Renewable Energy Index

February 2018

Green Energy Markets, March 2018

Key highlights

Over summer renewable energy generated more power than brown coal, gas or oil

- Over summer renewables supplied more power than brown coal, gas or oil-fuelled generators and was second only to black coal across Australia's main east and west-coast grids. The 9,880 gigawatt-hours (GWh) from renewables during the summer months (with 3,743GWh coming in February) exceeded that from brown coal by 8%, and gas by 40%. Summer generation from oil fuels such as diesel was negligible at 42GWh.

Renewables delivered power when it was needed most this summer

- Renewables delivered substantial amounts of power when demand for electricity was at its highest. In the National Electricity Market, renewables delivered an average of 5,610 megawatts over summer during the 11am to 7pm (NEM Time) peak demand period. This was 32% greater than that from brown coal and 78% higher than gas.

Over working hours solar produced substantially more power this summer than that lost from Hazelwood's closure

- Pivotal to renewable energy's contribution to peak demand has been the large growth in solar PV in Australia in recent years. From 9am until 5pm solar's average output in the NEM exceeded the maximum output of Hazelwood over the prior summer by between 48% (at 4-5pm) up to 162% (at 12pm-1pm).

Large-scale projects in construction now exceed 5000MW supporting 17,445 jobs

- Furthermore the generation from renewables can be expected to increase substantially over the next two years, with the amount of large-scale capacity under construction passing the 5000 megawatts mark in February. The 5,056 MW under construction are estimated to support 17,445 job years worth of construction employment.

Rooftop solar installs in February close to an all-time monthly record

- Rooftop solar PV continues to enjoy high levels of capacity installations by historical standards with February's 117 megawatts and 17,252 of installed systems for the month closely in line with November's all-time record. These systems supported 5,674 full-time jobs in installation and can be expected to deliver $208m in electricity bill savings over the next ten years, while producing an amount of power equal to the electricity consumption of 33,826 households.

Contents

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 February 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. Over last summer renewables generated more power than brown coal, gas or oil in Australia's main grids

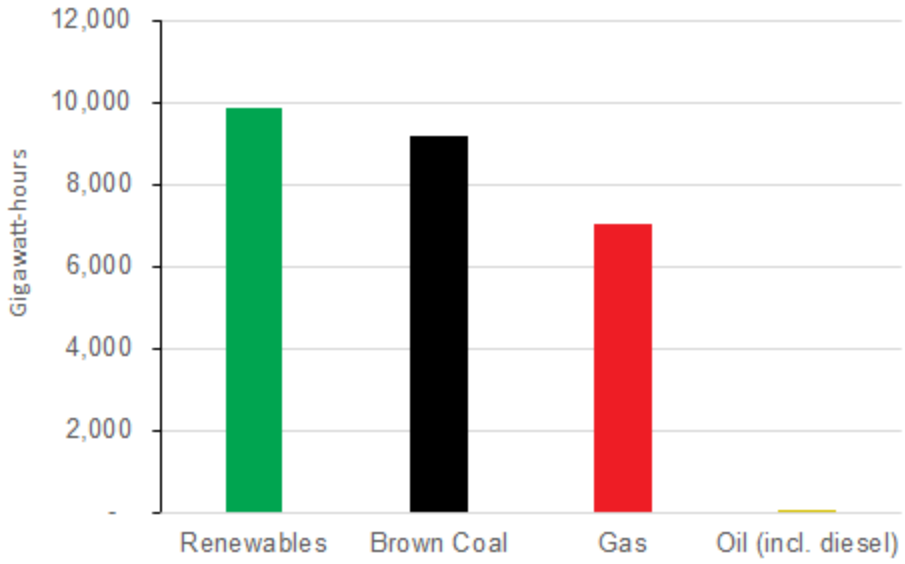

Figure 1: Total renewable energy power generation over 2017-18 summer months compared to brown coal, gas and oil (incl. diesel) across east and west-coast main grids

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2. Renewables delivered more power over the summer peak demand period than brown coal, gas or oil in NEM

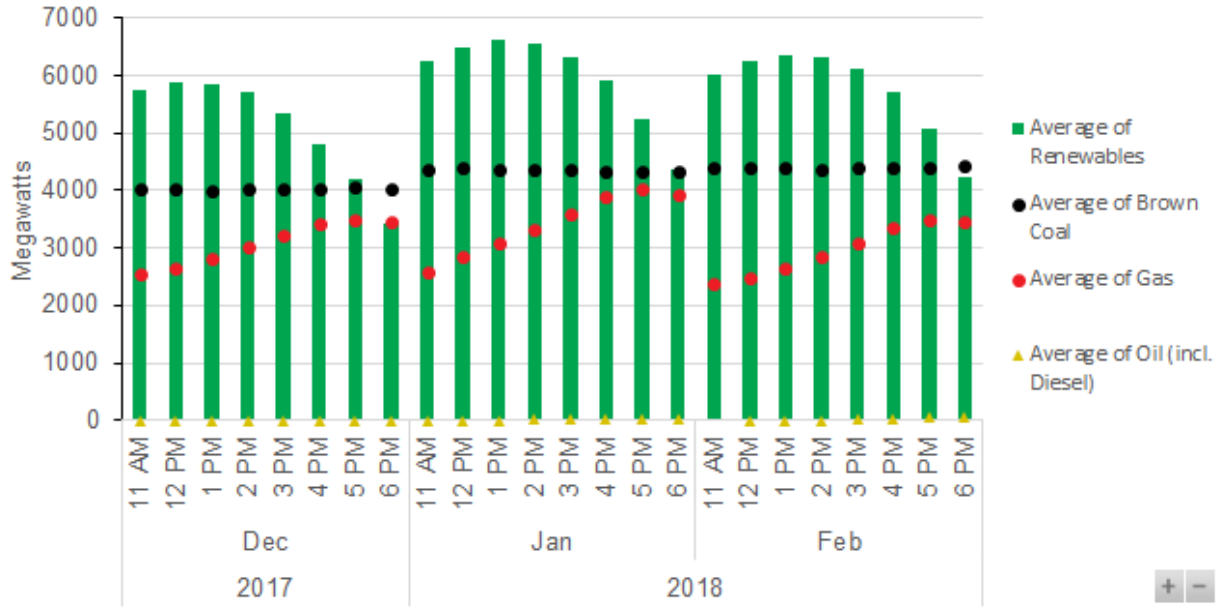

Figure 2: Average megawatts of power generation in NEM from renewables, brown coal, gas and oil over each 2017-18 summer peak demand hour (note 6PM period covers 6:00pm to 6:59.59pm)

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3. From 9 ‘til 5 solar output exceeded that of Hazelwood the prior summer

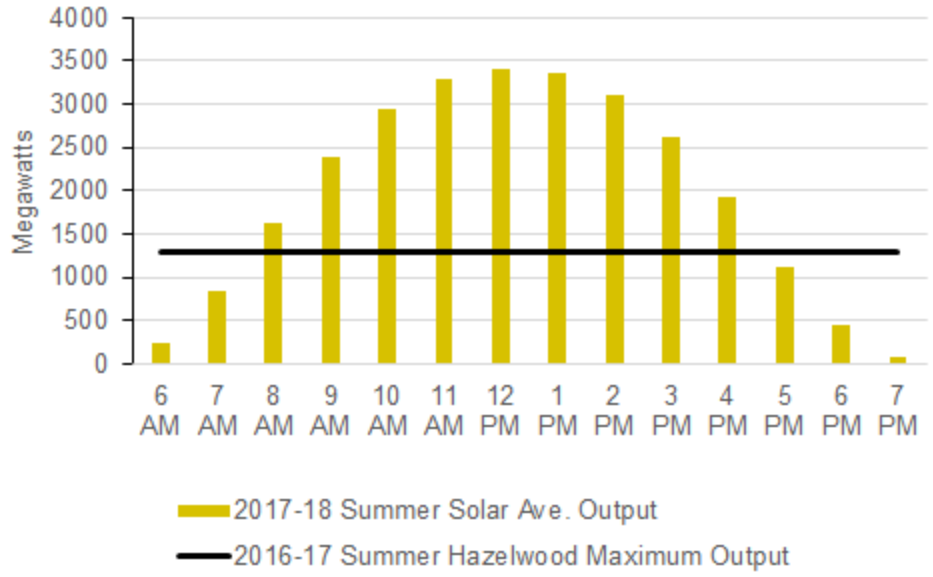

Figure 3: Average megawatts by hour from solar in the NEM over 2017-18 summer compared to Hazelwood Power Station’s maximum output in the 2016-17 summer (4PM period covers 4:00pm to 4:59.59pm)

4. In February renewables made up 17.6% of the electricity generated in Australia's main grids

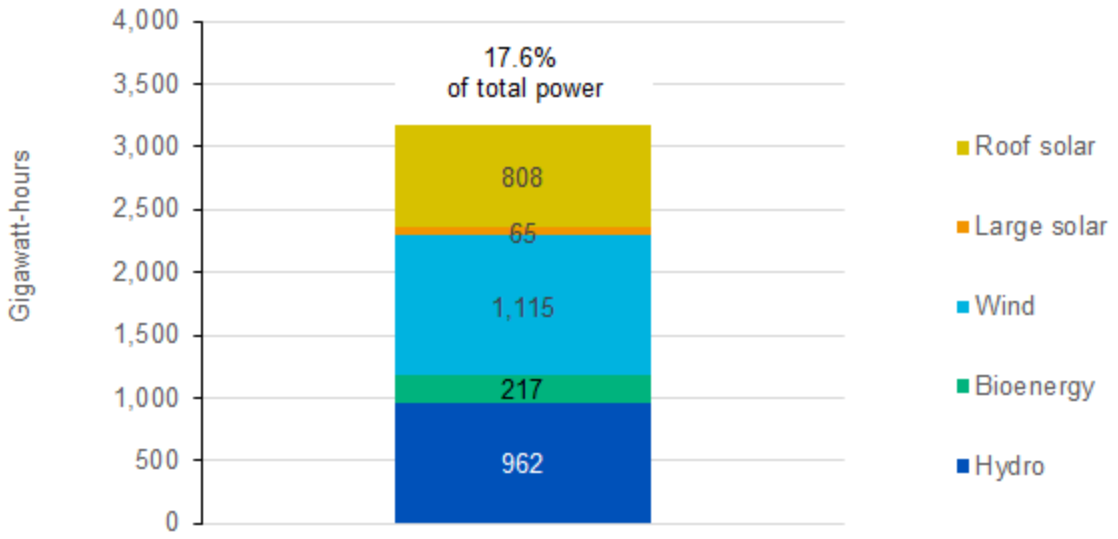

Figure 4: Renewable energy power generation by fuel & market share for west & east coast power grids – February 2018

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5. Enough renewable energy over February to power 7.8 million homes

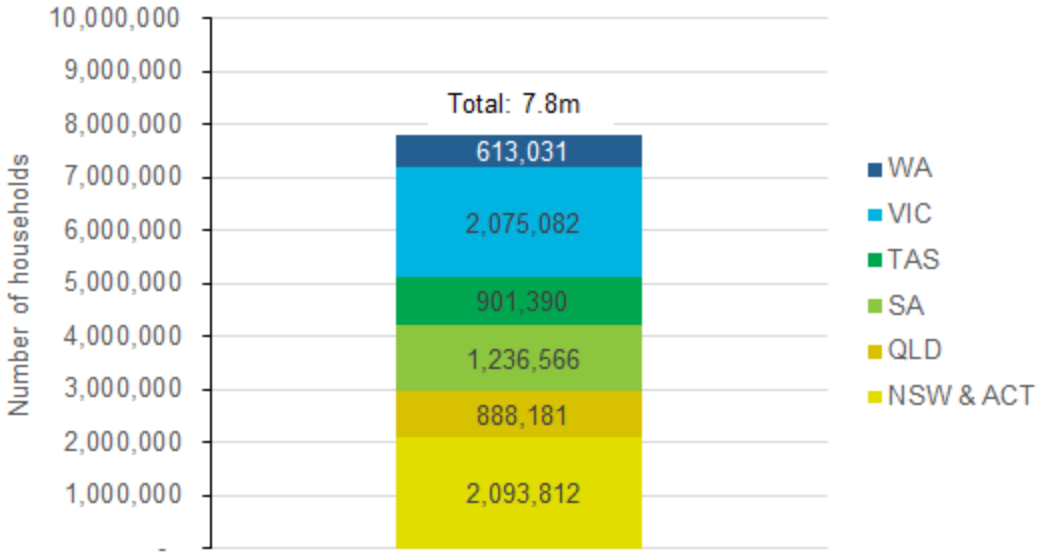

Figure 5: Renewable energy power generation February 2018 in terms of number of households' power consumption by state

6. Renewable energy avoided 2.2 million tonnes of CO2 pollution in February

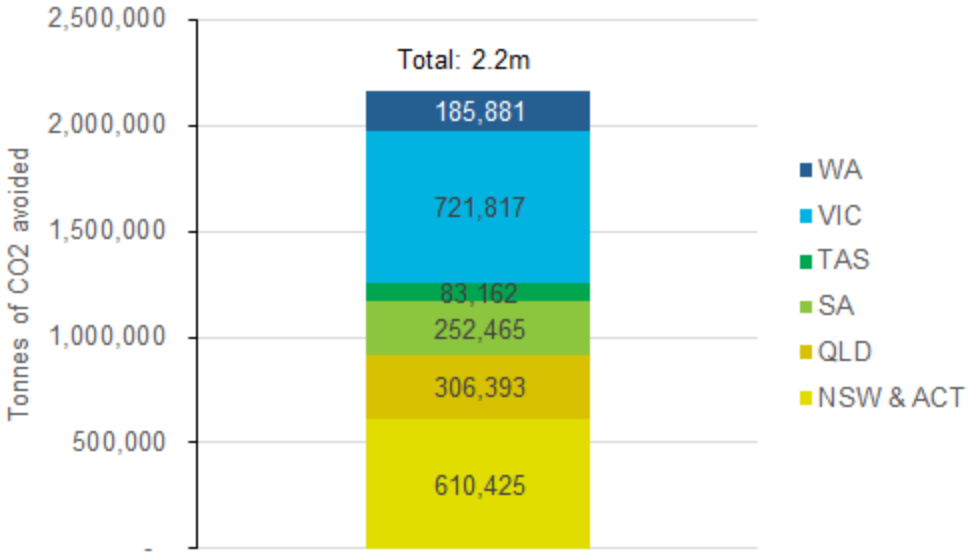

Figure 6. CO2 pollution avoided by renewable energy generation over February 2018

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7. Renewable energy avoided 8.3 million cars' worth of CO2 pollution in February

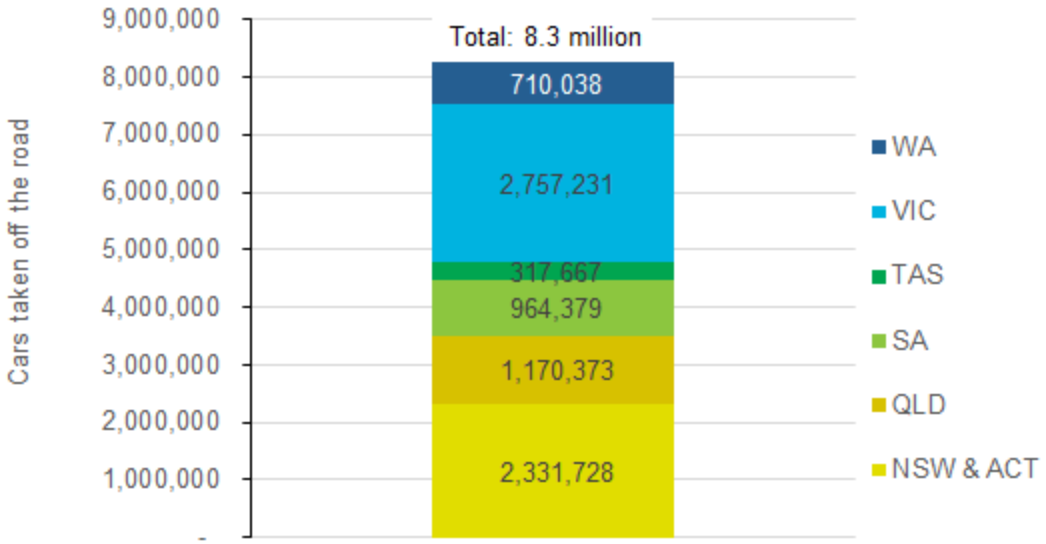

Figure 7. Number of cars' CO2 pollution avoided by renewable energy generation over February 2018

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Large-scale renewables construction activity

8. 5,056 megawatts of large-scale renewables currently under construction

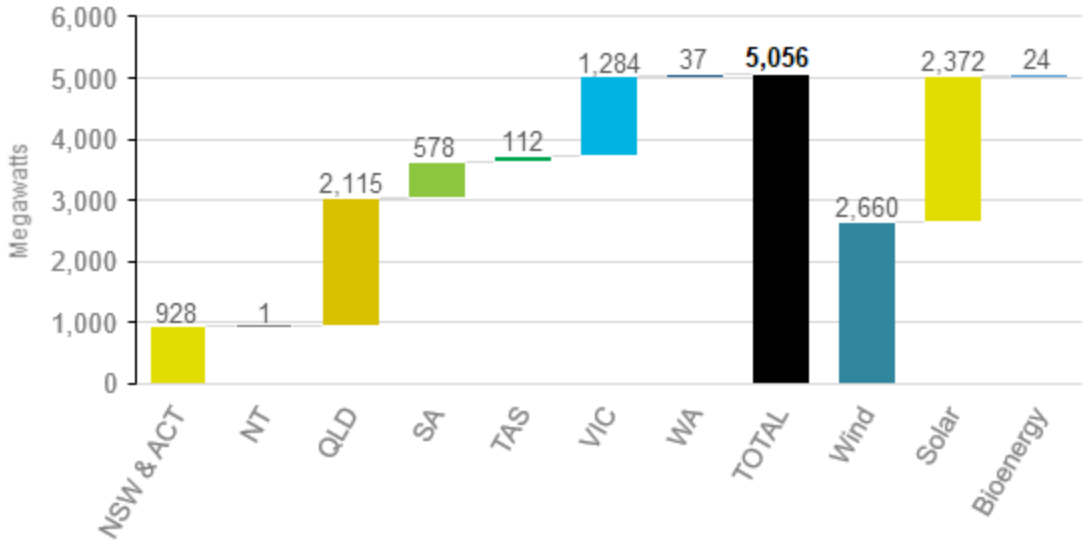

Figure 8: Megawatts of large-scale renewable energy projects under construction by state and fuel at end of February 2018

9. Enough work to employ 17,445 people

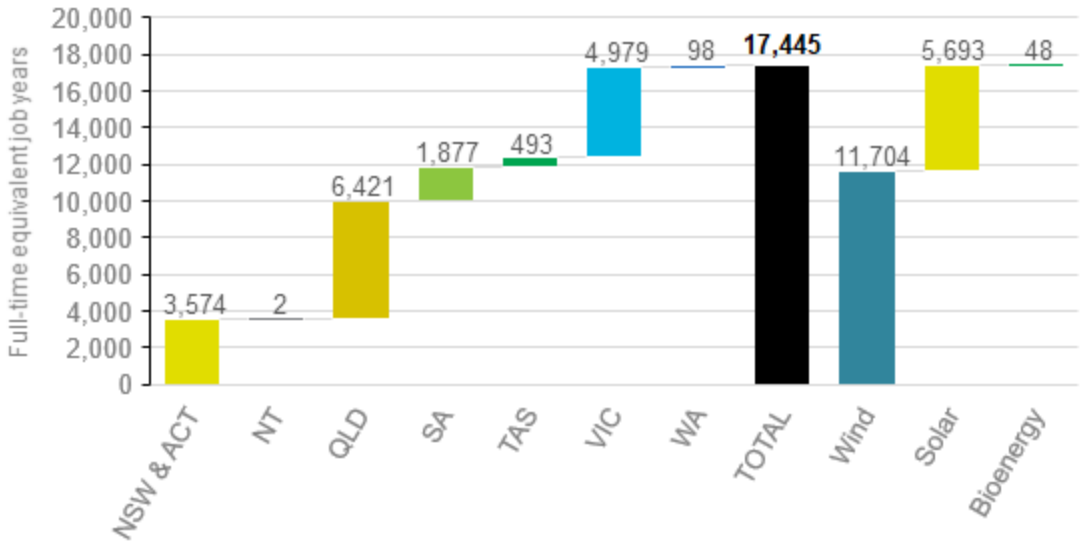

Figure 9: Job-years created by renewable energy projects currently under construction by state and fuel - as at end of February 2018

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Rooftop solar installation activity

10. 17,252 small-scale solar systems installed in February

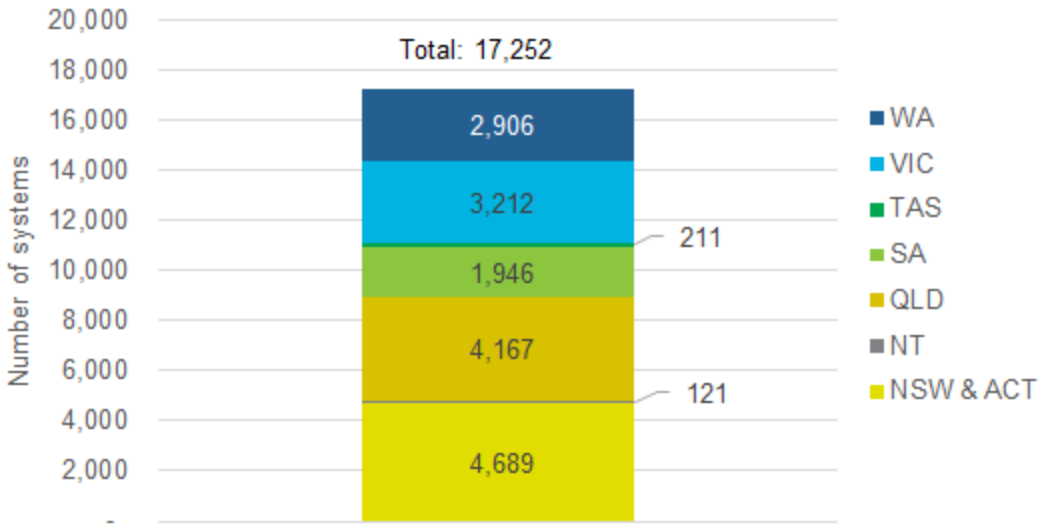

Figure 10: Small-scale solar PV systems installed by state - February 2018

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11. Rooftop solar employed 5,674 people in February

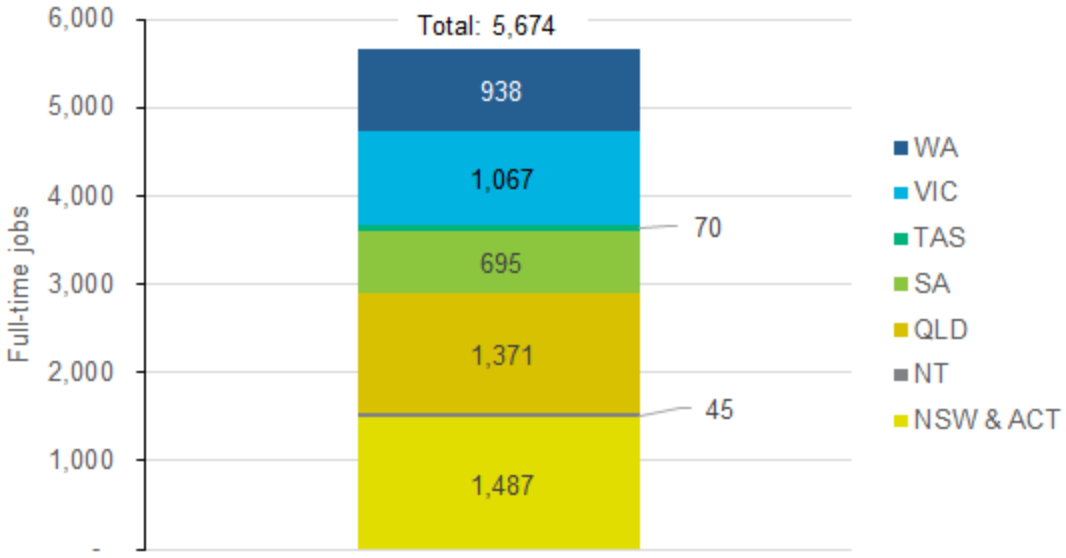

Figure 11. Number of full-time equivalent jobs by state in the installation and sale of rooftop solar PV systems installed over February 2018

12. Enough rooftop solar installed in February to power 33,826 homes

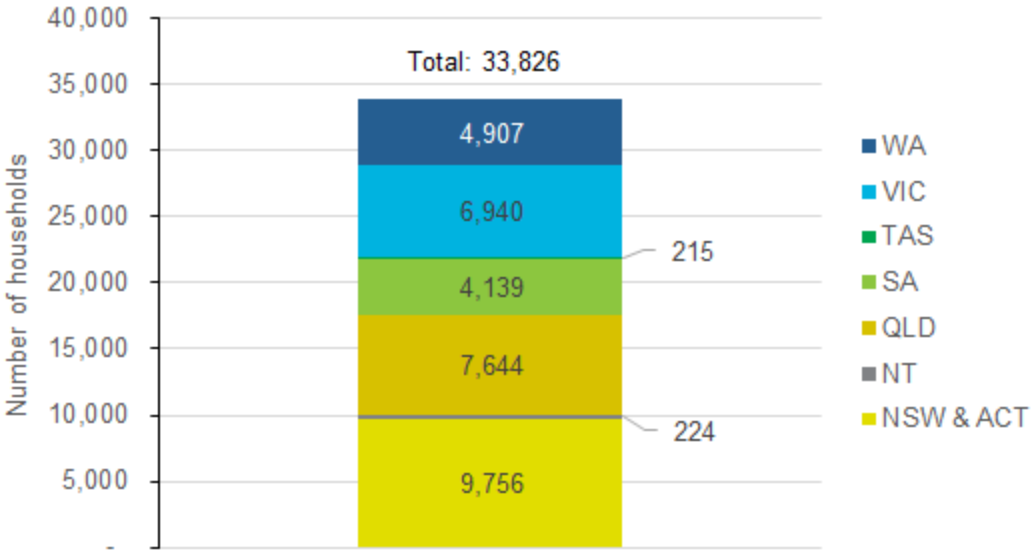

Figure 12: Expected generation from solar systems installed over February in terms of number of households' power consumption

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13. Rooftop solar installed in February will deliver $208 million in bill savings

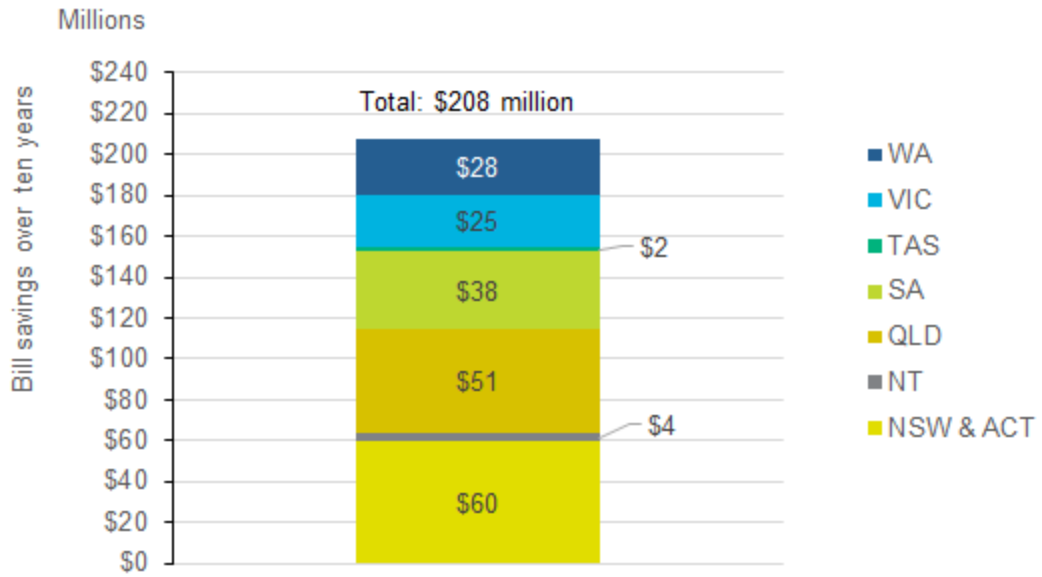

Figure 13: Power bill savings (in $millions) over next ten years from rooftop solar systems installed in February 2018

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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 – Data sourced from the Australian Energy Market Operator (AEMO) via NEM Review.

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Figure 5 – 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 6 – 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 7 – 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 8 – This data is sourced from Green Energy Markets' 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 9 – 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 10 - Data sourced from Green Energy Markets' Solar Report produced using data extracted from the Clean Energy Regulator's register 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 Green Energy Markets Solar Report 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 Green Energy Markets Solar Report 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.