

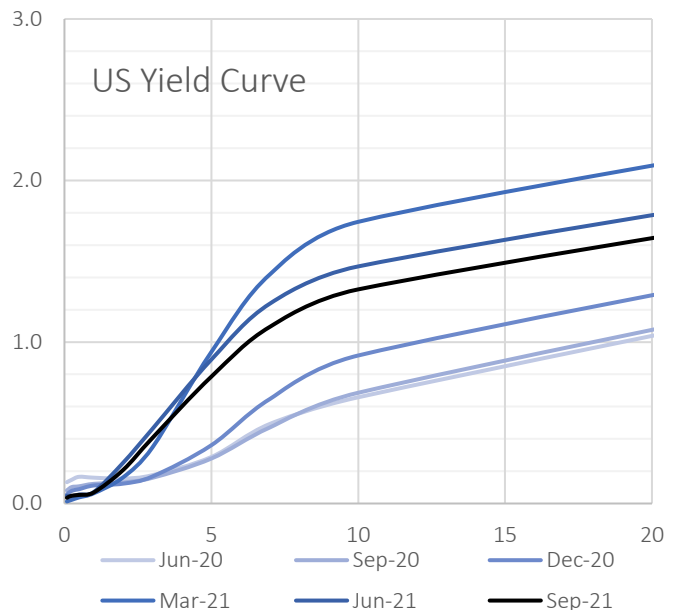
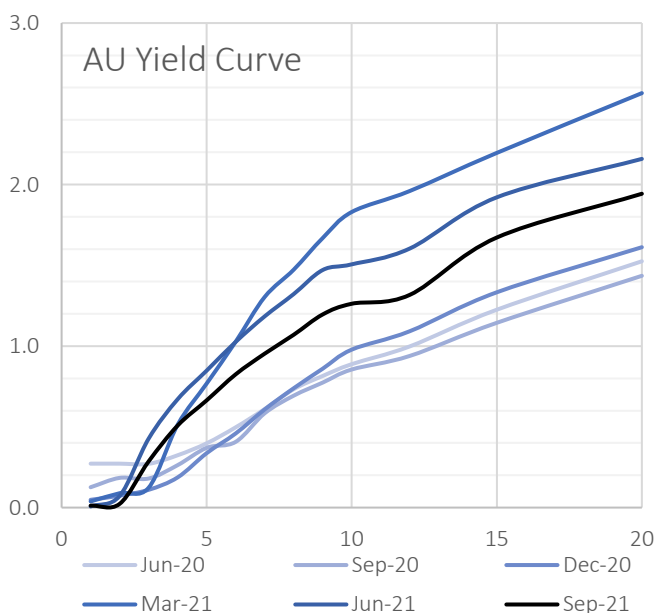
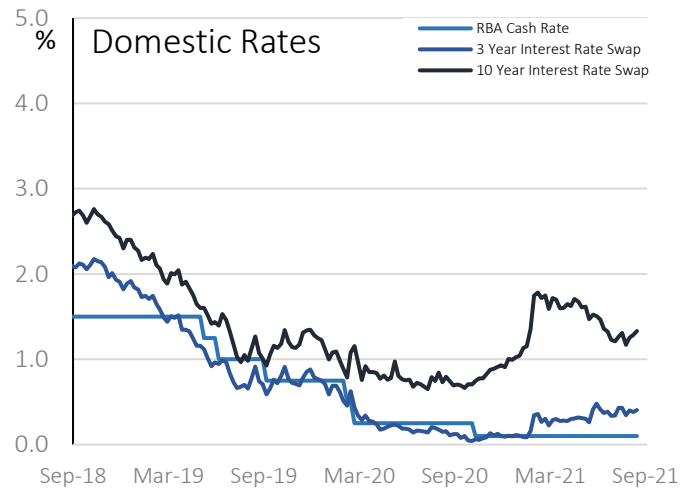
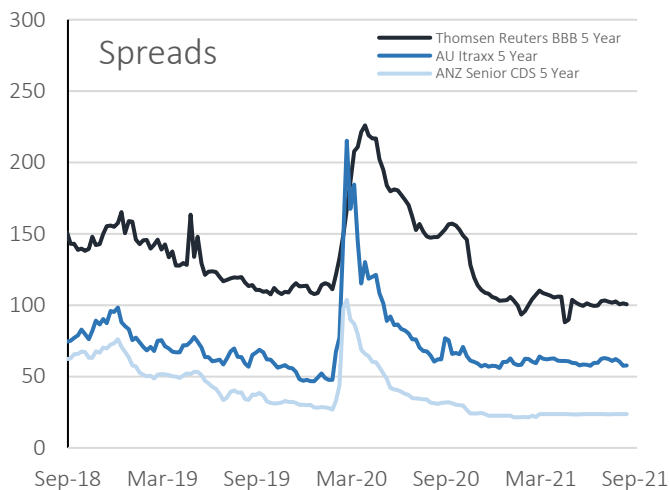
## Introduction

Quite possibly by the end of the next quarter Transurban will be the last, large, listed core infrastructure company in Australia with bids this quarter for both Sydney Airport (clearly our upside valuation last quarter was conservative to say the least!) and AusNet (though if APA wins the bid it will remain listed) coming amongst a series of take private transactions over the last three to six months. Whilst there has been quite a lot of transaction activity this quarter, generally capital markets have been fairly subdued.

This quarter we have three articles, the first looking Airports and Port/Cargo volumes, the second takes a comparative look at infrastructure assets versus technology assets, and finally we take a look at Large Generation Certificate (LGC) prices and why they remain high even though we have now met the Renewable Energy Target.

### Markets update

Interest rates have started to rise towards the back end of September. There are significant inflationary pressures in the short-term with increasing costs throughout global supply chains (in China, transport and energy). The market is trying to figure out whether the current bout of inflation is transitory or in fact a permanent feature. Rates are low despite current inflation being high which would suggest consensus is in the transitory camp.



### New issuance and refinancing

Date	Borrower	Instrument	Size (\$m)	Term (Yrs)
Jul	Property Exchange Australia	Loan	335	4
Jul	AusGrid	Loan	971	3
Jul	Bingo Industries Acquisition	Loan	1,001	5/7
Jul	Musselroe Wind Farm	Loan	103	n/a
Jul	Berrybank Wind Farm	Loan	321	5
Jul	Japara Healthcare Acquisition	Loan	500	3/5
Jul	Tellus	Loan	135	3/5
Jul	Gold Coast Hospital Carpark PPP	Loan	65	5
Aug	Australian Registry Finance	Loan	1,930	3/5/7
Aug	Dulacca Wind Farm	Loan	350	5
Aug	Sapphire Wind Farm	Loan	307	5/11
Aug	Victoria Power Networks	Bond	300	3
Sep	Telstra InfraCo Towers Acquisition	Loan	1,025	n/a
Sep	Victorian Cancer Centre PPP	Loan	425	n/a
Sep	Canberra Airport	Loan	250	3/5
Sep	Lochard Energy	Loan	1,296	5/7/10/12
Sep	Sungrow Solar Portfolio	Loan	20	n/a
Sep	ElectraNet	Bond	350	7

### Equity and other news

- This quarter Brookfield and APA Group put in bids to acquire AusNet (Victorian Distribution network company). Brookfield put in an all cash offer of \$2.50 per share first, with APA putting in a counteroffer of \$17b (or ~\$2.60 per share) via cash and script.
- The Transurban led consortium (Australian Super and Abu Dhabi Investment Authority) was the successful bidder for the NSW Governments 49% stake in WestConnex paying \$10b – taking the Transurban consortium's ownership stake to 100%.
- A consortium led by IFM and GIP put in a bid to take Sydney Airport private, the first bid was \$8.25 per share and a second at \$8.45, with the third and final bid being accepted at \$8.75 (\$32.6b) – the offer being subject to confirmatory due diligence and regulatory approvals (there are specific rules in Australian in respect of airports and ownership concentration).
- AustralianSuper has announced it is selling a 16.6% stake in NSW Transmission company AusGrid – bids are due in early October. AustralianSuper will retain a 9% stake.

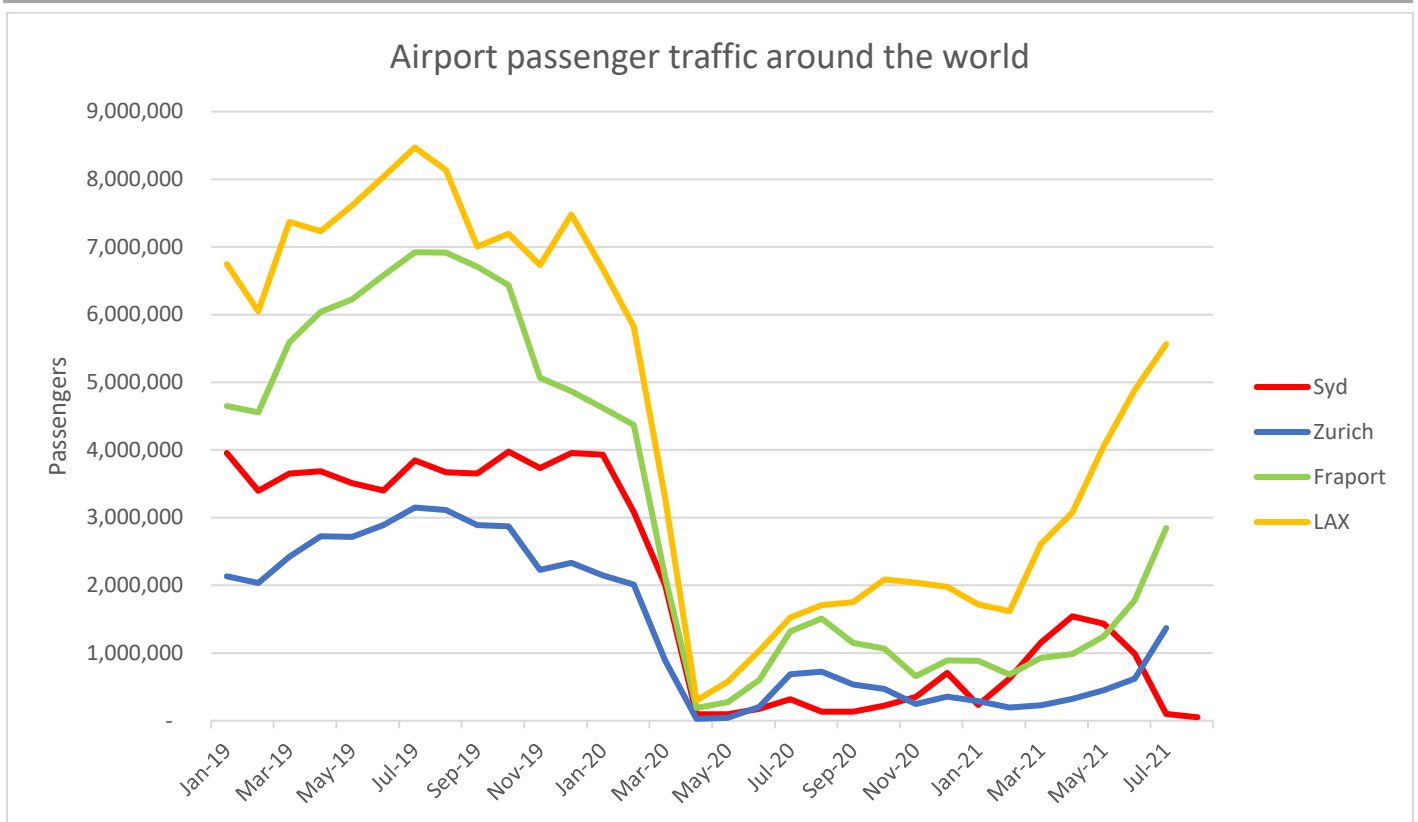
- Morrison & Co have decided to sell their 50% stake in Macarthur Windfarm. The Windfarm has a 100% offtake from AGL to 2038. AMP Capital owns the remaining 50% which it acquired in 2018 for \$880m.
- Elliot Green Power has announced that it is selling its portfolio of NSW and Qld solar farms (302MW) together with development assets (storage and solar). Bids are expected by the end of the year.
- Octopus Investments has acquired the 180MW Dulacca Wind Farm in Qld, the project has a 126MW offtake from the Queensland Government owned CleanCo.
- Brookfield and State Super have announced they are selling Geelong Port with the sale expected to complete by the end of the year.
- In July it was reported that KKR and Ontario Teachers put in a bid for Spark Infrastructure which owns stakes in distribution networks SA Power networks, CitiPower and Powercor (Vic distribution) and Transgrid (NSW Transmission). No further announcements have been made as the quarter comes to a close but it has certainly kept Spark's share price buoyant.
- Tilt Renewables 396MW Rye Park wind farm reached financial close. This is NSW largest windfarm and will feature Australia's largest turbines at 6MW each. The project has a 55% offtake from Newcrest Mining for 15 years.
- Brookfield is buying additional shares in Dalrymple Bay Coal Terminal, effectively partly unwinding the sell down (which took them down to 49%) as part of floating DBI on the ASX. DBI has performed reasonably poorly post its float at \$2.57.
- AGL announced more detail on their proposed demerger into New AGL (their retail and renewables/firming generation business) and Accel (principally their coal fired baseload generation business). This included announcing new CEOs for both entities. So far the market isn't impressed, with the AGL share price approximately half its year ago levels.
- While it isn't infrastructure, the evolving insolvency/debt default/restructuring of the Evergrande property development group in China is a situation worth watching. While some market pundits call of "China's Lehman moment" seem overhyped to us, it is a symptom of a slowdown in the Chinese property construction market – a sector that is an important driver of Australia's economic fortunes (particularly iron ore).

## Airport and seaport volumes

### Airports

The Sydney Aviation Alliance has increased its bid price for a third time \$8.75 to acquire Sydney Airport with the board granting due diligence to the consortium. This effectively values the airport at a \$30 billion enterprise value. Prior to Covid-19, the 2019 financial year EBIDTA was \$1.3 billion. This implies a valuation multiple of Sydney Airport 23x on a pre-Covid basis, a valuation some would consider high given the valuations on other 'moaty' assets (see the article on investment moats!).

With most of Australia in lockdown and state and international borders closed, Australian airports are suffering with very low passenger numbers. Elsewhere around the world, border restrictions have largely ceased, and the travel rebound is well underway. As shown in the chart below, In the US, passenger volumes are nearing 75% of the pre-Covid peak of passengers, and in Europe, a similar rebound is occurring where passenger numbers are nearing 50% of pre Covid levels.



Source: Sydney Airport, Zurich Airport, Los Angeles Airport and Frankfurt Airport,

Australia is about 6-12 months behind Europe and North America. It would seem that at some point in late 2021 or early 2022 the international border with NSW (and perhaps VIC) will be opened and states that have been successful with elimination to date (eg, QLD, WA and TAS) will open up to international travellers a bit later in early 2022.

Sydney Airport may be facing short run patronage issues, however, there is no doubt that the asset will continue to be one of the highest quality core infrastructure assets in Australia. It would be reasonable to expect a rapid rebound in travel to some base line figure.

The big question will be whether permanent damage has been done, particularly in the business travel segment. Have habits been formed over the last two years such that Zoom meetings will continue to be the acceptable norm? Will this provide a dampener on business travel, compared to pre-Covid norms?

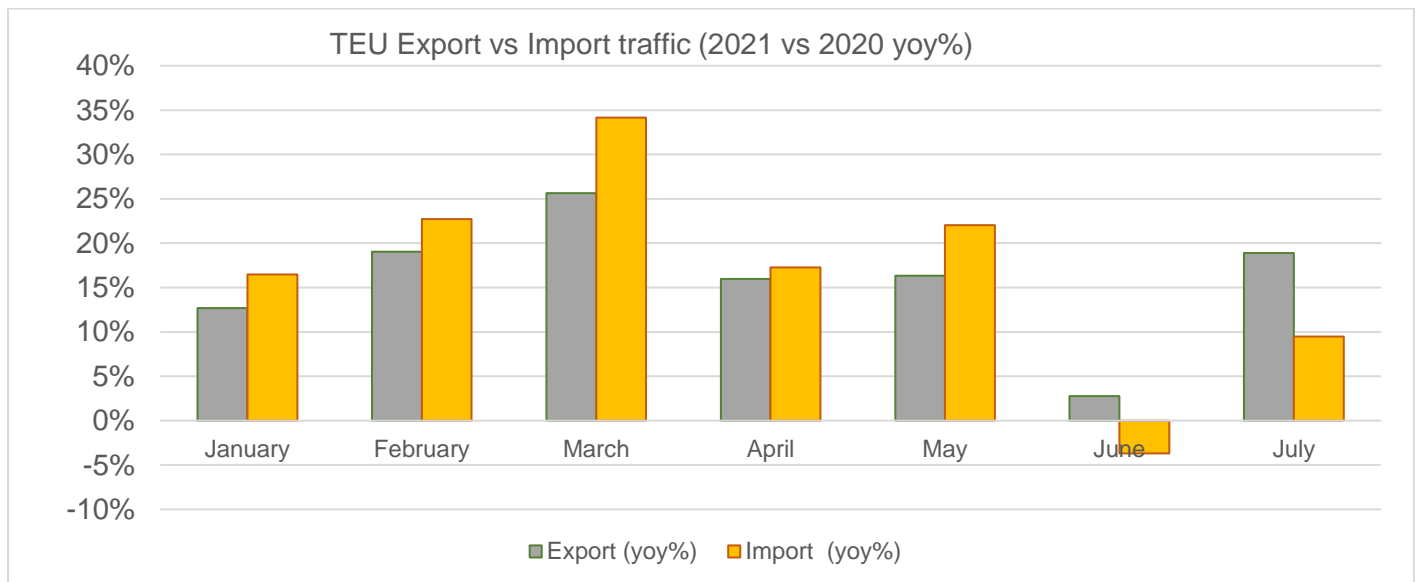
### Seaports

Containerised sea freight has seen an explosion in cost and demand, with shipping rates increasing at what seems like a parabolic rate. The Freightos Baltic Global Container Freight Index is at record all-time highs. This index measures the average global cost of a 40 ft shipping container which has increased from a price of US\$1,500 in 2020 to US\$10,920 today. This is an amazing seven-fold increase! When you drill down into specific routes it gets even worse. The average price of a container from East Asia to the North American East Coast is currently US\$22,234 versus US\$2,500 in early 2020, a nine-fold increase! As you can imagine, stock prices of businesses involved in all parts of the shipping services supply chain are going through the roof.



Source:Refinitiv Eikon

The time it takes to process containers has increased with additional health and safety measures introduced during the pandemic. There are reports that ships are waiting 8-10 days at North American Ports to be processed. For Australian ports, there has been a significant increase in volumes. Over the 2021 container volumes were 10-30% above the previous year (see next chart). The following is a chart of the aggregate container volume growth at Port of Botany, Port of Melbourne and Port of Brisbane.



Source: Port of Botany, Port of Brisbane, Port of Melbourne

This has the potential to create significant inflationary forces in the short term. Particularly when combined with the rising costs of manufacturing in China. The current market consensus is that current inflation is transitory. But is this really the case? Markets could be underestimating future inflationary expectations.

Seaports and airports are fantastic core infrastructure assets with strong correlations to economic growth. The current pandemic environment and the differing effects on assets are an example of the benefits of diversification!

## Investment moats: Infrastructure vs technology

As investors, key questions we are always thinking about are “What is the competitive moat for a project?” and “How sustainable are the cashflows?”. In infrastructure, the key investment characteristics are high upfront capital costs to build physical assets, low incremental marginal costs per user, high operating margins, being a price setter rather than a price taker and long term cashflows (often inflation linked). These characteristics are usually due to one of the following,

- Geographic monopolies. Due to an asset’s location or physical network, it is able to prevent competition. For example, if you want to fly to Adelaide on a scheduled passenger flight – you have to fly to Adelaide Airport.
- Regulatory monopolies. These infrastructure assets are regulated by Government with the allowable prices effectively set by Government. Examples include electricity and gas transmission and distribution networks.
- Government or corporate offtake. These infrastructure assets have some level of availability linked cashflows that are well defined. Project owners are effectively only taking execution risk versus the price they have bid. Examples are PPPs and highly contracted power generation assets. Assets with no offtake, for example merchant electricity generation, don’t really fall within the definition of core infrastructure.

A fascinating contrast is to compare the investment moats of physical infrastructure assets against today’s hot investment sector, technology (or software). Are the tangible infrastructure moats that different to the intangible moats in the technology space? In our view, the investment moats are more similar than you would otherwise think. Both have relatively high initial starting costs and low incremental marginal costs.

The main investment moat in technology is the phenomenon commonly known as a network effect. That is the utility a user derives from a good or service is dependent on the numbers of other users on the network. The more users there are on the platform, the greater the benefit to the users, the greater the competitive position of the platform and the higher the operating margins. This in effect creates a flywheel, which is considered the wholly grail of technology investing. So what are some of these network effects?

- Platform network effects. These are platforms (or intermediaries) that provide significant additional features and benefit to users that only increase as the number of users in the ecosystem increase. Common examples are Google, Microsoft, Shopify, Mastercard/Visa or any SaaS business.
- Marketplace networks effects. These are traditional two-sided marketplaces with supply and demand. These are difficult to start but once created have one of the strongest flywheels. Suppliers want a marketplace with significant numbers of buyers, and buyers want a marketplace with a large selection of quality suppliers. Examples are Amazon, Ebay, Alibaba, Shopee and even Tinder.
- Social network effects. The ability to communicate, interact and connect with others. These network effects are built of the identity of the user to perform or communicate some function with other users. As the network/metaverse builds it can become difficult to leave due to the number of social connections in the network. Examples are Facebook, LinkedIn, Twitter and Pinterest.

There are probably many other types of network effects we have missed. The key dynamic with all of them is that there is a significant competitive moat that can potentially be achieved through scale. The only issue is getting there. Here in lies the distinction between the two types of investing. In infrastructure large capital costs are spent with the future competitive position known with a reasonably high degree of certainty. Whereas in technology there is no economic moat to begin with and the future competitive position is path dependent on growing into network effects either by delivering great product or efficient marketing spend. Those technology businesses that make it to the endgame demonstrate significant monopolistic power as they do in core infrastructure.

The durability of established infrastructure moats is observable given the characteristics mentioned previously. However, it would be naïve to assume these moats can last forever. Technological change can render a monopoly irrelevant over time. For example, the canal barons of the 18<sup>th</sup> and 19<sup>th</sup> century did not last as the steam train was

invented. A more contemporary example in Australia is the monopoly pipeline position of APA which is starting to look weaker today with the decline of fossil fuels (and, hence, their desire to diversify into electricity).

The durability of a network effect in technology investing is complex as it is mostly unobservable until achieved. To achieve a durable network effect usually requires growing as fast as possible at the expense of short-term profit. This can be very polarising amongst investors particularly those tied to traditional valuation metrics. Not all high growth technology moats are equal, and some will prove to be illusory. Some issues to think about,

- How reoccurring is the revenue? How integrated into processes is the platform? What is the switching cost?
- What is the value proposition or unit economics to users on each side of the platform/marketplace?
- How easy is it to multi-tenant across platforms? For example, how easy is it to list a product or service on an alternative platform?

Even when market dominance is achieved there can be pressure from Governments to regulate anti-competitive behaviour. Given the strong similarities between infrastructure and mature technology businesses we make the following curious observations:

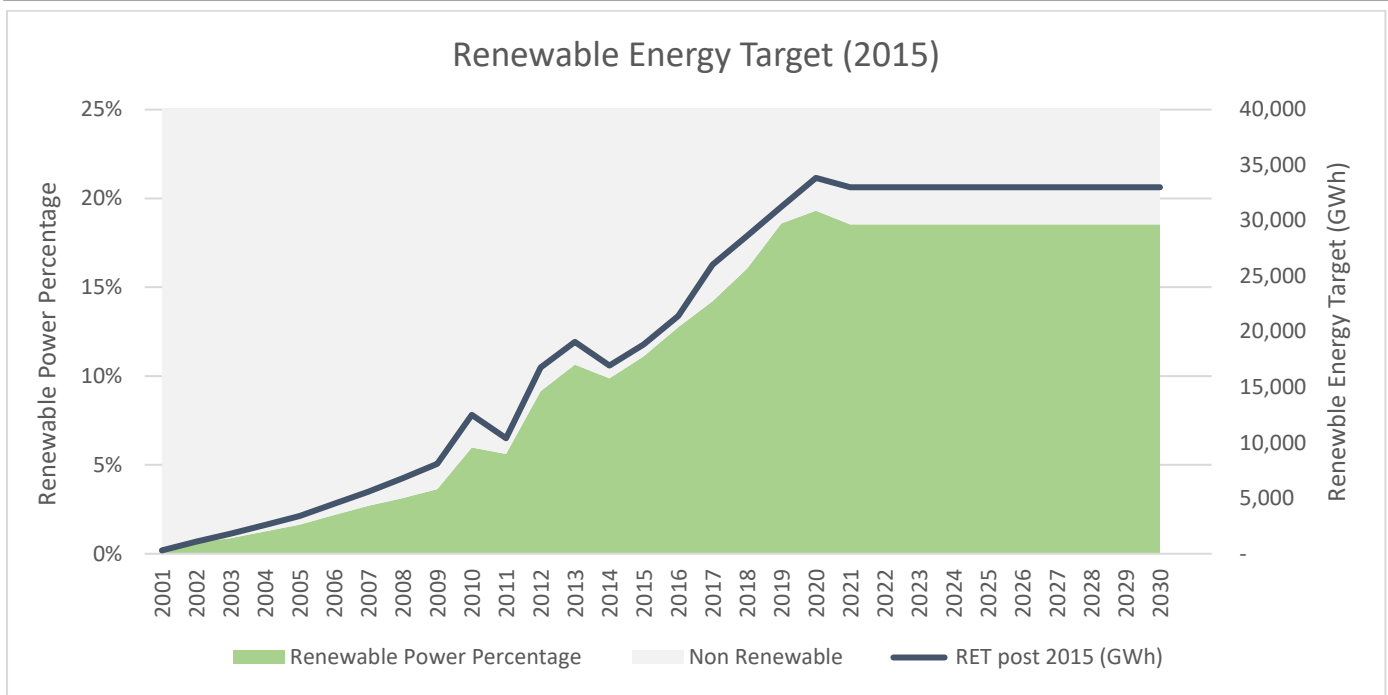
- What does this imply about earnings multiples? Is infrastructure overvalued versus big tech? Should core infrastructure assets trade at the rich EBITDA multiples of circa 20x today? Some forward EV/EBITDA multiples in tech: Microsoft 22x, Amazon 19x, Google 16x, Facebook 13x, Mastercard 26x, Visa 23x, Apple 20x.
- Listed big tech has the potential to be as interest rate sensitive as is infrastructure. Both sectors are long duration and interest rate exposed. This is potentially a new correlation dynamic that should be considered at a whole of portfolio level for funds with high allocations to both.
- Why are the capital structures so different? Technologies companies have traditionally had minimal debt on their balance sheets (and any they do have is mainly used to buy back stock). Infrastructure on the other hand is usually highly levered with physical asset offered as security.

Our key point is that these sectors may be more similar than you would otherwise think.

## Why aren't LGC prices zero?

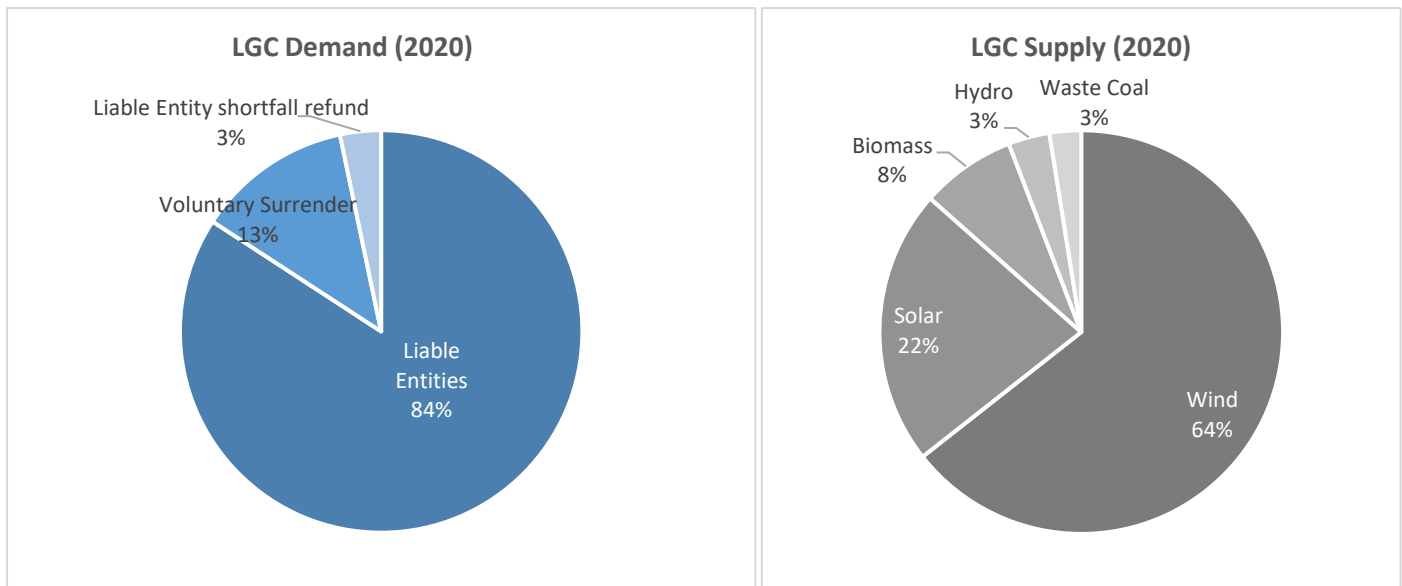
The Renewable Energy Target (RET) Scheme was initially introduced by the Howard government in 2001 with the goal of renewable energy reaching a 20% share of generation by 2020. In 2011, the RET target was split into two parts – the Large-Scale Renewable Energy Target (to incentivise construction of large-scale renewable power stations) and the Small-scale Renewable Energy Scheme (to incentivise rooftop solar for households). As part of this change the Large-scale RET was changed from 20% of generation to a fixed 41,000 GWh. This target was to be achieved in 2020 and held constant until 2030. The fixed target was revised down to 33,000 GWh as part of a bipartisan compromise post the Warburton review.





Source: Clean Energy Regulator, Infradebt

Under the RET one Large-scale Generation Certificate (LGC) is granted for each MWh of renewable generation. Liable parties (mainly electricity retailers) have an obligation to surrender LGCs in proportion to their customer load. This is the main source of demand for LGCs. State governments and private entities also voluntarily surrender LGCs as a contribution to the RET target. Liable parties can purchase LGCs on a spot market, directly generate LGCs by owning renewable regenerators or through buying LGCs and power together as part of a bundled power purchase agreement. There is an effective cap on LGC prices as failing to surrender enough LGCs results in a non-tax deductible penalty charge of \$65 per LGC. This implies a cap of LGC values of around \$90.



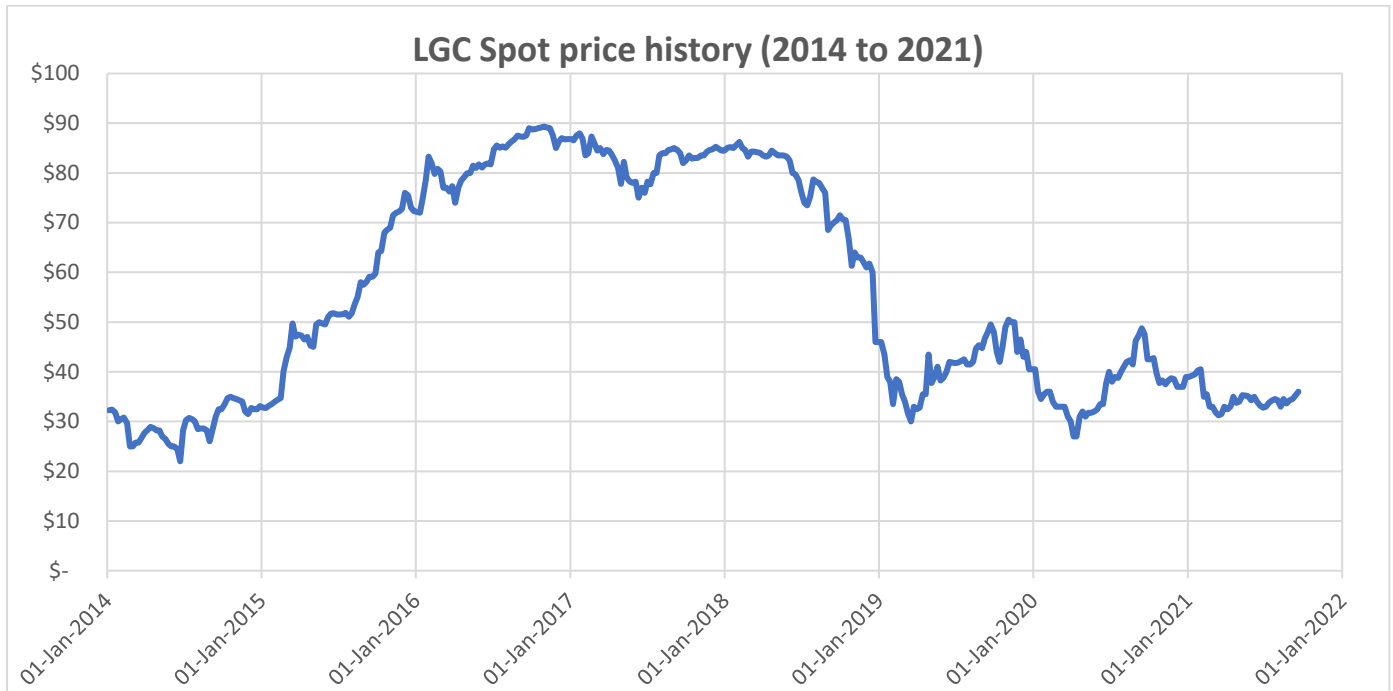
Source: Clean Energy Regulator, Infradebt

Each LGC is additional revenue for renewable generators over and above the value of energy. It is effectively a subsidy that is funded by an obligation on retailers (borne by electricity users). While an LGC is a green premium for generators, it is not equivalent to a carbon credit. One LGC unit represents one MWh of green electricity rather than one tonne of abated carbon. The carbon abatement value of LGCs is dependent on carbon intensity of the displaced generation.



History of LGC Prices

The chart below shows the history of LGC prices since 2014.

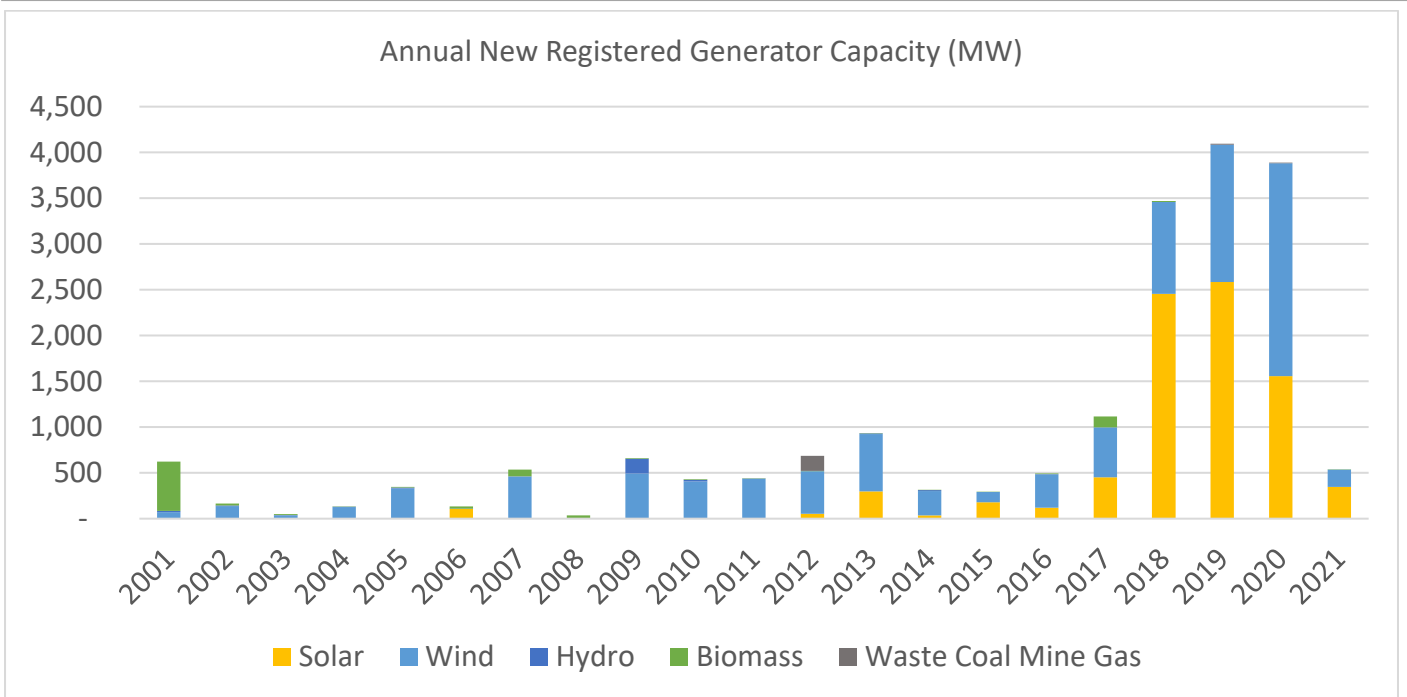


Source: Refinitiv Eikon

2014 was a low point for LGC prices since the establishment of the scheme. The Abbott government commissioned a review of the RET scheme by Dick Warburton which recommended the scheme be abolished. LGC prices crashed during this period (as did the pace of new renewables construction).

In late 2015, LGC prices rebounded along with confidence in the scheme. This reflected the compromise 33,000 GWh target adopted in June 2015 (which was a rejection of the Warburton review recommendation). The rebound also reflected the shift in outlook for the renewables sector after Malcolm Turnbull became Prime Minister. At this point it was clear to market participants that the industry was going to struggle to meet the 33,000 GWh target by 2020 and, hence, LGC prices exploded to near the price ceiling between 2016 and 2018.

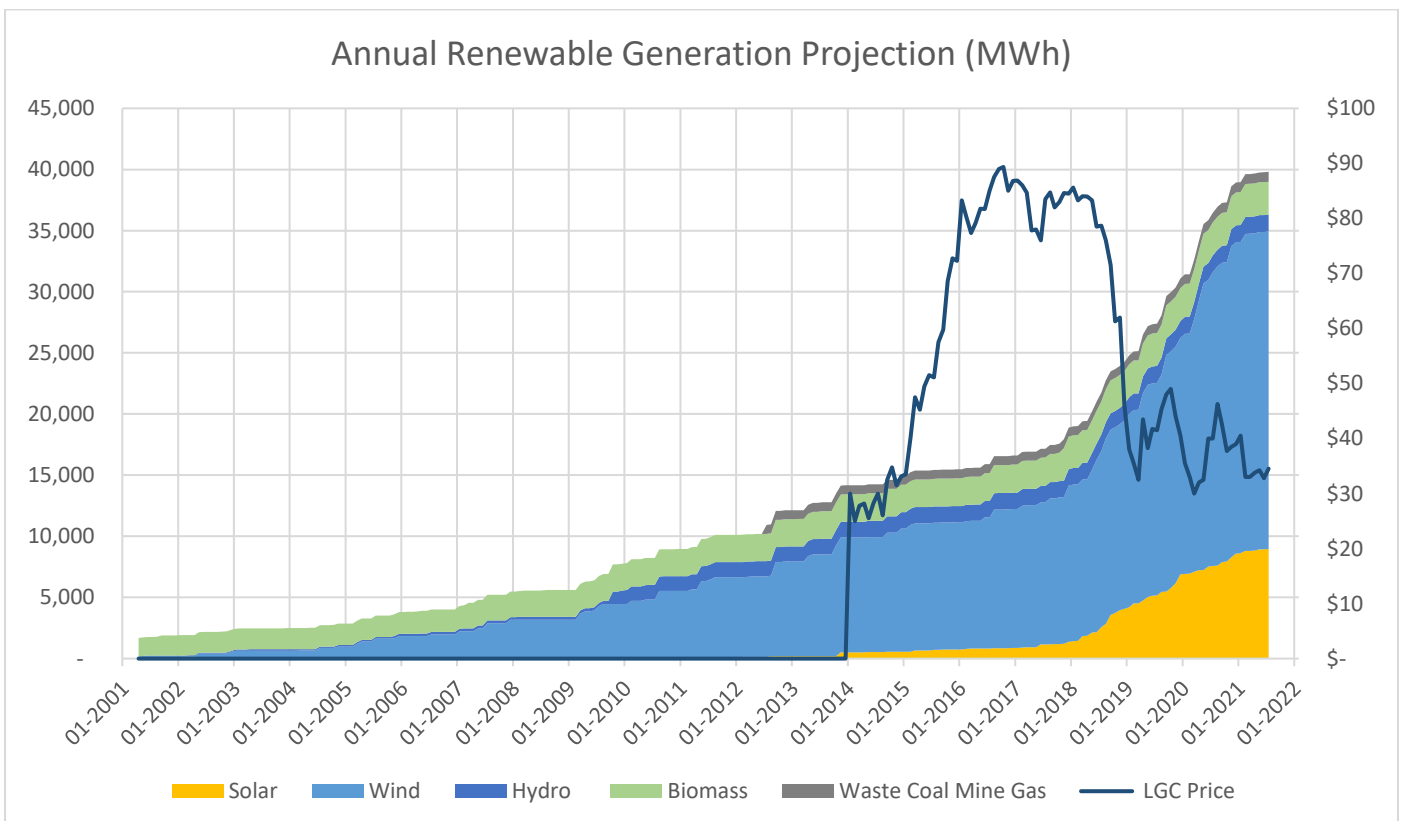
This, combined with a spike in energy prices following the closure of the Hazelwood and Northern power stations, drove the biggest boom in renewable energy construction Australia has ever seen (see next chart).



Source : Clean Energy Regulator, Infradebt

Many projects have suffered commissioning delays. However, in calendar 2020 the CER registered 33,152,980 LGCs. That is, there were enough LGCs registered to meet the RET target (only just).

It is possible to use the CER registration data (see chart above) and stereotypical capacity factors of renewable projects, to estimate the run-rate supply of LGCs based on current operational projects (see chart below). Current capacity implies a 2021 supply of LGCs of around 40 million LGCs. This is well above the 33,000 targets. With around 2-3GW of new projects reaching financial close per year, this supply of LGCs is be expected to grow at around 4 million LGCs per year.



Source: Infradebt, Refinitiv Eikon

This raises the question, if we are already 8 million LGCs per annum above the target and growing at 4 million LGCs per year, why haven't LGC prices fallen to zero. They have declined from the heady days of \$80-90 but at \$35-38 are still very valuable. Depending on the region of the NEM, LGCs are worth as much as energy – effectively doubling the revenue of projects.

### Why aren't LGCs worth zero?

There are a few factors supporting LGC prices – some short-term and others ongoing.

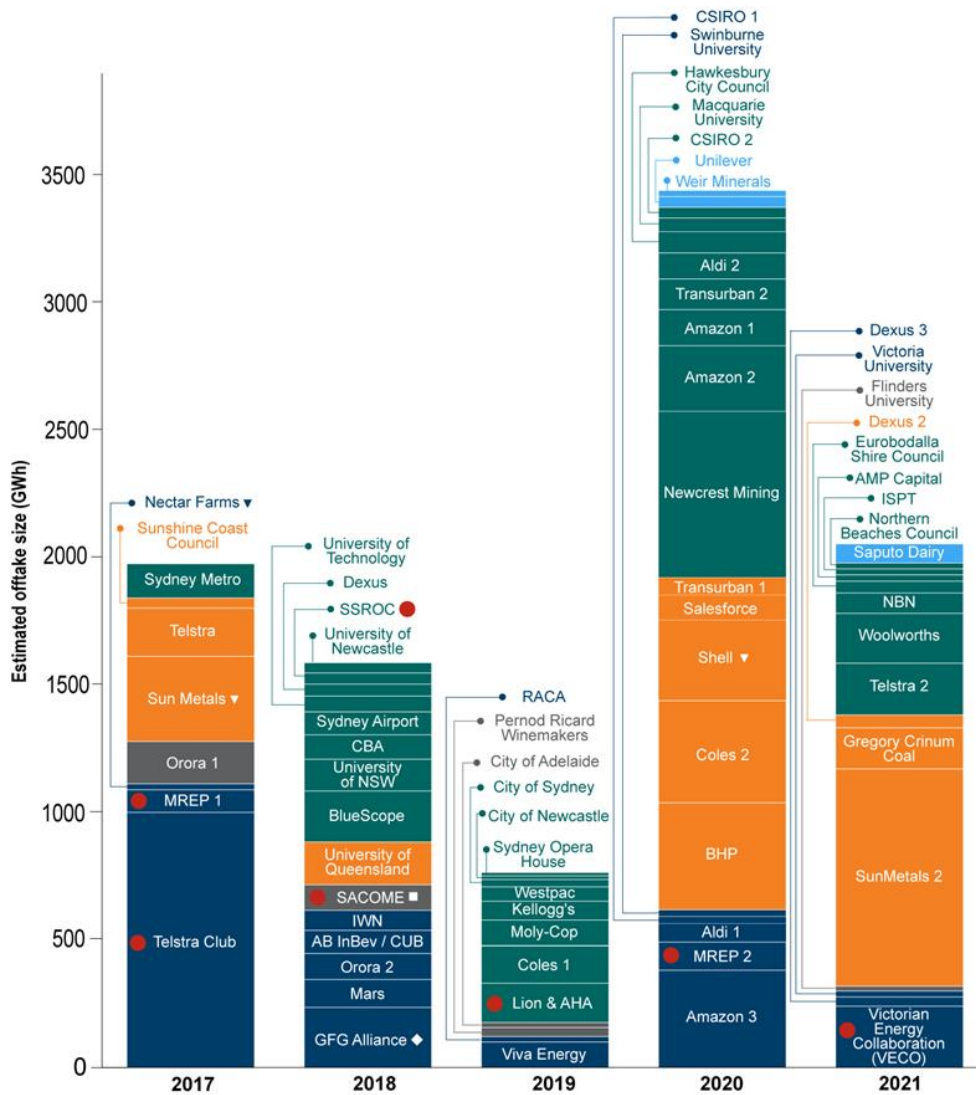
One wrinkle in the design of the RET is that retailers have the option of paying the shortfall penalty (\$65 not tax deductible) and then if they surrender sufficient LGCs to meet their obligation in the two subsequent calendar years, they can get this penalty refunded. In an era of low interest rates, and with LGC prices expected to fall, this provides a mechanism to meet the RET obligation at a lower cost. However, a side effect of retailers applying this strategy is that it increases demand for LGCs in future years above the 33,000 GWh target as retailers need to acquire additional LGCs to catchup the shortfall from previous years. The CER expects this to be 3,400 GWh of LGCs in 2021 (i.e. an extra 10% over and above the base target). This has the potential to continue for a year or two – the incentive for retailers exists while ever forward prices for LGCs are much lower than spot prices. However, in the context of LGC prices over the next decade, this is only a short-term phenomenon and will inevitably be swamped by the ongoing increase in supply of LGCs. This is part of it, but not the real reason prices aren't collapsing.

The key driver is demand over and above the RET. That is voluntary surrender demand.

The first element of this is state based schemes. For example, the ACT government has a 100% renewable energy target and as part of this has entered into long-term contracts for difference under which it acquires LGCs from wind and solar farms in SA, Vic and NSW. The LGCs acquired under these offtakes are voluntarily surrendered (and, hence, are not available to retailers to satisfy their RET obligations). This is approx. 2,200 GWh of LGCs a year (i.e. another 7% above the RET target).

The second element is private sector voluntary surrender. For the 2020-21 financial year this was 1,835 GWh of LGC demand. Data on this is patchy, but CER data suggest this represents a tripling of voluntary surrender activity compared to calendar 2018.

Within this voluntary surrender activity, one of the most rapidly growing segments is renewable energy commitments. That is, corporates which have entered into PPAs to acquire renewable energy voluntarily surrendering the LGCs acquired through these PPAs. This has grown from nothing (or at least not recognised as a category in the CER data) to approximately 300 GWh in 2020-21. However, based on the Energetics corporate PPA tracker (see chart below), this category is likely to explode over the years ahead. The chart below tracks PPAs based on when they are publicly announced. This is usually at financial close, prior to the start of construction, and so there is probably a two year lag between a PPA being announced and registration of LGCs. It is also not clear if all corporates intend to surrender their LGCs and so not all of this represents incremental demand over and above the RET.



<ul style="list-style-type: none"> <li><span style="color: green;">■</span> NSW</li> <li><span style="color: orange;">■</span> Qld</li> <li><span style="color: grey;">■</span> SA</li> <li><span style="color: blue;">■</span> Vic</li> <li><span style="color: lightblue;">■</span> Multi-state</li> <li><span style="color: red;">●</span> Buying group</li> </ul>	<ul style="list-style-type: none"> <li>MREP - Melbourne Renewable Energy Project</li> <li>SSROC - Southern Sydney Regional Organisation of Councils</li> <li>SACOME - South Australian Chamber of Mines and Energy</li> <li>CUB - Carlton &amp; United Breweries</li> <li>IWN - Intelligent Water Networks</li> <li>AHA - Australian Hotels Association</li> <li>CBA - Commonwealth Bank of Australia</li> <li>RACA - Royal Automobile Club of Australia</li> </ul>	<ul style="list-style-type: none"> <li>▼ Behind the meter utility scale solar</li> <li><b>Organisations include</b></li> <li>■ Whyalla Steelworks</li> <li>◆ Laverton Steelworks</li> </ul>	<p>The Victorian and NSW Government deals, and Victorian Government Buying Group, have been removed from this tracker as they are LGCs only. Adelaide Brighton, L'Oréal and some smaller deals are not included as information on their offtake sizes are not available.</p> <p>The GWh reflects the estimated annual offtake size.</p> <p>We do not have visibility of the ratio of electricity to LGCs contracted under the PPAs, nor do we track whether LGCs contracted through the PPAs will be sold or voluntarily surrendered.</p> <p>Listing based on year of contract announcement or, if available, year in which executed.</p>
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Source: Energetics

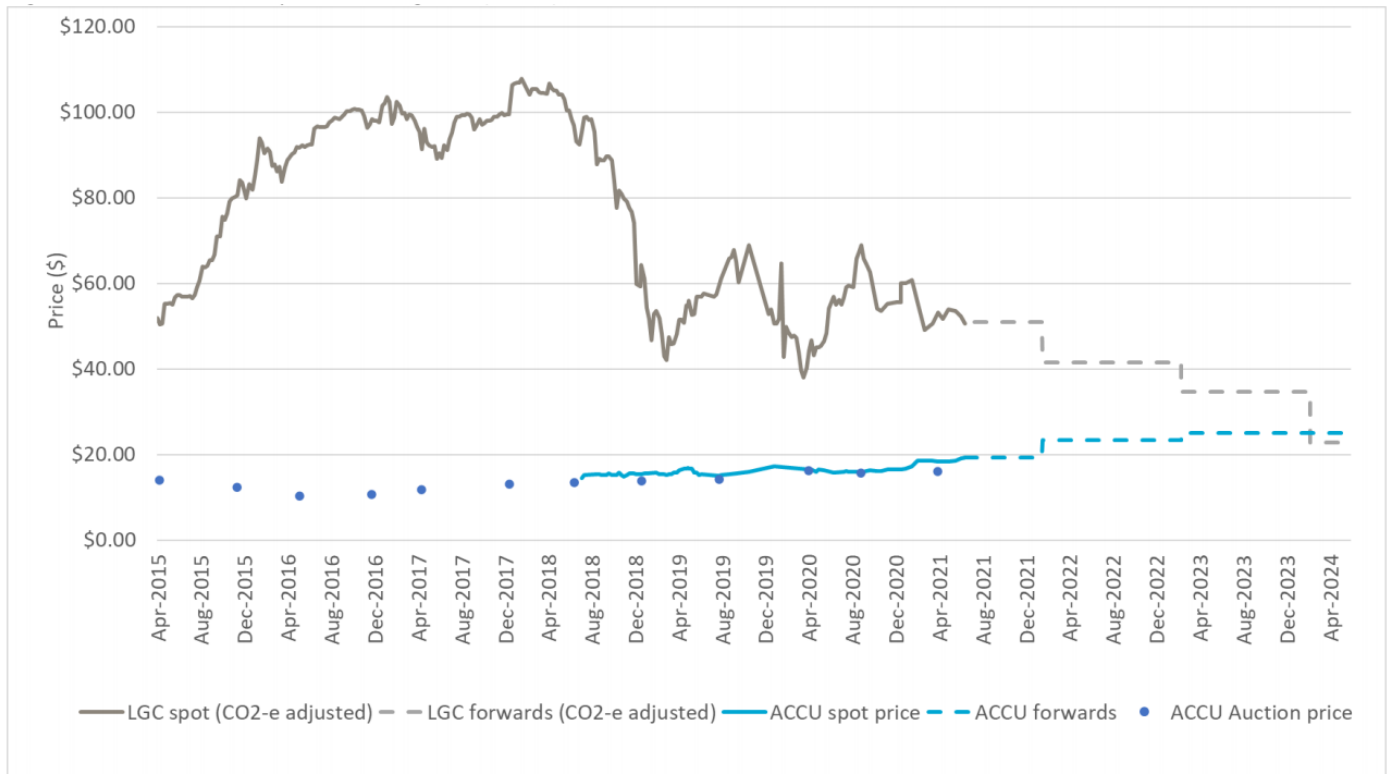
For corporates looking to purchase power on long term contracts, renewable energy PPAs have offered attractive prices compared to the spot market. It has allowed corporates to effectively acquire LGCs for no/limited incremental cost. Thus, entering into corporate PPAs can be a low cost source of carbon abatement.

In Infradebt's view, interest in carbon abatement and, hence, voluntary surrender demand over and above the RET, is likely to remain strong. This will arise both through international/national climate targets (and in this context the pressure will be on Australia to lift its ambition) as well as from corporates unilaterally adopting net zero goals (and, effectively, adopting a higher target than the minimum implied by Australian law).

LGCs are not directly analogous to carbon abatement or emissions. Carbon abatement of renewables will depend on what is displaced – if one extra MWh of renewables displaces one MWh of coal then this saves approximately one tonne of carbon. If one extra MWh displaces 1MWh of gas fired generation then this saves 0.4-0.6 tonnes of carbon.

However, in simple terms, in a world of \$25+ carbon prices it is not internally consistent to expect LGC prices to fall to zero. There should be some on-going consistency with the implicit price of carbon in electricity markets – which is

what LGC prices are signalling – and the economy wide (or international price of carbon). This has the potential to act as a floor on LGC prices in the second half of the 2020s.



Source: Clean Energy Regulator