NEM RISK BULLETIN

LIFE AFTER RET: WHAT IS THE FUTURE OF RENEWABLES?

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Life after the RET: What is the future of renewables?

Australia's world record pace of renewable energy installation is continuing. The latest update from the Clean Energy Regulator this week affirmed Australia's world record pace of renewable installation set a new personal best in 2019.

In 2019 6.3 GW of new renewable generation was installed: 4.1 GW from large scale wind and solar projects, and another 2.2 GW from sustained growth in distributed rooftop solar PV. This is a 24 per cent increase on the previous record rate of installation set in 2018.

2019 may very well be the high water mark given the multiple headwinds facing renewable developers in the immediate future. The main leading indicator of renewable development, the scale of new utility projects reaching financial close, fell dramatically from 4.4 GW in 2018 to 2GW in 2019. Projected generation has also been scaled back because of slowing project development and rising system constraints. The renewables market is cooling.

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The RET is ending

The Renewable Energy Target was legislated in 2009, adjusted in 2015 and "ends" at the end of 2020. It was a scheme designed to support development of renewables by providing a subsidy for each megawatt hour of renewable generation produced, paid for by consumers through their retailer.

The value of this subsidy is set by a trading scheme for certificates and has varied over the life of the scheme. When renewables were in undersupply (like around 2017) then they nearly hit their operational maximum price of around $90 per MWh. As world record supply has come on, the value of the subsidy has fallen to around $39.

At the end of 2020 the RET scheme plateaus for 10 years, meaning there is no increase in certificates required. What this means in practice is the scheme will soon be heavily oversubscribed, and the value of the certificates will continue to ease until they reach zero. This has been an important revenue stream for renewables projects, even though the cost of building large scale wind and solar has fallen. There is no appetite from the Federal Government to extend it.

Grid constraints

The electricity grid was built in the 20th century to connect large thermal generators to large load centres: cities, towns and big industrial facilities. This is less than ideal in the 21st century when increasing amounts of generation are coming from more remote parts of the network from wind and solar farms.

Electricity generators are paid not on how much they produce, but how much electricity gets to the consumer. This is calculated using Marginal Load Factors (MLFs) which adjust generation by how constrained the network is between the power supply and the load. This system has been in place since the creation of the National Electricity Market (NEM).

MLFs further discount the value of generation when more generators try to squeeze on to the same part of the constrained grid. One of the consequences of having a world record rush to build renewables in a constrained network is that some of the projects are now being hit by high MLF values. For a surprisingly large number of renewables developers, the application of loss factors has come as a bit of a shock. We have produced a briefing paper on MLFs here.

This is at least partly solved by upgrading transmission to these regions, which is one of the ideas at the centre of the Integrated System Plan (ISP) developed by the Australian Energy Market Operator (AEMO). But someone still has to pay for these multi-million dollar transmission lines.

Negative prices

The two most challenging technical features of renewables generation at scale are intermittency and correlation. Both wind and solar only generate some of the time, while the grid needs energy all of the time. Solar generation is highly correlated: all the solar across the NEM produces at the same time. Wind is more stochastic, but according to analysis done by Global Roam, is still positively correlated across south-eastern Australia.

Increasing solar generation is increasing supply during the middle of the day, irrespective of demand, leading to falling wholesale prices and even increased incidence of negative prices. While this may sound great for consumers, its bad news for developers of solar projects who need to get a return on their investment. In its recent quarterly report AEMO estimated that renewables were on average curtailed by 6 per cent across the NEM caused by network constraints and negative prices.

Negative prices are reversed by increasing demand during the middle of the day. This can be done by increasing the flexibility of demand (like turning hot water system on during the day rather than at night) and storage at sufficient scale to soak up and store surplus electrons. You can also close coal fired generators, but without replacement firm capacity that poses problems during demand spikes and evenings. Without concerted efforts to mitigate this, increased renewables will only increase the frequency and duration of negative price events in the future.

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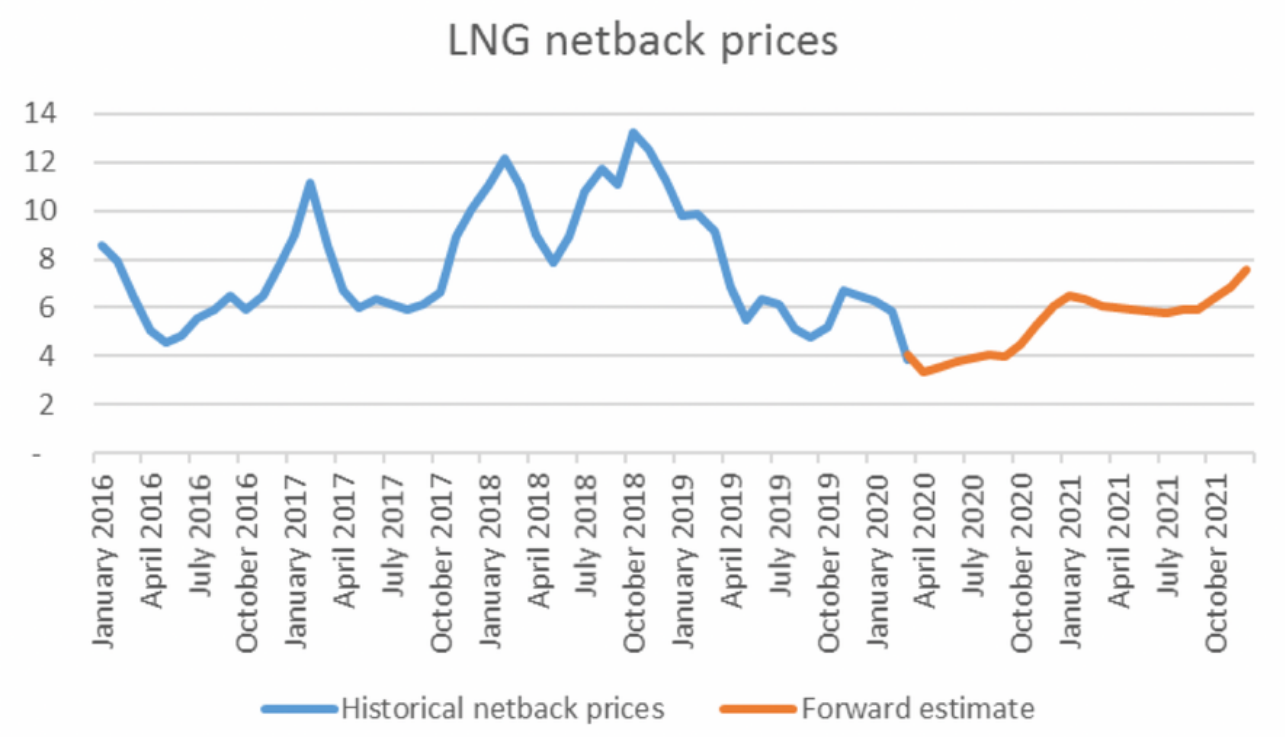
Can the Coronavirus save Australian manufacturing?

A perfect storm of slowing economic growth, mild winter temperatures and the short-term impact of the coronavirus on Asian economies has contributed to a slump in gas demand from the east Asian powerhouses of Japan, Korea and China. This has seen LNG spot prices for March delivery dip below $US3/MMBtu, well below long-term contract prices for gas in Asia (around $US8.50/MMBtu, which track the Japanese crude oil price index. These prices translate to A$4.23/GJ and A$12/GJ respectively. The spot price is also well below where it was a year ago.

As Australia is a supplier of gas to Asia, then spare gas should be available cheaper at the main supply hub in Wallumbilla than in the buyer countries, because there is no need to allow for costs of liquefying and shipping the gas (though if a domestic buyer is not located in Wallumbilla they will have to also pay the pipeline costs to get it from Wallumbilla to where they want it). This is known as a "netback price" and an indicative netback price is published by the ACCC.



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According to the ACCC, the decline in spot prices should translate to local spot prices of around $4/GJ or less over the next few months. This is comparable to prices before the LNG industry linked east coast prices to international trends. As countries such as India are reportedly buying up as much LNG as they can at these bargain basement prices, can Australian industrial customers also make the most of the regional glut of gas? Up to a point, yes, there is likely to eb some cheap gas available for a while. But here come the caveats...

The ACCC's netback price is a benchmark, not a guaranteed price

The ACCC has developed its netback pricing series as an indication of the price it believes gas should fetch at Wallumbilla in a perfectly competitive market. It's also dependent on assumptions where are reasonable, but still assumptions about transport cost, liquefaction cost and efficiency and future exchange rates. Its latest monitoring report (Gas inquiry 2017-2025 interim report, January 2020) observes that "domestic price offers have not fallen in line with expected LNG netback prices for 2020".

Spot prices are not contract prices

Most gas users would be looking to buy a steady flow of gas over a longer time period (multiple years). Spot prices are prices for a point in time. A multi-year contract should be priced according to expected gas prices over the duration of the contract. As chart 1 shows, by October 2021, netback prices are expected to be back up around the A$8/GJ mark.

Australia has no import capacity

Australian gas users can not currently take advantage directly of low spot LNG prices as there is no way of getting gas on a ship back into the onshore pipeline network. Three potential import terminal projects have been announced with AIE's Port Kembla project the furthest progressed.

Gas producers have an opportunity cost

The coal seam gas (CSG) to LNG projects that are the most likely source of surplus gas do not necessarily simply have to dump gas on the market if their major customers decline to take their full complement of gas. Because CSG supply is made up of hundreds of small wells from a given field, producers are able to control the overall supply to some extent.

So, they consider they can get more value from the gas by leaving it in the ground until prices recover. They will have to weigh this up against the risk of being more heavily regulated if they are seen to be sitting on gas that could be released into the domestic market.

There is a clear contrast with the US gas market. There, much of the gas is a by-product from liquids-rich shale gas, and so producers don't have much choice but to dump it on the market. This dynamic has helped keep US gas prices low.

Buyers still have to transport the gas to where they use it

Even assuming a buyer can get a good deal for gas at the Wallumbilla hub, then unless their factory is also at Wallumbilla, they have to back that up with contracts to transport the gas to where they want it. This may involve negotiating with more than one pipeline operator. As well as adding extra expense, there is limited liquidity in the pipeline capacity market. The ACCC reports that recent reforms to implement a capacity trading platform and a day ahead auction of unused capacity have had "a positive effect on the market" but that "some facility operator charges may deter trade".

The record low prices may not last that long

As one energy analyst put it "the cure for low prices, is low prices". These low prices will stimulate demand while signalling to suppliers that now is not the time to put more gas into the market. The gas price is set to fall below Asian coal prices for the first time ever (on a $/MMBtu basis), which could spark fuel switching.Conclusion: industrial buyers should "fill their boots" with cheap gas if they can as the prices won't last forever.

07

MLF: no change to the rules

A rule change proposal by Adani Renewables to change the current marginal lost factor regime (MLFs) to average loss factors has been rejected by the Australian Energy Market Commission (AEMC), consistent with its draft decision last November.

MLFs are the NEM's way of accounting for the physical losses that are an inevitable result of transporting electricity over long distances. AEMO allocates these losses through assigning an MLF to each generator (and technically large load) that acts as a multiplier to the spot price. So, if a generator is located at the edge of the grid, a long way from load centres, it will have a low MLF, meaning the spot price it receives is lower than other generators.

The speed of renewables connections, often in weakly connected parts of the grid that happen to have good sun or wind resource, has increased the overall level of losses but also resulted in volatility in annual MLF calculations. The new renewables, especially solar farms, have seen some of the lowest MLFs.

The AEMC's reasons for rejecting the rule change were that a marginal loss factor approach was better at signalling to generation proponents where to locate their projects and that it was more consistent with the marginal pricing approach used in dispatch decision-making and pricing. The final decision did include some tweaks to the rules that give AEMO more flexibility in determining MLFs. The AEMC also rejected a related request from Adani to amend the allocation of intraregional settlement revenue, which arises because the adjustment for losses does not fully net out. Currently, this revenue is used to offset customer transmission charges, but Adani thought some of it should be returned to generators to mitigate the impact of MLFs.

In theory, a dynamic, real-time loss factor calculation would be the most accurate valuation of electricity and promote the most efficient market outcomes. In practice, implementing such an approach would require major change to the NEM and its IT systems and so was not considered a viable option for the rule change process above.

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The decision brought a swift condemnation from the Clean Energy Council, reflecting that it comes at a critical time for the transition of the NEM. The topping out of the RET means that the subsidies available for wind and solar projects are expected to tail off sharply – although state schemes may fill the gap, at least in Victoria and Queensland. Additionally, the practical challenges of rapid turnover of the generation stock and managing high levels of variable renewables are starting to manifest in ways that hit renewables developers/operators' bottom line.

These include:

- the MLF issue above;
- Congestion on the grid that requires them to be constrained off to avoid overloading a transmission line;
- Constraints applied for security reasons;
- spot price discounts due to the fact that renewables output is highly correlated with other renewables of the same type;
- increasing frequency control costs allocated to generators – other generators that can supply FCAS are getting the revenue as well, but few renewable projects are set up for this.

The AEMC notes that ongoing work is likely to deliver some relief in many of these areas. The ISP-guided rollout of transmission will mitigate MLFs and congestion, as will the AEMC's Coordination of Generation and Transmission Infrastructure (COGATI) proposed access model. New solutions are being rolled out for frequency and other security services.

We have produced a briefing paper on MLF's here.