



Queensland Renewables 400: Worth the wait

After a very quiet period where little was heard for over a year, Queensland's 'Renewables 400' energy auction scheme roared back to life this week. The state has announced a shortlist of 10 projects which will now bid for power purchase agreements (PPAs) totaling 400 MW of generation and 100 MW of storage. This is great news for Queensland, which currently has the lowest installed wind and utility solar capacity of any mainland NEM state.

We do not know exactly how the scheme will work yet, as details of the bidding rules and process have not been released. But we review the projects that have made the shortlist, and look at how this development might impact our variable renewable energy (VRE) forecasts used in our price model.

Key takeaways

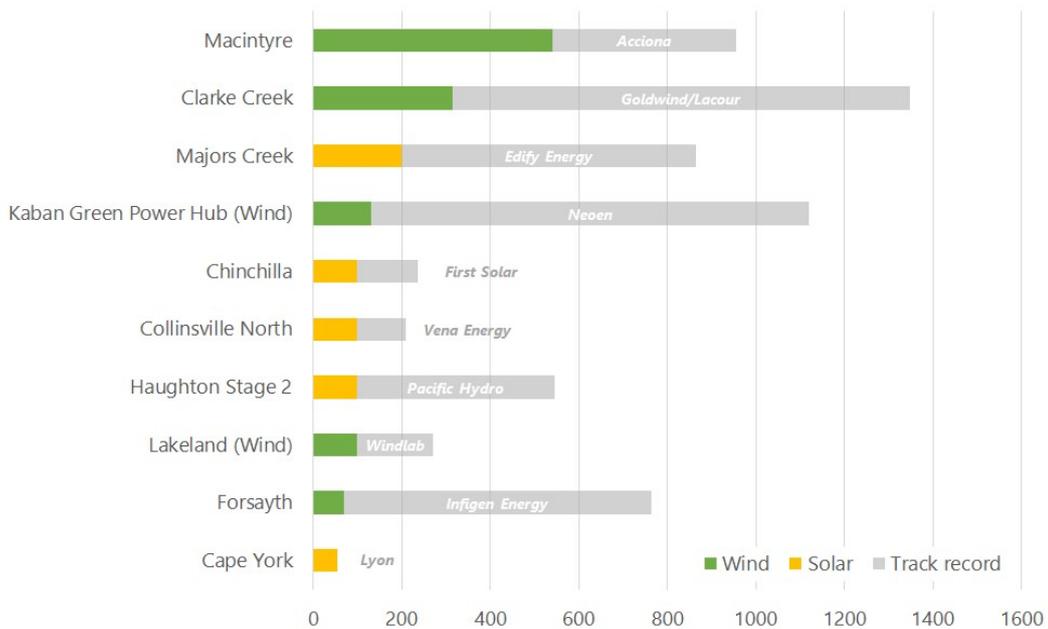
- The 10 shortlisted projects are dominated by wind – over 1 GW of the 1.6 GW total. This is probably due to the still (slightly) superior breakeven prices for wind power, and the stronger outlook for dispatch weighted wind prices in the NEM
- While the target of the auction is 400 MW of generation, we expect more capacity will be built as a result of the process. Developers will be keen to have multiple revenue sources to support their equity returns, so will look to sell additional electricity into the wholesale market or to a corporate buyer
- Our forecast renewable build in Queensland will not change much in response to the auction; we already allocate 500 MW of uncommitted project commissioning over the likely period the winning projects will be built. The exception is if the auction supports much more construction than we anticipate – double the target, for example. It's possible
- Bidding strategies are hard to guess, given the lack of detail around the scheme's design. If it is a simple reverse auction to secure a CfD strike price, we expect wind power to have the advantage. Wind LCOE's are lower, but also face a better wholesale price outlook. Wind developers could bid below breakeven to secure a project win, and cross subsidise their returns with higher wholesale exposure. This is not really an option for solar proponents
- The battery component is the toughest part to estimate. We expect a 4-hour integrated battery could add between A\$12 and A\$28/MWh to a project's breakeven, but it's highly uncertain
- Project location, transmission constraints and MLFs will be key considerations – further reductions in MLFs may be factored into the bids, boosting the price required to make a commercial return
- It has taken 20 months to decide on a project shortlist following the scheme's expressions of interest in 2017. The delay is likely a combination of the complexity of pulling together reverse auctions, and also the establishment of CleanCo, a new state owned energy trader that will own the project PPAs



The projects

The shortlisted projects for the Renewables 400 scheme all come from different developers, and are a mix of wind, solar and battery storage.

Shortlisted projects for Queensland's "Renewable 400" scheme, WM AC



Source: ITK Services

The majority of capacity that has been shortlisted is wind power, at a total of 1.16 GW. Solar capacity totals 475 MW AC by our estimates, and we do not have enough information yet to estimate the size of the battery proposals.

Most proposals come from companies with a track record of developing and constructing projects in Australia. Goldwind (in partnership with developer Lacour) and Neoen each have portfolios of around 1 GW of operating assets in the country. Infigen Energy, Pacific Hydro and Acciona each have major operational portfolios; while Edify Energy and First Solar have both developed significant solar assets which have then moved into operation under different ownership. Vena Energy's Tailem Bend was recently commissioned, providing it with operating capacity in Australia for the first time.

There is some uncertainty around some of the projects – Clarke Creek for example is a hybrid wind, solar and storage project, and we are unsure if the solar component is included for this scheme. And while we have attributed 200 MW to Major's Creek solar farm, we think it has the potential to be bigger.

Background to scheme

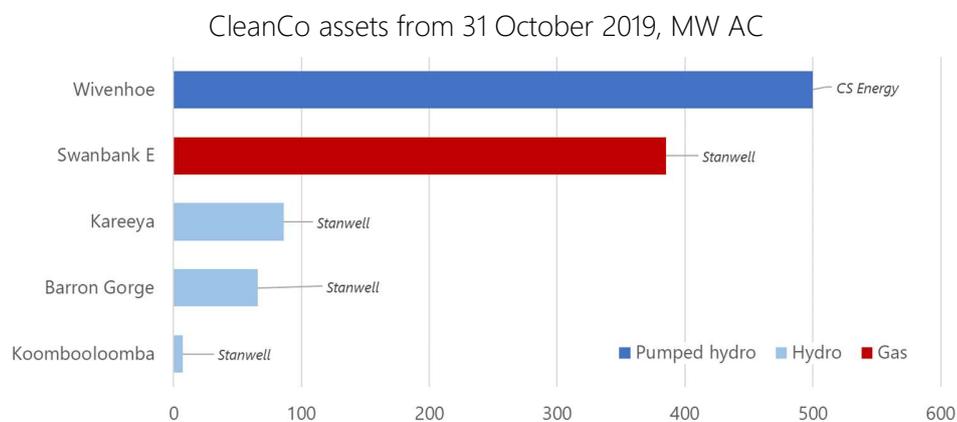
Queensland's Renewables 400 scheme is an action for 400 MW of generating capacity and 100 MW of storage. It was first announced in August 2017 as a core component of the Powering Queensland Plan.



The state government invited expressions of interest from project developers, with a deadline of September 25th 2017, and it attracted 115 proposals from 79 companies.

The EOI deadline was over 20 months ago, so why the wait? Designing the auction scheme can take time in itself, as they can be complex (for example, the successful but mind-bending Victorian renewable energy auction scheme of 2018). But the Queensland proposal has an extra twist: CleanCo.

Also announced in mid-2017, CleanCo is a state-owned energy trading company that will own and operate renewable energy assets (and the Swanbank E gas fired power station). It was finally established in December 2018 and will begin operating on 31 October 2019. CleanCo has a mandate to support 1 GW of new renewable generation in Queensland and this includes owning the PPAs associated with the Renewables 400 scheme.



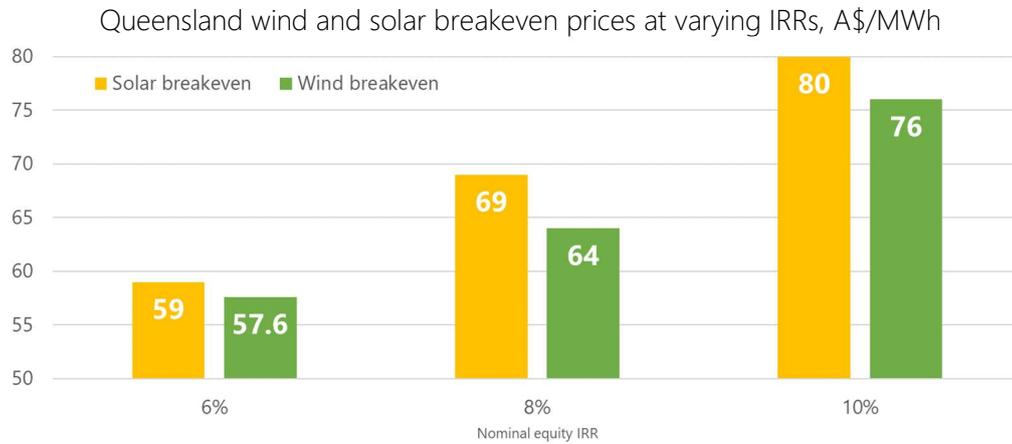
Source: ITK Services

As an active energy trader with a diverse portfolio of generating assets and contracts, CleanCo will be in a position to actively manage the price risks that come with the final PPAs. This seems a more sophisticated approach to state-based renewables procurement than we have seen before. But it is also an additional element of administration that has probably added to the timeline blow out.

No details have yet been released on exactly how the auction will work. It is apparently a reverse auction, so proponents will bid a price at which they are prepared to provide electricity, and the lowest bids will win. We expect it will be on a contract for difference basis – the winning bids will represent the CfD strike price and payments will be made between the project owner and CleanCo depending on the difference between the strike and wholesale spot prices. But it may of course get a lot more complicated than this.

Likely bids

Without knowing the details of the auction process, we're shooting in the dark by attempting to estimate potential winning bids. But on the assumptions that the scheme will be a vanilla reverse auction leading to a CfD contract, our project breakeven price estimates – or LCOE – should be a reasonable guide to the outcomes.



Source: ITK Services

Our wind breakeven estimates remain below solar breakevens, but the gap is now fairly close across all likely IRR targets. (We have made a uniform assumption on MLFs at 0.9).

Second guessing bidding strategies is complicated by how the Queensland auction PPA fits into the broader revenue for each project. Developers may bid into the auction low to secure the PPA and attract finance, while looking for revenue upside by selling some proportion of output into either the wholesale spot market, or on contract to other counterparties (most likely corporate buyers). In our view, this strategy advantages wind projects over solar: we forecast higher dispatch weighted wind prices in future relative to solar, due to more even average wind output through the day and therefore less exposure to the increasingly depressed daylight hours.

So wind project proponents can not only bid low; they may even bid below the project breakeven price in order to win the auction, and cross subsidise by using (assumed) higher value spot sales. Solar developers are more limited in their strategic options. That's not to say developers won't bid below breakeven in an attempt to win, but their assumptions around additional revenue will have to be more optimistic.

But the battery bids are the really tough bit to guess; there are a large number of potential options. Assuming the battery is charged with excess power from an integrated wind or solar farm and therefore has no power purchase costs, we estimate a 4 hour duration battery (e.g. a 10 MW battery with 40 MWh of storage) requires at least A\$140 per MWh to earn an 8% nominal equity rate of return.

On a very simple basis, if a wind farm generates for 20 hours on average per day and charges the battery for 4 hours, and the battery then discharges for 4 hours, this suggests a weighted average breakeven price of A\$77/MWh (at a cost of equity of 8%).

For solar, generating for 6 hours (at differing rates) and charging for 4 hours, most likely in the middle of the day, provides an average breakeven price of A\$97/MWh. While overly simplistic, this again supports our view that wind has an advantage, and is likely to take the lion's share of capacity in the auction.



Transmission network constraints, and marginal loss factors (MLFs), will be a key consideration for the developers that have been shortlisted. The more generation there is in a given area, and the more constrained the transmission line, the more likely it is for a project to have a disadvantageous MLF. The constraints reduce the volume of electricity that is delivered from a project to a node, and low MLFs account for this by reducing a project's revenue.

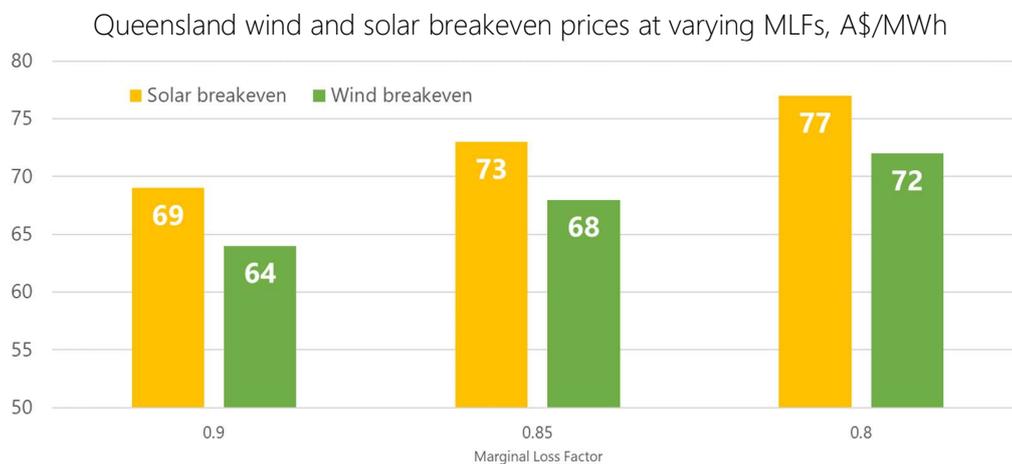
This is of course a hot topic in the Australian renewables sector – it has always been a key issue but the recent boom in wind and solar commissioning has resulted in MLF downgrades that took many by surprise. Lower MLFs mean lower revenue, lower returns and potentially tougher debt servicing.

Four of the shortlisted projects are in Far North Queensland: Lakeland wind farm, Cape York solar, Kaban Green Energy Hub and Forsayth wind farm. And most of the remaining projects are in North Queensland. This will be front of mind for developers as they calculate their potential bids, and may also be a consideration for CleanCo during the decision process. Last but not least, developers of non-shortlisted projects will be watching closely, as their project economics will be impacted by generation of the auction winners.

North Queensland has already been impacted by falling MLFs. In its most recent MLF update in June 2019, AEMO noted that the increase in projected losses (and therefore lower MLF numbers) between North Queensland and the regional reference node (RRN) in Brisbane is greater than for Central Queensland, as a result of more renewable projects coming online in the North, and greater network constraints in the region.

As an example, Kidston solar farm, which is one of few commissioned renewable generators in Far North Queensland, has had its MLF reduced from 1.01 in FY18 to 0.87 for FY20, a reduction of 14%.

Each percentage point drop in MLF requires an equivalent increase in breakeven price by our estimates, suggesting that auction bids should be quite sensitive to expectations around losses.



Source: ITK Services

That eight out of ten projects on the shortlist have associated storage suggests that project proponents see batteries as a primary way to combat this problem. That may not work of course: MLFs are currently fixed for each connection point for each financial year, and even if they were dynamic, if each battery is aiming to discharge at the same time of day, the same problem applies.



An alternative potential solution, although out of the hands of developers, is an increase in regional load. The Copper String project could deliver exactly that. Copper string is a 1,100km transmission line proposal from near Townsville out to Cloncurry, with the potential to expand to Mt Isa and other mining areas. It is currently going through an EIS process at the state government level. If it goes ahead, it would link major mining operations to the NEM, allowing access to cheaper electricity.

Although it's too hard at this stage to estimate what this would do to MLFs, an increase in load greater than an increase in generation should reduce transmission losses, and therefore boost MLFs – and economics – for northern Queensland projects.

That said, we will have to wait and see – under a best case scenario, Copper String is unlikely to be operating before 2023.

Impact on our forecasts

The winning projects are due to be selected in 'early 2020', which is hard to pin down but we take as March 2020 given how these processes have a tendency to stretch out. If we allow a further three months to secure financing (something that has probably already started behind the scenes) then we might expect the first projects to start construction in June 2020. Construction timeframes will vary by project, but on average we see recent solar projects around 12 months to go from the start of construction to full commissioning. Wind farms typically take longer – we assess it is closer to 2 years to construct and commission a large wind asset.

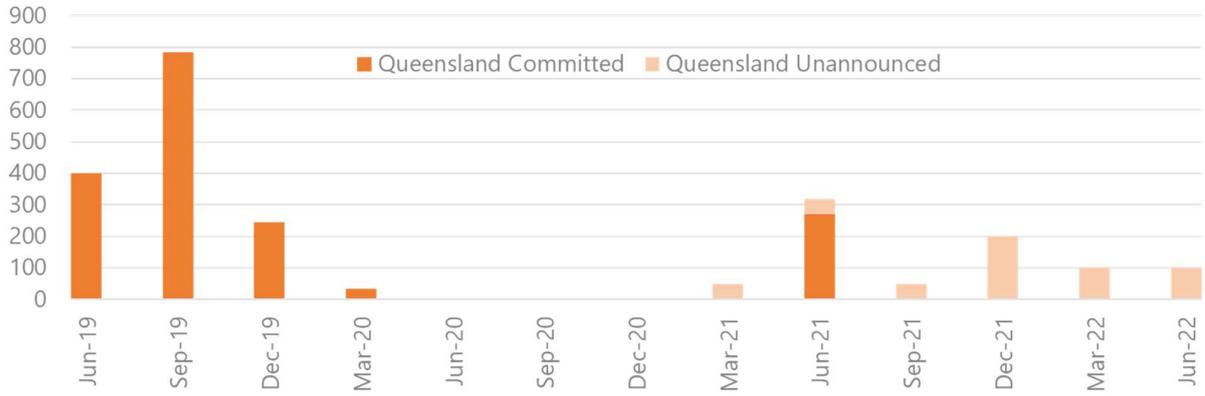
So the successful capacity from the auction will probably hit the market in full between June 2021 and June 2022. But how much will be built?

In Victoria, the facilitated approximately one-third more capacity than targeted. There is no reason to believe that the Queensland auction will provide the same result, but it's likely more capacity will be built than will be supported under the PPA contracts. Faced with compelling bids, CleanCo might decide to procure more than the target. And developers will almost certainly look for multiple revenue channels for each project.

If the Queensland scheme supported an additional 33% of capacity over and above the target, it would provide some 533 MW. This is inline with our commissioning forecasts in Queensland for FY2022, as we allocate 500 MW of as yet uncommitted projects over this period. Therefore if the auction process unfolds along these lines, there will be little impact on our price forecasts. The shortlisted projects remain uncommitted in our database for the time being; the winning projects will secure highly bankable PPAs and we will then update them to be committed.

But the renewable build will contribute to our expectation of falling prices in Queensland – we expect flat load prices to drop by around A\$15/MWh by FY2022 relative to FY2019.

Current renewable capacity commissioning forecast for Queensland, MW AC



Source: ITK Services