

Renewable Energy Index

2016-2017 Benchmark Report



Green Energy Markets, August 2017



Key findings

Renewable energy is on the way to producing as much power as Australian households consume. In fact, between July 2016 to June 2017:

- Australia produced enough renewable energy to power 7.1 million homes, or **70% of all households in the country**;
- Renewables made up 17.2% of the electricity generated in Australia (in the National Electricity Market and Western Australian Electricity Market);
- The amount of renewable energy used last financial year avoided an amount of carbon pollution equal to removing 8.1 million cars from the road. **This is more than half of all the cars in Australia.**

The recent boom in construction of large-scale renewables is employing thousands of people:

- **46 large-scale renewable energy projects** were under construction at the end of 2016-17;
- These projects are estimated to create **enough jobs to employ 8,868 people** full-time for a year (in other words, 8,868 job-years of employment);
- **NSW is in the lead**, gaining the largest number at 3,018, mostly from the construction of new wind farms;
- **Queensland is in second place** with 2,625 job years, with 70% flowing from solar farm construction and the remainder from wind farms.

Rooftop solar is making a big impact:

- **Almost 150,000 small-scale rooftop solar systems** were installed in the year to June 2017;
- These systems generated **enough energy to power over 226,000 homes**;
- **The systems installed last year will deliver around \$1.6 billion in power bill savings over the next 10 years** to the households and businesses that installed them — **almost \$10,000 per system**;
- Installing these solar systems supported **3,769 full-time jobs** (across installation, design and sales).

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About this report

The Green Energy Markets' Renewable Energy Index tracks 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 is the inaugural edition of the Renewable Energy Index and covers the entirety of the 2016-17 financial year from July 2016 to June 2017. Future editions will come out monthly.

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 17.2% of the electricity generated in Australia

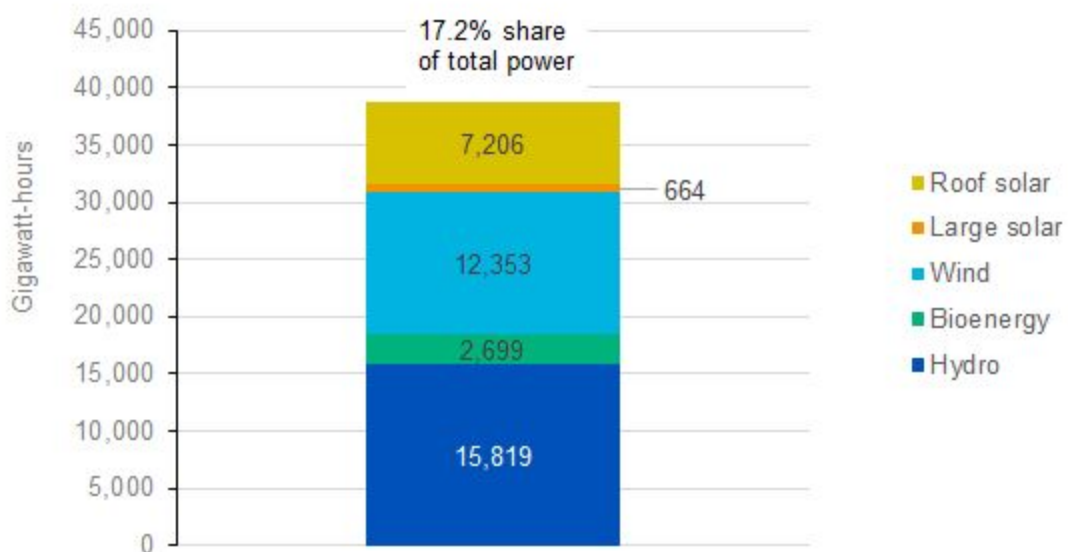


Figure 1: Renewable energy power generation by fuel & market share for west & east coast power grids – 2016-17

2. Enough renewable energy to power 7.1 million homes

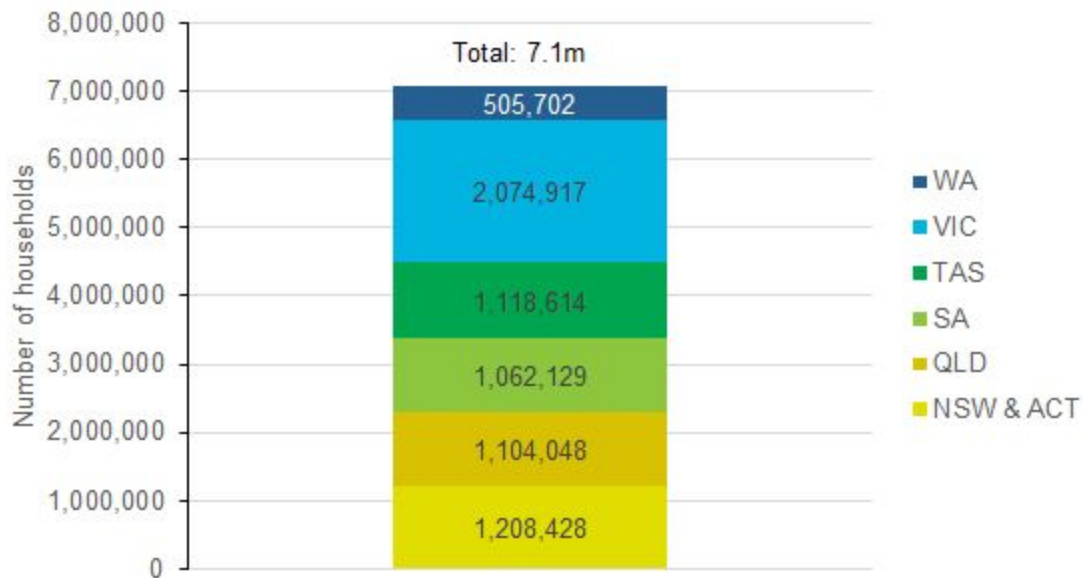


Figure 2: Renewable energy power generation 2016-17 in terms of number of households' power consumption by state

3. Renewable energy avoided 25.4 million tonnes of CO2 pollution

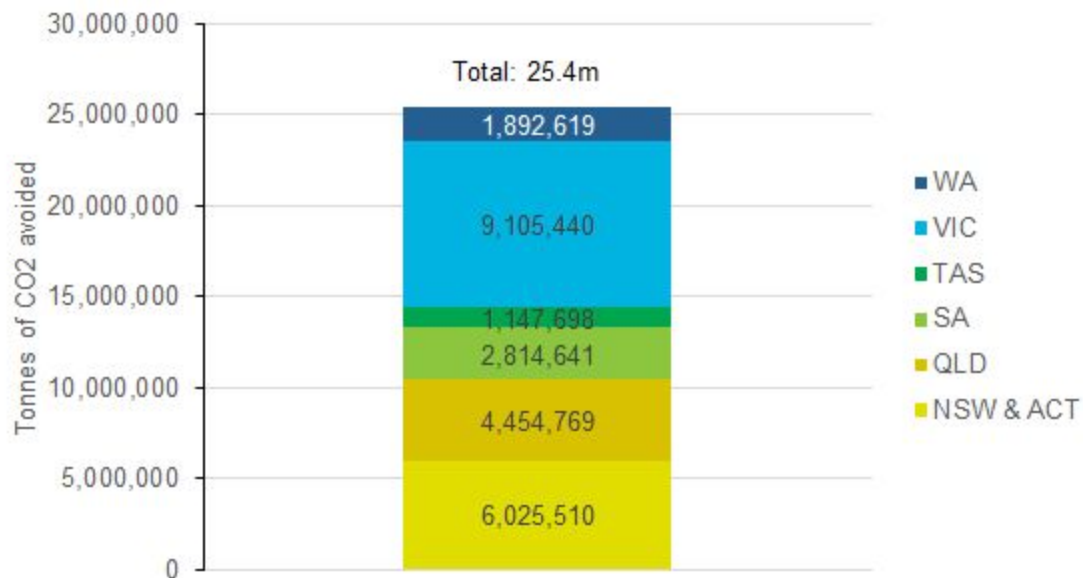


Figure 3: CO2 pollution avoided by renewable energy generation over 2016-17

4. Renewable energy avoided 8.1 million cars' worth of CO2 pollution

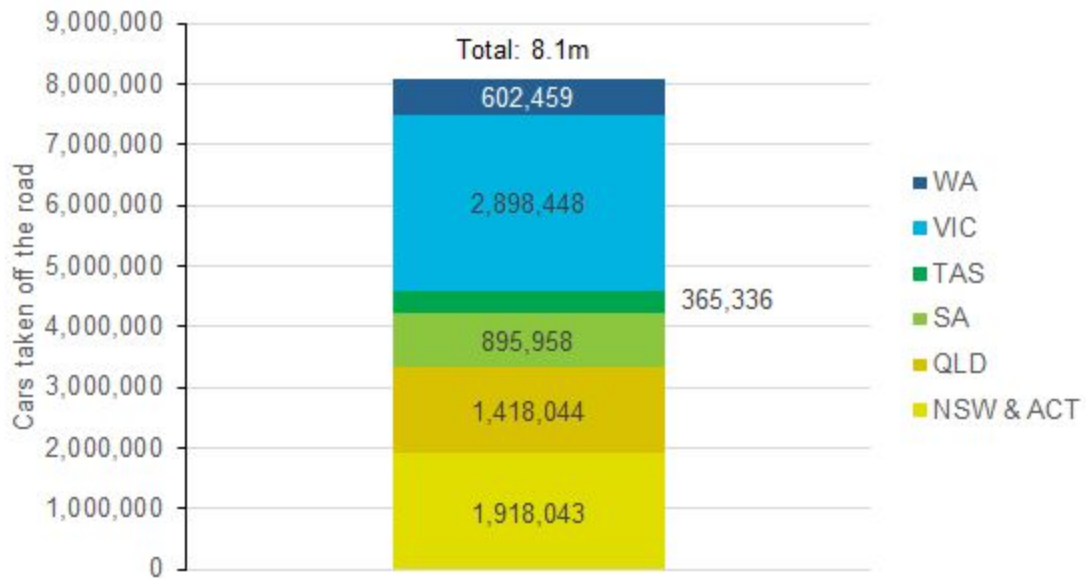


Figure 4. Number of cars' CO2 pollution avoided by renewable energy generation over 2016-17

Large-scale renewables are booming



5. 2,590 megawatts of large-scale renewables under construction

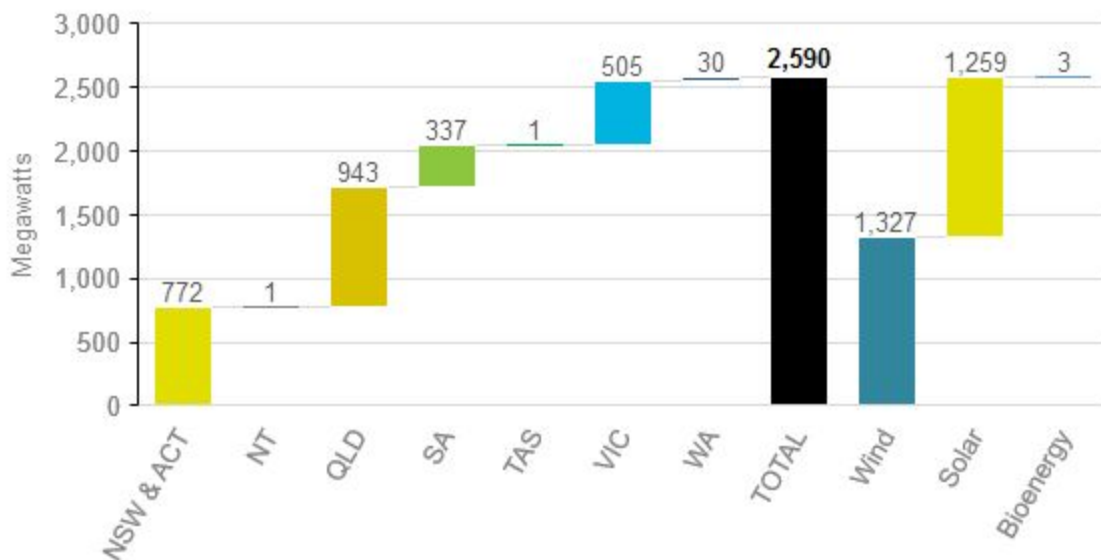


Figure 5: Megawatts of large-scale renewable energy projects under construction by state and fuel at end of 2016-17 financial year

6. Enough work to employ 8,868 people

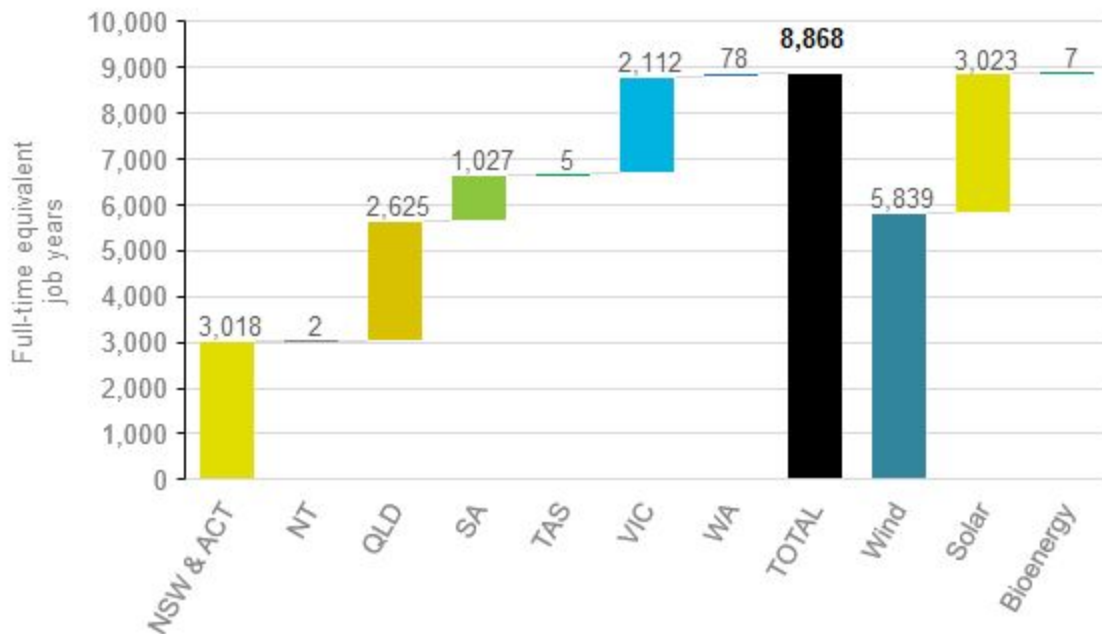


Figure 6: Jobs created by renewable energy projects currently under construction by state and fuel

Rooftop solar is making a big impact



7. Almost 150,000 small-scale solar systems installed in the past year

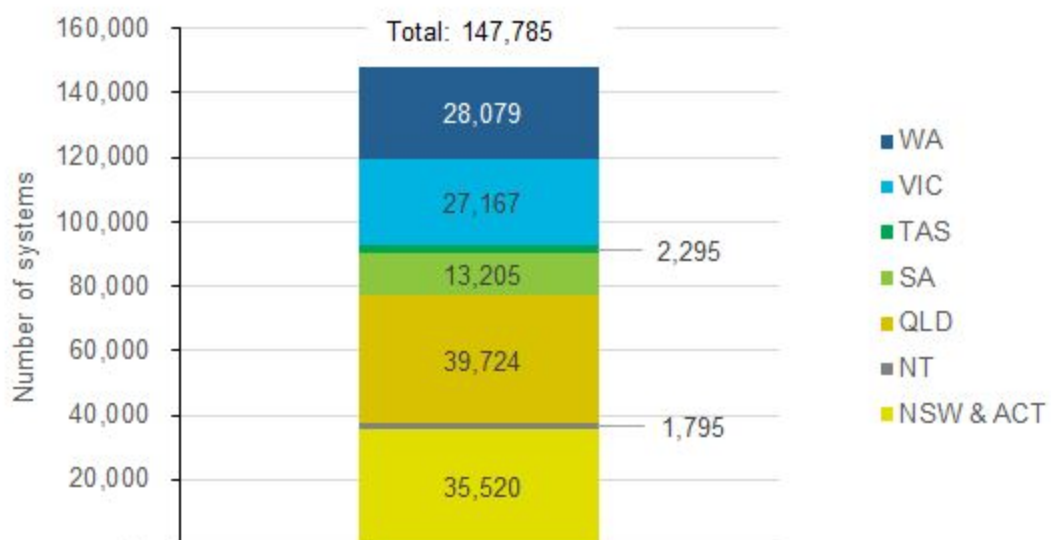


Figure 7: Small-scale solar PV systems installed by state over 2016-17

8. Rooftop solar employed 3,769 people in 2016-17

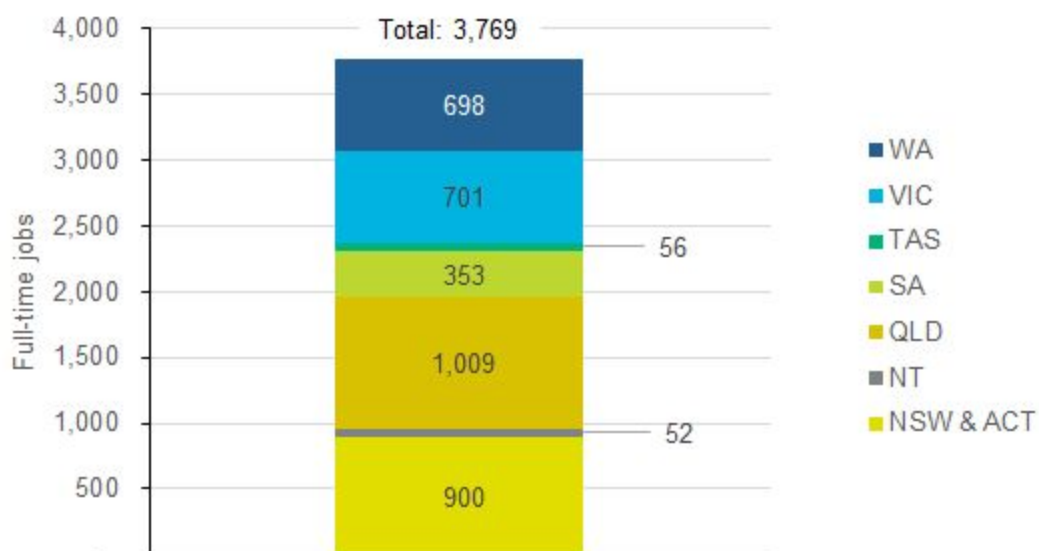


Figure 8. Number of jobs by state in the installation and sale of rooftop solar PV systems installed over 2016-17

9. Enough rooftop solar installed last year to power 226,381 homes

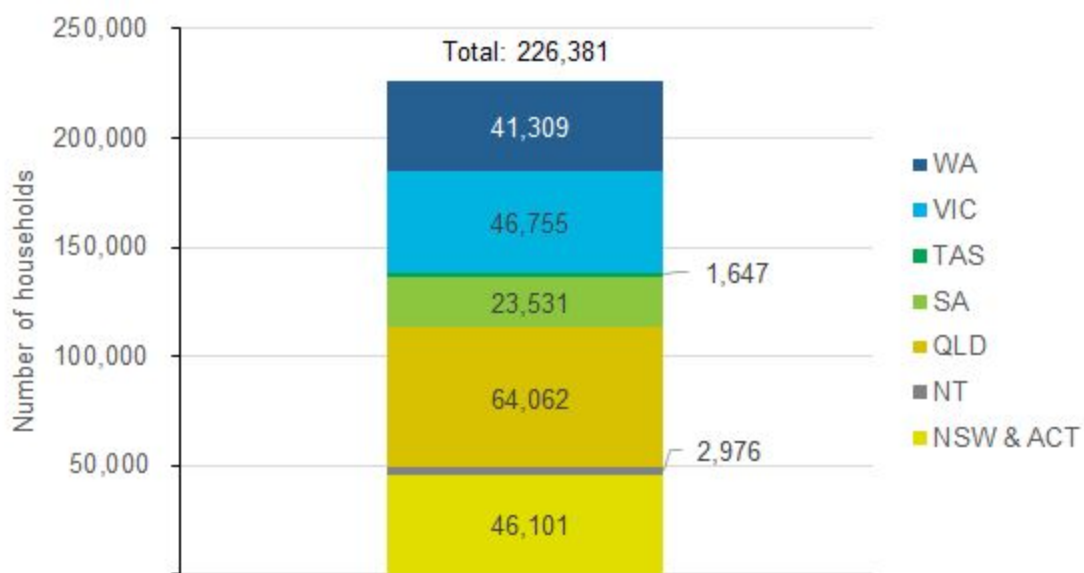


Figure 9: Expected generation from solar systems installed over 2016-17 in terms of number of households' power consumption

10. Rooftop solar installed last year will deliver \$1.6 billion in bill savings

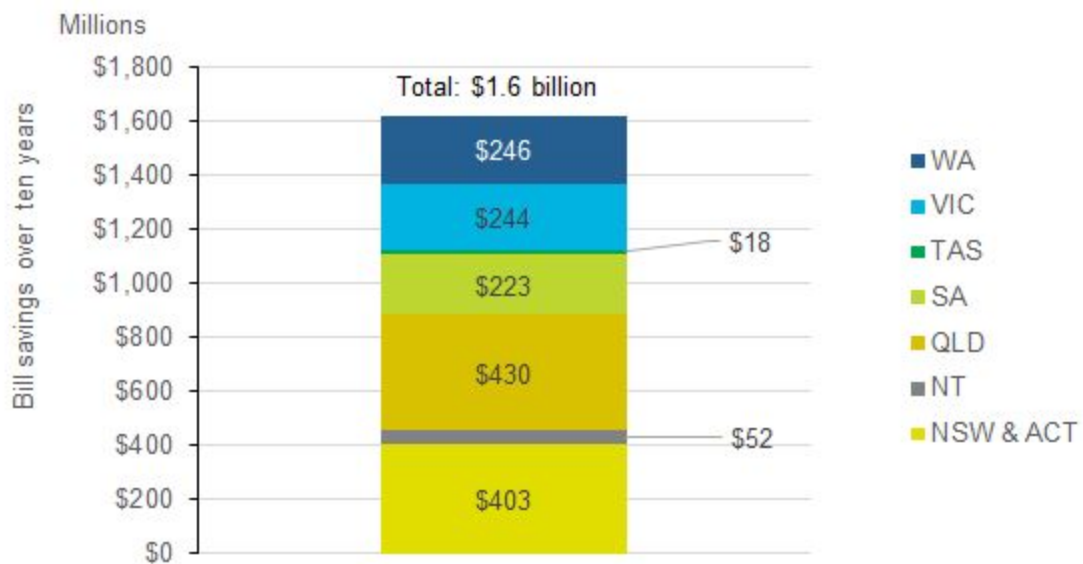


Figure 10: Power bill savings (in \$millions) over next ten years from rooftop solar systems installed in 2016-17

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 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's 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 - 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 8 – 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 9 - 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 10 - 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.