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*Via email: [projectmarinus@tasnetworks.com.au](mailto:projectmarinus@tasnetworks.com.au)*

Dear Ms Clark

Thank you for the opportunity to provide feedback on the Project Marinus Initial Feasibility Report of February 2019.

We administer the Renewable Energy Target; as such, we are well placed to comment on renewable energy trends at both a large and small-scale.

The Clean Energy Regulator's submission focusses on one key conclusion in the report (below); we have not assessed the assumptions underpinning that conclusion:

*The benefits of Marinus Link are likely to be greater than the costs when approximately 7000 megawatts of the NEM's present capacity of coal-fired generation retires, which could occur from the mid 2020s (with early retirement) to the mid 2030s (with retirement at the end of design life).*

Additional large renewable energy capacity would be one of several factors that could lead to the retirement of gas and coal generation. With the current mix of rooftop solar and utility-scale wind and solar, a simple analysis would suggest that around 29,000 megawatts of additional renewable energy capacity would be required to replace the generation from 7,000 megawatts of coal<sup>1</sup>.

In our view, this degree of additional renewable energy capacity would require firming (such as could be provided by Marinus Link), enhancement of the transmission system (such as is proposed in the Australian Energy Market Operator's Integrated System Plan) and other innovations in system operation.

Over the past three years to the end of 2018, 8,400<sup>2</sup> megawatts of renewable energy capacity was installed in Australia. Of this, approximately 3,600 megawatts was rooftop solar and 4,800 megawatts was utility-scale wind and solar.

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<sup>1</sup> This calculation assumes a 70 per cent capacity factor for coal and a 25 per cent weighted capacity factor for renewables.

<sup>2</sup> Approximately 86 per cent of rooftop solar capacity and 94 per cent of utility-scale wind and solar power station capacity are installed within the National Electricity Market.

This year we expect around 6,200 megawatts of new capacity or more to be installed comprising:

- 2,200 megawatts of rooftop solar (86 per cent in the National Electricity Market), and
- 4,000 megawatts of utility-scale wind and solar (94 per cent in the National Electricity Market).

Rooftop solar capacity has increased by around 45 per cent each year for the past two years (refer **Attachment A**). This trend is expected to continue into 2019. Rooftop solar is a consumer product and making accurate forward projections is difficult. The growth rate may moderate in future years, however, considering strong state based incentives and declining payback periods, we think this is unlikely in the near term.

The momentum in new utility-scale renewable projects has not slowed substantially despite the fact that the 2020 Large-scale Renewable Energy Target will be met and exceeded (refer **Attachment B**). The current pipeline of projects is almost double what was required to meet the 2020 Large-scale Renewable Energy Target and this has driven a significant fall in large-scale generation certificate prices. The Clean Energy Regulator stated in our 2018 Annual Statement to Parliament (refer **Attachment C**) that we believe the major drivers of new announcements has shifted from the 2020 Large-scale Renewable Energy Target to commercial factors. These include the ongoing appetite for both retailer and corporate power purchase agreements and the material fall in the cost per megawatt for new renewables projects.

Were these trends to continue in the short term, some 18,000 megawatts or more of renewable energy capacity would be added from 2019 to 2021, of which, approximately 16,000 megawatts could be in the National Electricity Market. There are some constraints in the transmission system that may slow those trends; however, there is also a range of initiatives under way that may relieve these constraints.

Predictions of renewable energy capacity additions after 2021 are considerably more uncertain than in the next several years as projects may be affected by several factors that are difficult to predict at this point, including the policy environment that will apply in that period. A plausible scenario is that installations continue at a lower rate than in the current period, but nevertheless, at a rate sufficient to reach the threshold in the report conclusion from the mid-2020s.

If you require further information on renewable energy capacity by National Energy Market region, we would be pleased to assist.

Yours sincerely



David Parker AM  
Chair, Clean Energy Regulator

11 April 2019

Rooftop solar PV capacity 2011 – 2019

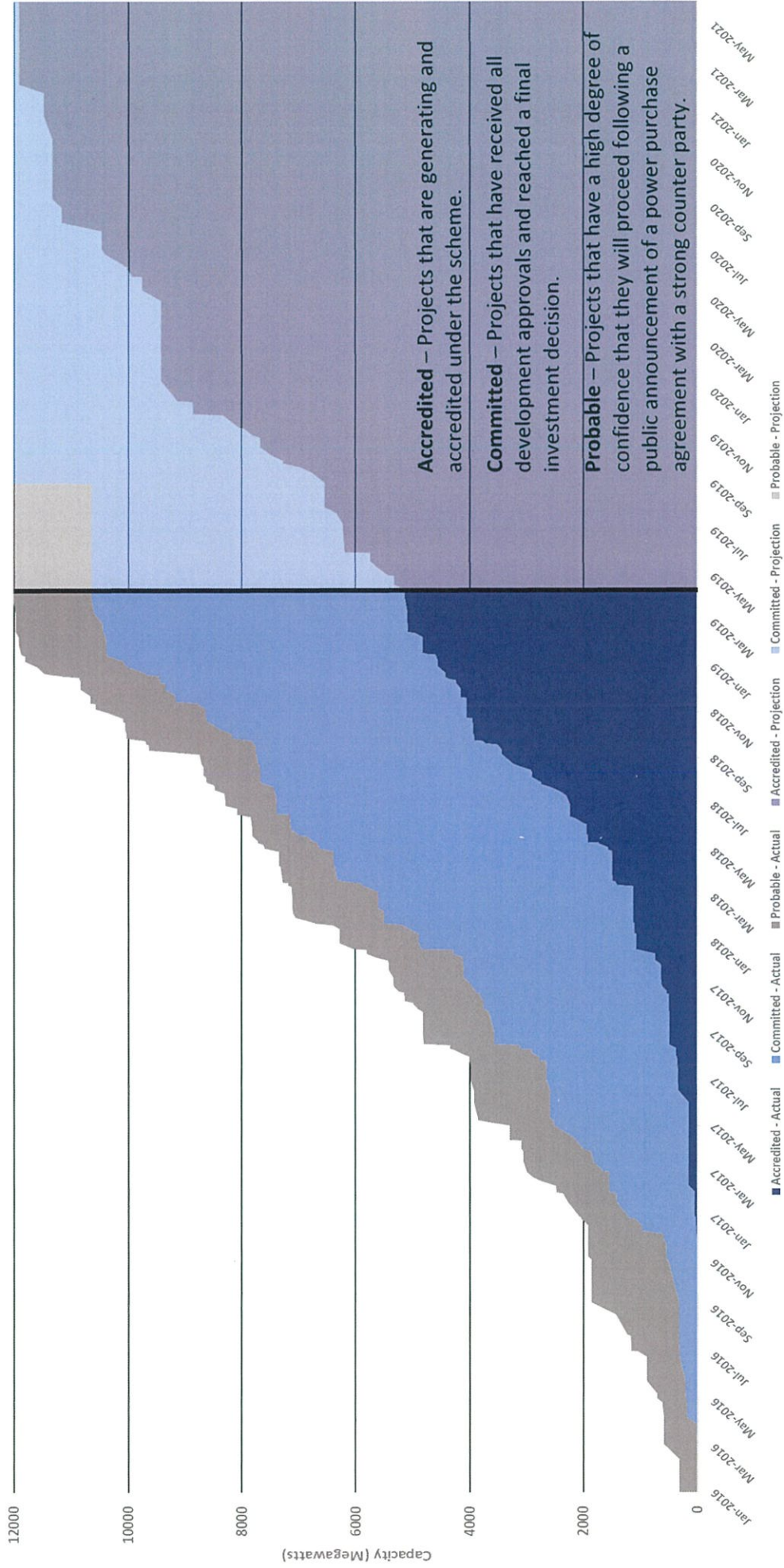
Rooftop solar PV capacity 2011 - 2019





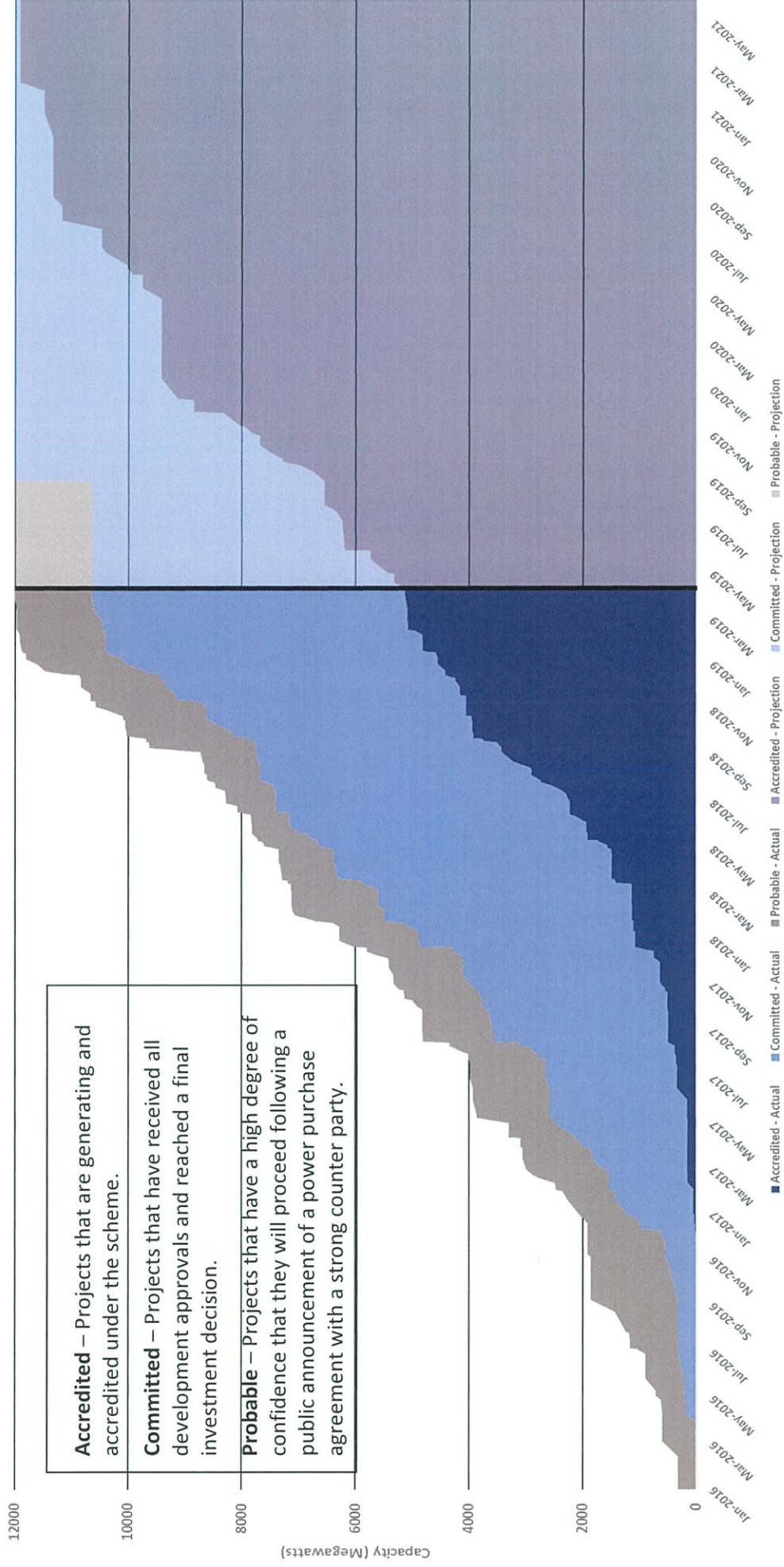
Attachment B

Large-scale renewable energy project pipeline



Attachment B

Large-scale renewable energy project pipeline







**Australian Government**  
Clean Energy Regulator

**RENEWABLE  
ENERGY  
TARGET**

## **2018 Annual Statement to the Parliament on the progress towards the 2020 Large-scale Renewable Energy Target**







## Letter of transmittal

The Hon Angus Taylor MP  
Minister for Energy  
Parliament House  
Canberra ACT 2600

Dear Minister

I am pleased to submit the 2018 Annual Statement to the Parliament on the progress towards the 2020 Large-scale Renewable Energy Target. This statement affirms the certainty that the Large-scale Renewable Energy Target of 33,000 gigawatt hours will be met in 2020.

This statement is submitted earlier than the 2018 Renewable Energy Target Administrative Report to allow for the Parliament to be informed of this important milestone in a timely manner.

As set down by Minister Hunt in his second reading speech on the Renewable Energy (Electricity) Amendment Bill 2015, the Clean Energy Regulator provides to the Parliament an annual statement on progress towards meeting the 2020 Large-scale Renewable Energy Target and its impact on household electricity bills.

Yours sincerely

David Parker AM  
Chair, Clean Energy Regulator  
22 March 2019



# 2018 Annual Statement – Progress towards the 2020 target

In 2018 it became certain that the Large-scale Renewable Energy Target of 33,000 gigawatt hours will be achieved in 2020<sup>1</sup>.

## Overall findings

At the end of 2018, enough utility-scale renewables capacity was commissioned and generating, or under construction, to meet the Large-scale Renewable Energy Target in 2020.

The portion of household electricity bills attributable to the Large-scale Renewable Energy Target was \$9.85 per quarter for the average household electricity bill in 2018<sup>2</sup>.

The large-scale generation certificate spot price moderated significantly towards the end of the year from around \$85.00 in January to \$47.50 in December 2018 and fell further to \$31.00 by mid-March 2019. This will moderate the costs to electricity retailers and should be reflected in the pass through cost to electricity bills in 2019.

## Capacity

A record 3455 megawatts of constructed projects were accredited in 2018, more than triple the 1113 megawatts accredited in 2017, the previous record.

In 2017, the Clean Energy Regulator stated that 6400 megawatts would need to be commissioned between 2017 and 2019 to meet the target in 2020. This capacity will be accredited and generating ahead of schedule, around mid-2019.

Since 1 January 2016, 11,611 megawatts of new capacity has been firmly announced. Of this, 4474 megawatts has been commissioned<sup>3</sup> against the 6400 megawatts required to meet the 2020 target. A further 5408 megawatts is under construction and an additional 1729 megawatts of projects hold a power purchase agreement. We would expect these projects to reach financial close and start construction in 2019.

This is due to the higher level of large-scale renewable energy capacity build by the industry in the three years from 2017 to 2019 than the first 16 years of the scheme.

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<sup>1</sup> This statement is made in compliance with the requirement for the Clean Energy Regulator to make an annual statement to the Parliament on how the scheme is tracking towards the 2020 target, and any impact the Large-scale Renewable Energy Target is having on electricity prices.

<sup>2</sup> Methodology taken from the Australian Energy Market Commission, 2018 Residential Electricity Price Trends Methodology Report, December 2018, available at: <https://www.aemc.gov.au/market-reviews-advice/residential-electricity-price-trends-2018>.

<sup>3</sup> This figure is slightly lower than 2017-2018 capacity. It does not include projects that were already committed in 2015 and adjustments to exclude non-renewable capacity.

## Certificate prices

Large-scale generation certificate spot prices stayed around the \$85.00 mark for most of 2018 before rapidly falling to around \$47.50 in December 2018 and further to \$31.00 by mid-March 2019.

This fall was likely due to a combination of the market recognising the 2020 target will be materially exceeded and our updated stance on deferral of certificate liability. This position was articulated clearly in our market update published in October 2018<sup>4</sup>.

Once it was clear the 2020 target will be exceeded, the Clean Energy Regulator communicated to the market that we had no objections to the use of shortfall in the expectation that liable entities would true up these positions with large-scale generation certificates in a subsequent year, as allowed for under the law.

The take up of this option by industry has likely shifted demand for certificates beyond 2020. It also brought forward and smoothed the expected fall in large-scale generation certificate prices. This will likely reduce the impact of the Large-scale Renewable Energy Target on electricity prices in 2019 and beyond.

As a result, a healthy 7.1 million surplus of certificates remained available in the market following the annual surrender of certificates in February 2019, down from 9.4 million the previous year.

Considering lower forward contract prices, and the large increase in supply expected in 2019, the Clean Energy Regulator expects further declines in the spot certificate price in 2019.

## Liability

On-time surrender of large-scale generation certificates reduced to 86.1 per cent from 93.3 per cent in 2017 as more liable entities chose to utilise shortfall provisions. As certificate prices are falling, there will be a commercial incentive for liable entities who paid shortfall charges in 2018 or earlier to purchase certificates and redeem the shortfall charge within the allowable three-year period.

## Household electricity prices

According to the Australian Energy Market Commission, the Large-scale Renewable Energy Target accounted for an estimated 2.9 per cent (or an average \$9.85 per quarter) of the average household electricity bill in 2018. The Clean Energy Regulator expects the certificate spot price to continue to moderate as liquidity improves; and this should further reduce the pass through cost to electricity bills in 2019 and beyond.

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<sup>4</sup> Clean Energy Regulator, Large-scale generation certificate market update – October 2018, available at: [www.cleanenergyregulator.gov.au](http://www.cleanenergyregulator.gov.au).

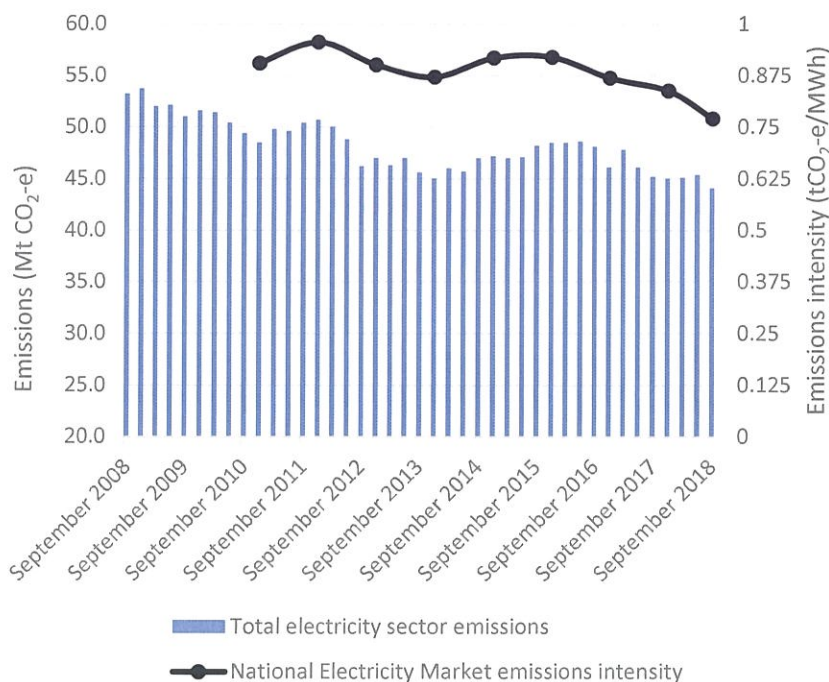
## Looking forward

The Clean Energy Regulator expects approximately 4000 megawatts of large-scale capacity will be accredited in 2019, taking the total to around 8400 megawatts generating since 2017.

With the capacity of new build commencing generation in 2018 combined with the expected accreditations in 2019 and 2020, we expect generation to step up from around 22,000 gigawatt hours in 2018 to around 30,000 gigawatt hours in 2019 and 40,000 gigawatt hours in 2020<sup>5</sup>.


This additional renewable energy generation will deliver large reductions in greenhouse gas emissions from the electricity sector. Quarterly electricity emissions have already fallen from 53.2 Mt CO<sub>2</sub>-e in September 2008 to 44.1 Mt CO<sub>2</sub>-e at end September 2018. This trend is shown in Figure 1<sup>6</sup>.

**Figure 1: Quarterly electricity emissions and National Electricity Market emissions intensity**



<sup>5</sup> It is not possible to forecast this with precision as a number of factors can affect this such as the year to year variability in hydro generation and potential curtailment of wind and solar at times.

<sup>6</sup> Australian Energy Market Operator, Quarterly Energy Dynamics - Q4 2018, February 2019, p.14 available at: <https://www.aemo.com.au/Media-Centre/AEMO-publishes-Quarterly-Energy-Dynamics---Q4-2018> and Department of Environment and Energy, Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2018, p.9 available at: <http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/quarterly-update-australias-national-greenhouse-gas-inventory-sept-2018>.



The current pipeline of projects that the Clean Energy Regulator is tracking suggests that we could see similar levels of capacity commissioned in 2020 and 2021 as we expect in 2019, though with less certainty.

Beyond that, the extent of the likely build is necessarily more uncertain, however, we can make observations on the factors currently at play.

The strong momentum in new firm project announcements continued in 2018 and early 2019 well beyond the point where it was clear the 2020 target would be met. Hence, it is likely that during 2018 the key driver of new announcements shifted from Renewable Energy Target incentive to commercial factors and state procurement processes.

There is evidence of an increasing number of power purchase agreements from both retailers and corporates for commercial reasons<sup>7</sup>. The record level of new construction over the past two years, combined with ongoing technology cost reductions, contributed to reported costs required for new renewables projects declining materially on a per megawatt hour basis.

There is also greater diversification in the finance models of new project developers, with some international participants not needing to raise debt finance in Australia.

In relation to potential 'headwinds', there has been much public discussion on grid and connection constraints in a number of areas as well as changing Marginal Loss Factors<sup>8</sup> impacting a number of projects as more power stations become connected in constrained parts of the grid.

Although it is clear the 2020 target will be exceeded, we will continue to track and publish the investment pipeline of firm projects to support policy considerations and planning by electricity market bodies to manage the transition. General market feedback is that the data is valued.

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<sup>7</sup> ESCO Pacific, BlueScope Steel Signs Largest Corporate Solar Offtake in Australia, July 2018 available at:

[http://www.escopacific.com.au/media\\_releases/bluescope-steel-signs-largest-corporate-solar-offtake-australia/](http://www.escopacific.com.au/media_releases/bluescope-steel-signs-largest-corporate-solar-offtake-australia/)

<sup>8</sup> Australian Energy Market Operator, Draft Marginal Loss Factors for the 2019-20 Financial Year, March 2019 p.28-33 available at:

<https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Loss-factor-and-regional-boundaries>.