

Introduction

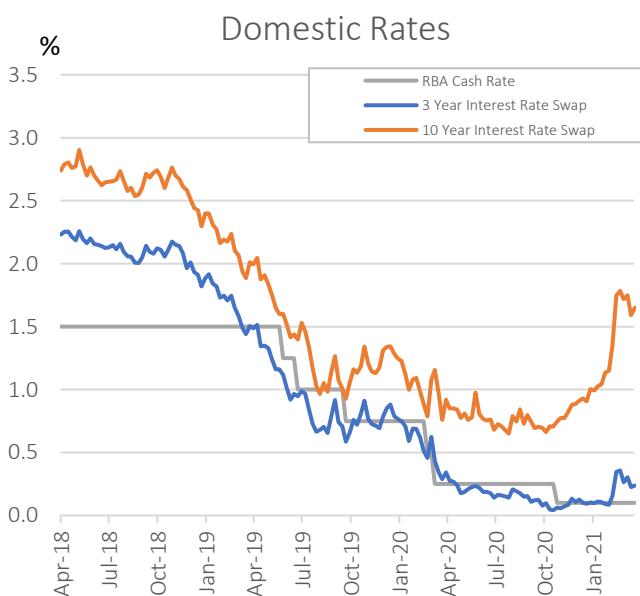
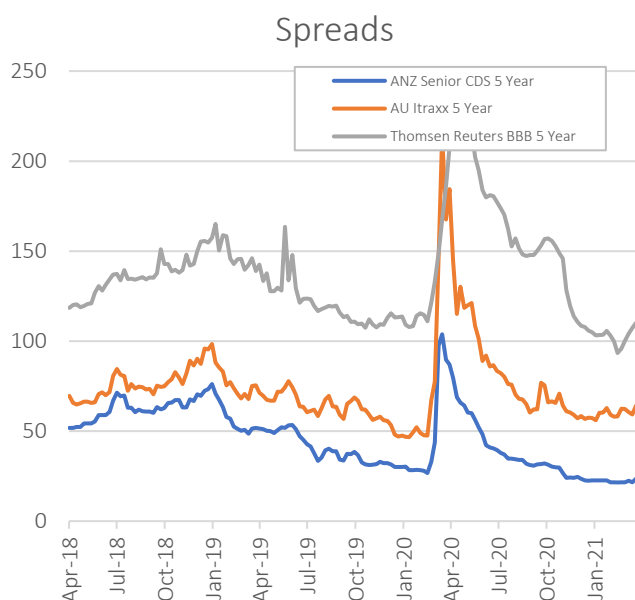
As we passed the one year anniversary of the outbreak of Covid-19 during the quarter, markets have switched their focus to the period ahead and are largely optimistically looking forward to a return to “normal”. This has seen bond yields rise sharply on the back of concerns regarding inflation (or at least an end to super accommodative monetary policy). In the context of the decline in yields over the last decade, the move is modest. However, it is a reminder to owners of long-duration assets, such as infrastructure, that base rates aren’t always a one way bet.

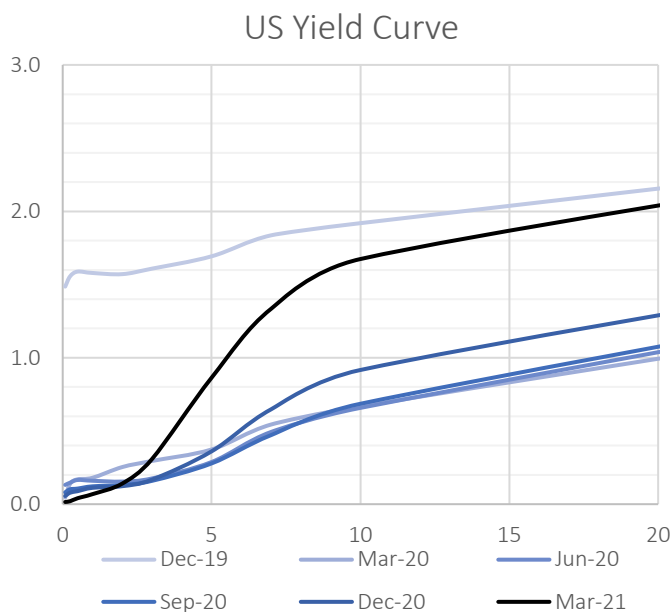
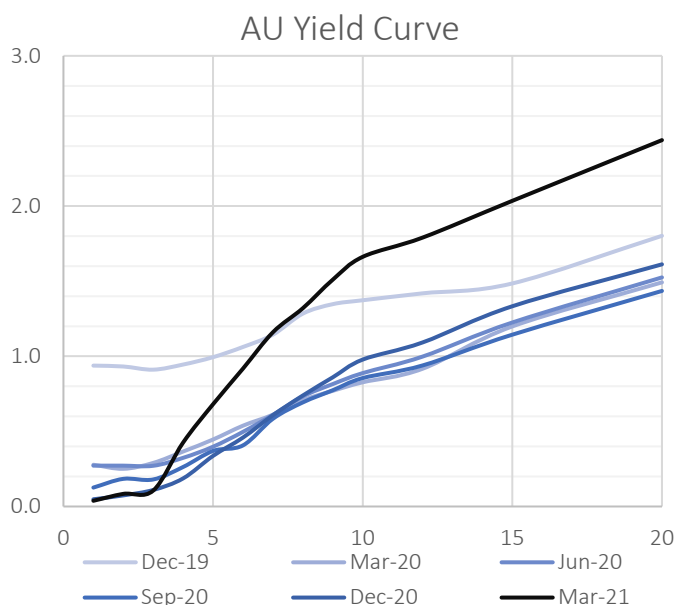
This quarter we take a look at the divergence in EBITDA multipliers amongst core listed infrastructure on the ASX. The second article is an assessment of electricity use in the bitcoin ecosystem. We end the newsletter with some deep analysis on easter egg hunts. Happy easter!

Markets update

This quarter we experienced significant interest rate volatility. The yield curve has started to twist with the long end rising dramatically. The 10 year Government bond has risen from 1.00% to 1.65% in Australia and 0.90% to 1.70% in the US. Rates at the long end of the curve have risen close to 1% from the October 2020 lows. Markets have been pricing in higher expected inflation and policy rate rises as the timeline to normalcy becomes more certain. These expectations are being reflected at the Fed with more members increasing their expectations of future rates in the last “dot plot”.

In broader listed markets high duration “growth stocks” (many seen as beneficiaries of the pandemic) have sold off where as “value stocks” (that have been hit by the pandemic) have rallied. Our assessment is that markets are in a transitory period grappling with when central banks will return to a more neutral monetary stance against vaccine efficacy and what looks like a third wave of infections climbing across the world (and as we write today, Brisbane has been put back into lockdown – a local hit to confidence).





New issuance and refinancing

Date	Borrower	Instrument	Size (\$m)	Term (Yrs)
January	Loy Yang B	Loan	480	5 & 7
January	Eastern Goldfields Prison PPP	Loan	200	18
January	Metz Solar Farm	Loan	140	5
February	Ausgrid	Bond	400	5
February	Ingenia	CEFC	75	
February	Transgrid	Loan	600	5
February	New England Solar Farm	Loan	212	5
February	Scape Student Accommodation	Loan	340	1.5
February	Neoen Victoria Big Battery	CEFC	160	
March	Westconnex	Bond	650	10
March	APA	Bond	2,100	8/12/15
March	Ausnet	Hybrid	1,085	60
March	Cherry Tree Wind Farm	Loan	195	3
March	Footscray Hospital PPP	Loan	1,771	7
March	Vocus	Loan	2,000	

Equity and other news

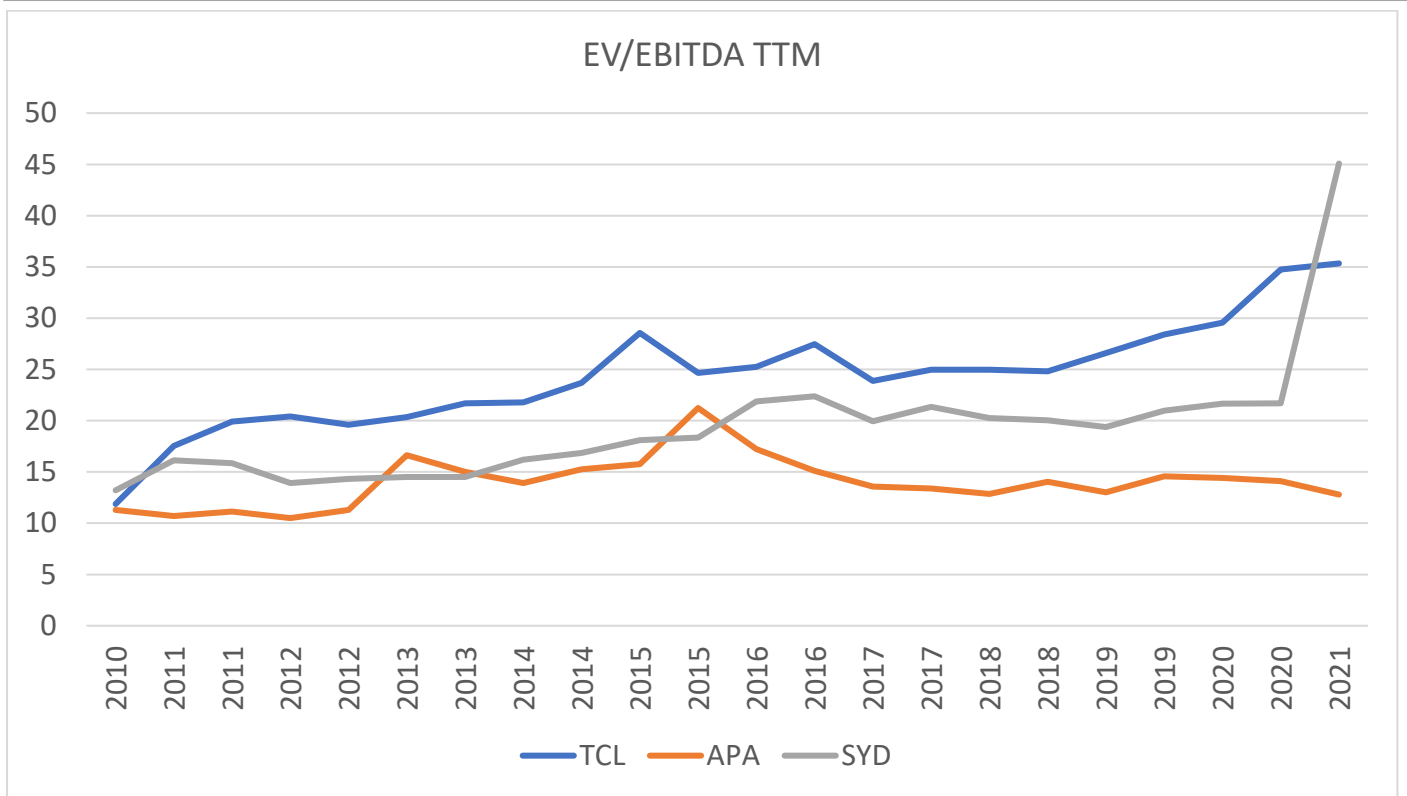
- Mercury and PowAR (formerly called PARF) have entered a scheme of arrangement to acquire Tilt Energy (ASX:TLT) for NZD \$7.80 per share. Mercury will acquire all of the New Zealand Assets and PowAR the Australian assets. Mercury is a New Zealand electricity generation and retailing company. PowAR is a partnership between AGL, QIC and the Future Fund focused on Australian renewables. The bidders view Tilt as a platform with a renewables development pipeline of 3.5 GW as well as 836 MW of existing wind generation.
- Vocus Group (ASX:VOC) has received a \$3.4 billion takeover offer from Aware Super and MIRA. The offer is \$5.50 per share and represents a 25.6% premium to the pre bid price. Vocus is a specialist fibre and network solutions provider. They own a 30,000 km fibre network including a 2,100 km submarine cable connecting Australia to Indonesia and Singapore.
- Energy Australia have announced they will shut down the Yallourn Power Station in mid-2028 (four years ahead of schedule) and replace it with a 350 MW battery by the end of 2026. Yallourn is a brown coal power station and provides about 22% of Victoria's electricity and about 8% of total NEM load. All coal fired generation has been struggling with sharply lower electricity prices over the past year.
- Genex Power has raised \$90 million at \$0.20 per share alongside a \$25 million additional investment from J-Power. The capital raise will allow Genex to reach financial close on the 250MW Kidston Pump Hydro project which is projected to cost \$909 million. The pump hydro project has a long-term offtake agreement with Energy Australia as well as Government funding from NAIF and ARENA. Other operating projects in the portfolio include the 50MW Kidston Solar Farm and the 50MW Jemalong Solar Farm.
- AGL have announced an intention to demerge their retail and generation businesses. The exact terms of this aren't completely clear, and will be subject to shareholder approval in June. However, the initial indication is there would be a separation of AGL's retail business (so called New AGL) and its generation assets – both coal fired as well as AGL PPA backed windfarms (which would be called Prime Co).

Stranded assets?

We previously wrote in our September 2020 newsletter about the differences in interest rate sensitivity between perpetuities and annuities. An interesting follow on is whether Australia's listed infrastructure assets exhibit valuations that reflects the expected useful lives of their underlying assets.

The following is the trailing twelve-month enterprise value to EBITDA ratios over the last 10 years for three of Australia's listed infrastructure companies – Transurban, Sydney Airport, and APA. At the end of 2009, Sydney Airport (then called Macquarie Airports) divested its stakes in Copenhagen and Brussels airport and became the 100% owner of Sydney Airport. From this point onwards these three assets are a pureplay on quality domestic infrastructure and traded between 10-15x EV/EBITDA a bargain compared to today! Since then, each of the three assets have taken a different path with respect to their valuation.





Transurban has been a market darling for some time now. Its trailing valuation has steadily risen during the period to sit at 35x EV/EBITDA today. This is due to a combination of factors ranging from attractive toll road concession terms which provide virtually locked in above inflation growth, smart toll road acquisitions (including acquisitions out of receivership), and a pipeline of augmentation projects, as well as greenfield projects (eg. Westconnex). Today they are the dominant Australian toll road operator and are a formidable party to bid against in any greenfield road project. Such is the extent of their dominance, it is now difficult for Governments to entice bids from alternative consortiums! The majority of concessions end between 2050 to 2060. This is 30-40 years of cashflows with both growing volumes and higher than inflation toll escalation. The higher valuation multiple is probably justified given the potential to extend this 30-40 years even further through augmentation and greenfield projects. Put it another way, in 2019, Transurban negotiated an extension of tolls on Citylink from 2035 to 2045 as part of funding for the West Gate Tunnel project – who wants to bet me a bottle of wine that Transurban doesn’t hand Citylink back to the State for \$1 in 2045?

Sydney Airport is another quality infrastructure asset that grew to around 22-23x EBITDA before the pandemic hit. Obviously, Covid has been catastrophic to current passenger numbers. Sydney Airport has a similar growth profile to Transurban, however, there are some limitations to passenger growth due to regulations that limit the number of aircraft movements to 80 per hour and only between 6am to 11pm. Under the dual till approach landing charges are lightly regulated and all other revenues such as carparking and retail are largely unregulated. Unlike Transurban, there are no brownfield or greenfield acquisitions. The concession with Government ends in 2097 which means this is effectively a perpetual type of investment and indeed is priced as such with a low 20s EBITDA multiple valuation.

APA Group is the third listed core infrastructure asset listed on the ASX. Over time the valuation of APA has stayed the same with a mid-teens EBITDA multiple valuation. Considering the fall in base rates over the last 10 years, the valuation has gone backwards today relative to 2010 when adjusted for base rates. APA has acquired a few assets over the years and even diversified into renewable energy with various solar and wind farms in the portfolio (albeit they are immaterial in terms of the value of the total business). The market however has looked less favourably on APA compared to Transurban and Sydney Airport.

Gas usage is declining in Australia and across the world. Many new homes today are being built without a gas connection (including those of Infradebt employees). Heat pumps are four times more efficient than instantaneous gas for both domestic water use and for hydronic heating. Likewise, induction cooktops deliver over 90% of electrical energy as instant heat where a gas cooktops only convert 40% energy to heat and it also takes time to heat up. For the household, it is a no brainer to switch to an all-electric house even when putting aside the environmental benefits and the ability to couple with rooftop solar. In industrial applications, heat pump technology is getting closer to reducing the need for gas for heating in applications that involve relatively low levels of heating (eg pasteurisation processes or drying of product).

In the electricity grid, renewables are displacing base load gas plants and eventually batteries will replace peaking plant. We are less confident there will be a role for gas outside industrial applications. It could be possible that gas pipelines are used to transport gas blended with hydrogen. But this is dependent on hydrogen becoming much cheaper over time, and of course adopted for various application (eg heavy vehicle transport or aviation etc)

While there has been talk of repurposing natural gas infrastructure for the transportation of hydrogen this appears to be hot air (sorry, couldn't help myself). The reality is that pressurised hydrogen in steel pipelines causes 'embrittlement' (ie pipeline degradation) at anything other than very low percentages (eg over 10% hydrogen). No doubt there are solutions to this problem, but they are not costless.

At a 13x EBITDA multiple (and base rates near zero) the market is implying that the gas assets of APA are not perpetual in nature. The market is probably pricing in around a 20 year remaining operating life. Our view is that the market is probably correct even when ignoring the value of carbon reduction.

Bitcoin and electricity

Lots of people have opinions on Bitcoin and whether it is or isn't a good investment, whether it is a tail-risk hedge asset or not, or whether it is just a massive speculative frenzy. However, in this newsletter we try to share insights, not just opinions. That is, opinions on things we actually think we know something about. Thus, while I have an opinion on Bitcoin, I won't bother sharing it.

Investment merits to one side, Bitcoin is interesting from an electricity perspective. As electricity prices have collapsed over the last year or two, under the torrent of new zero marginal cost renewables entering the market, a key thing that many electricity investors are hoping for is increased electricity demand. While electric vehicles may deliver this in time – this is 5-10 years away and not much help for a struggling generator today.

What if Bitcoin was the answer! Then at last this craze would be good for something (sorry that was just an opinion leaking out).

Let's dig into this in a bit more detail.

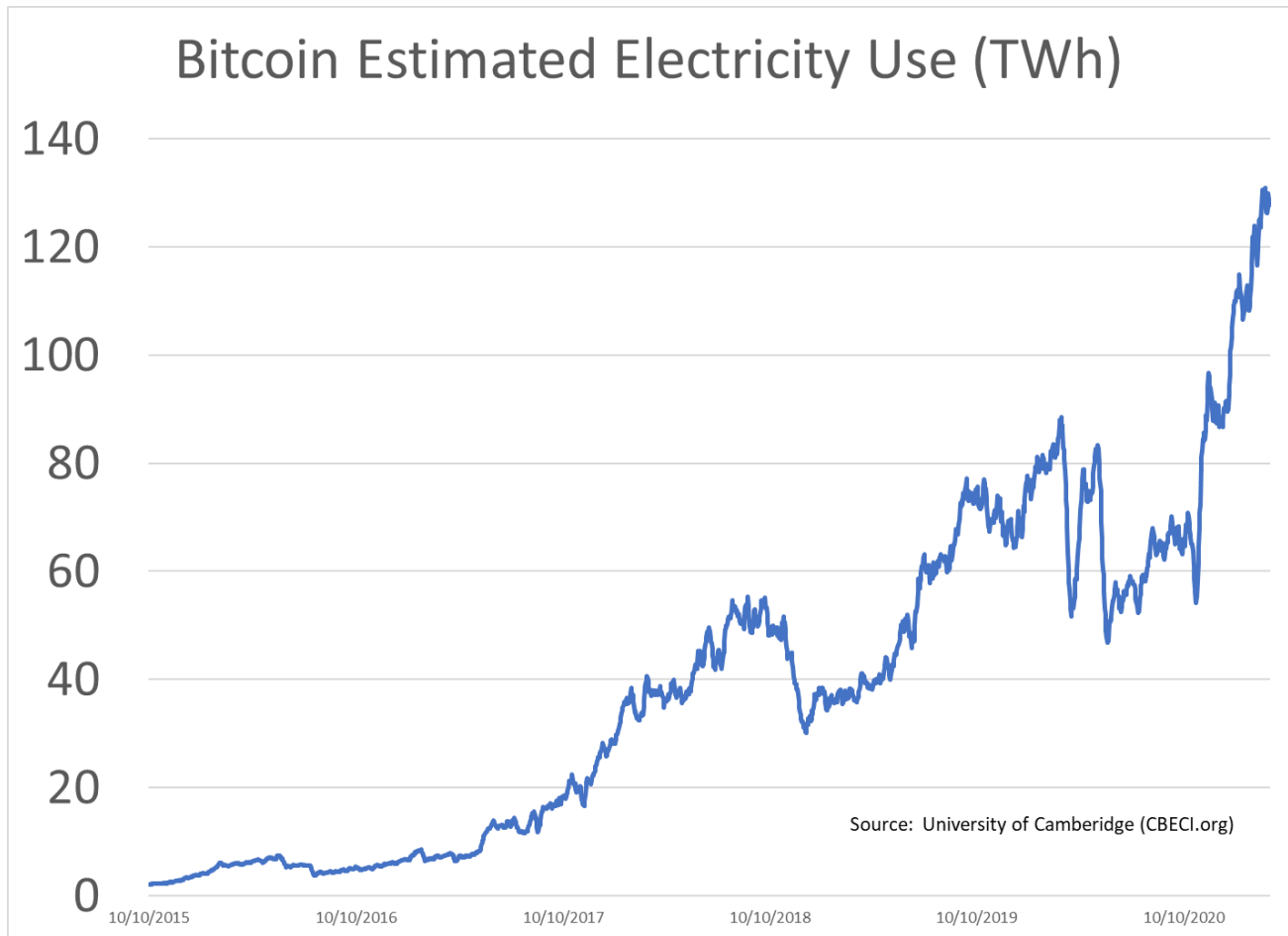
Bitcoin, as with all proof of work block chain cryptocurrencies, works through the efforts of a distributed network of "miners". These miners are networked banks of computers that work to verify transactions occurring in bitcoin and, in this context, validate who owns each bitcoin at any point in time (and the transactions that give rise to that). In exchange for this service, miners are paid in bitcoin. That is, each time a miner solves a "Hash" (the complicated mathematical problem that acts as the encryption) it gets issued a quantity of free bitcoin. This free bitcoin is payment for the services of keeping transactions secure.

The rub with this process is that the price of bitcoin has become so high, that the 6.25 bitcoins you currently get issued to solve a hash is currently worth around \$450,000. This is a big reward, and incentivises a large number of parties with thousands of server banks around the world to compete to earn this revenue.

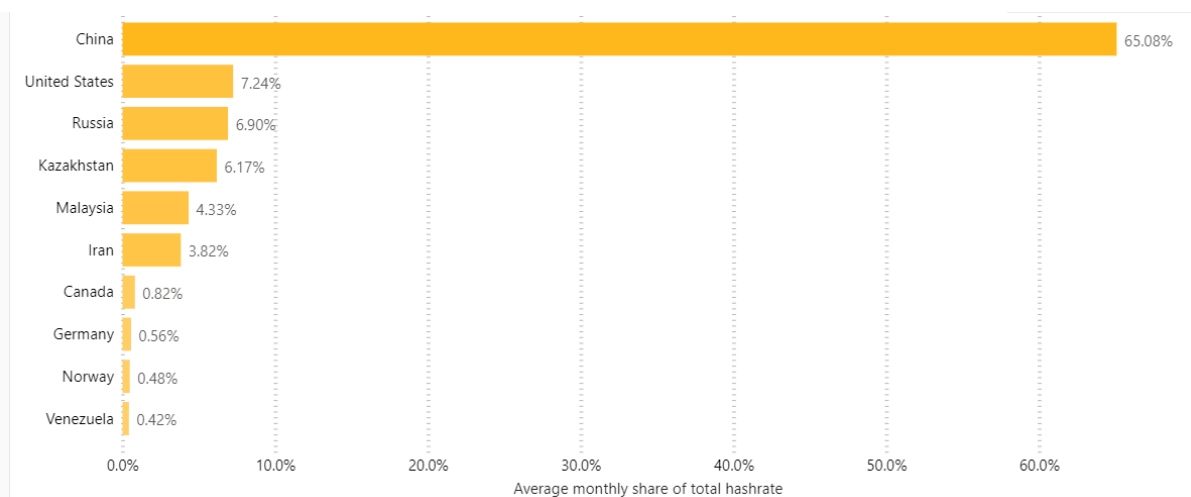
The University of Cambridge has tried to estimate the current amount of electricity used by miners (see below). It is a staggering 130 TWh per annum. To put that in perspective, total usage in the National Electricity Market (all of



Australia other than WA and the NT) is approximately 200 TWh. That is, bitcoin is currently consuming around two thirds of the power of the entire NEM.



Tragically for Australian generators – not much of the mining happens in Australia. The folks at University of Cambridge also analyse the location of mining activity (see below). You can see that mining disproportionately occurs in China as well as few other places.



Source: University of Cambridge (CBECL.org)

One of the team at Infradebt’s father is a metallurgist who used to work in the Aluminium industry. Aluminium is sometimes referred to as solidified electricity – reflecting the vast amounts of electricity used to turn bauxite into aluminium. Well perhaps bitcoin should be thought of the same way. Bitcoin is a way of turning electricity (and a bit of spending on servers) into money (assuming you sell the mined bitcoin for real money).

At today's prices, bitcoin perhaps consumes something like 0.5% of global electricity production. If prices rise further, let's assume it goes up by another factor of 10 from here (simply repeating the experience of the past year), this will incentivise a 10 fold increase in electricity consumption by miners. That is, in this state of the world, bitcoin (and the other cryptocurrencies) would be consuming as much electricity as the world spends on lighting (lighting is around 6% of total electricity consumption in the US in 2020). Whether this seems like a good idea or sustainable, I will leave to you.

But what about Australia. We are an energy superpower – with our exports of coal and LNG – and we can be an electricity superpower given Australia's abundant wind and solar resources (and in the interests of disclosure I should note that I am a director on Suncable). Should Australia think it could dominate the Bitcoin mining industry?

While the economics of Bitcoin mining turn on access to cheap electricity. I would say from the list of countries in the top 10 Bitcoin mining locations (see chart above) that there is more to it than that. While some of these countries have cheap electricity – who knows what electricity prices are in Venezuela (I am sure they are cheap in USD but are probably crushingly expensive in Bolivar). The mix of countries suggests that capital controls, risk of expropriation, currency debasement and exposure to international financial market sanctions are important drivers of the decision to establish a bitcoin industry (with apologies to Norway, Germany and Canada who also appear on the list). Thus, even if Australia dominated the rest of the world in electricity costs – which is something I think we can do – it doesn't mean that the Bitcoin miners will flock to setup shop here.

In summary – Bitcoin is an impressive piece of modern alchemy. It is a way of turning electricity into money (or something that might be like money – depending on your opinion). However, it is important to remember it is a one-way trip – you can't turn it back.

Easter egg hunt

Its Easter, so let's start with a tale of an easter egg hunts.

Imagine an easter egg hunt where each participant (child) has to contribute 10 easter eggs, they are hidden by an omnipotent gamemaster (parent), and then all participants are released to search for eggs and get to keep all they find.

What is the optimal strategy in this game?

Assuming the eggs are randomly hidden, the optimal strategy is to search for eggs where few participants are searching. If you search where others are searching, any eggs found will need to be shared amongst a large number of searchers and you will end up the loser.





Nice story – but what’s this got to do with investing!

Investing is a competitive search game. We are all trying to find undervalued opportunities that will deliver attractive returns. We compete against other players to secure these opportunities.

As any participant in an infrastructure bid process would know, this competition has direct impact on the long-term returns these investments realise. The more you are forced to compete, the more you will tend to adopt more aggressive base case assumptions (even, god forbid, assumptions that prove optimistic and aren’t realised) as well as more aggressive debt financing and exit assumptions.

Competition leads to lower returns!

Where is the most competition at the moment? I would say the most competition is for superannuation funds looking to invest in mid-risk assets with 7-10% IRRs – preferably dominated by long-term cash flows.

As risk free rates have collapsed (who wants a 1.5% return on their bond portfolio) and listed equities look pretty expensive (and the expected returns that feed into a lot of SAA models are based on a fixed premium above risk free – implying listed equity returns in the 4-6% per annum range), SAA optimisers are gorging on these mid-risk high return asset classes (eg infrastructure equity, defensive alternatives, etc).



Often the higher return of these asset classes is justified by an illiquidity premium. That's fine, illiquidity is an unattractive trait and investors should ask for higher returns to compensate. But illiquidity also means that if lots of people are trying to allocate to this asset class, then prices will get bid up! It is a mathematical certainty that higher prices equals lower future returns.

I would argue this means the illiquidity premium for in vogue asset classes is likely to be much lower than enjoyed in the past.