

Climate Risk and the Cost of Capital in NSW

Australia's Climate Policies Will Materially Impact NSW's Long Term Economic Outlook

Executive Summary

Australia's failure to commit to national net zero targets or any credible climate policy is a growing economic threat to the country and its subnational governments.

International focus on climate is intensifying rapidly. As world leaders discuss means and methods to accelerate the race to zero, Australia has signalled it has no climate ambition and its economy will continue to be powered by fossil fuels, with government subsidies undermining the rapidly improving economics of decarbonisation.

Central banks, insurers, asset managers and investors are preparing for a lower emissions future. More than half of all global assets under management are now linked to net zero commitments;¹ and central banks (notably the European Central Bank) have outlined measures to incorporate climate considerations into the purchasing of bonds.²

Decarbonizing portfolios will inevitably mean shifting money away from assets with a high climate risk profile. Australian sovereign and sub-sovereign bonds will not fit within the international community's low carbon goals.

Notably, climate risk will materially impact the economic and fiscal outlook for the state of New South Wales, Australia's largest state, responsible for around a third of the nation's economic output. The state has relied heavily on offshore investors for its funding requirements. Access to foreign capital is likely to become increasingly challenging as investors shun assets with high carbon exposure.

Riksbank, Sweden's central bank, has already divested its holdings in Queensland and Western Australian government bonds due to their climate

**Decarbonizing portfolios
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high climate profile... like
Australian sovereign and
sub-sovereign bonds.**

¹ Business Insider. [Almost half of all global assets under management are now geared towards net-zero goals, according to a group of fund managers.](#) 6 July 2021.

² European Central Bank. [ECB presents action plan to include climate change considerations in its monetary policy strategy.](#) 8 July 2021.

profile.³ As Australia's climate record comes under increasing scrutiny, global investors will look to proactively divest bonds in a high emitting, relatively insignificant global market.

Credit ratings agencies have also warned that climate risks are starting to be incorporated in their forecasts, and sovereign downgrades are coming. For NSW, a one-notch downgrade from its 'AA+ and AAA' ratings⁴ would mean reduced capital access and higher borrowing costs, potentially preventing a large subset of investors from holding NSW semi-sovereign bonds.

As Federal Treasurer Josh Frydenberg stated (in a desperate plea for the Australian Government to set climate targets), "higher borrowing costs impact everything... from interest rates on home loans to the viability of large infrastructure projects".⁵

Australia's failure to act on climate will impose a cost on future generations. For NSW, this could mean a debt boom as a result of the following impacts likely to materialise very soon:

- NSW Treasury expects the economic cost of natural disasters to NSW to treble to \$16-17 billion per year by 2061.
- Deloitte Access Economics estimates that the economic losses of Australia doing nothing to mitigate climate will shrink Australia's GDP by 6%.
- The combined loss of coal revenue and population growth will tip net debt to 100% of GSP by 2060.
- If climate mitigation efforts are not introduced until 2030, debt-to-GDP will increase to 156% by 2040, and Australia could default.
- Australia will see at least a 4-notch credit ratings downgrade by 2100 if it continues to ignore climate warnings; NSW ratings will be concurrently lowered.
- The bond market has reacted strongly to the NSW government's recent economic recovery spending, with interest cost spreads rising ~30bps since June 2021. Increased debt resulting from the rising costs of environmental damage and climate mitigation will come at a greater cost to taxpayers in the form of interest expense.

Aside from these tangible costs, international investors' perceptions of Australia and climate matter, and will inevitably have a material flow-on effect on the demand and liquidity of NSW Government bonds.

³ Sveriges Riksbank. [Floden: Riksbank selling bonds for climate reasons](#). 13 November 2019.

⁴ In December 2020, S&P lowered NSW' credit rating to AA+; Moody's reaffirmed the AAA credit rating.

⁵ The Hon Josh Frydenberg MP. [Address to the Australian Industry Group, Melbourne. Capital markets and the transition to a low emissions future](#). 24 September 2021.

Climate Risks Will Materially Impact NSW

More Extreme Weather Events

The Black Summer bushfires in 2019-20 exposed the vulnerability of NSW to the physical and economic costs of climate change. These costs will undoubtedly continue to multiply if the world continues in a 'business-as-usual' manner, failing to mitigate the potential impacts of burning fossil fuels.

Following a period of extreme drought, the catastrophic bushfires caused unprecedented loss of life and biodiversity. The resulting economic damage was officially estimated by NSW Treasury at about \$6.4 billion (~1% of Gross State Product (GSP)).⁶ Unofficial economic models suggest the true cost was closer to \$100bn (~16% of GSP).⁷

**The loss of coal royalties
will cost NSW around
\$51bn by 2055-56.**

By the NSW Government's own estimation, bushfire risk will increase by between 2%-24% over the next 40 years,⁸ the higher risk reflecting the increased probability of bushfires if the world makes no effort to mitigate the effects of climate change and continues its current trajectory.⁹ The total economic costs (of the increased occurrence and severity) of natural disasters are projected to treble by 2061 to between \$15.8-\$17.2 billion per annum.¹⁰

Coal in Terminal Decline

The declining outlook for coal will also have a significant impact on the state's finances. Coal royalties contributed \$1.5bn to the NSW State budget in 2019-20 and, assuming production is phased out as soon as 2042 (according to Treasury estimates), the cumulative cost to the state will be around \$51bn by 2055-56.¹¹

Before accounting for any incremental costs of natural disasters or climate change, the loss of coal revenue (combined with population growth and an ageing population) is projected to tip net debt in NSW to 100% by 2060, from ~15%

⁶ SGS Economics & Planning. [Economic recovery after disaster strikes](#). 2020.

⁷ The Conversation. [With costs approaching \\$100 billion, the fires are Australia's costliest natural disaster](#). 17 January 2020.

⁸ NSW Treasury. [An indicative assessment of four key areas of climate risk for the 2021 NSW Intergenerational Report](#). April 2021.

⁹ Current trajectory in climate models refers to the 'business-as-usual' scenario where economies continue to operate as normal and make no attempt to mitigate climate risks. The NSW Treasury estimations assess risk under this 'business-as-usual' scenario which reflects 'higher warming' and climate impacts consistent with Representative Concentration Pathway (RCP) of 8.5.

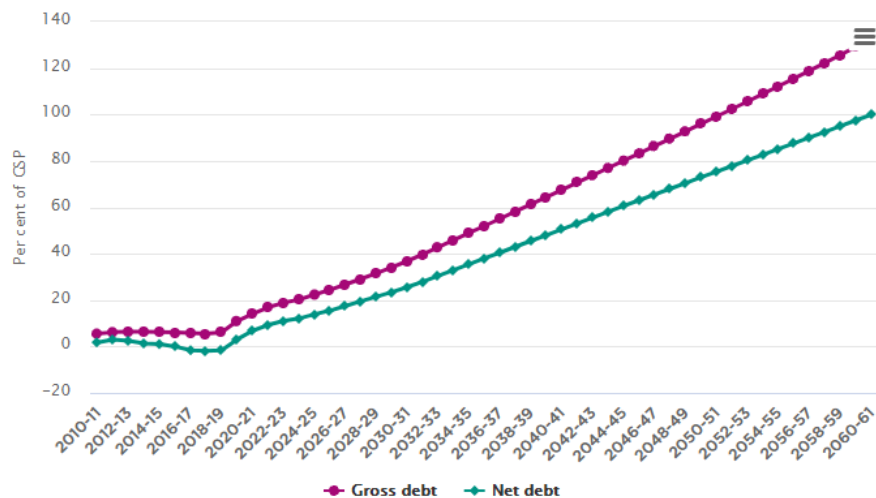
¹⁰ NSW Treasury. [An indicative assessment of four key areas of climate risk for the 2021 NSW Intergenerational Report](#). April 2021. p. 25

¹¹ NSW Government. [The sensitivity of the NSW economic and fiscal outlook to global coal demand and the broader energy transition for the 2021 NSW Intergenerational Report](#). May 2021.

currently (as a % of GSP)¹² -- net debt being a key determinant of sovereign bond yields and the costs of borrowing.¹³

Figure 1: Net Debt in NSW is Estimated to Reach 100% by 2060

Gross and net debt to 2060-61 (including the NSW Generations Fund)



Source: NSW Treasury.

Increasing Debt and Borrowing Costs

The combined effect of drought, bushfires, floods and the first round of COVID-19 lockdowns has taken debt in NSW to unprecedented levels.

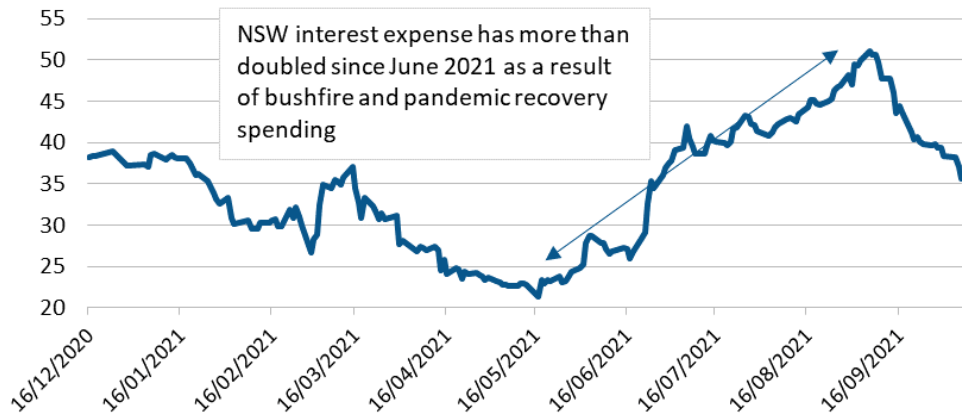
To support economic recovery, the State budget released in June proposed to raise further large amounts of cash (~\$10-\$20 billion for the year), blowing out NSW gross debt.¹⁴

¹² NSW Treasury. [Our fiscal challenge](#). 7 June 2021.

¹³ IMF Working Paper. [Long-Run and Short-Run Determinants of Sovereign Bond Yields in Advanced Economies](#). 2012.

¹⁴ NSW Government. [The NSW Budget 2021-2022](#).

Figure 2: 10-Year NSW Government Bond Spreads above 10-Year Commonwealth Government Bond (basis points)



Source: Bloomberg.

As a result, interest costs of NSW government debt, relative to what the Commonwealth pays for debt rose ~30 basis points between June and September 2021.¹⁵ The rise in borrowing costs added \$200-300 million in annual interest on new debt as old debt was replaced.

A study conducted by the IMF into the determinants of sovereign bond yields in advanced economies established that for every 1 percentage point increase in government debt-to-GDP, government bond yields increase about 2 basis points.¹⁶

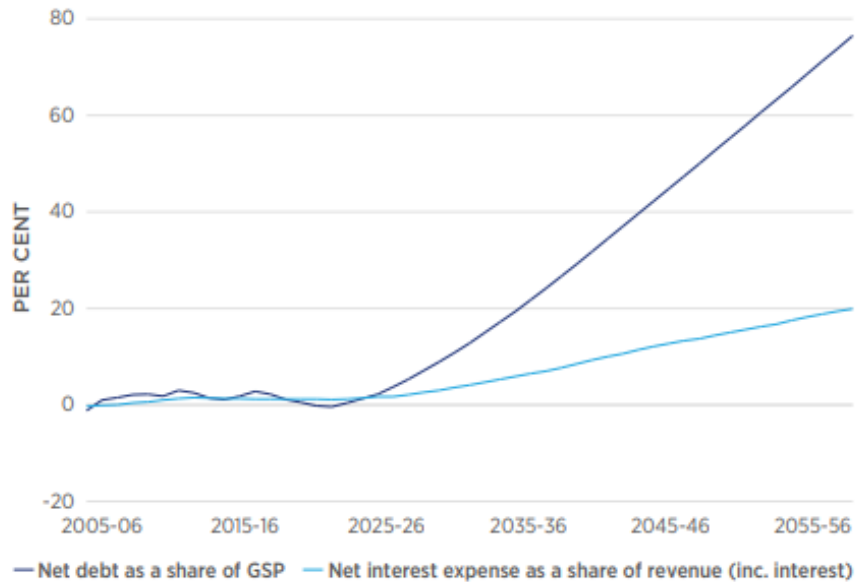
A 1% increase in government debt-to-GDP will increase bond yields by around 2 basis points.

On this calculation (ignoring the potential impact of extreme weather on total debt), interest expense in NSW would climb by 1.7% per annum (presently \$1.7bn).

¹⁵ Source: Bloomberg

¹⁶ IMF Working Paper. *Long-Run and Short-Run Determinants of Sovereign Bond Yields in Advanced Economies*. 2012.

Figure 3: Net Interest Expense Expected to Climb to 20% of Revenue by 2055-2056



Source: NSW Treasury. *6. Our Fiscal Challenge - Intergenerational Report 2016* (nsw.gov.au), p. 3.

This theoretical increase in interest maybe an unreasonable estimate, considering the historic fiscal resolve of Australia and the state of NSW; however, interest expense will become an escalating burden as revenues from coal royalties decline, and net debt peaks at 100% by 2061 per NSW Treasury estimates. In which case, net interest expense would be expected to climb to a staggering 20% of revenue by 2055-2056.¹⁷

Net debt is already forecast to reach 100% by 2061 meaning interest expense will climb to a staggering 20% of revenue.

A vicious cycle of spending and debt -- relating to the costs of environmental damage, climate mitigation and annual interest expenditure -- rather than a virtuous cycle of spending resulting in broader economic gain benefiting the entire population.

¹⁷ NSW Treasury. *Our Fiscal Challenge - Intergenerational Report*. 2016.

Sovereign Credit Ratings Are Starting to Reflect Climate Risk, Further Compounding the Cost of Borrowing

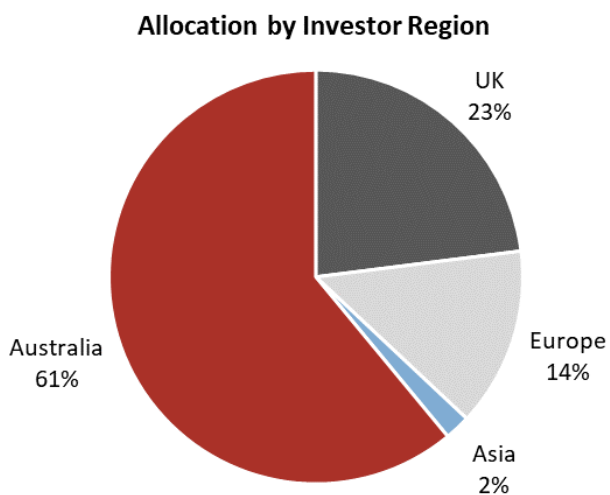
In December 2020, international ratings agency S&P Global lowered NSW's credit ratings one notch to AA+ amid fears of rising debt burdens.¹⁸ S&P's key concern was the increased infrastructure planned by the Government post-pandemic (following the first wave of lockdowns in 2020) -- which S&P believed, would propel public debt higher and run up NSW's annual interest expense.

Given the second state-wide COVID related lockdown (June to October 2021) and the succession of extreme events that have troubled the state, regaining S&P's 'gold standard' triple-A rating is unlikely short to medium term.

The one-notch downgrade from NSW's 'AAA' rating in December 2020 did not have a material impact on bond yields but further ratings downgrades may have that effect, substantially increasing the costs of borrowing and annual interest expense.

Further downgrades will limit the types of offshore investors able to purchase debt in lower-rated sovereign bonds. Insurance companies, non-resident sovereign wealth funds and central banks as a standard, have portfolio limitations that varyingly restrict them from holding debt below a certain credit rating. Non-resident investors represent about 45% (or \$45 billion) of the holders in NSW Treasury Corp bonds.¹⁹

Figure 4: Offshore Investors Represented 39% of T-Corp's Recent 2034 Issue



Source: NSW Treasury Corporation, p.2.

¹⁸ S&P Global. [Credit FAQ: Why We Downgraded the Australian States of New South Wales and Victoria](#). December 2020.

¹⁹ NSW Treasury Corporation. [Annual Report 2020](#). p.160.

At present, credit rating agencies do not incorporate climate risk into sovereign's overall credit ratings. To date, no major credit ratings agency has downgraded a sovereign based on an explicit attribution to climate risk. Rather, the agencies use a combination of commentary and ESG scores to highlight the potential risks and costs associated with issuers of sovereign and sub-sovereign bonds, and agencies are rapidly scaling up their inhouse capacity to evaluate and report on these key financial risks going forward.²⁰

The ratings agencies have however issued strong warnings that sovereign downgrades are coming and inevitable. S&P cautioned that unless governments take decisive action to mitigate climate change, burgeoning spending will result in G7 sovereign debt downgraded to the brink of junk status by 2030.²¹ Moody's has arrived at similar conclusions.²²

Considering the huge sums that credit ratings agencies have recently invested to ramp up their ESG offerings and the increased global focus on climate disclosures, climate risk will have a more considerable role in determining sovereign ratings in the future.

Further Long-Term Fiscal Impacts of Climate to Australia and Spill-Over Effects on NSW

Recent academic studies modelling the climate change risk on sovereign credit worthiness suggest there will be severe financial repercussions for the Australian economy.

Researchers at the University of Cambridge²³ simulated the effect of climate change on sovereign credit ratings for 108 countries under different warming scenarios. Assuming a business-as-usual trajectory (RCP 8.5), 63 sovereigns would have their ratings cut by 2030, and the majority of sovereigns will face an average downgrade of 2.5 notches by 2100.

Australia's debt-to-GDP will increase at least 20% due to economic shocks from extreme weather events.

Australia would be among the hardest hit sovereigns, expected to suffer a downgrade of 4 S&P notches by 2100, if the current trajectory of carbon emissions is maintained.

²⁰ Financial Times. [The case for 'truly-long-term' debt ratings](#). 8 July 2021.

²¹ Standard & Poor's Rating Services. [Global Aging 2016: 58 Shades of Grey](#). 28 April 2016.

²² Moody's Investor Services. [Moody's – Physical climate risk is credit negative for most sovereigns, particularly in emerging markets](#). 6 May 2021.

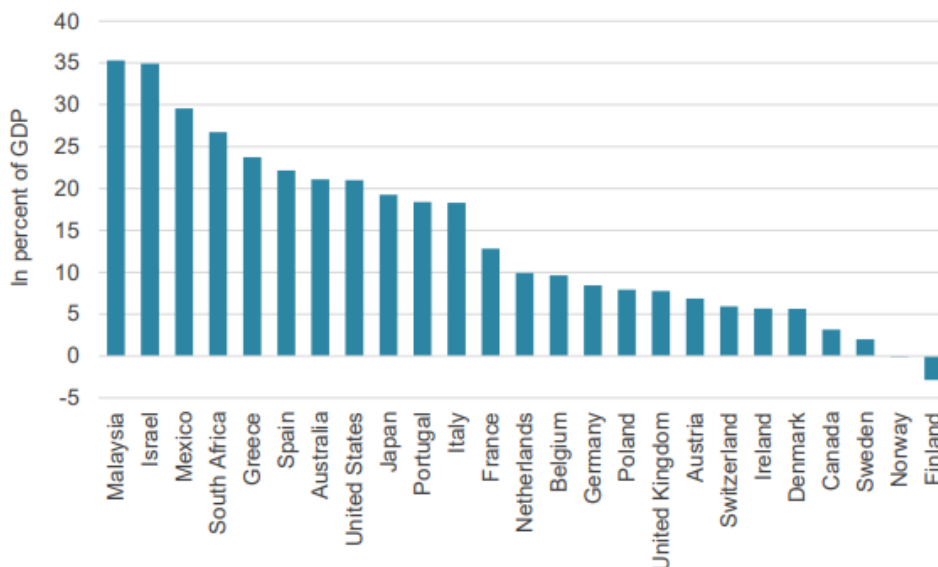
²³ Bennett Institute for Public Policy Cambridge. M. Agarwala et al. [Rising Temperatures, Falling Ratings: The Effect of Climate Change on Sovereign Creditworthiness](#). March 2021.

Assuming the same business-as-usual warming scenario, a separate study conducted by FTSE Russell concluded that the financial repercussions of climate would manifest much sooner than the turn of the century.²⁴ By 2030, FTSE determined that the GDP per capita for countries in the FTSE World Government Bond Index²⁵ would drop on average 4% by 2030, and 16% by 2050.

Australia would see a significant increase in its debt-to-GDP ratio of circa 20%, due to the economic shocks and productivity losses caused by extreme weather events, compounding the extreme increases in debt ratios over the last two years from COVID-19.

Figure 5: By 2050, Australia’s Debt-to-GDP Will Increase 20% Due to Extreme Weather Events

Chart 13. Debt increase in the hot house world scenario by 2050



Source: *FTSE Russell, Beyond Ratings*. p. 17.

FTSE Russell further simulated the costs of climate mitigation for countries that do not introduce climate policies until 2030 (a ‘disorderly transition’).²⁶

Under this scenario (a highly probable outcome for Australia), the costs of climate mitigation would explode, increasing government expenditure markedly by 2050 and increasing the likelihood of default.

²⁴ FTSE Russell. [Anticipating the climate change risks for sovereign bonds Part 1](#). March 2021.

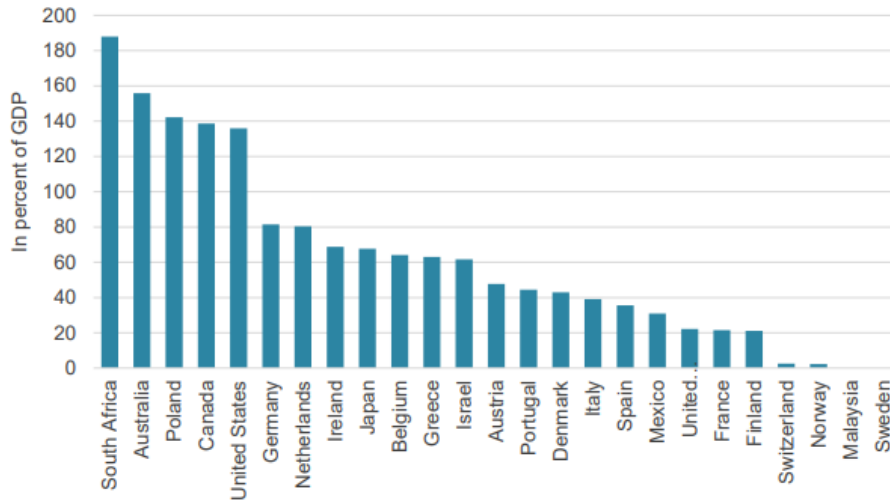
²⁵ Countries which are members of the FTSE World Government Bond Index (by weight % in the index): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, Norway, Poland, Singapore, Spain, Sweden, United Kingdom, United States.

²⁶ FTSE Russell. [Anticipating the climate change risks for sovereign bonds \(part 2\)](#). June 2021.

This scenario forecast Australia paying a very heavy price, with debt-to-GDP increasing to 156% -- and by 2050 (Figure 6) being almost certainly in default (Figure 7).

Figure 6: If Australia Does Not Introduce Climate Policies Until 2030, Debt to GDP Will Increase by 156%

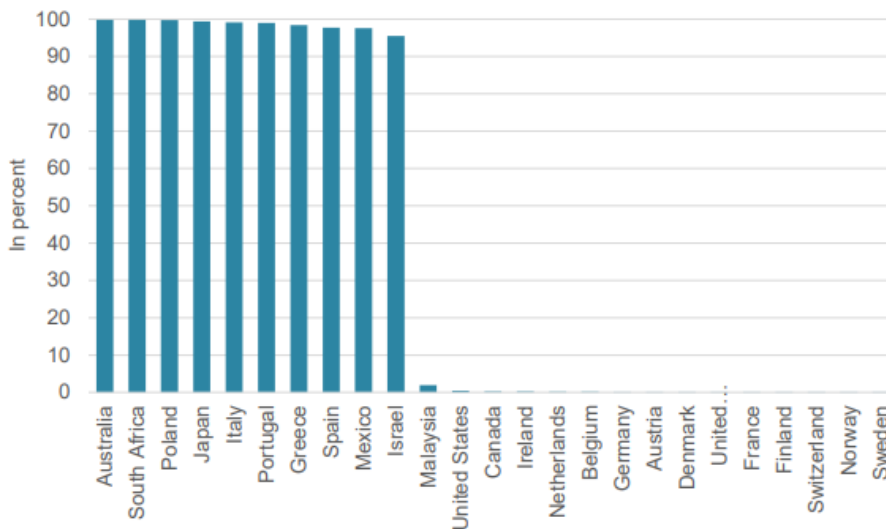
Chart 16. Debt increase in the disorderly transition scenario by 2050



Source: *Beyond Ratings, FTSE Russell*, p. 22.

Figure 7: Australia Has a 100% Probability of Default by 2050 if It Fails to Introduce Policies to Mitigate Climate Change

Chart 17. Default probability in the disorderly transition scenario, 2050



Source: *Beyond Ratings, FTSE Russell*, p. 23.

Deloitte Access Economics further determined that the economic losses of Australia doing nothing to mitigate the impacts of climate change would shrink Australia's GDP by 6%, a \$3.4 trillion loss in GDP in present value terms.²⁷

Looking forward, researchers at the University of Technology Sydney also established that increases in emissions will have a significant impact on bond yields.²⁸ Specifically, advanced economies will see a 0.26 percentage point increase in yields for every 1% increase in carbon emissions; and a 59bps increase in bond yields for a 1% rise in natural resources rents profits.

These broader impacts on Australia's fiscal stability from climate inaction would most certainly spill over into the semi-sovereigns in terms of lower credit ratings and yields of state government bonds.

Tragedy On the Horizon – Australia's Failure to Commit to Climate Goals Will Penalize Future Generations

The NSW economy has faced challenging conditions in the past two years. Following extreme droughts, bushfires, flooding and the pandemic, the State increased borrowings to unprecedented levels to support economic recovery. Borrowing costs subsequently soared and are estimated to add ~\$200-300 million a year.

The events of the past two years Australia-wide may once have been considered 'Black Swans' or 1-in-100-year anomalies. NSW's own assessments suggest the state has become increasingly vulnerable to natural disasters, and spending to mitigate climate events will be extremely costly going forward. Forecasts which simulate the economic impact of climate on Australia's economy are alarming. A significant ramping up in these costs is likely to start materializing soon.

Tangible costs of climate aside, international investors' perception of Australia and climate matter, and will have a material effect on the demand and liquidity of NSW Government bonds. Just as the Swedish Central bank divested Queensland and Western Australian bonds back in 2019 due to emissions, global investors are increasingly conscious of Paris-aligned investment and are likely to divest bonds that do not align with sustainable goals. Global financial institutions managing a collective US\$90 trillion of assets have committed to the Net Zero Asset Managers Initiative with its 1.5°C target (including aggressive interim 2030 targets), a growth in total pledges of 35% in just the last four months.

Increased debt and decreased demand will push out bond spreads and annual interest expense. The bond market's reaction to NSW's recent recovery spending is evidence this will happen.

²⁷ Deloitte Access Economics. [A new choice Australia's climate for growth](#). November 2020.

²⁸ Collender, S. et al. [Climate Change Transition Risk on Sovereign Bond Markets](#). 8 June 2021.

Australia's climate stance will inhibit NSW' access to cheap capital, drive the cost of capital higher, and could eventually send NSW (and other sub sovereigns) into a debt spiral. For NSW, this could mean a debt boom, the impact of which may start to materialise shortly as the State is penalised for the Australian Government's lack of progress in setting climate goals.

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