Renewable Energy Index

April 2018



Green Energy Markets, May 2018



Key highlights

Rooftop solar PV installs 56% above last year's record-breaking rate, with employment in solar installations making up more than a third of the all employment in the electricity generation sector.

- With a third of the year passed, rooftop solar installs have exceeded 100 megawatts for every month of this year.
- Over April 108 megawatts were installed and the monthly average for 2018 is 113 megawatts. The amount installed over just these four months will generate more electricity than what is consumed by households in major regional cities like Darwin, Geelong, Newcastle, Toowoomba, or Bunbury.
- This monthly average of 113 megawatts is 56% higher than the average monthly rate at the same time last year a year which represented a new record for solar installs at 1,072 megawatts.
- Given installs tend to lift towards the end of the year, this rate suggests 1,400 to 1,500 megawatts by the end of 2018 are reasonably likely. To put this into perspective, in the time it would take to build a completely new coal power station (at least five years), this rate of solar installations would deliver a combined amount of capacity two and half times larger than Australia's largest coal generator Eraring.
- Solar installation is now a major component of the Australian electricity generation sector. Employment in the design, installation and sales of solar PV so far this year has averaged just under 5,500 full-time jobs. By comparison the last census recorded 10,268 people employed across the entirety of other power stations in the country.



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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 April 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. In April renewables made up 19.8% of the electricity generated in Australia's main grids



Figure 1: Renewable energy power generation by fuel & market share for west & east coast power grids – April 2018





2. Enough renewable energy over April to power 8.4 million homes

Figure 2: Renewable energy power generation April 2018 in terms of number of households' power consumption by state

3. Renewable energy avoided 2.3 million tonnes of CO2 pollution in April



Figure 3. CO2 pollution avoided by renewable energy generation over April 2018





4. Renewable energy avoided 8.7 million cars' worth of CO2 pollution in April

Figure 4. Number of cars' CO2 pollution avoided by renewable energy generation over April 2018



Large-scale renewables construction activity



5. 5,430 megawatts of large-scale renewables currently under construction



Figure 5: Megawatts of large-scale renewable energy projects under construction by state and fuel at end of April 2018





6. Enough work to employ 19,288 people

Figure 6: Job-years created by renewable energy projects currently under construction by state and fuel - as at end of April 2018



Rooftop solar installation activity



7. Rooftop solar capacity installed over 2018 is 56% higher than prior record year



Figure 7: Megawatts of small-scale solar PV capacity installed from January to April 2018 compared to 2017





8. Within the time it would take to build a new coal power plant we could build an amount of rooftop solar 2.5 times larger than even our biggest coal plant

Figure 8: Amount of rooftop solar capacity installed within five years based on 2018 rate of installations, compared to capacity of Australia's five largest coal power plants





Figure 9: Average full-time equivalent jobs in the installation of rooftop solar over Jan-Apr 2018 compared to number of people employed in electricity generation according to 2016 Census





10. 15,896 small-scale solar systems installed in April





11. Rooftop solar employed 5,261 people in April

Figure 11. Number of full-time equivalent jobs by state in the installation and sale of rooftop solar PV systems installed over April 2018





12. Enough rooftop solar installed in April to power 31,563 homes

Figure 12: Expected generation from solar systems installed over April in terms of number of households' power consumption



13. Rooftop solar installed in April will deliver \$191 million in bill savings

Figure 13: Power bill savings (in \$millions) over next ten years from rooftop solar systems installed in April 2018



Notes on sources and methodology

Figure 1 – 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 2 – 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 3 – 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 4 – 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 5 – 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 6 – 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 7 - Data sourced from <u>Green Energy Markets' Solar Report</u> based on the creation date of Small Scale Technology Certificates associated with solar PV systems with data extracted from the Clean Energy Regulator's registry of Small Scale Technology Certificates.

Figure 8 - Solar PV capacity estimate based on an extrapolation of first four months of 2018 installation rates assuming a slight rise towards the end of the year to achieve 1,450MW of installations for the year, which is then multiplied by 5 years. Capacity of five largest Australian coal power plants sourced from AEMO's March 2018 listing of generators.

Figure 9 - For solar employment estimates refer to figure 11 methods explanation. People employed in all other electricity generators taken from the Australian Bureau of Statistics' 2016 Census listing of people employed in the industry category of 'electricity generation'. Note that rooftop solar employment is actually full-time equivalents while the 2016 Census is total people employed which will include a large proportion of part-time employees. A like for like comparison would mean employment in solar would be higher relative to all other generators than that shown in the chart.

Figure 10 - Data sourced from <u>Green Energy Markets' Solar Report</u> based on the creation date of Small Scale Technology Certificates associated with solar PV systems with data extracted from the Clean Energy Regulator's registry of Small Scale Technology Certificates.

Figure 11 – 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 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. 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 13 - 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.

