Introduction

Welcome to the final newsletter of 2022. What an eventful year this has been for Infradebt and the industry in general. From rising interest rates to energy market suspensions, solar farms to batteries, embedded networks to land leases, we have experienced it all this year. 2022 brought great opportunities with it and we are hoping 2023 will follow suit.

As always, we would like to thank our investors for putting their faith in us to manage their capital and would like to thank new and existing investors for their continued support. To everybody, thanks for continuing to read our newsletter. We hope you and your families all have a safe Christmas/New Years, and we look forward to engaging with you again in 2023.

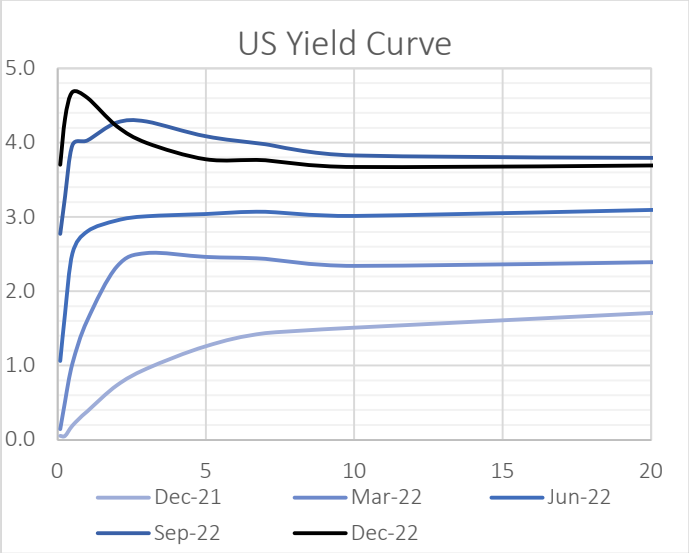
This quarter we have four articles:

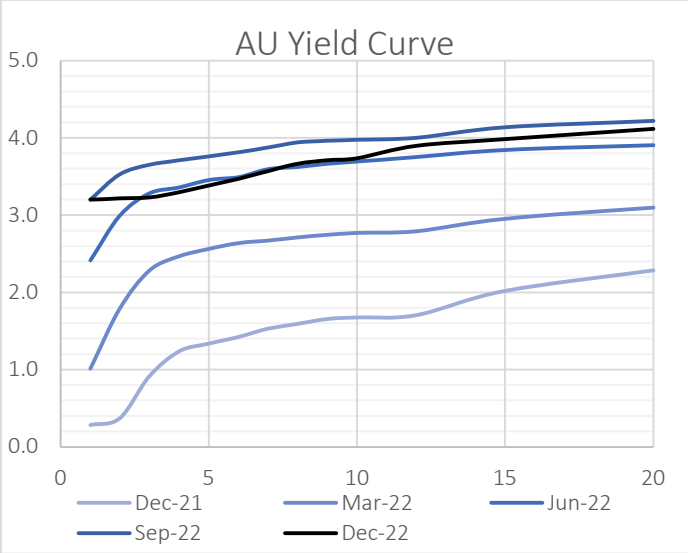
- Value of Dispatchability – Hornsdale Power Reserve during an Islanding Event
- 2022 – the year coal died
- 2023 outlook
- Airports are special

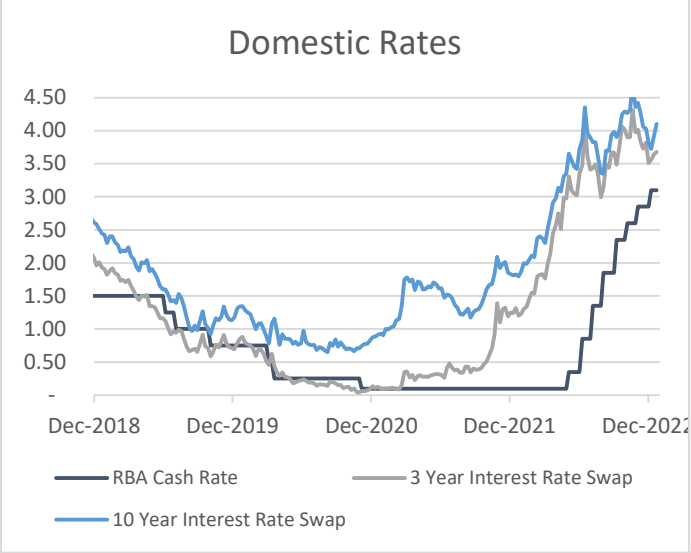
Markets update

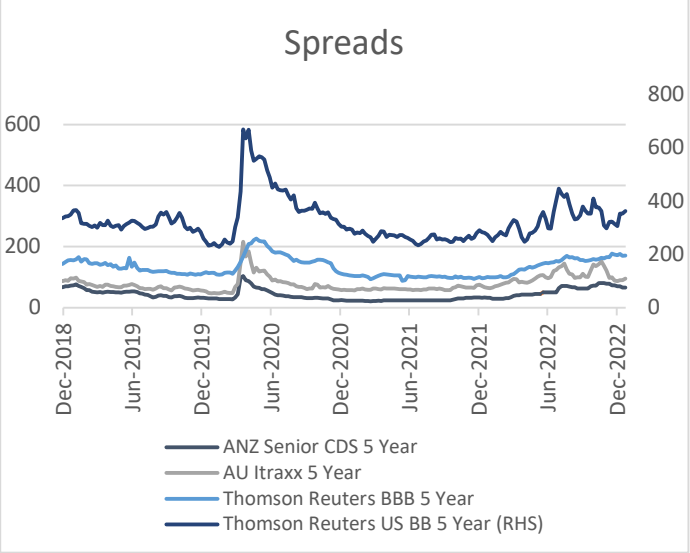
After four consecutive 75 basis point rate hikes, the Federal reserve has slowed down the pace of rate hikes, increasing the federal funds rates by 50 basis points in the last meeting of 2022. Interest rates in the US are at their highest level since 2008 but the market is anticipating that the peak is near and anticipating rate hikes of 25 basis point next year and even a potential cut at the end of the year. Interestingly, this is inconsistent with the federal reserve board members' median forecast, who expect the funds rate to reach 5.1% by 2023. The latest US inflation reading of 7.1% is much higher than the Fed target of 2% and Jerome Powell has confirmed his intention/preference to keep rates high until inflation is clearly back under control.

Domestically, the short end of the curve is flat. The RBA has been in 'sit and observe' territory for the last two meetings, the new monthly CPI series saw the annual inflation rate drop from 7.3% to 6.9% in October. The RBA expects a further tightening of conditions in the new year as central banks battle to keep inflation within target bands. On the spreads front, recessionary pressures in the new year are forcing credit spreads wider in the last quarter of 2022. Combined with the rise in base rates, this spells a large increase in borrowing costs for corporate borrowers over 2023.









New issuance and refinancing

Date	Borrower	Instrument	Size ($m)	Term (Yrs)
October	ACEN Australia renewable platform	Loan	75	N/A
October	Emerald Energy Finance Pty Ltd	Loan	69	5
October	NSW Ports Finance Co Pty Ltd	Loan	200	12
October	Zenith Pacific Energy Pty Ltd	Loan	440	5
November	Genex Power Ltd	Loan	15	2.5
November	Golden Plains WF1 Finance Pty Ltd	Loan	725	5
November	Goyder Wind Farm 1 Pty Ltd	Loan	442	5
November	Marinus Link Pty Ltd	Loan	3,000	N/A

Date	Borrower	Instrument	Size ($m)	Term (Yrs)
November	Moree Solar Farm Pty Ltd	Loan	57	3
November	Port of Newcastle Investments (Financing) Pty Ltd	Loan	340	3.5/5/3.5
December	Ausgrid Finance Pty Ltd	Loan	1,475	4/4/7/7/5/5
December	ConnectEast Pty Ltd	Loan	200	10
December	NEXTDC Ltd	Loan	200	4
December	Stockyard Hill Wind Farm Pty Ltd	Loan	723	5
December	Transurban Queensland Finance Pty Ltd	Loan	480	2
December	Westconnex Finance Co Pty Ltd	Loan	425	10
December	LS Australia FinCo 2 Pty Ltd	Loan	540	3

Equity and other news

- Aware Super and Palisade have teamed up to buy 49 percent of Stockyard Hill Wind Farm. Stockyard Hill is a 530MW wind farm in Victoria and has a long-term PPA with Origin Energy.
- Squadron Energy has acquired CWP renewables for an estimated valuation of $4 billion.
- Qatar's Nebras Power has acquired a 49 percent stake in 312-megawatt Moorabool Wind Farm in Victoria.
- Origin Energy has received a takeover proposal worth around $10 billion from a consortium led by Brookfield Asset Management. Brookfield has been granted an extension to due diligence till 16 January.
- Stonepeak and Spirit Super have completed acquisition of Geelong Port from Brookfield and State Super. Geelong Port's initial acquisition by Palisade Investment Partners and Spirit Super was rejected by ACCC three months ago.
- Basslink's creditors have approved $773 million sale to APA group.
- Akaysha Energy, backed by BlackRock, has been announced as the preferred bidder to build and own the Waratah Super Battery
- Genex Power takeover bid by Skip Capital/Stonepeak seems to have been delayed as the suitor assesses the announcement of tunnelling issues with Genex's flagship Kidston pump hydro project.
- China's State Power Investment Corporation is looking to sell Pacific Hydro in the new year through an auction process

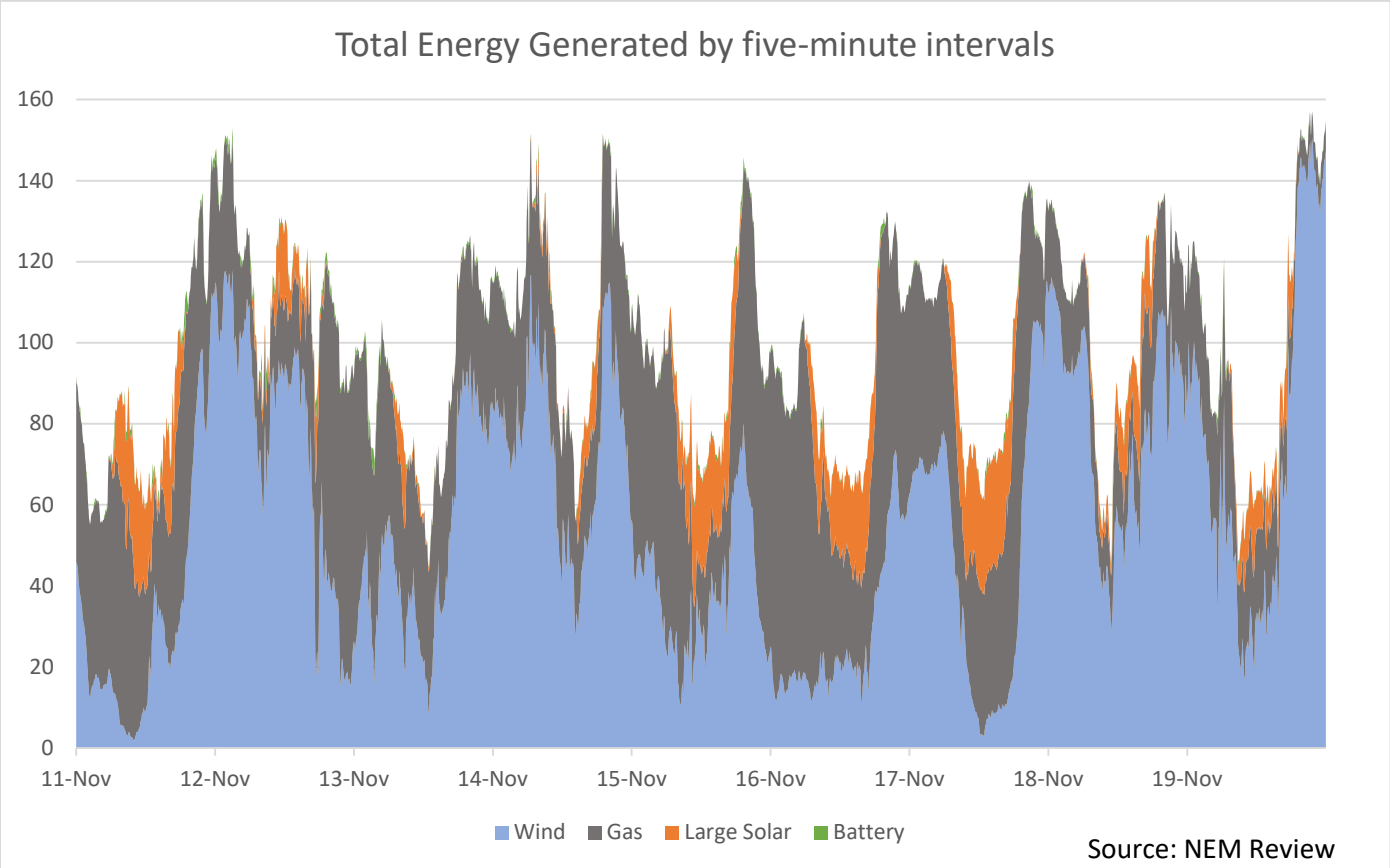
Sources: Refiniv Eikon, AFR

Value of Dispatchability – Hornsdale Power Reserve during an Islanding Event

South Australia experienced another islanding event on the 12th through 19th of November 2022. An islanding event, as the name suggests, is when the power system of a state/region is separated from the rest of national electricity market. Extreme weather conditions including thunderstorms and strong winds uprooted a transmission tower near

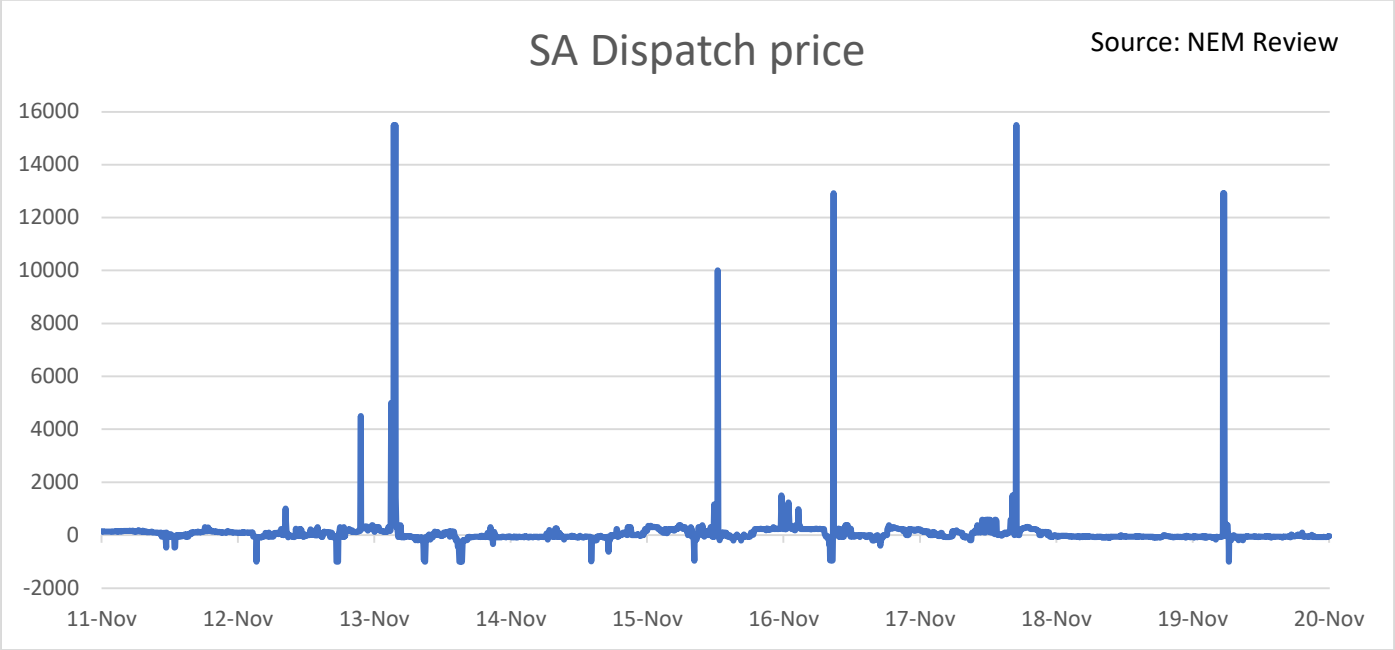
Tailem Bend and as a result Heywood interconnector (connecting SA with Victoria) tripped. This caused separation of the SA power system from the rest of the NEM and SA became 'Frequency Islanded'. Under normal conditions, frequency of each State power system is maintained consistently across the whole NEM. This involves generators bidding to provide frequency stabilisation services (FCAS) on a whole of NEM basis.

However, when a State becomes islanded, this changes with FCAS being provided on a local basis only. The islanding event lasted for seven days. During this period, 62% of South Australian operational demand was provided by solar and wind (collectively variable renewable energy or VRE sources). This is followed by gas, which provided 36% of the total demand. The chart below shows the pattern of SA load and generation over the islanded period.



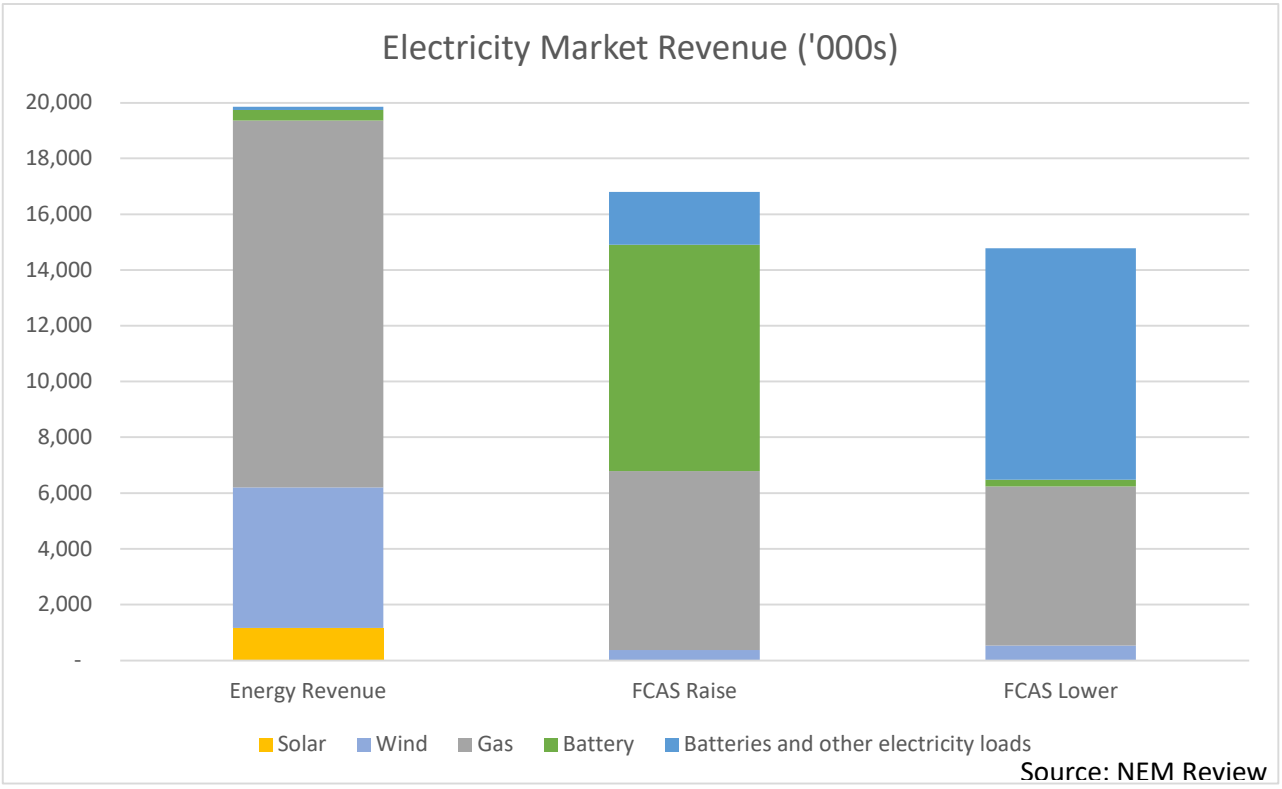
Source: NEM Review

During the islanding event, most of the electricity was supplied by VRE and Gas. Dispatch prices were relatively low on average at $79/MWh. However, there were a total of 26 five-minute intervals where the price was greater than $1000/MWh. Interestingly, 53% of the five-minute intervals during the islanding period had negative prices. That is, despite being cut-off from the rest of the NEM, half the time wholesale electricity prices were negative (and there were also significant periods when household and grid scale solar generation was curtailed).

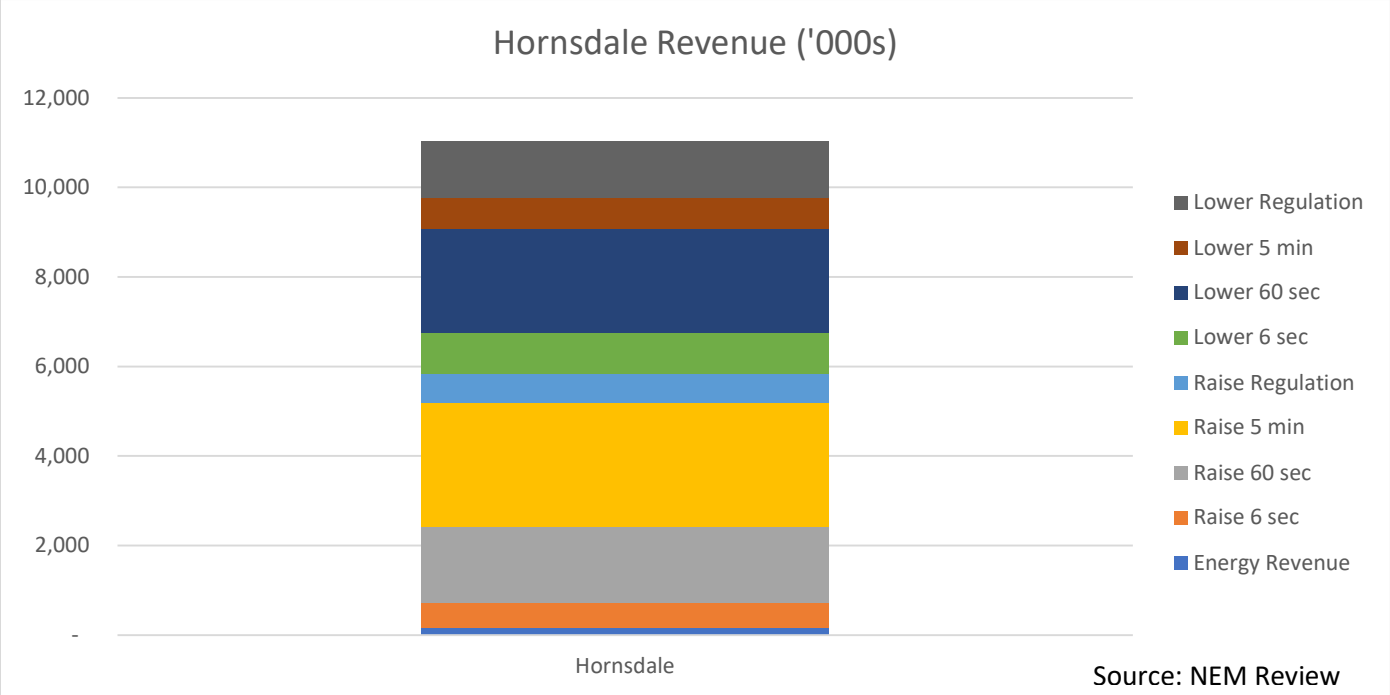


However, the situation was quite different in the FCAS markets. As FCAS could only be provided by SA Generators, the FCAS prices were high throughout the islanding event. The bulk of frequency control services were provided by Gas generators and Batteries as seen in chart below.

Over the week, the total wholesale cost of electricity (both energy and FCAS) was $51 million. However, this was dominated by FCAS costs. FCAS was $32 million out of $51 million of total costs. That is, stablisation services were paid much more (by a factor of 1.6x) than actual energy.



We looked a bit deeper to understand how the batteries were performing during the islanding event. A good project to focus on is Neoen's Hornsdale Power Reserve. Hornsdale provided 34% of the FCAS services needed across the SA grid during the islanding event. This has been extremely profitable.



Source: NEM Review

Hornsdale power reserve earned approximately $11 million by supplying FCAS services during the islanding event. With a total construction cost of $171 million, earning $11 million in a week – that's not bad for a payback period! Another interesting comparison is with wind and solar. The combined state-wide capacity of 2,943 MW ($5+ billion in capex) across 48 solar and wind projects earned $6.2 million by supplying electricity only (only a few windfarms are able to provide FCAS revenues). That is, a single battery earned almost 2x more than all VRE projects in the state.

This demonstrates the colossal value-add from having dispatchable capacity.

Some people say that SA is half an hour and 10 years behind the east coast …. But maybe its half an hour and 10 years ahead. In 10 years' time, our grid will be dominated by variable renewables (the government target is 83% renewables). This will provide low-cost energy (and often more than we need). In this world, storage has the potential to capture a disproportionate share of returns.

2022 – the year coal died

Climate Change, politics, jobs, reliable electricity and the economy have dominated the debate about the role of coal fired electricity generation in our national electricity market for over a decade. Simplistically, participants in this debate have been in two camps – the greenies and the deniers. 'Greenies' believe that coal is completely unnecessary and inconsistent with a sub two-degree climate transition and coal power plants must be shut immediately. On the other side of the spectrum have been the 'deniers' who cannot imagine life without coal, especially as an electricity baseload, and the idea that affordable and reliable electricity can be provided without coal-fired power plants until late 2040s. There has been very little consensus between these groups on the long-term vision for supply chain for electricity until 2022.

A series of events in 2022 have created a tectonic shift in the debate.

Let us recap:

- **ALP wins the federal election** with a mandate to reduce national greenhouse gas emissions by 43% compared to 2005 levels by 2030. Labour campaigned with the Powering Australia plan, a plan to roll out renewables and upgrade the transmission grid. The ALP policy included a forecast of 83% VRE supply to the grid by 2030s. This election also saw a group of 'Teal' independents being elected to the parliament under a united banner to fight climate change. This election signalled a powerful change in sentiment (similar to 2007), that the climate is a chief concern amongst voters (along with other social and economic issues) and those campaigns that promoted policy change in this area did well..
- **Grok backed AGL brings forward the closure of Loy Yang A from 2045 to 2035**. AGL is the largest polluter in Australia, but following Grok's intervention, it has changed the future trajectory of its business. AGL's new board is committed to building new renewable and storage assets and has materially brought forward the shutdown of its coal plants. While perhaps more can be done, AGL have firmly shifted into the 'as quick as practicable' camp.
- **Origin Energy brought forward the closure of Australia's largest coal-fired power plant, Eraring, by seven years to 2025.** Origin's closure reflects that even the big gentailers have accepted that their legacy coal fired plants are no longer economic. This has been reinforced with the Brookfield takeover proposal which would see Origin transformed to a green retailer with a massive $20 billion capex plan.
- **Queensland government announces plan to end reliance on coal-fired power stations by 2035 – a decade earlier than planned.** Queensland has the highest dependence on coal with eight operating coal-fired power plants, one commissioned as recently as 2007. Coal is a very political issue for Queensland as six out of eight power stations operate under state ownership. The Queensland Government's plan comes with a 'job security guarantee' to allow workers to either keep working at existing coal power plant sites with new technologies or find new jobs. The plan has been endorsed by the Electrical Trades Union (ETU) which shows the support from both the employers and the employees.. The Queensland Government's 10-year $62 billion plan involves creating a clean super grid of solar, wind and world's largest pumped hydro, paving an orderly exit of coal from politics, jobs and most importantly the grid. This is an enormous shift. Cast your mind back to April 2021 when the CEO of Stanwell (one of the two Queensland government owned generation companies) was forced to quit for saying some coal plants might shut before the end of their technical lives. Now the Queensland Government has come out and said they will shut the lot by 2035. Voldemort's name is being shouted from the rooftops!
- **Federal Government along with state and territory ministers announces the Capacity Investment Scheme (CIS).** While details are scant, this is a Commonwealth led scheme (but with very strong State influence) that would see storage assets (batteries and pump hydro) participate in reverse auctions to receive a revenue floor (to encourage investment in dispatchable capacity). While the mechanism is similar to a range of different options developed by the previous Federal Government and the Energy Security Board, these options also held out the prospect of capacity payments for gas and coal plants (euphemistically called 'Coal-Keeper'. COAG's decision to exclude coal and gas from the CIS can only lead to one conclusion – 'Coal Keeper is dead'.

2022 has completely changed the debate from whether to shut coal or not, to what is the optimal speed. The transition to zero carbon energy is not going to be easy, especially with the 2030 emissions target. Losing a decade to policy indecisiveness and lack of cohesion has transformed a punishing marathon to a herculean sprint. But at least we can be glad that the destination now seems clear.

2023 Outlook

It wouldn't be a year-end newsletter if we didn't offer some comments about the year ahead. But before we start, let me qualify our remarks with the following – "forecasting is difficult, especially if it's about the future" – which you can attribute to either Nobel prize winning physicist Niels Bohr or baseball catcher Yogi Berra.

What are the key issues for investors in 2023?

In order, we see them as follows:

- **Inflation**. Inflation is in the process of moderating in the US (and Australia is probably pretty close to the peak as well). However, the key question for 2023 is how far will inflation fall? In particular, will inflation fall back to the 2010-2020 average of around 2%, or are materially higher medium-term rates of inflation in store (eg 4-5%)? If the former, rates will come down quickly and we are back in the low inflation, low interest rate world of the 2010s. In this world, the old challenges (where do investors get yield?) and the old investment playbook will be back ('duration is back baby!'). If not, the rise in bond rates that occurred in 2022 would resume in 2023, and this would continue to ratchet up the pressure on all asset prices.

- This dichotomy also goes to heart of the difference between the Fed's view of future monetary policy and Wall Street consensus. The Fed's outlook focuses on a "pause" – that is the Fed raises rates to a terminal rate and then maintains that high-level of rates for a significant period until inflation has clearly moderated. The Wall Street consensus focuses on a "pivot" – that is once rates peak, the economy quickly weakens (see recession below), and this leads to rapid cuts in interest rates. If inflation doesn't fall to 2% quickly, then Wall Street isn't going to get its pivot.

- **Recession**. There is reasonable consensus amongst economists and market pundits that there is a high probability of a global recession in 2023 as the rapid rise in interest rates (and tax like impact of sky-high energy costs) bite. The 2023 recession forecast is a bit unusual. In particular, this seems to be one of the most anticipated recessions of all time. It is slightly weird that financial market participants seem to want a recession. From a Wall Street perspective, the sooner this happens, the sooner central banks might cut rates, and the sooner we can go back to a world of low interest rates and cheap money. However, on main street, recessions always hurt. In this context, if a slowdown were to happen later in 2023 (and, hence, rates go higher than expected) this would be a surprise outcome.

- **Energy**. Energy is a key input to economic activity and growth and it's going to stay expensive. It might be cheaper than the worst points of 2022, but energy is not going to be cheap. There is a global scramble to reset energy sources and supply chains. What is happening in Australia, post the ALP election victory in May, is massive, but this is just a drop in the bucket compared to what is happening globally. There is also a big difference in urgency. In Australia we are slammed by high global fuel costs. But this is a question of price – not really one of availability. That is quite different to what is happening in Europe as they face up to the lack of availability of Russian gas. Thus, while a recession might provide some short-term relief on oil or gas prices, the overarching dynamic is likely to be one of high energy costs (and this feeds through into broader commodity and food prices).

- **China**. My final comments are about China. China is an important driver of global economic growth. Australia, through its exports, is particularly exposed (which has historically been a positive). The growth picture for China is particularly uncertain in late 2022. They are in the process of relaxing Covid zero measures. This is a long-term positive as those measures were clearly unsustainable. However, exactly what it means for economic activity in China in 2023 as they suffer the inevitable waive of community transmission that many Western economies experienced in late 2021, is unclear. It may be a case of needing to go backwards to go forwards. The other source of uncertainty is the property sector in China. This is clearly a massive bubble and unwinding the leverage behind it is most likely economically very painful. How this turns out and what the implications are for some of Australia's key exports (given the iron ore intensity of the property sector) might be an underappreciated source of volatility for markets in 2023.

Airports are special

Airports play a special role in the history of the infrastructure asset class in Australia. It is hard to believe, but prior to the 1990s there was no such thing as infrastructure. Rather, superannuation funds invested in three main asset classes listed equities, bonds (mainly government) and property (mainly unlisted). For some funds, who were particularly adventurous, there was a thing called private equity, where managers invested in unlisted equity stakes. There was no such thing as infrastructure and if it was anything it was just a subset of private equity.

The 1990s saw a range of infrastructure privatisations that laid the foundation for the infrastructure asset class. Notable ones of these are:

- The Citylink project. Centered on the construction of what was then Australia's largest toll road project, the $1.8 billion CityLink road system in Melbourne. This is the first toll road of the roads behemoth that is Transurban (market capitalisation $43 billion).
- The breakup and privatisation of the State Electricity Corporation of Victoria. This saw the segregation of the Victorian Government's electricity activities into generation, distribution and retailing and their privatisation between 1995 and 1999. The generation assets in general provided terrible financial performance for their new private sector owners (mainly offshore investors). Under the Andrew's labour government there are plans to recreate the SEC.
- The privatisation of the assets of the Federal Airports Corporation by the Keating Government. This began in 1997 with the sale (99 year lease) of Melbourne, Brisbane and Perth Airports. This was followed by the sale of Adelaide, Canberra and Gold Coast Airports later in 1997, the remaining smaller airports in 1998 and the big one - Sydney Airport in 2002. The last Commonwealth airport to be sold were the Sydney Basin Airports of Bankstown, Camden and Hoxton Park in 2003.

These airports were special and I would argue have formed the very foundation of the infrastructure asset class for Australian institutional investors.

This is a bit of an Australian quirk. Australia has more privately owned airports than most other countries.

Airports are regulated differently here. Australia uses the 'dual till' regulatory approach. That is, airport landing and takeoff charges are treated as a regulated monopoly with oversight of potential abuse of monopoly power undertaken by the ACCC. By contrast, retail and property revenues are unregulated.

This creates very attractive return dynamics – airports are a combination of a regulated asset and shopping mall with captive patronage growth.

Airports have been almost universally successful investments. For example, Sydney Airport was privatised for $5.4 billion in 2002 (a price that Allan Jones famously found completely incomprehensible) and was recently taken private by an IFM lead consortium for more than $33 billion. Six times capital growth over 20 years is a return that would make old fashioned private equity investors proud.

All successful Australian infrastructure fund managers were keen on airports on the 1990s (and this does give rise to the question, what was the chicken and what was the egg). This is probably a uniquely Australian dynamic – if you speak to the big global infrastructure managers, airports are probably a reasonably minor part of the infrastructure asset class.

Thanks for the history lesson, but why does it matter going forward?

It matters because of the Your Future Your Super (YFYS) investment performance benchmark. For these all-important tests, the Australian unlisted infrastructure asset class is proxied by the MSCI Private Infrastructure Fund Index. This is an index of the returns to a small group of open-ended infrastructure funds (think of your favorite managers – dominated by three letter acronyms). This index is dominated by one particular manager (one manager is currently over half the index). It is also more than half transport assets (eg airports, seaports and tollroads).

Australian airports are, in general, not replicable assets. There aren't new airports being built (West Wellcamp is an exception to this). This is different to other infrastructure sectors (eg Transurban has grown through the acquisition and construction of new toll roads) and there a new renewable energy projects all the time.

This dearth of airports, their special place in the YFYS benchmark, and non-replicable nature, creates an incentive for Australian superannuation funds to allocate capital to legacy open-ended funds. It is also a different perspective on IFM's take private of Sydney Airport – although it would be a bold call to label a $20+ billion take-private as closet indexing.