GPT's disclosure of physical impacts of climate on its asset portfolio is well laid out in its dedicated [Climate and Nature Disclosure Statement](#). GPT has undertaken a physical climate hazard vulnerability assessment of its office, retail and logistics assets, using RCP 8.5 climate modelling over multiple time horizons. GPT states that 89% (by value) of its owned assets have completed climate adaptation plans. The company has undertaken physical climate change modelling across all of its assets indicating that less than 3% (by value) are in locations modelled with an overall value at risk (VaR) due to the physical impacts of climate change and between 0.2% and 1% (moderate risk), and no assets modelled as a high risk (greater than 1% VaR).

The company also discloses (see image below) specific regional areas where physical climate risks are concentrated and outlines asset level mitigation efforts in these locations. The asset-level assessment is particularly valuable for investors, as it offers clear insights into the company's exposure to physical climate risks and its proactive strategies to manage these risks.

Table 5: Concentration of acute and chronic climate-related risks by region, adaptations and mitigations, and opportunities

Physical risk	Concentrated risk region	Portfolio	Adaptation or mitigation implemented	Resulting opportunities
River flooding 	Brisbane CBD	Office	Brisbane River flood barrier system installed at Riverside Centre and One One One Eagle Street.	Continued operation with minimal tenant disruptions in flood events as evidenced by the 2022 flood.
River/creek flooding 	Western Brisbane, Western Sydney, Greater Melbourne and Adelaide	Logistics	Due diligence throughout the acquisition and/or development process to specifically consider flood impacts, including on building design.	Increased likelihood of continued operations during times of heavy rain and flooding of local waterways.
Severe storms 	All regions	Office, Retail and Logistics	In design and at life cycle upgrade opportunities, our assets undertake climate adaptation planning, including upsizing hydraulics to account for increased severity of storms.	Continued operations during times of severe storm activity.
Tropical cyclones 	Townsville	Logistics	Asset designed and built to wind speeds specific to the region. Not located within area at risk of storm surge and tidal inundation.	Continued operations following the passage of a tropical cyclone.
Increasing average temperatures, extreme hot days and heatwaves  	All regions	Office, Retail and Logistics	Climate adaptation planning, including passive cooling techniques, installing better plant technology and implementing energy efficient procedures.	Creating conditions where customers and tenants remain comfortable during hot periods, while maintaining energy costs.

Physical risks: acute vs. chronic risk



Acute risk: Shocks, event-driven risks such as increased severity of cyclones, floods and other extreme weather events.



Chronic risk: Stresses, longer-term shifts in climate patterns that may cause sea level rise, increased frequency of heatwaves and changes in rainfall patterns.

Key disclosure positives:

Quantification of risk	Yes
Asset level adaptation plans	Yes
% of portfolio in high risk areas	Yes

Woolworths Limited (WOW)
Sector: Consumer Staples

Woolworths clearly identifies the physical climate risk impacts on its operations and supply chain. The company notes that in F24 there were a total of 205 days of unplanned disruption to the Group's supply chain from over 42 events including flooding and rail outages, bushfires, cyclones and systems connectivity issues as new software was deployed. Woolworths is currently working to improve the resilience of its assets through initiatives such as - implementation of generators for areas exposed to a high risk of power outages, flood barriers, rainwater harvesting, and roof strengthening. Furthermore, the Group incorporates the potential increase of future flood risk into its existing site selection and design procedures. Given that the average remaining useful life of the Group's significant non-financial tangible assets is approximately eight years, the potential impacts of climate change are not considered to present a risk of impairment of the carrying value of non-financial assets in the near term.

The company also acknowledges the impact of acute weather events, such as flooding, being not limited to physical assets and business interruptions but also risks increasing the Group's cost of insurable risks primarily due to higher premiums, higher deductibles and policy exclusions.

In its recent quarter results [announcement](#)⁷, WOW noted that the recent floods in east coast of Australia led to additional costs of \$20-25 million due to higher stock loss, incremental transportation costs and damage to the Hervey Bay supermarket.

Key disclosure positives:

Financial impacts of physical risk	Yes
Asset resilience and adaptation planning	In progress
Efforts on supply chain resilience	Yes

Our view on evolving best practice for Physical Climate Risk Disclosure

As companies prepare for mandatory climate reporting disclosures, investors are increasingly expecting more meaningful and comprehensive disclosures on physical climate risks as part of the full reporting suite. Based on our assessment, we believe the following areas represent best practices for effective climate risk disclosure:

- **Linking Physical Risks to Climate Scenario Modelling:** Companies should align their physical climate risk disclosures with climate scenario modelling, showing how different climate scenarios (e.g., 1.5°C, 2°C, or 4°C warming) might affect their operations and financial performance over the short, medium, and long term.
- **Identifying Key Material Physical Risks:** Companies must clearly identify and disclose the most material physical risks that could impact their assets, operations, or supply chains. This includes acute risks (e.g., floods, storms) and chronic risks (e.g., temperature rise, water scarcity).
- **Physical Risk and Resilience Assessment:** Investors expect companies to conduct robust risk assessments at both the asset and portfolio level. This involves evaluating the vulnerability of assets and operations to physical climate risks and the resilience strategies in place to mitigate these risks.
- **Key High-Risk Locations/Assets/Products:** Investors expect companies to disclose which locations, assets, or products are most exposed to physical climate risks. This allows investors to assess how specific business segments may be affected by climate change.
- **Investment in Adaptation and Resilience:** It is useful to see companies disclose capital allocated toward implementing their climate adaptation and resilience plans. This includes physical infrastructure improvements or operational changes aimed at reducing vulnerability to climate risks.

⁷ <https://www.woolworthsgroup.com.au/content/dam/wwg/investors/reports/f25/q3/2884770.pdf>

- **Adaptation Targets and Planning:** Investors expect companies to set clear adaptation targets and timelines for improving climate resilience. These targets should be measurable and aligned with the company's long-term sustainability goals.
- **Extending Analysis Beyond Own Operations:** Companies should extend their physical climate risk analysis beyond their own operations to cover their entire supply chain. This includes assessing the resilience of key suppliers and considering how climate risks could affect the company's ability to source raw materials or deliver products.

Meeting these expectations ensures that companies are not only mitigating physical climate risks but also align with investor expectations for climate resilience, transparency, and long-term value creation. As we track the progression of corporate sustainability disclosures in preparation for mandatory reporting requirements, we look to international case studies to highlight what's achievable and highlight what perhaps may be considered as best practices in this area.

BASF (German Company) **Sector: Chemicals**

Disclosure on Physical Risks⁸:

The company discloses: *We anticipate that **most sites will be particularly affected by increasing heat and drought**, whereas some may be faced with heavy precipitation, and a few could also be exposed to risks in connection with flooding, hail, water stress and wildfires. Where risks are estimated to be **in excess of €10 million**, potential material losses are quantified and **an adaptation plan is drawn up**. Targeted site and business-specific measures can involve optimizing process flows and infrastructure, for example.*

*Based on our assessment in the reporting year, **we consider our sites to be well positioned for climate change**. However, the transportation of key raw materials and products depends materially on water levels on the River Rhine, for example, especially in the critical Middle Rhine region. An **extreme drought could significantly impact transportation, or even bring it to a standstill**.*

Landsec (UK Company) **Sector: Real Estate**

Disclosure on Physical Risks⁹:

The company discloses: *Low physical risks - **only 6% of our portfolio** is currently highly exposed to combined physical risks (earthquake, storm, flooding and wildfire). **2.9% of portfolio** is exposed to river flood with a return period of 50-100 years. **0.3% of portfolio** is exposed to storm surge with a return period of 100 years. These risks are constantly monitored, and we ensure all assets have appropriate mitigation plans in place.*

In conclusion, as companies move toward mandatory climate reporting, it is essential that they provide comprehensive and transparent disclosures on physical climate risks. By adopting best practices such as aligning risk assessments with climate scenario modelling, identifying key material risks, and investing in adaptation strategies, companies can not only manage their exposure to climate impacts but also meet growing investor expectations for climate resilience. Through continuous monitoring and strategic planning, businesses can strengthen their long-term value creation and contribute to the global transition toward sustainability.

⁸ https://www.basf.com/dam/jcr:a0caf160-c019-40b1-a4ea-eaedb29b0685/basf/www/global/documents/en/investor-relations/calendar-and-publications/reports/2025/BASF_Report_2024.pdf

⁹ https://www.landsec.com/sites/default/files/2025-06/Annual%20Report%202025%20Interactive_0_0.pdf

Carbon Emission and Intensity Tracker:

WaveStone – Australian Share Fund (WASF)	Carbon Emissions		
	Portfolio	Benchmark	Difference
Carbon Emissions Scope 1+2 (tonnes CO2e/USD M invested)	69.2	107.1	-35.4%
Carbon Intensity Scope 1+2 (tonnes CO2e/USD sales)	101.4	139.3	-27.2%

Source: MSCI ESG (as at 30/06/2025)

Benchmark is the S&P ASX 300 Accumulation Index

Engagement

ESG-related Engagements during the Quarter

Company	ESG Category	Topics
MQG	Environment Governance	Approach to climate targets, customer transition plan assessment, climate disclosure, fossil fuel financing, shareholder proposal on climate
ANZ	Governance	Strategy, culture, capital allocation
TCL	Governance	Social license, group strategy, risk management, STI/LTI structure
ORG	Governance	Social license, energy policy, capital management, battery deployment
NAB	Environment Social Governance	Climate targets, transition and physical risks, mandatory climate reporting, nature, AI
TWE	Governance	Acquisitions, CEO resignation, strategy
XRO	Governance	Capital allocation and share based payments
ALL	Social Governance	Management succession, responsible gaming
ING	Environment Governance	Animal welfare, free range chicken, bird flu, management succession
CSL	Governance	Stakeholder relations, group strategy, capital management, regulatory landscape
AIA	Governance	Social license, regulatory landscape, stakeholder relations
ANZ	Governance	Findings and recommendations of Oliver Wyman's review of culture and risk governance in Global Markets
TCL	Social Governance	Social license, NSW tolling reform, EU debt markets
SGP	Governance	Corporate history, Board, acquisitions
VGN	Social Governance	Market structure, EBA progression and negotiations, fleet renewal plans, group strategy

Memberships and initiatives

- Principles of Responsible Investment (PRI)
- Climate Action 100+
- 40:40 Vision

Links to WaveStone Policies

- ESG Policy: **WaveStone ESG Policy**
- ESG Activity Report: **WaveStone ESG Activity Reports**
- Proxy Voting Policy: **WaveStone Proxy Voting Policy**
- Proxy Voting Records: **WaveStone Proxy Voting Records**
- Engagement Policy: **WaveStone Engagement Policy**
- **WaveStone PRI Transparency Report 2023**
- **WaveStone PRI Assessment Report 2023**

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