Renewable Energy Index

March 2018



Green Energy Markets, April 2018

Key highlights

The capacity of large-scale renewable energy projects under construction and to be delivered by contracting initiatives underway already exceeds what is required to achieve the government's 2030 National Energy Guarantee emission targets

- According to economic modelling undertaken by Frontier Economics for the Energy Security Board, from 2017 onwards we'd need to install 9,271 megawatts of wind and solar in the NEM to achieve the government's 2030 emission reduction target.
- Yet we already have 9,691 megawatts of projects that will be delivered in the NEM based on what has been committed to construction and what is being contracted under procurement processes currently underway.
- This suggests that the National Energy Guarantee will deliver no meaningful emission reduction benefit unless the emissions target is further tightened.

Furthermore, March rooftop solar installs were the highest monthly total ever, and installs over the first 3 months of 2018 are running at levels 50% above those anticipated in economic modelling of the National Energy Guarantee.

- Households and businesses are continuing to install solar PV on rooftops at record rates in order to reduce their electricity bills. March installs set a new monthly record of 127 megawatts which will produce power equivalent to the consumption of 36,710 homes.
- Capacity installed in the first quarter of this year is 56% higher than the same time last year, which was a record-breaking year for capacity.
- The rate of rooftop installs so far this year is about 50% higher than what had been assumed in the economic modelling of the National Energy Guarantee. On top of the underestimates of large scale renewables, it suggests that the emission reduction target could be substantially strengthened at minimal economic cost.

The amount of renewable energy to be generated in 2020 is now set to exceed the original 41,000GWh renewable energy target that was in place before cuts made under the Abbott-led Government.

- Over 2014 to 2015 the Abbott-led Government sought and legislated substantial cuts to the large-scale Renewable Energy Target on the basis we had too much electricity generating capacity and the 41,000GWh target was too difficult to achieve.
- In spite of investment collapsing over that period, the industry has staged a dramatic recovery since 2016 and Australia now appears set to build enough new projects to generate more than 41,000GWh in 2020.



Contents	
What renewable energy is contributing to the grid	4
 Post-2016 renewables capacity under construction or to be contracted already exceeds what is required to achieve the 2030 NEG emissions target 	4
The amount of renewable energy we are on track to generate in 2020 will now exceed the original 41,000GWh target prior to Abbott-cuts	5
In March renewables made up 19.7% of the electricity generated in Australia's magnitude grids	ain 6
4. Enough renewable energy over March to power 8.7 million homes	6
5. Renewable energy avoided 2.4 million tonnes of CO2 pollution in March	7
6. Renewable energy avoided 9.2 million cars' worth of CO2 pollution in March	7
Large-scale renewables construction activity	8
7. 5,175 megawatts of large-scale renewables currently under construction	8
8. Enough work to employ 18,182 people	9
Rooftop solar installation activity	10
9. 18,237 small-scale solar systems installed in March	10
10. Rooftop solar employed 6,084 people in March	11
11. Enough rooftop solar installed in March to power 36,710 homes	11
12. Rooftop solar installed in March will deliver \$225 million in bill savings	12
Notes on sources and methodology	13

About this report

The Green Energy Markets' Renewable Energy Index tracks on a monthly basis the amount of renewable energy Australia relies on, the jobs it's creating, the power bill savings it is delivering for Australian households, and the environmental benefits of the rising use of clean power.

This edition covers the period of March 2018.

The Renewable Energy Index is funded by GetUp! to provide a reliable, up-to-date record on renewable energy's contribution to Australia.



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What renewable energy is contributing to the grid



1. Post-2016 renewables capacity under construction or to be contracted already exceeds what is required to achieve the 2030 NEG emissions target



Figure 1: NEM large scale renewable energy capacity to be in place post 2016 based on already announced project commitments and contracts/tenders compared to that anticipated in 2030 under National Energy Guarantee based on Energy Security Board's forecast by Frontier Economics



2. The amount of renewable energy we are on track to generate in 2020 will now exceed not just the current 33,000GWh target but also the original 41,000GWh target before it was cut back by the Abbott Government



Figure 2: Estimated Australia-wide gigawatt-hours of RET-eligible generation in 2020 from projects in operation, under construction, contracted and delivered under the Queensland and Victorian Government auctions



3. In March renewables made up 19.7% of the electricity generated in Australia's main grids



Figure 3: Renewable energy power generation by fuel & market share for west & east coast power grids – March 2018



4. Enough renewable energy over March to power 8.7 million homes

Figure 4: Renewable energy power generation March 2018 in terms of number of households' power consumption by state





5. Renewable energy avoided 2.4 million tonnes of CO2 pollution in March





6. Renewable energy avoided 9.2 million cars' worth of CO2 pollution in March

Figure 6. Number of cars' CO2 pollution avoided by renewable energy generation over March 2018



Large-scale renewables construction activity



7. 5,175 megawatts of large-scale renewables currently under construction



Figure 7: Megawatts of large-scale renewable energy projects under construction by state and fuel at end of March 2018





8. Enough work to employ 18,182 people

Figure 8: Job-years created by renewable energy projects currently under construction by state and fuel - as at end of March 2018



Rooftop solar installation activity



9. 18,237 small-scale solar systems installed in March



Figure 9: Small-scale solar PV systems installed by state - March 2018



7,000 Total: 6,084 6,000 939 NA N 5,000 VIC 1,158 Full-time jobs TAS 4,000 82 732 SA 3,000 QLD 1,480 ■NT 2,000 NSW & ACT 59 1,000 1,635

10. Rooftop solar employed 6,084 people in March

Figure 10. Number of full-time equivalent jobs by state in the installation and sale of rooftop solar PV systems installed over March 2018



11. Enough rooftop solar installed in March to power 36,710 homes

Figure 11: Expected generation from solar systems installed over March in terms of number of households' power consumption





12. Rooftop solar installed in March will deliver \$225 million in bill savings

Figure 12: Power bill savings (in \$millions) over next ten years from rooftop solar systems installed in March 2018



Notes on sources and methodology

Figure 1 – The forecast of required solar and wind capacity to achieve the 2030 emissions target under the National Energy Guarantee (26% below NEM's 2005 levels) is taken from Frontier Economics modelling results contained within the <u>Energy Security Board Advice Paper</u> on The National Energy Guarantee, dated 20 November 2017. The amount of capacity expected to be delivered from already announced projects under construction, contracted or via tenders and other contracting initiatives is sourced from <u>Green Energy Markets</u>' Power Plant Register which tracks information on every renewable energy project in the country that is currently registered or likely to register under the Large-Scale Renewable Energy Target, as well as well advanced tendering and contracting initiatives to procure renewable energy.

Figure 2 – This data is sourced from <u>Green Energy Markets</u>' Power Plant Register which tracks information on every renewable energy project in the country that is currently registered or likely to register under the Large-Scale Renewable Energy Target , as well as well advanced tendering and contracting initiatives to procure renewable energy.

Figure 3 – Data sourced from the Australian Energy Market Operator (AEMO) via NEM Review for all power except rooftop solar PV generation in the WEM. Rooftop solar PV generation in the WEM is derived from an estimate of the cumulative installed capacity in WA multiplied by a generic capacity factor for each month derived from AEMO's 2017 WA Electricity Statement of Opportunities with a discount to align it with Clean Energy Regulator estimates for solar PV annual average generation.

Figure 4 – This chart is calculated by dividing the amount of renewable energy produced in each state by the average annual electricity consumption of households in that state which are sourced from the Australian Energy Market Commission's 2016 Residential Electricity Price Trends publication.

Figure 5 – This chart is calculated by multiplying the amount of renewable energy produced in each state by the average emissions intensity of grid power in that state sourced from the Australian Government's National Greenhouse Accounts Factors – August 2016. Readers should note this is an approximate measure because estimating abatement precisely depends on a complex array of factors. The method employed in the Index is highly likely to underestimate abatement delivered by renewable energy in Tasmania and South Australia while potentially overestimating abatement in Victoria and to a lesser extent other states.

Figure 6 – This chart is calculated by dividing the estimated tonnes of CO2 avoided by renewable energy generation by the average emissions of an Australian passenger car. The



average annual emissions of an Australian passenger car was derived by dividing the total CO2 emissions of Australia's passenger cars sourced from the Australian Government's 2016 Emissions Projections by the number of passenger vehicles in Australia as estimated in the Australian Bureau of Statistics' 2016 Motor Vehicle Census (31 Jan 2016).

Figure 7 – This data is sourced from <u>Green Energy Markets</u>' Power Plant Register which tracks information on every renewable energy project in the country that is currently registered or likely to register under the Large-Scale Renewable Energy Target.

Figure 8 – This chart is calculated by multiplying the number of megawatts under construction by an estimate of the job years (a person employed full-time for a year) involved in constructing renewable energy projects by fuel type sourced from ROAM Consulting report to the Clean Energy Council –RET Policy Analysis, dated 23 May 2014. Readers should note that job estimates provided by individual project proponents may not align due to inconsistent definitions of how to measure job creation that are not necessarily reported in job-years.

Figure 9 - Data sourced from <u>Green Energy Markets' Solar Report</u> produced using data extracted from the Clean Energy Regulator's register of Small Scale Technology Certificates.

Figure 10 – This chart is calculated by sorting solar PV systems into different kilowatt size categories using information sourced from the <u>Green Energy Markets Solar Report</u> using data extracted from the Clean Energy Regulator's register of Small Scale Technology Certificates. These are then multiplied by estimates of the average person-hours involved in selling, designing and installing such sized systems based on a Green Energy Markets' survey of solar PV industry participants which is then converted into full-time equivalents working a 37.5 hour work week.

Figure 11 - This chart is calculated by using data on the number of small-scale technology certificates within the Clean Energy Regulator's registry as a proxy for the expected average annual power generation from solar PV systems installed in each state. This is then divided by the average annual electricity consumption of households in that state which are sourced from the Australian Energy Market Commission's 2017 Residential Electricity Price Trends publication.

Figure 12 - This chart is calculated by using data on the number of small-scale technology certificates within the Clean Energy Regulator's registry as a proxy for the expected average annual power generation from solar PV systems installed in each state. To determine how much of this generation is displacing imported power from the grid at retail rates or exported to the grid where it receives a feed-in tariff tied to wholesale electricity prices, systems are sorted into different kilowatt size categories using information sourced from the <u>Green Energy Markets</u> <u>Solar Report</u> using data extracted from the Clean Energy Regulator's register of Small Scale



Technology Certificates. The amount exported by solar power systems rises from 50% for 2 kilowatts systems up to 90% for 8-10kW systems based on advice received from the Alternative Technology Association. Systems larger than 15kW are assumed to only avoid or receive an electricity rate equal to the export feed-in tariff we estimate for residential customers in each state. The imported retail rate of electricity and the export feed-in rate is based on an average of the AGL, Origin and EnergyAustralia lowest post-discounted published offer for the capital cities in the states of QLD (Energex), NSW (Ausgrid), VIC (Citipower) and SA (SA Power Networks). For Tasmania, WA, ACT and NT we use the regulated and standard feed-in tariff rates of the Government-owned retailer in each state.

