BULLETIN

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CENTRAL BANKS AND CLIMATE CHANGE

Speech by Michele Bullock on the RBA's approach to incorporate climate change into their economic analysis

- **Deputy Governor Michele Bullock gave an important speech on the RBA's approach to analysing the economic impact of climate change. In the following we summarise the main points plus add some of our own thoughts inspired by the speech.**
- **The RBA is putting significant resources towards analysing the impact of climate change and the transition to net zero emissions on the economy, particularly as it relates to inflation and the operation of monetary policy.**
- **Climate change has significant implications for the evolution of the Australian economy that are relevant for monetary policy and the Reserve Bank's financial stability remit.**
- **Some of this will be the usual supply shocks, structural changes and uncertainty that a central bank has to deal with.**
- **However, there will be new challenges and in particular, heightened uncertainty around how climate change will impact the economy and financial system.**
- **Not mentioned in the speech, but implicit in its rhetorical structure, was the implication for government finances given the challenges of extreme weather events and the transition to a low emissions economy.**
- **A critical challenge for the Bank will be how we navigate the expected boom in investment required to transition to a low emissions economy without generating inflationary pressures.**
- **As such, the RBA is building capacity to research how climate change will affect the structure and operation of the economy thus the implications for inflation as well as financial stability.**

The impact of climate change, and the transition to a net zero economy, raises many questions, not least of all about what it will ultimately cost and how the transition to a low emissions economy will impact that economy. At the annual Melville Lecture in Canberra the RBA Governor in waiting, Michele Bullock, stepped into the breach and outlined some thoughts on how these issues might influence the Australian economy and what considerations the RBA would give in responding to its effects (see Climate Change and Central Banks).

In the following we summarise the main points as well as adding some thoughts of our own inspired by the speech.

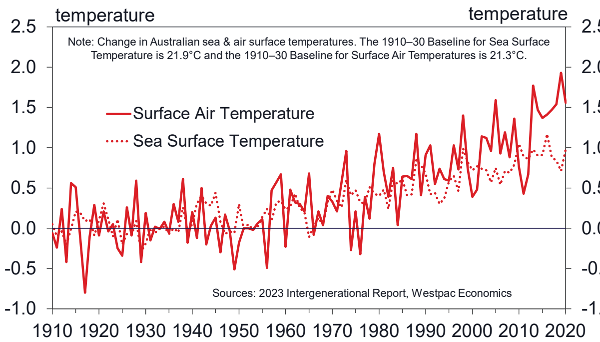
The RBA is far from the first central bank to reveal its thoughts on the potential impact of climate change and the transition to net zero emissions may have on the economy and/or financial markets (see a speech by Isabel Schnabel, Member of the Executive Board of the ECB, on Monetary Policy Tightening and the Green Transition) nor was it the RBA's first public exploration of this issue (see Debelle Panel participation at Climate Change Authority COP26, Climate Risks and the Australian Financial System and Kearns Climate Change Risk in the Financial System). Nevertheless, it was an important speech outlining the concerns of the RBA, the potential impact of climate change and the remedial action to limit the impact of climate change on prices (including asset prices), economic activity, financial markets and monetary policy. It also covered some of the current research being conducted and the resources being allocated toward future research on these issues. What it did not address, which is perhaps the climate change elephant in the room, was the potential impact of government fiscal positions.

Bullock's main conclusion was that these issues have significant implications for monetary policy as well as financial stability. Some of these are the usual sort of economic issues the Bank already encounters with supply shocks, structural change and uncertainty. But climate change also presents new issues such as heightened uncertainty about exactly how the climate will change and how this, and our responses, will impact the economy and the financial system. In addition, rather than just working to a normal business cycle timeframe, climate change is occurring over a prolonged period, and there is significant uncertainty around the evolution of technology as well as the speed of adaptation by climate, economic and social systems.

The starting point is that, like the rest of the world, Australia's climate is already changing. Recent years have been warmer than any multi-year period on record and the frequency of extreme heat and intense rainfall events has also risen, leaving many parts of the country more susceptible to the risk of droughts and floods. The projections are not promising either, suggesting that the frequency of these events will continue to increase.

Globally, we are seeing increasing action to reduce greenhouse gas emissions and Bullock noted that these actions are not independent of economic outcomes. Both climate change, and the actions taken in response, have broad implications for economic activity, the stability of the financial system and our society at large – something that was also noted in the recent RBA Review.

Average sea & air surface temperature



Climate-related Economic and Financial Risks

Central banks navigate uncertainty as part of their day-to-day work, but climate change presents something more acute than usual. Not only is there uncertainty around timing and intensity, but we also do not know where any possible tipping points are – that is, when events become severe and irreversible – nor do we know how policies, technology and individual preferences will evolve. Bullock divided the risk from climate change into two types:

- ***Physical risks*** – the direct impact of extreme weather events.
- ***Transitional risks*** – the negative impact of the actions taken in response to climate change. These can be actions taken to reduce climate change as well as adaptive responses to climate change itself.

It was stressed that timing and sequencing of actions taken to mitigate the physical risk of climate change could increase the transitional risks associated with the move to lower emissions. It was also noted that while there are risks associated with taking action to reduce the physical risks of extreme weather, they also present opportunities. As such, Bullock argued that while there is much uncertainty, there is a general agreement that a timely and orderly transition will be less costly in the long run.

Climate Change and Monetary Policy

An inflation-targeting central bank like the RBA need to understand how climate change, and the transition to a lower emissions economy, will affect inflation and its determinates. Many of the physical and transitional developments will, at least for the near term, affect the supply side of an economy and while monetary policy works by influencing demand and expectations, supply side developments will also need to be considered. Just as we saw during the pandemic, working through the demand side does not mean monetary policy does not have a role to play. In addition, it is not just the short-term effects on supply that matter, but also the possible longer-term impacts on potential output. This can influence where the neutral real interest rate is seen, thus altering what could be considered an appropriate stance for monetary policy.

Physical Risk

The RBA expects that many of the physical effects of climate change can be treated as a negative supply shock, something which is normally looked through, especially in the short-term. However, should these shocks become more frequent, severe or protracted, prices could become more volatile. Also, should climate change affect productive capacity, meaning prices remain higher for longer, this could affect expectations and thus have a meaningful impact on the effectiveness of monetary policy.

The RBA has had to deal with supply shocks in the past, but these have been short-run events related to cycles in weather or even the recent COVID-19 crisis. Here it is important to remember that weather is a short-run cycle while climate is a longer-term concept, so climate change should be thought of as the long-run trend change in weather cycles which leads to longer-run shifts in temperature, rainfall and water availability/distribution. The result is that some agriculture regions, and some crop types, may no longer be viable. Westpac also notes that some tourism industries, such as those tied to the delicate ecosystems of the Great Barrier Reef and the snow sports of Snowy Mountains region, are also clearly at risk. Climate change has the potential to lead to the structural change of our industries.

More extreme weather events could also affect demand due to the rebuilding damaged infrastructure, or modifying infrastructure that is no longer sufficient for its intended purpose, diverting investment away from more productive opportunities. So, climate change has the potential to degrade the value of our capital stock while higher temperatures, plus increased rainfall in some regions, could adversely affect society wide health outcomes, further weighing on productivity. These climate impacts will vary across regions and while some events may be small for the overall nation, the localised impact could be catastrophic for a given community.

The scope of the potential of some of the direct economic impact of climate change was outlined in the 2023 Intergenerational Report. The report noted that higher temperatures would be just one, if significant, channel through which climate change impacted on labour productivity. The report noted that if global temperatures were to increase by up to 3°C or over 4°C, then without adaptive changes to current ways of working Australia's labour productivity could fall by 0.2ppt to 0.8ppt by 2063. This is not an insignificant economic impact reducing estimated economic output by between $135 billion and $423 billion.

Not noted in the speech, but an issue that flows from the above is the potential risk for more frequent and extreme weather events to weigh on government finances, at a local, state and even national level with significant spillover effects to the economy and financial stability. These risks will likely first materialise at a local level but over time could extend even to a national level.

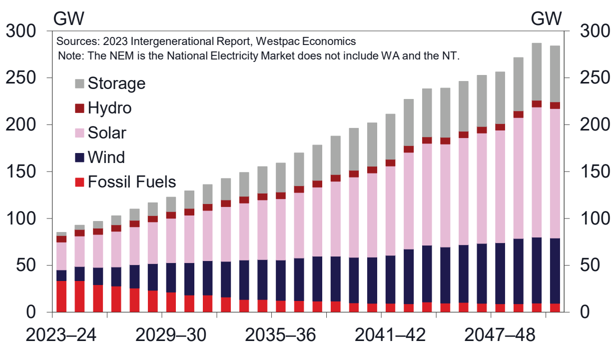
Transition Risks

Bullock did not shy away from highlighting that mitigating climate change presents significant transition risks. Policies to reduce emissions will impact prices, leading to structural change in output and employment as some economic activities become unviable in a low carbon world, while others rise to take their place.

The RBA does not believe it has a role in driving the transition. Rather, it sees its role as a tool to maintain stable long-term inflation expectations. This can be done via the current process of setting policy based on an inflation target while not overreacting to short-lived price shocks.

The Bank is aware that phasing in lower emissions production may temporarily constrain, or even reduce, aggregate supply while the investment required to switch to alternative production methods could boost aggregated demand, at least for the near-term. The net effect of temporary lower supply, and possible stronger demand, would put upward pressure on

Generation Capacity in the NEM



inflation. One of the key risks is the planned shutdown of coal-fired plants over the next three decades, which if not matched by increases in renewable supply, transmission and storage, will result in upward pressure on electricity prices. Recently, there has speculation that the planned closure of the [Eraring power station in NSW]() could be delayed by up to two years and that it could cost as much a $3 billion to keep the plant running. Bullock also noted that keeping the coal fired plants running longer may also do little to offset the inflationary pressure on electricity prices due to increased outages from aging plants and the increased pressure on other sectors to meet national emissions targets.

The speech also highlighted a flow-on effect from the shift to renewable energy. Significant investment in not just wind, solar and hydro generation, but also the storage and transmission requirements in support of renewable power generation, will require a significant labour force with a wide range of specialist skills.

Bullock also noted that Australia's transition is occurring in the context of a global transition with all countries drawing on similar materials and labour at an increasing pace. To achieve net zero emissions globally, the International Energy Agency (IEA) has estimated that by 2030, annual investment in clean energy will be running at around three times the current pace. If this pace of investment is realised (the International Energy Agency has forecast that global investment in clean energy is set to lift from just under US$2 trillion in 2023 around US$4½ trillion by 2030) such a large surge in demand is likely to have a sizable, and possibly volatile impact, on inflation.

There is the counter argument that a rapid adoption of renewables, or faster than expected developments in clean technology including improving energy efficiency, could push energy costs down even more quickly than anticipated. There is also the impact of technological innovation which so far has been driving the cost of renewable plants down.

The speech also noted that energy prices have a sizable direct impact on inflation, with retail electricity and gas prices accounting for around 3% of the CPI (and this could possibly rise as the economy is electrified), as well as indirect effects as businesses pass on higher energy costs. As such, how the transition affects energy prices will be an important consideration for inflation and thus monetary policy.

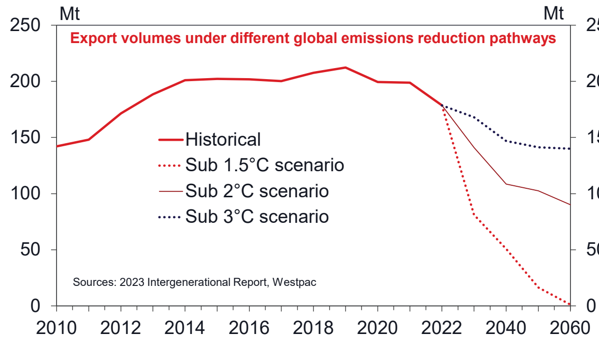
The Global Dimension

Turning to the world, Bullock noted that the global economy's transition to lower emissions production will have a direct and indirect impact on Australia. One direct impact is via the demand for our exports. Over one-third of Australia's exports are fossil fuels and most of Australia's major export markets have announced commitments to meet net zero emissions. If these targets are met by mid-century, it would likely come with a collapse in demand for fossil fuels. The [Intergenerational Report]() had a scenario where global action is sufficient to limit the rise in temperature to 1.5°C, and this would see Australian coal exports fall to 1% of current levels by 2063.

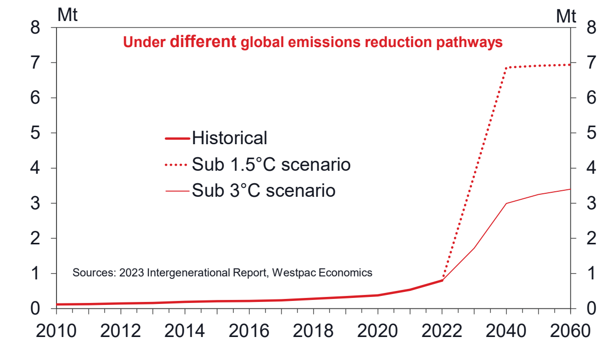
Bullock noted that there is no clear pathway on how net zero would be achieved, with significant variation in the various scenarios prepared by different organisations, resulting in significant uncertainty around the speed and extent of coal being phased out.

It is likely that some offsets will emerge from the new low emissions industries which could see a rise in demand for alternative mineral exports from Australia. This would be an

Potential demand for Australian thermal coal



Potential global demand for refined lithium



indirect benefit of the global transition to a low emissions economy. Bullock noted that the IEA has identified a number of minerals that Australia has significant endowments of and are also critical inputs into the to the electrification of economies and the decarbonisation energy production. This includes lithium, demand of which is expected to increase significantly over the next 40 years.

Climate Change and Monetary Policy

Bullock then moved to the crux of the lecture: how climate related events and the transition to net zero might affect monetary policy. This could come via the impact on potential output, and/or its effect on the neutral interest rate. When supply and demand is in balance, there is no pressure on inflation to rise or fall. Climate change has the potential to affect both supply and demand and is therefore set to have an impact on inflation. Bullock noted that relative price changes due to mitigation policies could render some of the capital stock obsolete, reducing supply until that capital stock is replaced. On the other hand, the investment in new capital stock associated with low emissions output is likely to see significant technological innovation, boosting productivity and thus adding to potential output.

But how would climate change affect a theoretical economic construct such as the neutral rate? Recall that the neutral rate is the rate of interest that is neither expansionary nor contractionary. Bullock admitted that the impact of climate change on the neutral rate is unclear. In a world of increasing risk and uncertainty, it is possible that households would increase their rate of savings while firms might be less willing to invest. Such an outcome would put downward pressure on the neutral rate. Alternatively, if there is greater than expected destruction in capital stock (due to natural disasters, or if high-emitting productive capital is removed faster than it is replaced by renewables-based production), that would place upwards pressure on the neutral rate.

Bullock also posited that "there is a question about whether climate-related trends could cause central banks to re-examine the relative merits of flexible inflation targeting." We don't think the Bank is questioning the merits of inflation targeting per se, "the RBA Review considered this question and found that flexible inflation targeting had served the Bank well and recommended its continued use", but rather some of the complexity of managing an inflation target in the face of new climate related trends. We suspect this could include issues such as running tight policy to control inflation resulting in a delay in the investment required for the transition, resulting in a debate on whether there should be a temporary relaxation of the inflation target during the transition period.

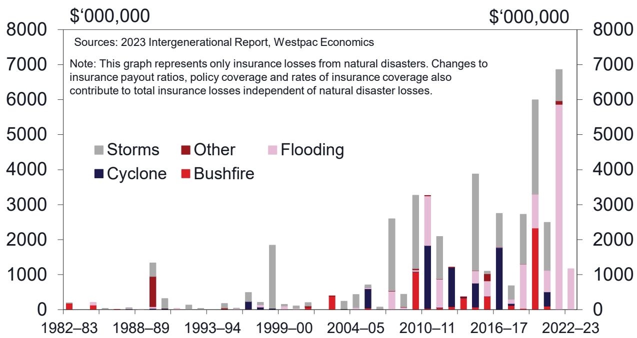
Potential Impact on the Financial System

Financial institutions could face unexpected credit losses, increased insurance claims and the write down of investments if more extreme climate events lead to a decline in some assets value and a reduction in some income streams. If not managed, this could have implications for the stability of the financial system. This is something the RBA is monitoring along with the Council of Financial Regulators.

For Australian banks, the RBA view the key risks as being around falling housing values as some houses become less desirable in more extreme situations and the possible loss associated with their exposure to high carbon emitting industries.

The RBA has estimated that around 7½% of properties are in post codes that could see property prices decline by 5% or more by 2050 due to climate change. This analysis was presented to Australia's five largest banks in the Climate Vulnerability Assessment which found that losses on bank lending would increase but not cause severe stress as the lending losses were concentrated in specific regions and industries.

Normalised value of insured losses



However, Bullock stressed that it does not mean we can relax as there are many unknowns with climate change and more work needs to be done as well as extending the research to non-bank lenders. Also, of concern is the risk climate change presents to insurers as more frequent, more severe weather events are expected to increase both the number and magnitude of claims for property and other assets damage. We would also note that these issues could also have significant implications for various governments finances which, if negative enough, could compound the negative implications of these issues.

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