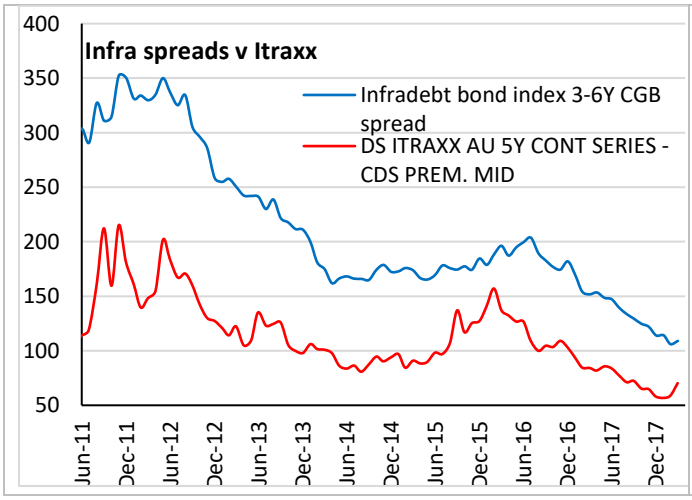
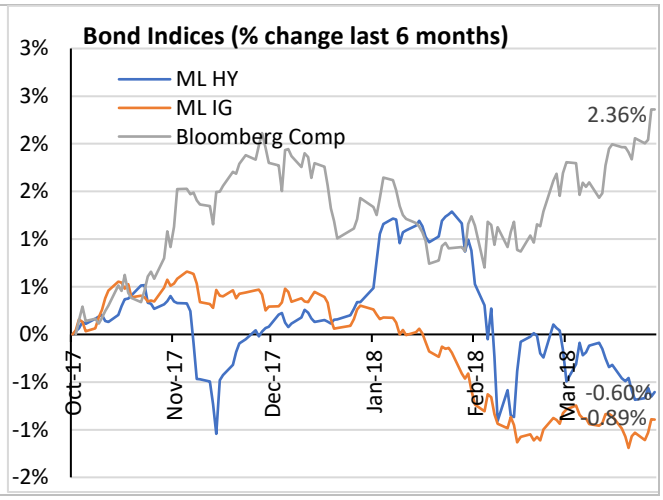
Introduction

Markets have moved dramatically from a low to high volatility paradigm this calendar year. Equity markets have been swinging wildly - with intraday moves of greater than 1% occurring consistently over the quarter. The VIX averaged around 12% in 2017, but has jumped to average around a 20% so far this year. This is a remarkable increase in implied volatility.

At the forefront of risks for investors are the threat of tech stock regulation, Trump trade wars and the ever-present threat of rising interest rates and contractionary monetary policy. The yield curve appears to be in the process of inverting (a traditional indicator of a market correction) with short term rates rising 30 bps in the quarter and long rates falling 30 bps. An unusual occurrence in bond yields also occurred this quarter, with the 10 year US Government bond yield going above the 10 year Australian Government bond yield for the first time since the late 90s. With equity valuation multiples high compared to historic norms and the Fed tightening it appears that markets are entering the later stages of the current bull market cycle.

Markets update





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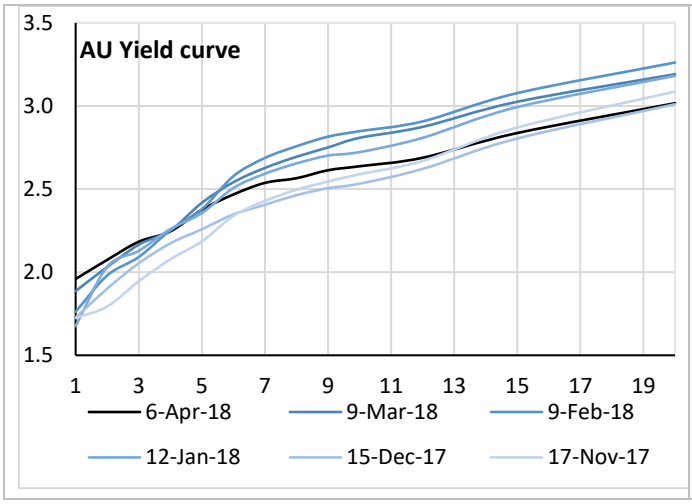
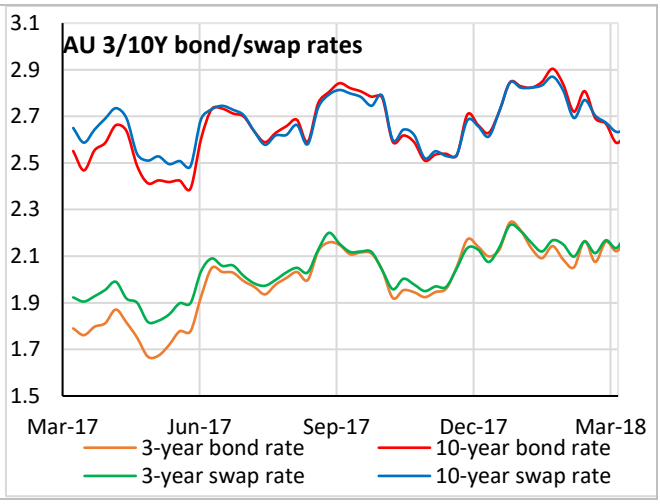




New issuance and refinancing: March Quarter 2018

The table below provides a list of publicly available deals.

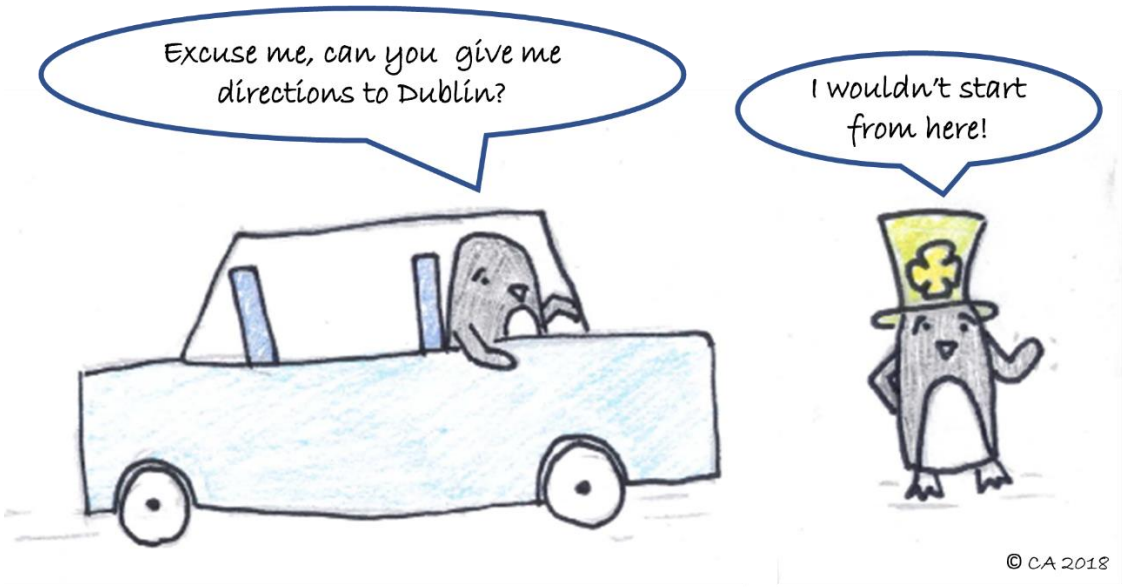
Date	Borrower	Instrument	Size (m)	Term (Yrs)	Curr.	Pricing/Notes
January	Amaroo Solar	Loan	1.4	5	AUD	Government offtake
February	United Energy	Bond – floating	150	5	AUD	BBSW+97bps
February	United Energy	Bond - fixed	250	5	AUD	Swap+112bps
February	Ausnet	Bond – fixed	500	10.5	AUD	Swap+130bps
February	Infigen	Loan	525	5	AUD	Partial amortisation
February	Sydney Desalination	Loan	250/250	11	AUD/USD	BBSY+170, Libor+125
February	Mumbida Wind Farm	Loan	124	12	AUD	Contracted wind farm
March	Victoria Power Networks	Bond – fixed	225	10	AUD	Swap+133bps
March	Murra Warra Wind Farm	Loan	320/65	5	AUD	Contracted wind farm
March	Sydney Desalination	Loan	680/500	3/5	AUD	BBSY+90/120
March	Multinet gas	Loan	300	5	AUD	Refinance

Equity and other news

- Auckland Airport sold its 24.55% stake in North Queensland Airports to Perron Investment and The Infrastructure Fund.

- Lenders to Queensland's debt-laden WICET have agreed to extend about US$3bn due on an outstanding loan for eight years and a cash sweep. The extension has been agreed to but not yet been signed by the parties.
- The Queensland Government has announced the consortia shortlist for the Cross River Rail PPP. The three groups are led by CIMIC, QIC and Plenary. The project includes a tunnel and underground stations running under the Brisbane River and the central business district.
- The Victorian Government has kicked off its land registry sale, following NSW and South Australia. The government is offering a 40-year lease to the successful bidder with sale proceeds to go into improving the state's transport infrastructure. However, several services, including subdivisions, applications and surveys will remain under state ownership. The government will also retain full control over prices for statutory land registry services and price monitoring of non-statutory services provided by the private operator. Victoria is targeting to announce a preferred bidder in the second half of the year, ahead of a state election in November.

The National Electricity Guarantee



Last quarter we elected to not make comment on the proposed NEG. We did this because far too little information was publicly available – with policy makers stating conclusions, but policy detail being completely absent other than the broad mechanisms (e.g. reliability guarantee, renewables mandate). Since this time, we've spoken with numerous market participants (retailers, regulators, generators and investors across the supply chain) and reviewed material released by various regulators and market commentators, and whilst our views will continue to evolve, from an investment standpoint our modelling and approach to new investments in the sector now incorporates the NEG.

At the core of the NEG are two new obligations on retailers as part of their licencing conditions:

- **Reliability Guarantee**. Retailers would be required to contract with dispatchable generators in for a 'certain' amount relative to their customers' forecast load.
- **Emissions Guarantee.** By contracting with a mix of renewable and traditional generation sources, retailers would be required to meet a maximum emissions intensity level. This level would be set to achieve the targeted 26-28% reduction in emissions for the electricity sector.

Reliability – what is it? This term has broad meaning generally, but in energy markets (and under the NEG) it has very specific meaning. Reliability is defined as having sufficient generation capacity to meet demand. Reliability does not cover the operation of the distribution and transmission network (that is, being able to get that energy to customers) or issues with the stability/frequency/voltage of supply

Based on material released lately by the ESB – it is clear that the concept of the reliability guarantee has evolved a fair way from the initial announcement. It seems that retailers will only be forced to buy capacity if there is a reliability

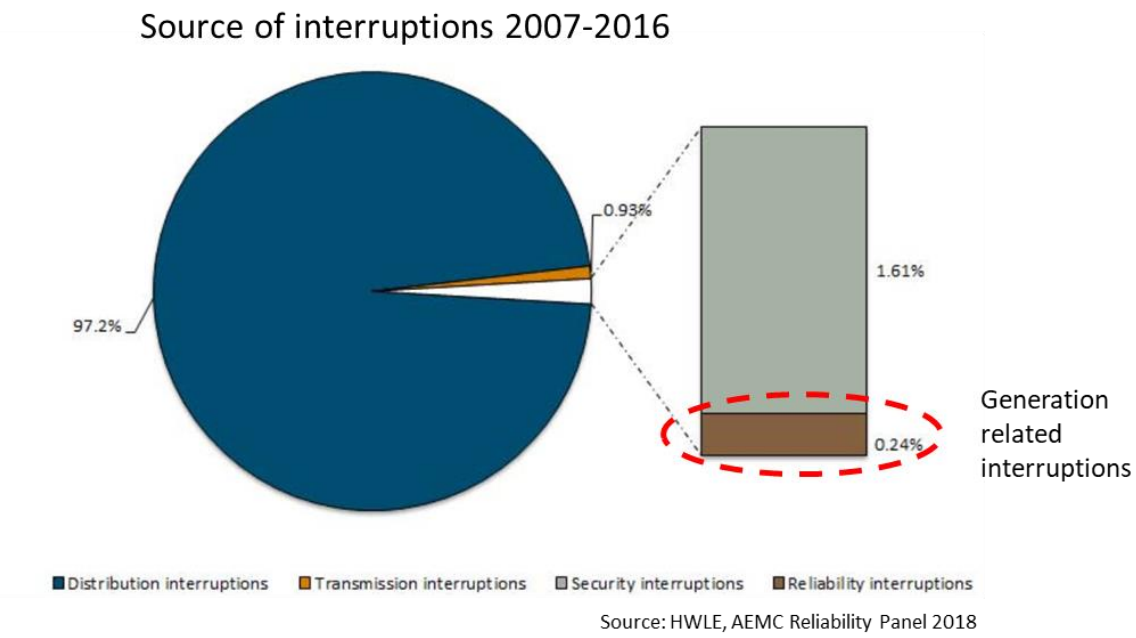
gap forecast by AEMO in a particular NEM region. It's important to note that at present there is no reliability gap in any NEM region (see chart later). At the moment it would appear that the reliability guarantee – announced with much fanfare – would not require anybody to do anything.

However, assuming there was a gap, it could be met through a range of mechanisms including:

- Investing in capacity (e.g. new gas-fired plant, pump hydro, storage);
- Demand response (e.g. during peak events contracting with large clients/users to lower demand so as to meet reliability standards); or
- Use markets to trade capacity so as to hedge against reliability shortfalls.

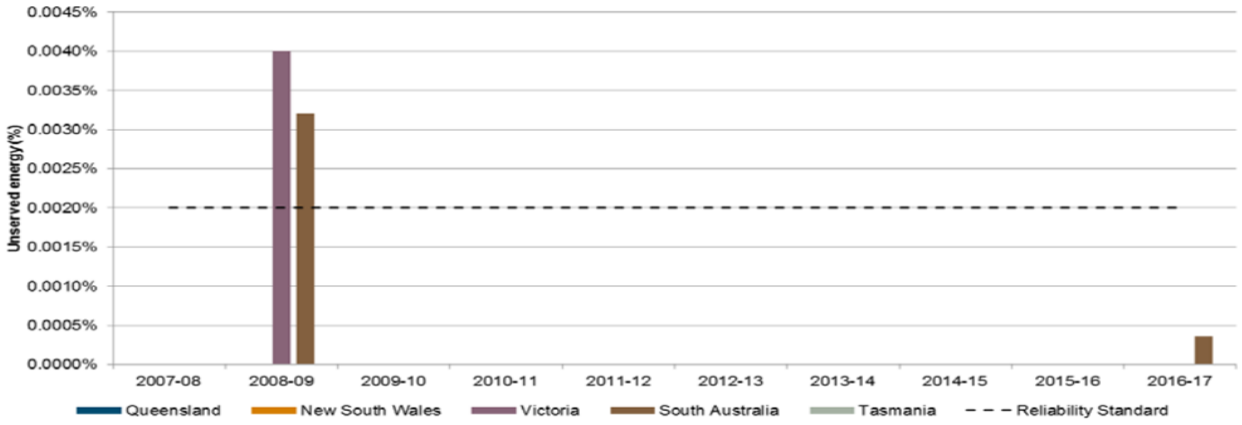
In many ways, whilst complexity and compliance requirements may increase, the change under the NEG from the operation of the market today is small. Essentially participants in the market will meet their requirements (reliability and emissions) through physical capacity (i.e. retailer owned generators or contracted capacity) and trading through ASX energy derivatives. ASX traded derivatives, or OTC equivalents, are where the bulk of hedging occurs.

So does Australia have a 'reliability issue' (using the definition employed by the NEG)? The facts:



Source: HWLE, AEMC Reliability Panel 2018

Yes just 0.24% of all network outages for the last 10 years related to generation. Of that 0.24%, the vast majority of interruptions related to old coal and gas fired plants tripping. Ok so you might look at the above chart and say, that's nice, but we know there are issues in individual states. The existing rules and the NEG set the reliability standard at 0.002% of forecast demand – this equates to 10.5 minutes per annum of unserved load. The next chart dispels the myth that we have a reliability issue in individual states.



So noting that reliability is not an issue, what does the NEG give us (especially as investors)?

It could be argued that the NEG is a solution in need of a problem. But by far and away the biggest problem we have in energy markets relates to narrative. If the NEG has bipartisan support, it will hopefully remove the political grandstanding and create a basic framework where the nation can begin to address the real issues in our electricity supply chain. This more than anything, is the most important thing to unlocking investor capital and lowering the cost of doing business in Australia.

So what are the real issues that are effecting energy markets, and more than anything affecting our industry competitiveness (think Portland aluminium smelter), that the NEG doesn't address?

Market concentration

- The NEG mandate specifically excludes a review of the exiting market structure. However, we have three dominant retailers (AGL, EA, and Origin) controlling a huge share of the market. Competition is a big issue.
- Vertical integration of the big 3 retailers also creates further issues - the NEG as specified implicitly assumes that generators and retailers are separate entities competing in an efficient market – this is not the case. In particular, we are sceptical of the ESB's claims that the NEG will act to bring down wholesale prices. Wholesale prices are likely to fall due the wave of new renewable supply on the back of the RET – but the NEG in our view will have limited impact on pricing.
- The NEG will likely have increased compliance requirements (NEG enforcement occurs at the retailer level) and thus smaller retailers will be at an even greater disadvantage. Here there are parallels with Australia's banking market.

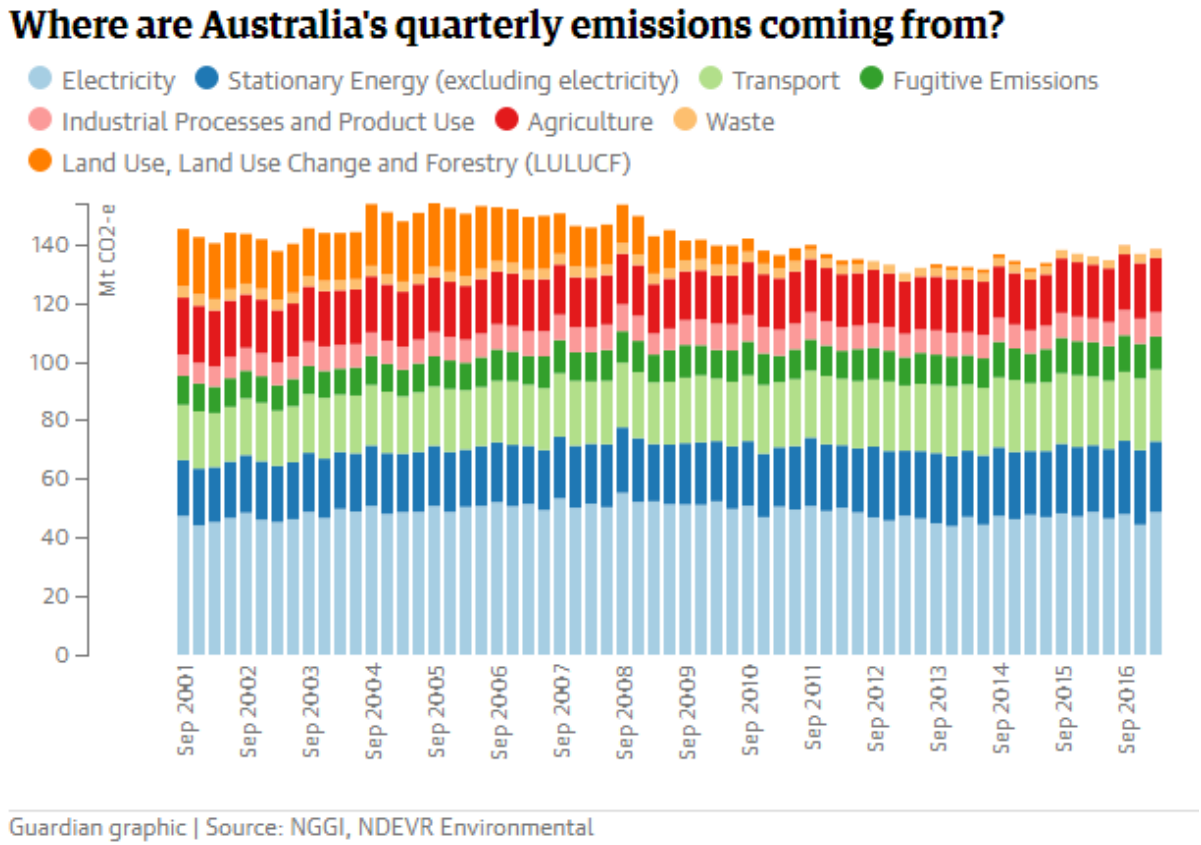
Transmission/Distribution – the elephant in the room

- Network costs make up circa 40-50% of the household bill - it varies widely based on the type of customer and network location. Generation, which is the focus of the NEG, makes up only circa 20%-30% of a customer's bill. Even if generation costs were halved under the NEG, the reality is that the average consumers energy bill will only benefit at the margin. Network costs as a proportion of the average bill have accelerated far faster than any other cost component over the last 10 years.
- Looking forward, as Infradebt has previously noted, we see network costs as a very big issue for the efficient operation of the market. Embedded solutions are really beginning to move forward (many projects have approached Infradebt seeking debt finance, a number are under due diligence). Embedded technologies (e.g. solar, storage, control systems) operate in a deflationary environment, the faster costs fall, the greater the network arbitrage. As more users switch at the margin, it forces more cost onto a shrinking base of consumers (as network costs are largely fixed and spread across users). It should be noted that energy consumption has been, and is forecast to be, flat into the future. Some say that fixed and demand charges solve this problem – but really this simply solves the network assets owner's problem, the total cost of supply to users remains very high.
- You may reflect on the pie chart above (99.76% of outages relate to the network) as a demonstration that we need more, not less network investment, but by world standards reliability is a non-issue – Australia's electricity system is very reliable. The real question is are we overpaying for reliability relative to what we actually need? Energy Australia estimates that $11 billion (13% of total network assets) of Australia's grid infrastructure is used only **1%** of the time.

Environment

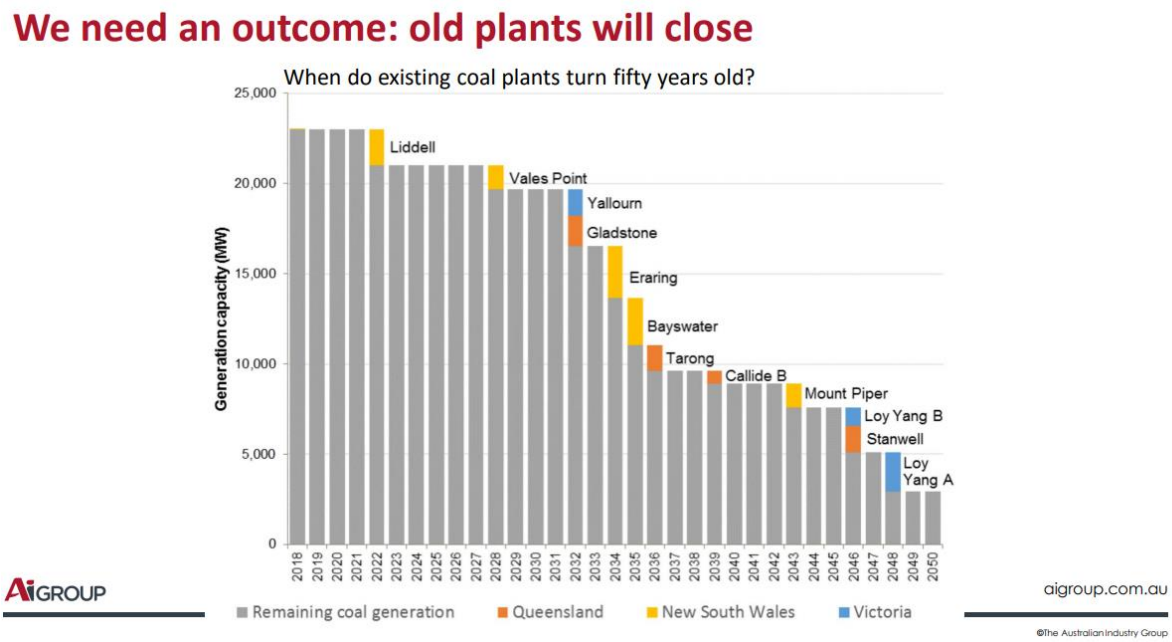
- What is often missed in the media is that targets for CO2 emissions are fixed. We have a budget to reduce our emissions by 26-28% over 2005 emissions. Every year we miss this target, we need to outperform the target (that is, be below target) in a subsequent year. This means deferring action imposes a steeper adjustment path in the future.

- The stated target of the NEG matches the Paris commitment. But electricity emissions only make up around a third of emissions (see chart below). So either we will not meet our Paris commitments or we expect the transport, mining and agricultural sectors to carry a much higher burden into the future.



Plant

- Our fleet of generation assets is rapidly aging (see chart below). Irrespective of whether replacement assets are renewable, this renewal needs to start now. To put the change in perspective, the replacement of Hazelwood's capacity – requires 4GW of solar capacity (approximately twenty 200MW plants – which is typically as big as farms go in Australia).



- Storage will be an increasingly important component of the electricity market as we move forward, but we're yet to be convinced on the merits of projects like Snowy Hydro 2.0. We just can't see how under the NEG the project has revenue certainty. As we've demonstrated above, capacity today is not an issue. With plant retirements and increasing intermittent generation, capacity could become an issue – but the project is enormous, has a long lead time and is exceptionally expensive. The question we have is who will absorb this much capacity at a price that recovers costs. We'll likely have another piece on Snowy Hydro 2.0 in the future – but suffice to say we question whether this project will go ahead when it is apparent there are cheaper, more fit for purpose, alternatives.

Conclusion

The stated objective of the NEG is to deliver Australians cheaper, more reliable, and cleaner electricity – but in many ways, and linking it to the title, if this is the objective – we wouldn't be starting from here (generation). The NEG may not hurt, but nor is it really a solution to the real structural issues affecting electricity markets. That said, we are supportive of the NEG, especially if it creates a base (with bi-partisan support) by which policy makers can move forward, because the uncertainty of the status quo only increases costs into the future.

As investors we urge caution irrespective of where you play in the electricity supply chain. There are definitely value accretive opportunities, but it's very important that you contemplate a wide range of potential outcomes.

A shift in inflation?

The period since the GFC has been characterised by very low inflation (and interest rates) and, investors' portfolios have responded to this with an ever increasing reach for yield. However, is the inflation outlook at an inflection point?

Low inflation has been built on four foundations:

1. Excess capacity following the GFC, particularly in labour markets
2. Globalisation
3. Exported deflation from China
4. Excess debt and debt deflation

But three out of four of these foundations are starting to break down:

- *Labour market slack is much lower*. While the rebound from the recession of 2008 has been slower than most – this was almost a decade ago. Modest employment growth as well as the impact of demographics on the size of the labour force has seen unemployment fall. For example, see below for the US.

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- *Globalisation is under threat* with increased protectionist sentiments in many countries. The most glaring example of this are the recently announced steel tariffs in the US (and response from China with retaliatory measures of their own). Protectionism is inherently inflationary (the whole point is to push up prices for domestic producers).
- *China is no longer exporting deflation to the rest of the world*. Chinese producer prices are rising. There has been a shift in government policy on two fronts.
    - The *environment and pollution* are a much higher priority in China than a decade ago. The Chinese government is making substantial efforts to reduce pollution in China (and is under material pressure from its population to do so). This will push up costs and prices. It will also rapidly reduce excess capacity in highly polluting industries.
    - *China's attitude to debt and capital allocation*. Part of what has made the "equilibrium" of economic growth of the last few years work is China's willingness to continue to make large debt funded investments in capital goods and capacity even when those investments have low returns on capital. This has propped up aggregate demand on a global basis – but at the cost of ever more debt on the Chinese balance sheet. There are increasing signs that the Chinese government is concerned about the risks from its prodigious debt build up and, going forward, will not be willing to be the low return investor. This will reduce excess capacity and, combined with the costs of better environmental performance, see China shift from exporting deflation to potentially exporting inflation. See below for PPI trends in China.

The one deflationary factor that has not disappeared is debt. Debt levels have continued to grow and the recently passed tax changes in the US will see the US run a very large budget deficit for the next few years (particularly for this stage of the economic cycle). At present, concerns about debt sustainability – which were acute during and in the immediate aftermath of the GFC – have abated. Whether markets retain their current sanguine view of debt sustainability as interest rates rise (see below) remains an open question.

What does a shift to higher inflation mean?

It means higher interest rates – both at the long end as bond investors demand higher yields to protect against inflation – as well as at the short end as central banks act to tighten monetary policy from its incredibly stimulatory levels.

It means central banks have less room to respond to financial market weakness. That is, perhaps the end (or at least the reduction) of the Greenspan/Bernanke/Yellen put. Certainly, if central banks had a choice between a bit of financial market weakness now (when the underlying real economy in the US is benefiting from a trifecta of hurricane

rebuilding activity, massive tax cuts and potentially an infrastructure building program) and a year or two from now (when these temporary stimuli will have passed) they would most certainly choose now.

It means lower valuations for assets – higher base rates will put downward pressure on equity valuations as well as the bond substitutes such as infrastructure and property. Our view is that credit spreads are likely to move wider – on the back of a reversal of the liquidity and market dynamics that have driven the hunt for yield. If low interest rates and the There is No Other Alternative mindset have driven yields and spreads down over the past decade – then presumably higher rates, higher volatility and lower liquidity (as quantitative easing turns to quantitative tightening) operates in reverse.

All this says inflation will be a key focus of financial markets for the months ahead.

The tyranny of asset class boxes

Asset consultants like to define asset classes boxes. These are used to group investments of similar risk and return characteristics. They are also used to communicate the investment strategy of different member investment choices to members – think of the ubiquitous pie charts on product dashboards.

Asset class boxes are an intellectual tool to group similar assets together and allow parts on the portfolio to be optimised individually. That is, rather than assessing a potential new investment against all possible alternatives – the process is to, step 1, decide which asset class box it falls into and step 2, to decide if adding that asset improves the risk return characteristics of that box.

In the good old days these boxes very simple. They were Cash, Bonds, Shares and Property. However, as time has passed, the number of asset class boxes has grown (with a plethora of different and inconsistent names). A key driver of this growth is alternatives. First there was an Alternatives box – which covered assets that where neither simple listed shares or liquid high quality bonds. That is, Alternatives started as the box for assets that didn't fit neatly in a box!

Now, as strategies grow in sophistication and complexity, most funds have boxes labelled "Defensive Alternatives" and "Growth Alternatives".

What do these labels mean? Here is my simplistic interpretation of the labels – which is probably correct 80% of the time – but many funds and asset consultants have different definitions of these boxes.

Box Names	**What's in the Box**
Fixed Interest/Bonds	Highly liquid and high credit quality bonds. Usually dominated by government bonds. Some funds also sneak a bit of junk bonds or emerging market debt in here.
Defensive Alternatives	Things that aren't in Bonds because of lower liquidity or higher default risk. Most funds put junk bonds here. But lots of funds also include infrastructure equity, hedge funds, mezzanine debt and below investment grade debt as well. Sometimes property gets put in this box as well. Simplistically this box usually has assets with returns between that of fixed income and listed equity but expected to be less risky than listed equity. As funds have reached for yield – most assets are more at the top end of this band than the bottom.

Growth Alternatives	This is the box that contains assets that aren't simple listed equities and that are clearly higher risk and higher returning than listed equity. This is the double digit returns box. Venture capital and private equity go here. Property development might go here. Sometimes the risky parts of infrastructure equity might be allocated to growth alternatives – eg greenfields infrastructure equity.

Well you might say – that's all very interesting – but what is the problem?

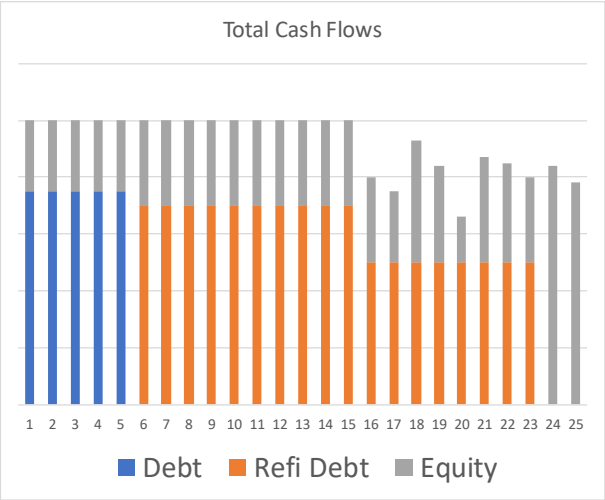
Bonds/Fixed Income is narrowly defined with only fully liquid high grade portfolios included.

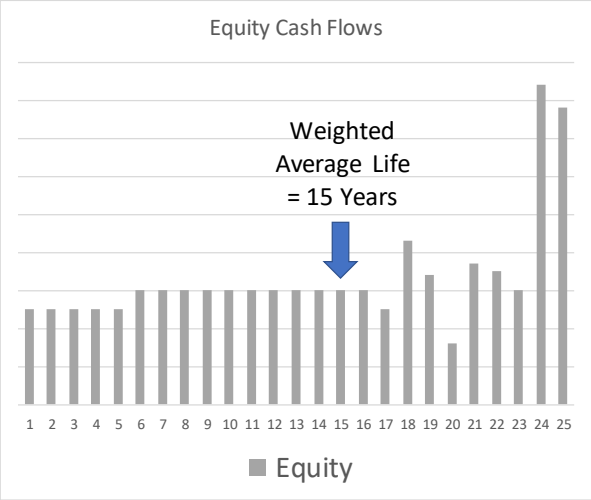
As funds reach for yield, but want to maintain their growth/defensive splits (which are important for classifying which section of the monthly performance survey they appear in), they are increasingly including equity investments – most notably infrastructure equity – in the Defensive Alternative bucket.

This results in a Defensive Alternatives box which is quite crowded and contains things with fundamentally different risk profiles.

As an infrastructure debt manager – it doesn't make sense to me that infrastructure senior debt gets put in the same box as infrastructure equity. This is effectively saying there is no significant difference in risk profile between debt and equity in the same asset!

That is ridiculous. Debt has seniority. Equity suffers (or benefits) from variability in returns/performance first. Debt's cash flows are front ended. Equity's large cash flows typically occur late in the life of an asset (see wind farm chart below).





In today's era of potentially rising interest rates – this differential in duration may be critical. In particular, it is often the "safest" infrastructure equity assets (for example, PPPs) that have the most leverage and the most back-ended equity cash flows. This leaves them particularly exposed to a rising interest rate environment.

While it is important to acknowledge my frustration as a debt manager – I would also caution investors to take a step back and undertake a sanity check of their asset class box definitions and where they might be leading them.

Contact Us

We're always happy to chat (and learn new things!) if you want to know more, contribute more on a particular topic, or wish to discuss any of the above topics in greater detail feel free to drop us a line. Also, please don't hesitate to send us ideas for future articles.

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