

# Renewable Energy Index

November 2017



Green Energy Markets, December 2017

## Key highlights

### **Australia set to exceed the 2020 Renewable Energy Target and enough renewable energy projects now under development to deliver half of Australia's electricity by 2030**

- The 3,923 megawatts of projects currently under construction in Australia will create enough jobs to employ 13,443 people full-time.
- The capacity of renewable energy projects in operation, under construction as well as those contracted by power retailers and state governments has now reached a level that will produce more power than required under the Australian Government's Renewable Energy Target.
- In addition, a huge pipeline of more than 12,000MW of wind farm sites and 15,000MW of solar farm sites have been proposed for development across Australia, of which more than half already have planning approvals in place. When combined with expected growth in rooftop solar, they could supply half Australia's electricity needs in 2030. However most of these projects will remain dormant until the government puts its long-term Paris agreement commitments into a legally enforceable policy.

### **Rooftop solar installs in November reached an all time record**

- Australia installed 120 megawatts of solar PV on rooftops over November which will produce an amount of power equal to the consumption of 31,543 homes while saving \$225 million on electricity bills over the next ten years.
- This is the highest capacity ever installed in a month, breaking the prior record set in June 2012 when subsidies were two-to-three times higher than they are now.
- The 18,038 systems installed over November supported 5,867 full-time jobs.

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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 November 2017.

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. Renewables made up 17% of the electricity generated in Australia's main grids

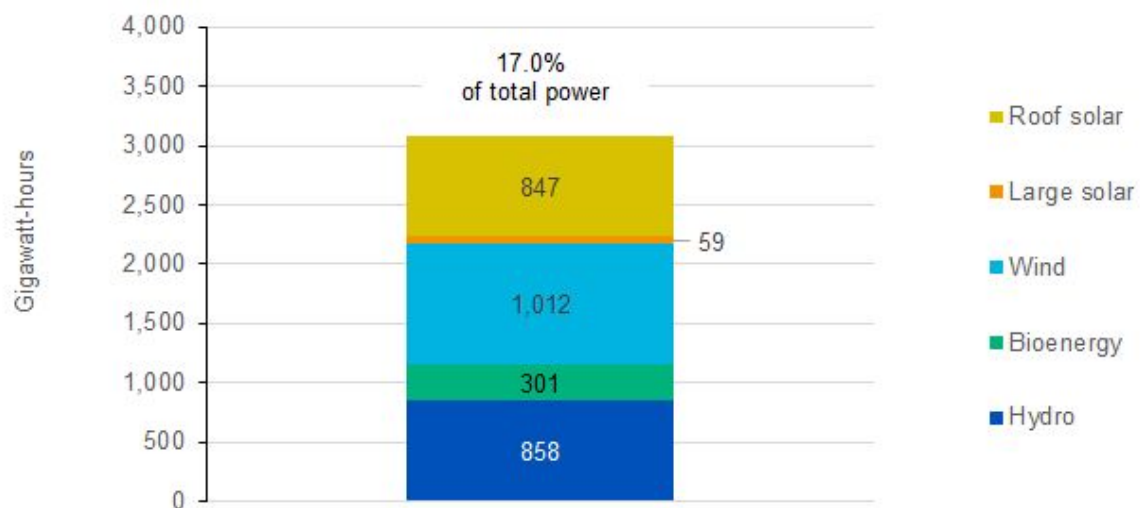


Figure 1: Renewable energy power generation by fuel & market share for west & east coast power grids – November 2017

## 2. Enough renewable energy to power 6.8 million homes



Figure 2: Renewable energy power generation November 2017 in terms of number of households' power consumption by state

## 3. Renewable energy avoided 2 million tonnes of CO2 pollution

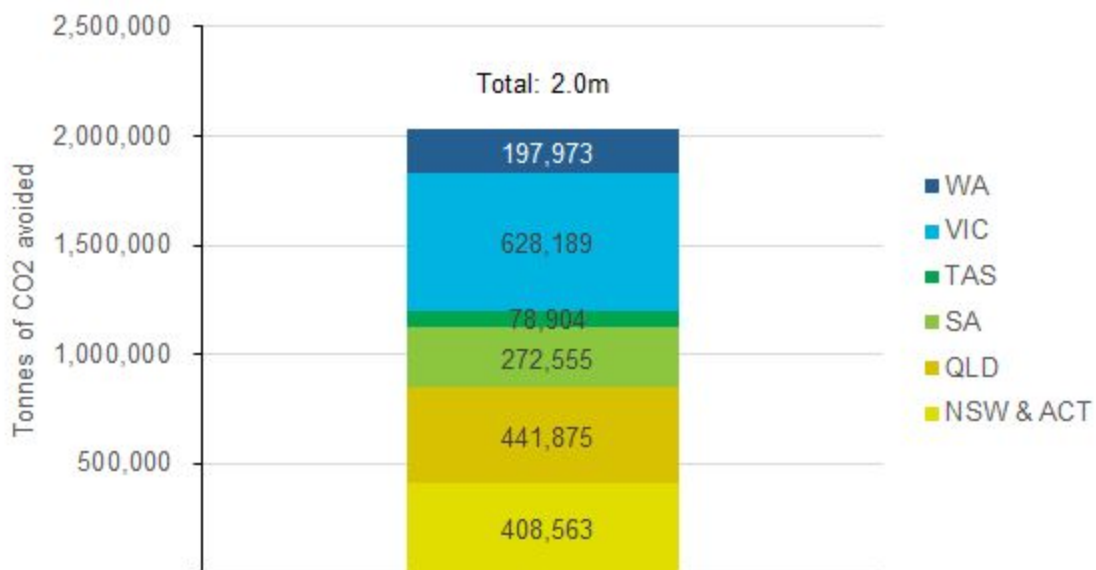


Figure 3. CO2 pollution avoided by renewable energy generation over November 2017

#### 4. Renewable energy avoided 7.7 million cars' worth of CO2 pollution



Figure 4. Number of cars' CO2 pollution avoided by renewable energy generation over November 2017



## Large-scale renewables construction activity



### 5. 3,923 megawatts of large-scale renewables under construction

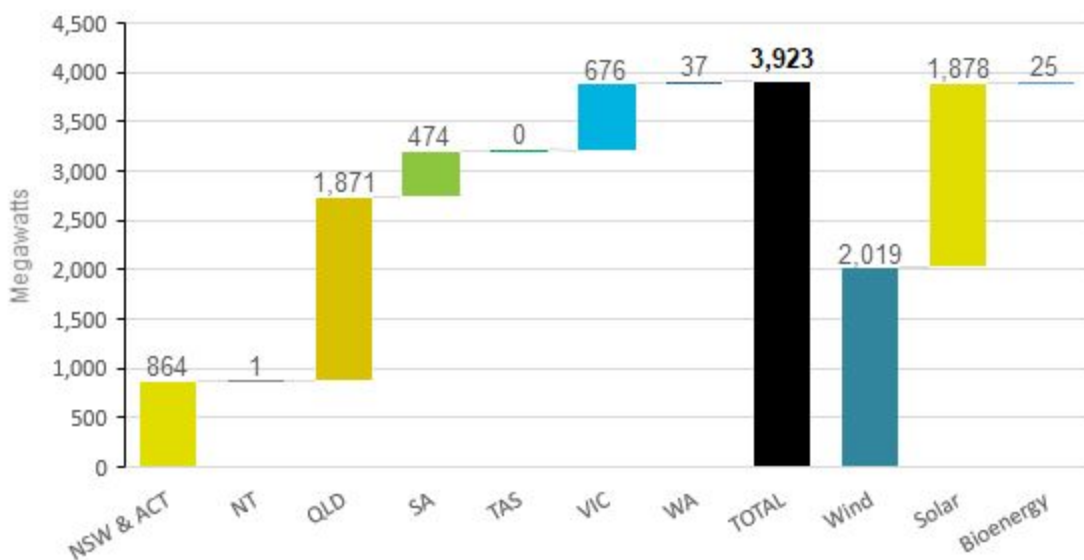


Figure 5: Megawatts of large-scale renewable energy projects under construction by state and fuel at end of November 2017

## 6. Enough work to employ 13,443 people

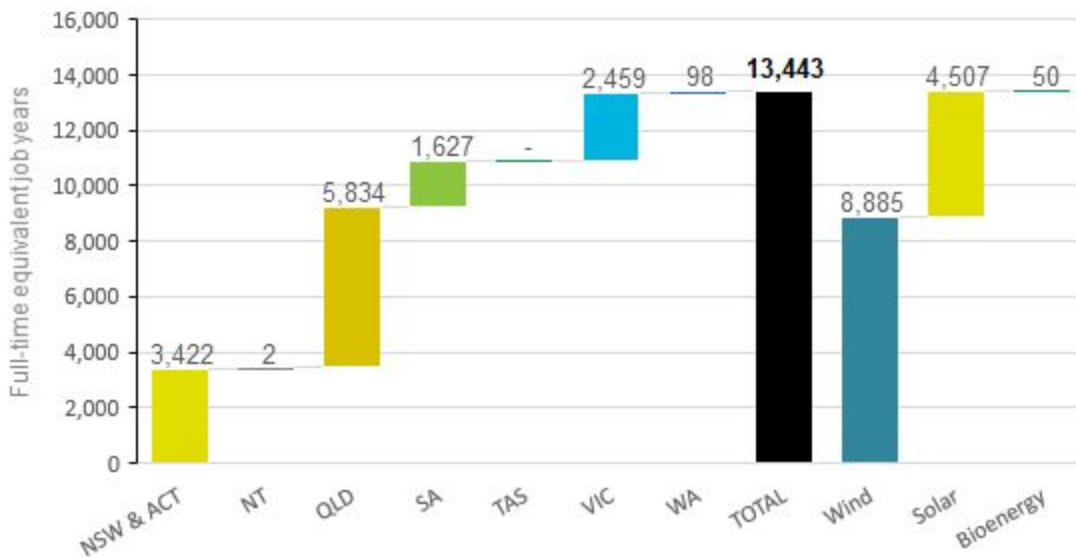


Figure 6: Job-years created by renewable energy projects currently under construction by state and fuel - as at end of November 2017



## 7. We now have enough projects under construction or contracted to exceed the Renewable Energy Target (RET)

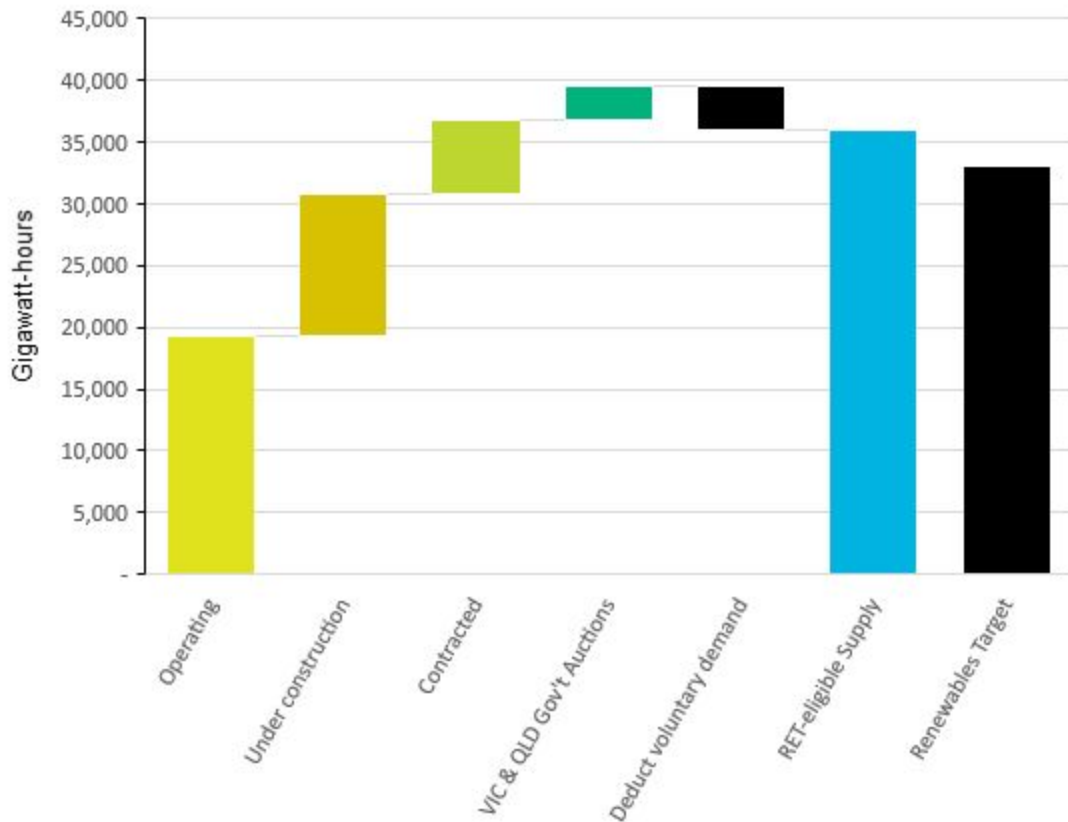


Figure 7: Projected 2021 annual power generation from operating, under construction and contracted renewable energy projects relative to what is required to meet the Renewable Energy Target (RET)

8. In addition projects announced for development could allow Australia to meet half its electricity needs with renewable energy in 2030

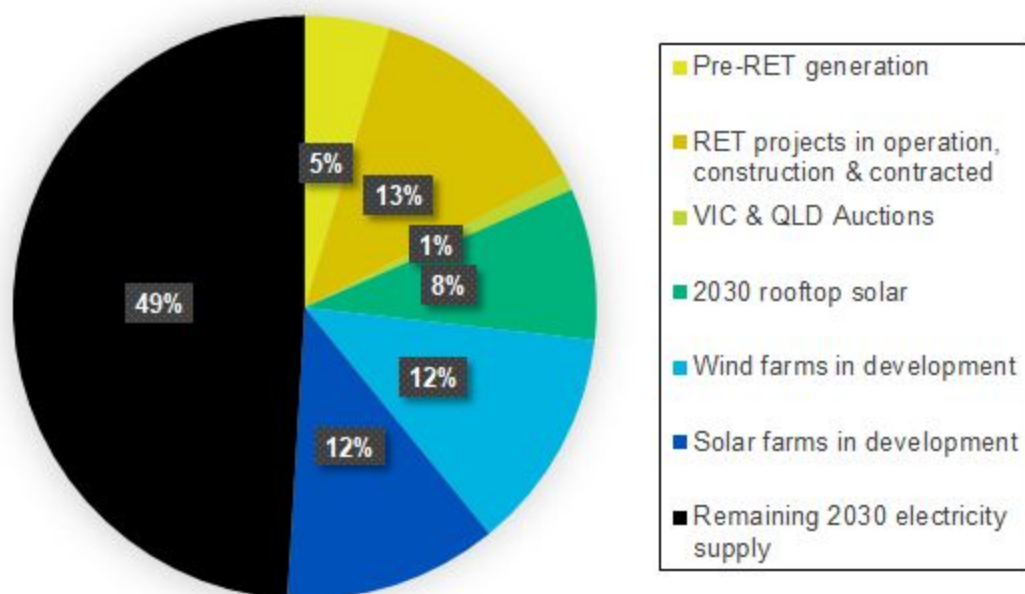


Figure 8: Share of Australia's 2030 electricity supply that could be met from renewable energy projects already in place or underway plus rooftop solar & project sites announced for development.

## Rooftop solar installation activity



### 9. 18,038 small-scale solar systems installed in November

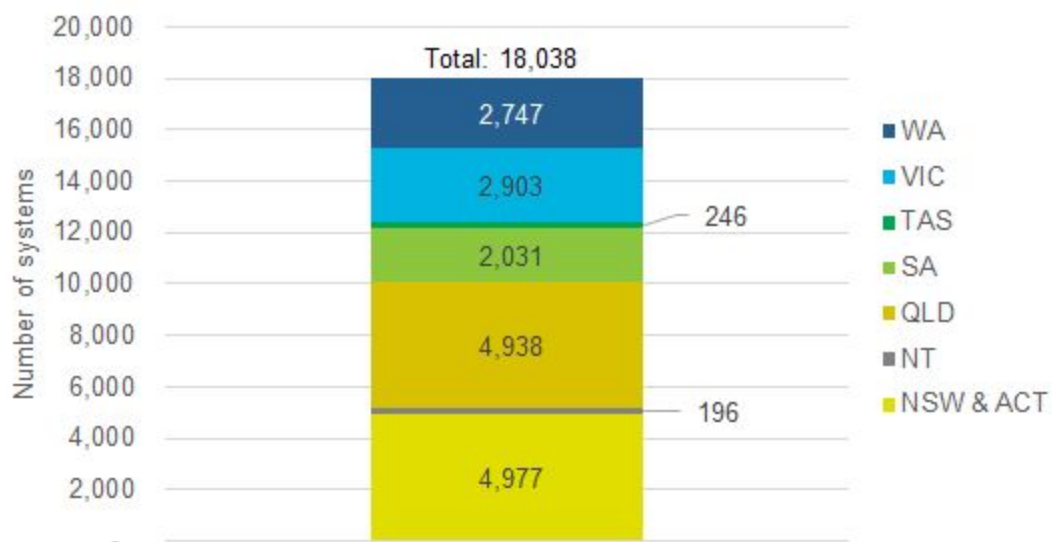


Figure 9: Small-scale solar PV systems installed by state - November 2017

## 10. Rooftop solar employed 5,867 people in November

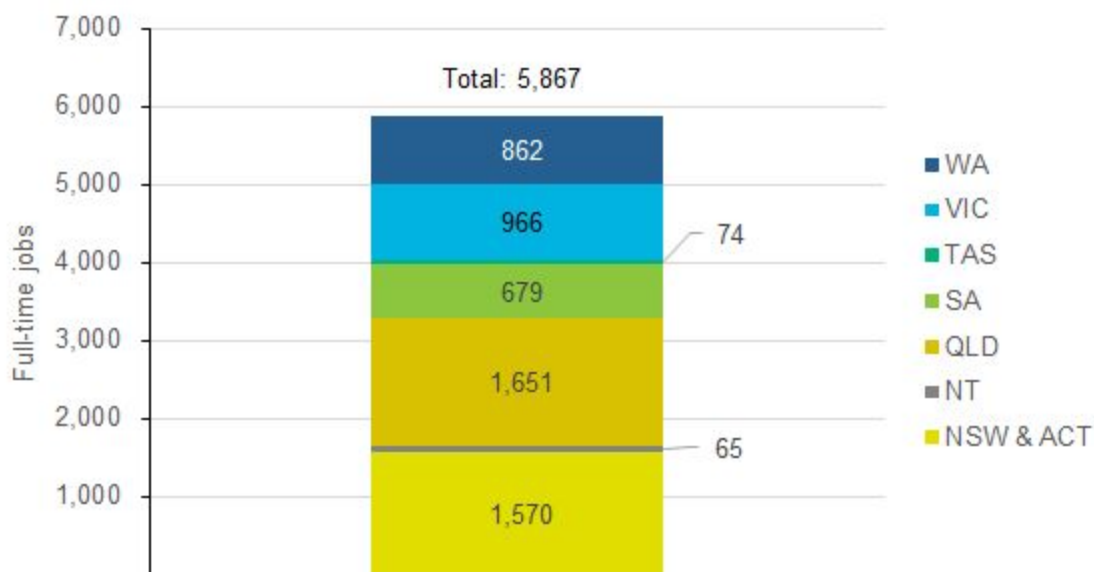


Figure 10. Number of full-time equivalent jobs by state in the installation and sale of rooftop solar PV systems installed over November 2017

## 11. Enough rooftop solar installed in November to power 31,543 homes

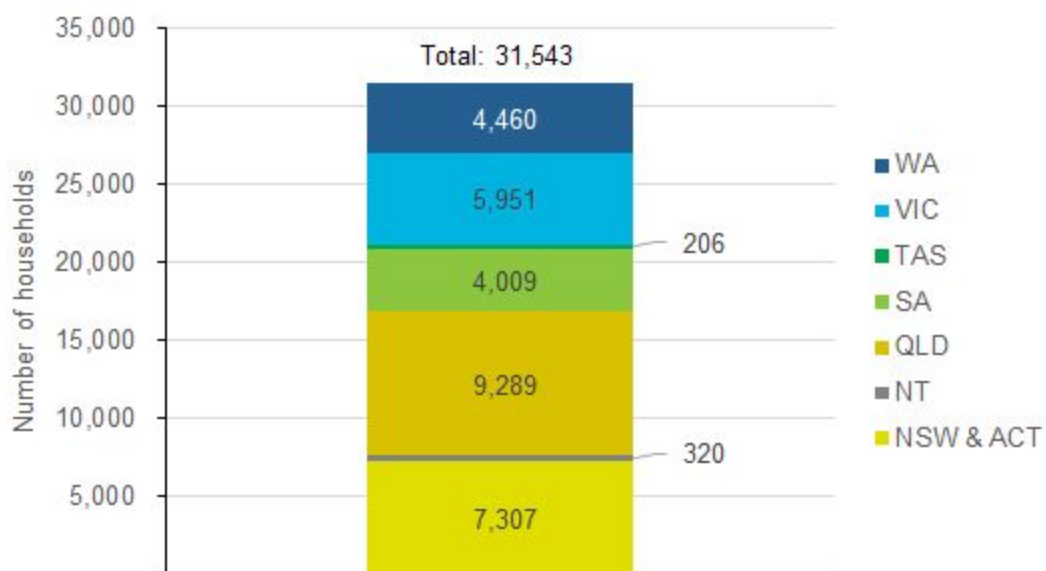


Figure 11: Expected generation from solar systems installed over November in terms of number of households' power consumption

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



Figure 12: Power bill savings (in \$millions) over next ten years from rooftop solar systems installed in November 2017

## Notes on sources and methodology

Figure 1 – Data sourced from the Australian Energy Market Operator (AEMO) and 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 [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 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 - 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 as well as projects announced by companies for development. Estimates of power production are based on a combination of historical generation patterns and projections from project owners.

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 as well as projects announced by companies for development. Estimates of power production are based on a combination of historical generation patterns and projections from project owners.

Figure 9 - 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 10 – 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 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 2016 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 [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.