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PROMISES, PATHWAYS & PERFORMANCE

Climate change disclosure in the ASX200

September 2020

ABOUT ACSI

Established in 2001, ACSI provides a strong, collective voice on environmental, social and governance (ESG) issues on behalf of our members.

Our members include 37 Australian and international asset owners and institutional investors. Collectively, they own on average 10 per cent of every ASX200 company. Our members believe that ESG risks and opportunities have a material impact on investment outcomes.

As fiduciary investors, they have a responsibility to act to enhance the long-term value of the savings entrusted to them. Through ACSI, our members collaborate to achieve genuine, measurable and permanent improvements in the ESG practices and performance of the companies they invest in.

We undertake a year-round program of research, engagement, advocacy and voting advice. These activities provide a solid basis for our members to exercise their ownership rights.

We also offer additional consulting services including: ESG and related policy development; analysis of service providers, fund managers and ESG data; and disclosure advice.

37 Australian & international investors

Leading voice on ESG issues and advocacy

Together, ACSI members own around 10% of every ASX200 company

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INTRODUCTION

Climate change has been a major priority for ACSI and its members over many years. ACSI members have long been aware the transition to a low carbon future presents clear economic risks, as well as opportunities for new investments. This is why, for the past decade, ACSI has actively engaged with companies, and regulators, to seek improvements in the way climate risk is managed and promote the orderly transition to a low-carbon economy.

To assess climate risk, investors require sufficiently granular climate-related disclosure to adequately understand their investment exposure and consider the impacts of transition and physical risks. This research provides an overview of the current state of climate-related disclosures in ASX200 companies.

The research also highlights examples of best practice, as well as gaps in reporting, a state-of-play for TCFD adoption and an insight into how companies are setting objectives for meeting the Paris Agreement. Additionally, we examine the disclosure, comparability and depths of climate scenario analysis being provided to the market as well as emerging disclosures of physical risks.

In preparing this research, ACSI reviewed all publicly available documents produced by ASX200 entities as at 31 March 2020 – this includes Annual Reports, Sustainability Reports, standalone TCFD Reports, company websites and ASX announcements. Additional context was drawn from ACSI's ongoing engagement with directors of ASX200 companies.

KEY FINDINGS

The research indicates that climate-related disclosure and management has significantly improved in ASX200, but there are still key challenges for both companies undertaking it and for investors assessing how it relates to company strategy and the goals of the Paris Agreement.

NET-ZERO EMISSIONS COMMITMENTS

- **Fourteen ASX200 companies have set net-zero aspirations.** Examples include BHP Group, Dexus, Fortescue Metals, Graincorp, GPT Group, Insurance Australia Group, Qantas, Rio Tinto, South32, Scentre Group, Stockland, The Star Entertainment Group, Santos, Suncorp, Vicinity Centres and Woodside. The correlation between companies with net-zero targets and time-based emissions targets was also high. Twelve of the 13 companies we found setting long-term emissions reduction targets were also members of the net-zero group and, interestingly, six of those companies had also set short and medium-term targets – suggesting they have developed pathways for achieving net-zero. For the remainder, the challenge is to articulate clearly how company strategy and investment plans align with the Paris Agreement.[1]

- **Current disclosure reveals many companies that have set net-zero targets have not yet disclosed how their short and medium-term strategies are aligned to a pathway for achieving their net-zero commitments.** Additionally, we found that companies were not explaining sufficiently how their capital expenditure, investment decisions, R&D spending or technology milestones were aligned to Paris or driving the changes needed to meet net zero.

[1]Please note that the data point has changed to be consistent with new reporting metrics for 2021and this version of the report has been updated.

TCFD ADOPTION:

- **There has been a material uplift in companies disclosing against the Task Force on Climate-related Financial Disclosures' (TCFD) framework.** In 2019, 60 ASX200 companies had adopted the framework, which is 5.5 times the early-adopting companies in the first year of TCFD disclosure (2017: 11 companies). A further 14 companies have also committed to disclose against the framework.

- **The largest increases in TCFD adoption have been in higher-risk industries as 56% of the companies from these sectors have adopted the framework.** This includes 83% of ASX200 Energy companies in 2019 using the TCFD (up from 36% in 2018), 50% of Utilities (25% in 2018), 83% of Transport (50% in 2018), 43% of Materials (31% in 2018), 67% of Insurance (0% in 2018), 71% of Banks (29% in 2018) and 50% of Real Estate (15% in 2018).

- **Disclosure is, more often than not, found in free-standing climate change reports rather than being integrated into financial statements.** In 2020, we are beginning to see a trend for companies to link risks arising from the low-carbon transition into their asset-impairment analysis. For example, in recent months Oil Search, Woodside, Origin Energy and Santos have all announced impairments to assets to reflect changed oil, LNG and carbon prices.

EMISSIONS REPORTING AND TARGETS

- **A majority (60%) of the ASX200 now disclose the carbon footprint of their operations (Scope 1 & 2).** That increases to 66% based on companies providing some level of GHG-emissions reporting across Scope 1, 2 & 3 emissions.

- **In contrast to the strong levels of greenhouse gas reporting, only 37% of ASX200 companies have set emissions reduction targets, with most pitched at the short term rather than medium or long term.** We found only 28 companies with medium-term targets (2026-2039) and 12 with long-term targets (2040+).

- **Only four companies have short-, medium- and long-term emissions targets** this includes; BHP Group Limited (to be announced in FY20), Fortescue Metals Group Ltd, Insurance Australia Group Limited and The Star Entertainment Group Limited.

- **Concerningly, we identified a lack of target-setting in sectors where there is a material exposure to direct and indirect transition-risk.** We found 67% of Energy, 59% of Materials and 75% of Utilities companies had not set any emissions targets.

- **Seven companies have set Science-Based Targets (SBTi) aligned with the Paris Agreement goals.** These companies are Origin Energy, Dexus, SkyCity Entertainment, Fletcher Building, QBE Insurance, Insurance Australia Group and Suncorp.

- **We expect an emerging trend in 2020-2021 will be the linking of short- and long-term incentives to decarbonisation targets.** Rio Tinto and BHP have both indicated this work is underway, and as of this month AGL and Origin Energy have both announced new targets.

TRANSITION RISK SCENARIO ANALYSIS: COMPANY RESILIENCE TO LOW-CARBON FUTURES

- **Companies disclosing scenario analysis increased 80% year-on-year.** Of the 60 companies that reported against the TCFD, 32 undertook scenario analysis in 2019 (compared to 18 in 2018). A further 28 were reported as either having the analysis currently in progress or planned for in FY21.

- **Comparability of scenario analysis continues to be challenging. ACSI found there is a greater number of scenarios being used than there are companies disclosing them – even among industry-group peers.** We found 35 different scenarios being disclosed by 32 companies. Scenarios typically had differing assumptions and included many bespoke (company-designed) scenarios, and differing focuses of analysis (commodity, portfolio or asset). International Energy Agency (IEA) scenarios were the most popular, adopted by 19 companies in a variety of forms.

- **Disclosure of scenario analysis across the ASX200 was limited and with variable quality when provided**. While some companies provided significant detail and quantified outcomes of their climate-related financial risks at an enterprise or asset level, many companies only provided general, qualitative information that provided little insight for investors. From discussion with investor Members, ACSI has established there is an expectation that companies produce detailed information on the assumptions used and how the financial impact is substantiated using analysis of impacts on demand and carbon costs. Detailed disclosure of opportunities in abatement and cost pass-through are also desirable.

- **The number of Paris-aligned scenarios (1.5°C & <2°C) undertaken or in progress has more than doubled,** increasing from 11 in 2018 to 26 in 2019**.** However, the paucity of 1.5°C scenarios suggests companies are not stress-testing their business against challenging and disruptive scenarios**.** We found only 13 companies had progressed to using 1.5°C scenarios, compared to six in 2018.

- **While uptake of scenario analysis has improved year-on-year, many companies in high risk sectors still do not stress test their businesses against climate risk.** 25% of Energy companies, 50% of Utilities companies and 62% of Materials companies have neither undertaken nor committed to undertaking scenario analysis.

- **Risk assessments in company scenario analyses rarely highlight negative impacts.** We found all companies which had undertaken scenario analysis stated that they were resilient in a low-carbon economy, with few companies quantifying downside risk under scenarios or disclosing likely reductions in future cash flows. This means that either companies are extremely resilient or the inputs into climate scenarios may not be significantly challenging.

- **There are few examples of how the scenario analysis is informing company strategy and actions over the short and medium-term to meet the Paris goals.** Few companies discuss how their analysis informs corporate decisions and capital investment frameworks for assessing growth opportunities and acquisitions. For industries relying on emerging technologies to meet Paris-aligned targets, there is often insufficient supporting disclosure such as information on investments in research and development, or the key technologies that relevant company strategy is depending on.

PHYSICAL RISK ANALYSIS: TESTING ASSET AND OPERATIONAL RESILIENCE

- **Companies across the ASX200 are increasingly acknowledging and disclosing their exposure to physical climate risks in a meaningful manner.** We found 10 companies reported on physical risks in a meaningful manner and specific to their assets and locations: Commonwealth Bank, Iluka Resources, Northern Star Resources, News Corp, Oil Search, Rio Tinto, Sims Limited, Sydney Airport, Westpac Bank and Wesfarmers. We also found a further 28 companies had identified and provided a limited discussion of high-level thematic risk areas that they are exposed to.

- **Physical-risk disclosure is at the early stages of development, with standardised disclosures and financial quantification yet to emerge.** There was no common framework of physical-risk disclosure and, while there was disclosure of the range of impacts on a high to low level, no ASX200 company quantified the potential financial impacts of physical climate risk or the cost of capital expenditure to build resilience.

TCFD ADOPTION

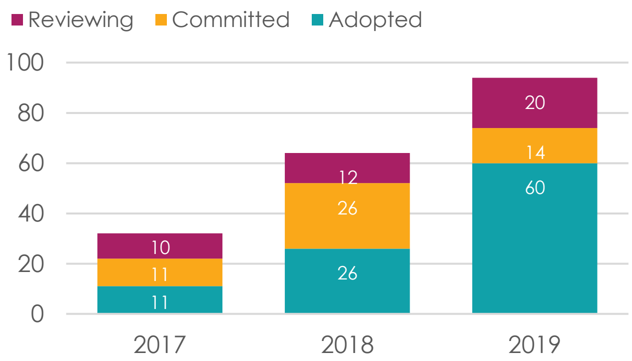
Since 2017, ACSI has been engaging with companies in the industries most at risk of climate change transition and physical risk, encouraging the adoption of the TCFD framework. In 2019, ACSI held almost 300 meetings with directors of ASX-listed companies to discuss ESG issues, including company management of climate change risk.

This focused investor engagement has helped drive a rapid adoption of the Task Force on Climate-related Financial Disclosure (TCFD) framework, which has now become widely accepted as a minimum standard for companies exposed to climate-change risks. The number of companies which have adopted the TCFD framework has jumped from 11 in 2017 to 60 in 2019 (refer Graph 1).

Additionally, we see a pipeline of companies which will likely adopt and disclose against the framework in future reports as a further 34 companies are committed to disclosing against, or reviewing the use of[2], the TCFD framework (refer Table 1).

Of those companies not using the TCFD framework, we found that most are in sectors with limited direct and indirect exposure to climate-change risks (refer Graph 2).

Graph 1: Level of TCFD adoption, commitment and review over three years



Disclosure has increased significantly in the most at-risk sectors, as 56% of companies have now adopted the framework. This includes 83% of companies in the Energy sector disclosing against TCFD in 2019 (up from 36% in 2018), 50% of Utilities companies (25% in 2018), 83% of Transport companies (50% in 2018), 43% of Materials companies (31% in 2018), 67% of Insurance companies (0% in 2018), 71% of Banks (29% in 2018) and 50% of Real Estate companies (15% in 2018). However, it is surprising, given investor sentiment, that many companies in high-risk sectors still have not adopted the TCFD framework.

We expect the incorporation of climate-related reporting within financial statements will develop in the coming years. While the TCFD framework stresses the importance of connecting TCFD reporting with existing financial statements and disclosure requirements. ACSI found that, more often than not, the disclosure sits in standalone climate change or sustainability reports with few examples of climate-related risks considered specifically within the financial statements

Australian accounting standards now acknowledge that qualitative external factors, including investor expectations, may make climate-related risks 'material' and appropriate for inclusion in financial statements, regardless of their numerical impacts.[3] This is an important consideration for investors. As climate-related risk assessment becomes more mature, investors expect companies to discuss climate-related risks within financial statements to provide appropriate context for investment decision-making.

[2] Reviewing was typically be disclosed to be 'reviewing the use of' or 'reviewing how to disclose against' the framework. From engagement we understand this to also include companies working to understanding their resourcing
[3] AASB/IASB Practice Statement 2 Making Materiality Judgements (APS/PS 2): https://www.aasb.gov.au/admin/file/content102/c3/AASB_AUASB_Joint_Bulletin_Finished.pdf

We are already seeing this develop globally and locally in the oil and gas sector. After the conclusion of our review of the ASX200, several climate risk-exposed companies announced impairments and adjustments after linking risks borne from the low-carbon transition into their asset impairment analysis. BP plc led the pack in June 2020, revising down the oil price assumptions in its forecasting (reflecting reduced demand predictions) as well as increasing carbon price assumptions (reflecting assumptions in line with Paris Agreement climate policies).

BP's chief executive, Bernard Looney, explained that 'these difficult decisions – rooted in our net zero ambition and reaffirmed by the pandemic – will better enable us to compete through the energy transition'. Shortly after this announcement, we saw the domino effect hit BP's ASX-listed peers with significant impairments recorded at Oil Search, Woodside, Origin Energy and Santos from changes in oil, gas and carbon assumptions as prices more consistent with a pathway to achieving Paris-aligned targets were applied in the nearer term. (see Appendix).

Graph 2: Sectoral TCFD adoption:

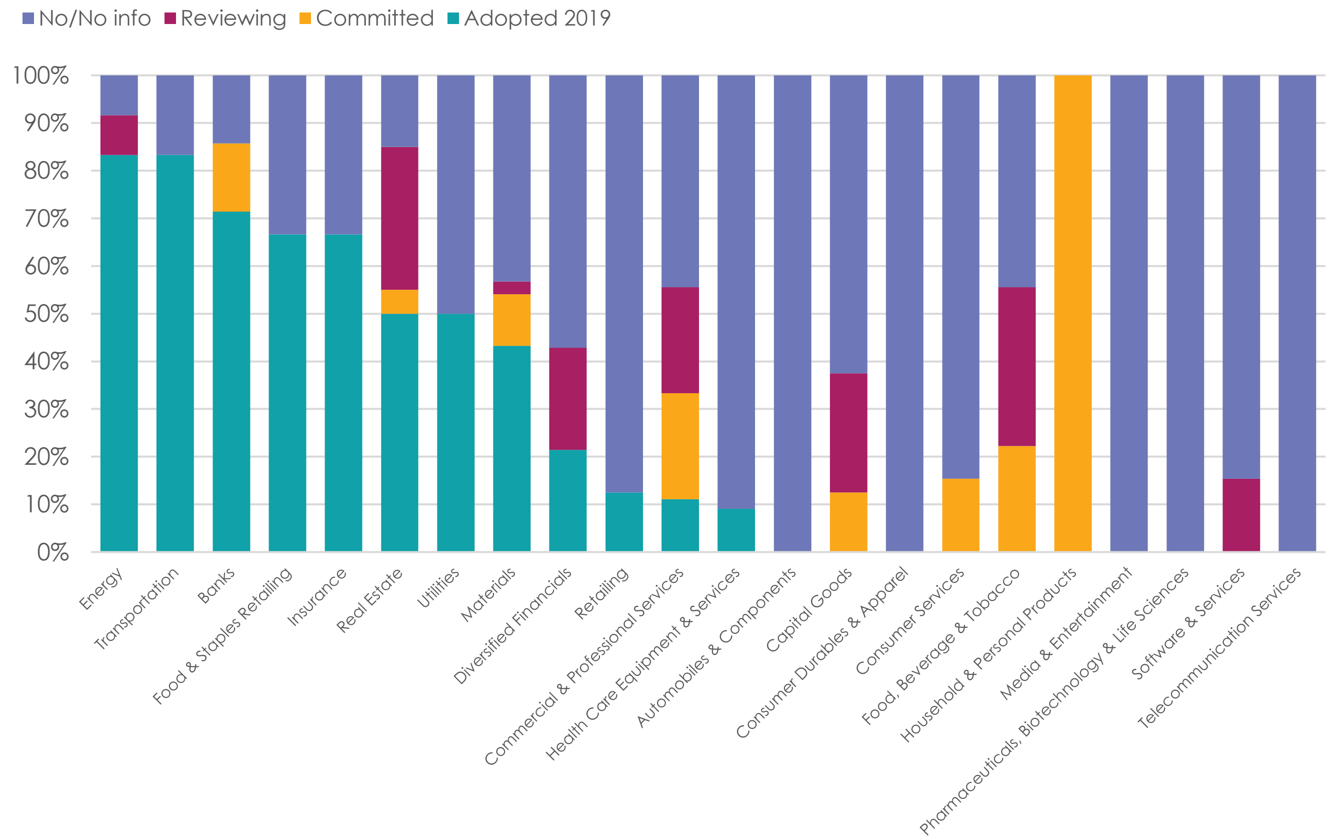


Table 1: New TCFD adopters in each year

2017	2018	2019
Aurizon Holdings Limited	AGL Energy Limited	ADBRI
BHP Billiton Limited	Ampol Limited	AMP Limited
Boral Limited	Australia & New Zealand Banking Group Ltd	Ansell Limited
BlueScope Steel Limited	Commonwealth Bank of Australia	APA Group
Incitec Pivot Limited	CSR Limited	Bank of Queensland Limited
Oil Search Limited	Dexus Prop	Beach Energy Limited
South32 Limited	Downer EDI Limited	Coles Group Limited
Stockland	DuluxGroup Limited	Cooper Energy Limited
Santos Limited	Fortescue Metals Group Ltd	Cromwell Property Group
Sydney Airport	Orica Limited	CSR Limited
Vicinity Centres	Origin Energy Limited	DuluxGroup Limited
	Orora Limited	Fortescue Metals Group Ltd
	Qantas Airways Limited	GPT Group
	Rio Tinto Limited	Growthpoint Properties Australia
	Sims Metal Management Limited	Iluka Resources Limited
		Insurance Australia Group Limited
		LendLease Group
		Macquarie Group Limited
		Mineral Resources Limited
		Mirvac Group
		National Australia Bank Limited
		Newcrest Mining Limited
		NIB Holdings Limited
		Northern Star Resources Ltd
		Orocobre Limited
		Orora Limited
		OZ Minerals Limited
		Pendal Group Limited
		QBE Insurance Group Limited
		Qube Holdings Limited
		Scentre Group
		St Barbara Limited
		Suncorp Group Limited
		Sydney Airport
		Transurban Group
		Unibail-Rodamco
		Viva Energy Group Limited
		Wesfarmers Limited
		Westpac Banking Corporation
		Whitehaven Coal Limited
		Worley Limited

NET-ZERO EMISSIONS COMMITMENTS

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change, by keeping global temperature rises this century to well-below-2°C above pre-industrial levels, and to pursue efforts to further limit the temperature increase to 1.5°C.

In order to meet the well-below-2°C global-warming target in the Paris Agreement, global carbon emissions should reach net zero around mid-century. While the Paris Agreement applies to countries, leading companies are increasingly adopting net-zero emissions targets.

Externally, investors view net-zero emissions targets as a strong signal to the market about a company's strategic direction while, internally, net-zero targets help set the agenda for corporate climate strategy. Recently we have seen several Australian companies release targets to make commitments to become net-zero emitters with some companies in less emissions-intensive industries, such as real estate, going further by setting carbon neutrality targets for the short to medium term.

Companies are beginning to set targets aligned with the Paris Agreement's aim to keep global temperature rise this century to well below 2°C. Whilst setting a net-zero target is an important signal to investors, the current disclosure reveals that companies often failed to disclose how their short and medium-term strategies align to a pathway for achieving their net-zero commitments.

In the ASX200 we found few companies had set net-zero and long-term targets. Overall, only 14 companies had net-zero ambitions and targets.

From this disclosure and ACSI's company engagement program we found two key challenges companies face:

- For those who are not setting such targets, the hesitation typically stems from the uncertainty of the decarbonisation pathway the company would undertake, particularly those in hard-to-decarbonise industries, such as steel and cement making, where they are reliant on negative-carbon or step-change technology that is not currently commercial.
- For the companies setting these targets, not enough disclosure is being provided to investors that demonstrates the planned steps over the medium-term companies to stay in line with the net-zero trajectory. Again, from our extensive company engagement we understand that companies struggle particularly with what actions would need to be undertaken specifically in the 2040 to 2050 decade due to limited insight into emerging technology, material substitution, abatement opportunities and technological improvements.

Whilst we recognise these challenges, investors do expect those companies strategically reliant on step-change technology to meet the Paris Agreement to disclose key milestones for commercialisation, as well as how much investment into the research and development is being done. A key concern for investors is leadership teams announcing targets aimed at achieving well-below-2°C, and then leaving all the actions for achieving this to future leadership teams.

Table 2: Net-zero targets by the ASX200[4]

Company	Summary of Target
BHP Group Limited	BHP aims to achieve net-zero operational GHG emissions in the second half of this century
Dexus	Net zero emissions by 2030.
Fortescue Metals Group Ltd	Net zero emissions by 2050.
Growthpoint Properties Australia	100% reduction in Scope 1&2 by 2050 (2017 base)
Qantas Airways Limited	Net zero emissions by 2050.
Rio Tinto Limited	Net zero emissions by 2050.
South32 Limited	Every 5 years, sets emission reduction targets to achieve "net zero" emissions goal by 2050 in line with the ambition of the Paris Agreement.
Scentre Group	Net zero scope 1 and 2 by 2030 across wholly owned portfolio.
Stockland	Net zero carbon emissions by 2030 (Industrial, Retirement and corporate offices)
The Star Entertainment Group Limited	Net-zero carbon emissions for wholly owned and operated assets by 2030
Santos Limited	Net zero emissions by 2050.
Suncorp Group Limited	Net zero (scope 1 and 2 emissions) by 2050
Vicinity Centres	Net zero carbon emissions by 2030.
Woodside Petroleum Limited	Net zero emissions by 2050.

[4] Please note that the data point has changed to be consistent with new reporting metrics for 2021and this version of the report has been updated.

EMISSIONS REPORTING AND TARGET SETTING

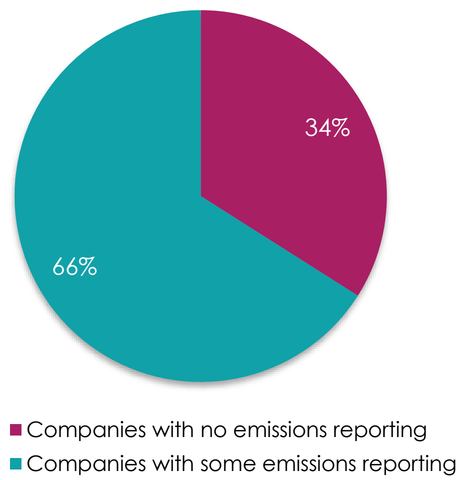
Asset owners and investment managers require the ability to map the carbon footprint of their portfolios. Carbon footprints are used to provide insight into portfolios' exposure to carbon-intensive companies and sectors.

ACSI members expect companies to provide accurate disclosure of current greenhouse gas emissions, and where appropriate, set climate-related targets that accelerate meaning change and decarbonisation in the business.

As in previous years, the majority of the ASX200 now disclose their carbon footprint, with almost 60% of companies detailing both types of direct emissions (Scope 1 & 2). This is in part due to companies with significant greenhouse gas emissions being required to report under Australia's National Greenhouse and Energy Reporting (NGER) Act 2007[5]. A further increased 6% provide some level of GHG emissions reporting across their direct emissions (Scope 1& 2) and value chain (Scope 3). The remaining 34% provide no backward-looking carbon information (refer Graph 3).

In contrast to the strong levels of GHG reporting, only 37% of ASX200 companies have set emissions reduction targets, with a noticeable shortage of medium and long-term aims. We found only 28 companies with medium-term targets (between 2026-2039) and 13 with long-term targets (2040 and beyond) compared to 55 companies setting short-term targets out to 2025 (refer Table 3).

Graph 3 : Emissions reporting



Of the companies with emissions reduction targets, only four disclosed short, medium and long-term targets to demonstrate the intended pathway they aim to take: BHP Group (note to be announced in FY20), Fortescue Metals, Insurance Australia Group and The Star Entertainment Group. Although we do note some companies achieve their required level of decarbonisation earlier, and as such may only set short and medium-term targets.

We also found few companies select targets by aligning company strategy with the goals of the Paris Agreement (refer Table 4). Seven ASX200 companies have targets accredited by the Paris-aligned Science-Based Targets Initiative (SBTi), shown in the table below. We also note that, more recently, a further three companies have committed to setting SBTi targets: Woolworths, Westpac and Telstra. From an investor standpoint, Science-Based Targets help companies to align their strategy with emissions-reduction pathways, drive innovation and increase resilience to regulatory change. SBTi accreditation increases investor confidence that targets are meaningfully set to reduce transition risk.

[5] The current corporate group threshold for reporting is: companies with 50kt or more of greenhouse gases (scope 1 and 2 emissions), production of 200TJ or more of energy, or consumption of 200TJ or more of energy.

Table 3: Target setting across the ASX200

Short term	Medium term	Long term
present to 2025	2026-2039	2040+
ADBRI, AGL Energy, ALS, Amcor, AMP, Ansell, Australia & New Zealand Banking Group, Aurizon Holdings, Bapcor, BHP Group, Boral, BlueScope Steel, Brambles, CBA, Coca-Cola Amatil, Coles Group, Computershare, CSR, Downer EDI, Fortescue Metals Group, Fisher & Paykel Healthcare Corporation, G8 Education, Goodman Group, Growthpoint Properties Australia, Insurance Australia Group, Janus Henderson Group, LendLease Group, Macquarie Group, Metcash, National Australia Bank, News Corporation, Orora, Orocobre, Origin Energy, Orica, Platinum Asset Management, Qantas Airways, QBE Insurance Group, REA Group, South32 Limited, Scentre Group, Shopping Centres Australasia Property Group, Sandfire Resources, Stockland, The Star Entertainment Group, Spark New Zealand, Santos, Sydney Airport, Transurban Group, Telstra Corporation, Virgin Money UK, Westpac Banking Corporation, Wesfarmers, Worley, Woodside Petroleum.	Amcor, Australia & New Zealand Banking Group, BHP Group[6], Blackmores, Charter Hall Group, Charter Hall Long Wale REIT, Chorus, Charter Hall Retail REIT, Dexus Prop, Fletcher Building, Fortescue Metals Group, GPT Group, Insurance Australia Group, Mirvac Group, Newcrest Mining, Orocobre, Origin Energy, Rio Tinto, Scentre Group, Stockland, The Star Entertainment Group, SkyCity Entertainment Group, Super Retail Group, Suncorp Group, Transurban Group, Unibail-Rodamco, Vicinity Centres, Westpac Banking Corporation, Woolworths Group.	BHP Group, Fortescue Metals Group, Graincorp, Growthpoint Properties Australia, Insurance Australia Group, Qantas Airways, Rio Tinto, South32, The Star Entertainment Group, SkyCity Entertainment Group, Santos, Suncorp Group, Woodside Petroleum.

[6] to be announced in FY20

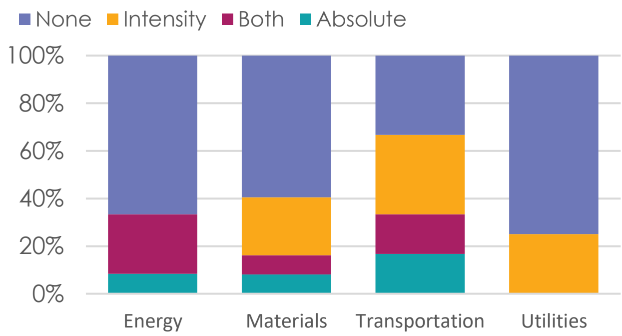
Table 4: Companies with Paris-Aligned, Science-Based Targets

Company	SBTi Target
Origin Energy	Reduce Scope 1 and 2 GHG emissions by 50%, and scope 3 emissions by 25%, by 2032 from a 2017 base-year.[7]
Dexus Property	Reduce absolute Scope 1 and 2 GHG emissions by 70% and absolute Scope 3 emissions 25% by 2030 from a 2018 base year.
SKYCITY Entertainment Group	Reduce absolute Scope 1 and 2 GHG emissions 38% by 2030 and 73% by 2050 from a 2015 base year. SKYCITY Entertainment Group Limited commits that 67% of its suppliers by spend, covering purchased goods and services and capital goods, will set science-based targets by 2023.
Fletcher Building	Reduce absolute Scope 1 and 2 GHG emissions 30% by 2030 from a 2018 base year. Fletcher Building Limited also commits that 67% of its suppliers by emissions will have science-based targets by 2024. (The target boundary includes biogenic emissions and removals from bioenergy feedstocks).
QBE Insurance Group	Science based to 1.5DC. 20% reduction in air travel by 2021 (from 2017 level, achieved already), 15% reduction in energy use by 2021 (from 2018 levels), 100% renewable electricity use for our operations by 2025* (from 2018 levels), 30% reduction in Scope 1 and 2 carbon emissions by 2025 (from 2018 levels, achieved already) and zero direct investments in thermal coal by 1 July 2019, achieved already)
Insurance Australia Group	IAG is carbon neutral and has set SBT for absolute emissions reductions for alignment with <2°C. Emission target for Scope 1 & 2 is a 20% reduction by 2020, 43% reduction by 2025, 71% reduction by 2030 and a 95% reduction by 2050 on an FY18 baseline.
Suncorp Group	Suncorp will track and reduce its operational greenhouse gas (GHG) emissions footprint through its new carbon budget and science-based emissions reduction target: For Corporate operations (Australia and New Zealand operations): 51% absolute reduction by 2030 (From 2017–18 baseline) & Industrial operations (Suncorp Insurance Ventures): 59% intensity reduction by 2030 (From 2017–18 baseline).

A high proportion of companies in the sectors most exposed to climate transition risks have not set any emissions reduction targets (refer Graph 4). We found 67% of Energy, 59% of Materials and 75% of Utilities companies had not set any targets.

This is concerning given these sectors face significant transition risks such as demand destruction for carbon intensive products, and direct carbon-pricing exposure under Paris Agreement-aligned scenarios. Investors expect companies to set targets to drive alignment with the Paris Agreement, as it is likely that global policy will drive the majority of the changes to demand for fossil fuels and fossil-fuel intensive products, and carbon costs. ACSI is concerned that too many companies are waiting on national policy to drive change and investment.

Graph 4: Sectors with significant exposure to carbon risk vs target setting



From company engagement, we expect an emerging trend in 2020-2021 will be the linking of short and long-term incentives to decarbonisation targets. Examples of companies who have flagged they will be looking at this include Rio Tinto and BHP, and as of this month both Origin and AGL incorporated targets into their STI and LTI respectively. While we did not capture this data comprehensively across the ASX200, it has been a key discussion point with companies in ACSI's engagement, often with a focus on: how to set incentive-linked targets, where they are best placed and the potential tensions – such as the trade-off between decarbonising the business and the achievement of other targets like increasing production.

[7] ORG target has some exclusions for Scope 1 & 2 targets (Lattice & Australia Pacific LNG's Train 2) from baseline, and for Scope 3 excludes emissions associated with LPG, Corporate and Australia Pacific LNG export volumes)

Table 5: Exposed sectors and their target setting

Energy		Utilities		Materials	
Targets	No targets	Targets	No targets	Targets	No targets
Origin Energy Santos Worley Woodside Petroleum	Beach Energy Cooper Energy Ampol New Hope Corporation Oil Search Washington H. Soul Pattinson and Co. Viva Energy Group Whitehaven Coal	AGL Energy	APA Group AusNet Services Spark Infrastructure Group	ADBRI Amcor plc BHP Group Boral BlueScope Steel CSR Fletcher Building Fortescue Metals Group Newcrest Mining Orora Orocobre Orica Rio Tinto South32 Sandfire Resources NL	Alumina Brickworks Evolution Mining Gold Road Resources Independence Group NL Iluka Resources Incitec Pivot James Hardie Industries Plc Lynas Corporation Mineral Resources Northern Star Resources Nufarm OZ Minerals Pilbara Minerals Perenti Global Regis Resources Resolute Mining Saracen Mineral Holdings St Barbara Sims Metal Management Silver Lake Resources Western Areas

TRANSITION RISK SCENARIO ANALYSIS: COMPANY RESILIENCE TO A LOW-CARBON FUTURE

Given the considerable uncertainty about future climate policy and associated temperature pathways, climate scenarios can help organisations explore a variety of plausible pathways.

In 2017, the TCFD recommended that companies assess the resilience of their business strategy to different climate change scenarios, including a 2°C-or-lower scenario. Since then, regulators have acknowledged the role of scenario analysis in addressing corporate climate risk[8] and investors, including ACSI on behalf of its Members, have called on companies to test the resilience of their business to a range of climate scenarios, and to disclose their findings.[9]

MORE COMPANIES UNDERTAKING ANALYSIS

Significantly more companies have undertaken and disclosed scenario analysis in 2019 and many included a Paris-aligned scenario in their analysis. On the back of investor engagement, the number of companies undertaking scenario analysis has significantly increased, from 18 to 32 in 2019. We noted a further 28 were reported as either having the analysis currently in progress or planned for FY21.

The number of Paris-aligned scenarios reported[10] has more than doubled, but few companies are using challenging and disruptive 1.5°C scenarios. In 2019 there was an increase to 26 companies using, or planning to use, a Paris Agreement-aligned (a 1.5°C or 'well-below-2°C') scenario in their analysis compared to 11 companies in 2018. The paucity of 1.5°C scenarios suggest many may be failing to stress-test their portfolios against sufficiently challenging and robust scenarios; we found only 13 companies have used, or plan to use, a strict 1.5°C scenario in their analysis (refer to Table 6).

Table 6: Companies with Paris-aligned scenarios

Paris Aligned Scenarios	Company name
1.5°C	Ampol, CSL, CSR, Downer EDI, GPT Group, Insurance Australia Group, NIB Holdings, Oil Search, Stockland, Transurban Group, Westpac Banking Corporation, Wesfarmers, Woolworths Group. **Planned:** National Australia Bank
Well-below 2°C	APA Group, Aurizon Holdings, Beach Energy, BlueScope Steel, CSL, Downer EDI, Macquarie Group, NIB Holdings, Origin Energy*, Orica, Rio Tinto, Santos, Sydney Airport, Westpac Banking Corporation, Wesfarmers, Whitehaven Coal, Woodside Petroleum. **Planned:** BHP Group, LendLease Group, National Australia Bank *note Origin disclosed a 1.5 °C IEA scenario, however as this scenario only achieves 1.65°C we have classified as well-below 2°C

[8] See Geoff Summerhayes, 'Australia's new horizon: Climate change challenges and prudential risk', Speech (17 February 2017). See Guy Debelle, Deputy Governor, Reserve Bank of Australia, 'Climate change and the economy', Speech (12 March 2019).
[9] These developments are strengthened by the Australian Accounting Standards Board's *Practice Statement 2*, which notes that investor expectations may make climate risks material and therefore warrant their inclusion in financial statements, regardless of their numerical impact: Australian Accounting Standards Board, *Climate-related and other emerging risks disclosures: assessing financial statement materiality using AASB Practice Statement* (2 December 2018).
[10] Reported means that the company has either undertaken and disclosed analysis, or has it in progress.

Many companies in sectors with high exposure to transition risk do not disclose scenario analysis. Recent research, conducted for ACSI, has found that, based on current assets, the ASX200 Energy, Utilities and Materials sectors see the most value at risk under Paris Agreement-aligned climate scenarios.[11]

Despite this significant downside risk, during the 2019 reporting period, 25% of Energy companies, 50% of Utilities companies and 62% of Materials companies had not undertaken stress testing (nor had they indicated they planned to undertake scenario analysis in the future). Where there is no scenario analysis, investors have limited insight into how companies intend to make their businesses resilient to change (refer Table 7).

Table 7: scenario analysis in sectors

High-risk sectors	Undertaken scenario analysis	No scenario analysis
Energy	Beach Energy, Origin Energy, Oil Search, Santos, Whitehaven Coal, Woodside Petroleum **In progress or planned:** Ampol, Cooper Energy, Viva Energy	New Hope Corporation, Washington H. Soul Pattinson and Co. Worley
Utilities	AGL Energy, APA Group	AusNet Services, Spark Infrastructure Group
Materials	BHP Group, Boral, BlueScope Steel, CSR, Incitec Pivot, Northern Star Resources, Orica, Rio Tinto, South32 **In progress or planned:** ADBRI, Alumina, Fortescue Metals Group, Orora, Orocobre	Amcor plc, Brickworks, Evolution Mining, Fletcher Building, Gold Road Resources, Independence Group NL, Iluka Resources, James Hardie Industries Plc, Lynas Corporation, Mineral Resources, Newcrest Mining, Nufarm, OZ Minerals, Pilbara Minerals, Perenti Global, Regis Resources, Resolute Mining, Saracen Mineral Holdings, St Barbara, Sandfire Resources NL, Sims Limited, Silver Lake Resources, Western Areas

[11] ACSI commissioned research by Vivid Economics, a London-based economics consultancy, to analyse impacts on the ASX200 under different, Paris-aligned scenarios.

PROLIFERATION OF SCENARIOS AND LEVELS OF DISCLOSURE

Comparability continues to be challenging. ACSI found there is a greater number of scenarios being used than there are companies disclosing them – even among industry-group peers (see page 19). While there has been a proliferation in the number of companies undertaking scenario analysis, there is also a proliferation of different assumptions and scenarios being used. We found 35 individual scenarios being used by 32 companies, including many bespoke (company-designed) scenarios, and differing focuses of analysis (commodity, portfolio or asset). International Energy Agency (IEA) scenarios were the most popular, adopted by 19 companies in a variety of forms.

Some of the challenges we faced when assessing scenario analysis for this report and for our company climate change engagement program include:

- Insufficient disclosure of inputs and assumptions in bespoke analysis and, for standardised scenarios, we could not assume that companies used the same inputs. In our engagement, companies often noted that inputs used in standardised scenarios were incompatible with the reality of their business, hence their preference for adopting bespoke scenarios. However, there is limited transparency on the assumptions, signposts and inputs that drive those scenarios, making it difficult for investors to assess if the scenario choice is sufficiently challenging. Conversely, for companies using a universal scenario, such as IEA, which includes standard assumptions across demand, commodities, prices and technology, we found from discussions that companies were not disclosing when certain assumptions were reduced or excluded.

- Accompanying analyses by companies had different focuses, reflecting operational differences between groups. Some companies focused on commodity pricing impacts or individual asset performance, while others assessed outcomes under each scenario for their whole portfolio or a combination of the above.

Disclosure of scenario analysis across the ASX200 shows that there is limited disclosure and variable depths of information. The most detailed scenario analysis disclosures in the sample included enterprise and asset-level valuation impacts, and information about potential demand changes for products or commodities. However, we found many companies only provided general, qualitative information that provided little insight for investors.

Investors expect meaningful disclosure and when looking across the ASX200, the most detailed examples of company scenario analysis described:

- parameters used, for example: discount rate, GDP, other macro-economic variables, demographic variables
- the main assumptions applied, for example: on policy changes, technology development/deployment, energy mix, price of key commodities or inputs, geographical tailoring of transitional and physical impacts, and timing of potential impacts[12]
- the most significant impacts on the business. These included: direct transition impacts such as carbon costs alongside abatement savings and ability to pass costs on to customers, and indirect transition impacts such as demand destruction and creation.

The analysis should also include some quantification of potential overall climate-related financial impact on businesses, and, where appropriate, on large individual assets.

Two examples of different approaches to scenario analysis where we found that companies were providing a higher level of analysis for investors included:

- Oil Search (OSH)[13], an early adopter of scenario analysis, provides asset level information, quantifying the financial impact of potential transition risks under a 1.5°C scenario on the net present value of each of its large oil and gas assets.

[12] See TCFD Technical Supplement, p 8.
[13] Oil Search Limited, Climate Change Resilience Report 2017, pp 20-25.

The company describes key attributes of each scenario, and notes inflection points that could indicate one scenario is more likely than another. Detailed asset-level disclosure allows investors greater insight into areas of the business most at risk or more likely to capitalise on the low carbon transition. It allows investors to scrutinise decisions made for growth, capital expenditure or investment around these assets, and provides insight into how the company is weighting its portfolio for a low-carbon economy.

- Conversely, Rio Tinto (RIO)[14] applied a portfolio impact approach looking at the demand for key commodities (iron ore, aluminium, copper and minerals) and translated the commodity impacts into business impacts. While it did not aggregate the impacts into a financial metric it did provide investors with a view to how Rio intends to remain resilient and how Rio assesses the level of risk certain minerals are exposed to, as well as its ability to hedge impacts from diversification. For example, Rio's analysis shows the transition risks iron ore faces under a below 2°C scenario, but also why it remains a viable business despite being a key element in the carbon-intensive steel-making process.

By contrast, investors find generalised, qualitative information less useful. Woodside Petroleum (WPL) states that it undertakes analysis using scenarios including the IEA Sustainable Development Scenario (a '<2°C' scenario), and concludes simply that 'in all these scenarios, both our existing assets and mature growth opportunities would make a positive contribution to shareholder value and operating cashflows.' WPL provides high-level statements about the growing demand for natural gas and WPL's 'track record of low-cost production' as evidence to support this position, without quantifying asset-level impacts or disclosing any underlying information that helps investors understand how it is assessing resilience.[15]

There are few examples of how the scenario analysis undertaken is informing company strategy and actions or climate-related opportunities over the short and medium-term to meet the Paris goals. While a large focus is on climate-related risks, investors are equally expecting companies to provide disclosure on how their corporate strategy is informed by the analysis, and where they are undertaking actions such as potential savings from abatement, cost pass-through and investment in low-carbon alternatives or technology:

- Few companies explain how the company's strategy, reduction targets or milestones and remuneration align to work toward the goals of the Paris Agreement. Most company scenario analysis fails to link the low-carbon narrative with tangible actions on how they will manage the impacts on revenue from carbon costs and demand destruction, position the business to take advantage of demand for products associated with the transition to a lower carbon economy and invest in emissions abatement.

- Most companies do not disclose how climate change impacts capital expenditure and operational expenditure decision-making within the business. While it was not a focus of the data collection and analysis, from engagement we have found limited disclosure of shadow carbon prices and few companies disclosing how they assess investments, capital and operational expenditure and acquisitions as being 'Paris aligned'. The oil and gas sector, for example, has not adequately explained how LNG growth strategies are 'Paris aligned'. Recent real-world asset impairments in the sector suggest that the risks from scenario analysis had not been translated into project assessments.

The table below presents the frequency at which the ASX200 reported against scenarios of different levels of warming as well as the sheer scale of different scenarios used. The table shows all scenarios reported in public disclosure, which includes those undertaken and those planned or in progress.

[14] Rio Tinto, Our approach to Climate change for 2018 & 2019
[15] Woodside Petroleum Limited, Our Energy Future, pp 4-5.

Table 8: Scenario analysis for the FY19 reporting year up to 31 March 2020

Scenario reference		Banks	Comm & Prof Services	Div Financials	Energy & Utilities	F&S Retailing	Healthcare	Household & Personal Products	Insurance	Materials	Media & Entertainment	Real Estate	Retailing	Transport
1.5°C	RCP 2.6		DOW				CSL		NHF			SGP		
	Greenpeace advance energy revolution				OSH									
	1.5 °C Global Energy Monitor	NAB												
	'1.5 degrees' *									CSR		GPT	WES	TCL
	1.5°C IPCC	WBC			ALD AGL (being undertaken in 2020)				IAG					
	Sectorial Decarbonization Approach to 1.5°C					WOW								
Below 2°C	IEA 1.5 °C (only reaches 1.65°C so counted as a below 2°C scenario)				ORG									
	IEA Below 2°C Scenario				BPT, STO									
	'Below 2 °C' *				AGL (being undertaken in 2020) APA					BHP (being undertaken in 2020)		LLC	WES	
	IEA Sustainable Development Scenario	NAB, WBC		MQG	BPT, NHC, STO, WHC, WPL					ORI, RIO				AZJ, SYD
	RCP 4.5 (IPCC)	CBA					CSL					URW		
	Global Cooperation (listed by companies as either well-below 2°C and 2°C)									BSL, S32				
2-3°C	IEA 450	ANZ												
	Globally Aligned carbon policy									BLD				
	Bloomberg New Energy Finance									ORI				

Scenario reference		Banks	Comm & Prof Services	Div Financials	Energy & Utilities	F&S Retailing	Healthcare	Household & Personal Products	Insurance	Materials	Media & Entertainment	Real Estate	Retailing	Transport
	Regionally Differentiated carbon policy									BLD				
	IEA 2°C Scenario				ORG, OSH, STO									AZJ
	IEA New Policies (2.7 °C)	ANZ, NAB		MQG	APA, BPT, ALD, OSH, NHC, STO, WHC					ORI				AZJ
	Global Accord									BHP				
	Sectorial Decarbonization Approach to 2°C					WOW						DXS		
	'2 degree'				AGL, COE		BKL		IAG	CSR, IPL	NWS	GPT, LLC		TCL
	RCP 6.0 (IPCC)						CSL							
	A New Gear									BHP				
	Two Giants									BHP				
	Coordinated Action									RIO				
3°C +	Patchy progress									BSL, S32				
	Current Government Policy (NDC)/IEA Current Policy				AGL, BPT, ALD, ORG, NHC, STO, WHC					AGL				SYD
	Closed doors									BHP				
	Co-ordinated Action									RIO				
	IEA Reference Technology				STO									
	Reference Case									BLD				
	Runaway climate change									BSL, S32				
	Limited Action									RIO				
	RCP 8.5	CBA	DOW						NHF	NST		SGP, DXS, URW		SYD
	'4 degree'	ANZ					BKL			CSR, IPL		GPT, LLC	WES	TCL

Note: The table includes those undertaken or disclosed as in progress or planned and thus is more inclusive than the statistics quoted above.
* Denotes scenarios that did not provide a specific name to reference or used a combination of scenario families

WHAT COMPANIES ARE SAYING ABOUT THEIR RESILIENCE

Across the board, companies paint a rosy picture of financial performance under all scenarios. We are concerned that the general level of optimism may be unrealistic for several reasons.

Source: Task Force on Climate-Related Financial Disclosures, The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities, June 2017

First, companies often failed to account for physical climate risk, even in analyses that included limited policy action and extreme levels of warming, despite the widely acknowledged trade-off between the two types of risk.[16]

Among companies disclosing resilience against a 3°C+ scenario, the majority did not disclose the physical risks to their assets. No company disclosed the financial impact of reactive physical climate change impacts (for example, production lost due to a stop in operations from extreme heat days) or pro-active costs of improving the resilience of their infrastructure to physical climate risks (for example, capital spent on improving and adapting infrastructure to be more resilient from changing weather patterns).

Aurizon Holdings, as an example, reported that between 2011 and 2017, extreme weather events (lasting more than 48 hours) accounted for 65% of cancellations on the Central Queensland Coal Network, but the company did not provide an assessment of financial impact from physical climate change in its projections.

Second, few companies attempted to quantify downside risk under scenarios. Some companies cited a risk of reduced demand for commodities (e.g, BHP and Rio Tinto) under certain scenarios. Several companies acknowledged a potential decrease in the NPV of their portfolio (e.g, Origin and Santos) or their assets (e.g, Oil Search). Most described the impacts as moderate to small, and many companies argued that negative impacts would be offset by value accretion achieved through executing climate opportunities. For example, while Aurizon acknowledged that Australian coal export volumes were projected to decrease under the IEA's Sustainable Development scenario, with a compound annual growth rate (CAGR) of -2.1%, the company argued that under this scenario Australia's coal export market share would increase thanks to the quality of its coal – resulting only in a -0.6% CAGR impact.[17]

Third, few companies foresee significantly reduced future cash flows under a 2°C, or below, scenario. In reaching this conclusion, companies have variously discussed and quantified (to some extent) changes in demand for commodities and products, increased future costs, assumptions about cost curves and changes in revenue generation. However, this contradicts conclusions of research commissioned by ACSI, which finds that given the likely economic impacts of the transition to a lower-carbon economy will be significantly negative for some ASX200 sectors unless companies adapt business models to focus on new, greener revenue streams and invest in emissions abatement.[18] Where companies fail to acknowledge significant cash flow reductions under some scenarios, we question the rigour of the assumptions and inputs used, and encourage these companies to examine a broader range of scenarios.

[16] See for example, APRA, 'Buy now or pay later', Speech, Geoff Summerhayes (21 June 2019).
[17] Aurizon *Sustainability Report* (2018), p 30.
[18] See also, eg *Economist Intelligence Unit*, *The Cost of Inaction: recognising the value at risk from climate change* (2015), which argues that the mean expected losses from climate change to the total global stock of manageable assets to 2100 (in discounted, present value terms) is $4.3trn (the report estimates the world's current stock of manageable assets to be $143thrn).

PHYSICAL RISK ANALYSIS: TESTING ASSET AND OPERATIONAL RESILIENCE

Investors value climate change scenario analysis because it provides insight into the potential financial impact of climate change. As this report notes, however, Australian companies have some way to go in reporting adequately on scenario analysis and even further to go on addressing the financial and operation impacts of physical risks associated with a warming planet.

FEW COMPANIES REPORTED ON PHYSICAL RISKS IN A MEANINGFUL MANNER

Physical risk disclosure is in the early stages of development with no standardised disclosure. Investors are increasingly looking for more in-depth analysis on what physical climate change risks would impact businesses and the frequency of them.

Physical climate risks may impact businesses in several ways, including:

- Limiting the company's ability to staff and operate different sites under extreme weather conditions
- Damage to assets from fire, flood, extreme heat
- Changes to rainfall patterns

We found 10 companies that presented physical risk in a manner that suggested a robust internal analysis was being undertaken and a further 28 which provided some general physical risk disclosure. The below table shows that most companies provide only general risk identification. That was typically found in the risk disclosures section in the Directors Report of the Annual Report. This kind of disclosure addresses key risks at a very high level, typically highlighting the risk and discussing in a limited and general manner the mitigation strategies. The majority of this disclosure was cursory and provided no insight into physical risk management.

Table 9: companies that have undertaken a level of physical risk analysis

General physical risk acknowledgment		Detailed physical risk analysis
AMP Limited	GPT Group	Commonwealth Bank of Australia
Ansell Limited	Insurance Australia Group Limited	Iluka Resources Limited
Australia & New Zealand Banking Group Ltd	Mineral Resources Limited	Northern Star Resources Ltd
APA Group	National Australia Bank Limited	News Corporation
Aurizon Holdings Limited	Orica Limited	Oil Search Limited
BHP Group Limited	OZ Minerals Limited	Rio Tinto Limited
Bingo Industries Limited	Qantas Airways Limited	Sims Metal Management Limited
Boral Limited	QBE Insurance Group Limited	Sydney Airport
BlueScope Steel Limited	Qube Holdings Limited	Westpac Banking Corporation
CSR Limited	South32 Limited	Wesfarmers Limited
Caltex Australia Limited	St Barbara Limited	
Downer EDI Limited	Stockland	
Dexus Prop	Transurban Group	
Fortescue Metals Group Ltd	Whitehaven Coal Limited	Date

Financial impact analysis is yet to emerge; however, we have found a few examples of better physical risk disclosure. For example, Rio Tino has done desktop analysis of physical climate risk across different geographies, South 32 provides more comprehensive asset level disclosure on its Mozal and Worsley assets and Sydney Airport did a detailed risk assessment of different infrastructure to particular climate variables.

Over time, investors are looking for companies to quantify the potential financial impacts of physical climate risk or the cost of capital expenditure to build resilience, particularly given the increasing frequency of extreme weather-related events.

Companies who did address physical risks posed by climate change did so in different ways. Four varying examples of this are summarised below:

Aurizon	Aurizon provides some disclosure on impacts of physical risks, with the company noting between 2011 and 2017 65% of the cancellations to the Central Queensland Coal Network was due to extreme weather events[19]. More recently, they disclosed that an 11-week shutdown of the Mount Isa Line was due to record rainfall and flooding and they provide case studies on how they have built resilience into their operations for temperature variation of track conditions and ensuring power supply[20].
Rio Tinto[21]	In 2018, Rio Tinto examined physical climate risk to 2035 under an RCP 8.5 scenario, assessing location and nature of operations and possible weather-related impacts. Rio identified its significant Pilbara iron ore assets as having a high exposure to all physical climate variables. In 2019, Rio completed a further study of past extreme weather events and their impacts, eg Cyclone Veronica forced Rio to declare a force majeure on certain contracts while the company responded and recovered. Additionally, Rio provides a case study on Oyu Tolgoi copper mine, and how physical risks impact water scarcity, which is an important element in processing copper ore.
South 32[22]	South 32 provides more comprehensive physical climate risk disclosure than peers, addressing exposure, sensitivity and adaptive capacity and resilience to different weather impacts. Over the course of 2018 and 2019 reporting periods, S32 has disclosed asset-by-asset the physical risk challenges out to 2040 for operations and supply chain management. In 2018 S32 produced an assessment of the Worsley Alumina asset and in 2019, the assessment covered the Mozal Aluminium. The company rated its resilience to integrity and production continuity, ability to maintain supply chain and logistics and worker health
Sydney Airport[23]	Sydney Airport undertook a process where they assessed the infrastrucure and operations at the site; the airport, airlines, air traffic controll and ground transport and access and assessed their exposure to changes in temperature, percipitation, wind, sea level rises and extreme events. Alongside this they also disclosed initiatives being undertaken to build in operational resilience.

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[19] AZJ: https://www.aurizon.com.au/-/media/Project/Aurizon/Files/Sustainability/Sustainability-Reports/FY2017-Sustainability-Report.pdf
[20] AZJ: https://www.aurizon.com.au/-/media/project/aurizon/files/sustainability/fy2019-aurizon-sustainability-report.pdf
[21] RIO: 2018 & 2019 Climate Change Reports: https://www.riotinto.com/sustainability/climate-change
[22] S32: https://www.south32.net/docs/default-source/exchange-releases/our-approach-to-climate-change-2019.pdf?sfvrsn=71dfa0ac_2
[23] SYD: https://www.asx.com.au/asxpdf/20190221/pdf/442f243b188rdv.pdf

APPENDIX

Recent announcements on asset impairments from changes to assumptions from the low-carbon transition.

	BP (2021-2050)[24]	Oil Search	Woodside (2020-2025)[25]	Origin (2021-2026)[26]	Santos (2020-2025)[27]
Oil assumptions	US$55/bbl (Brent oil, real 2020)	No announcement	$35/bbl in 2H2020 out to $65/bbl in 2025 (Brent, real 2020)	US$40/bbl in FY21 - $60/bbl in FY26 (Brent oil, real 2020)	$45/bbl in 2020 out to $62.50/bbl in 2025 (Brent real 2020)
Gas assumptions	US$2.90/mmbtu (Henry Hub gas, 2020 real)	No announcement	$3/mmbtu spot LNG in 2H2020 out to $8/mmbtu in 2025 (spot LNG prices, real 2020)	Includes: a US$ 7.15/mmbu from FY26 (JKM linked price, real 2020) & a long term US$2.60/ mmbu from FY26(Henry Hub, real 2020)	No announcement
Carbon price	US$100/teCO2 in 2030 (2020 real).	For projects in PNG US$25 price and for projects in the USA US$40 price.[28]	US$80/teCO2 (applied as long-term price to Aus emissions that exceed facility-specific baselines)	$15-80/teCO2[29]	Only disclose the carbon price for emissions >Safeguard Mechanism ($17/teCO2 from 2019). Notes 90% of emissions are covered by the Safeguard mechanism[30]
Impairment	Estimates that the aggregate second-quarter 2020 non-cash, post-tax PP&E impairment charges and exploration intangible write-offs will be in the range of $13 billion to $17.5 billion.	US$360-400mn – largely relating to PNG exploration licences where the outlook for oil and gas prices have changed[31]	$2.76bn for oil and gas. $1.16bn exploration and evaluation assets. US$447mn Corpus Christi LNG sale and purchase agreement Total: Post tax loss of US$4.37bn – 80% driven from immediate reduction in oil and gas prices up to 2025 with additional impacts from COVID-19 and carbon pricing.	Statutory profit after tax: $1,160 – 1,240mn driven by revised commodity assumption due to COVID and low carbon transition. Comprising of: $720-770mn for APLN and $440-460mn for Cameron LNG onerous contract provision	US$700-800 before tax ($490-560 after tax) due to revised oil price assumptions from COVID and energy market fundamentals. The impairment increases STO's gearing by 1.5%

[24] BP: https://www.bp.com/en/global/corporate/news-and-insights/press-releases/bp-revises-long-term-price-assumptions.html
[25] WPL: https://www.asx.com.au/asxpdf/20200714/pdf/44kj80ksrqlxr0.pdf
[26] ORG: https://www.asx.com.au/asxpdf/20200715/pdf/44kk2wy2vhysr5.pdf
[27] STO: https://www.asx.com.au/asxpdf/20200721/pdf/44kpmk4pqdmsts.pdf
[28] OSH: https://www.oilsearch.com/__data/assets/pdf_file/0005/18968/OSL-Climate-Change-Resilience-Report_FINAL.pdf
[29] ORG:https://www.originenergy.com.au/content/dam/origin/about/investors-media/documents/1_5c_paper_final_.pdf
[30] STO:https://www.santos.com/wp-content/uploads/2020/02/2020-climate-change-report.pdf
[31] OSH: https://www.asx.com.au/asxpdf/20200713/pdf/44kgktd5q6vhjq.pdf

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