

# AUSTRALIA

## PHOTOVOLTAIC TECHNOLOGY STATUS AND PROSPECTS

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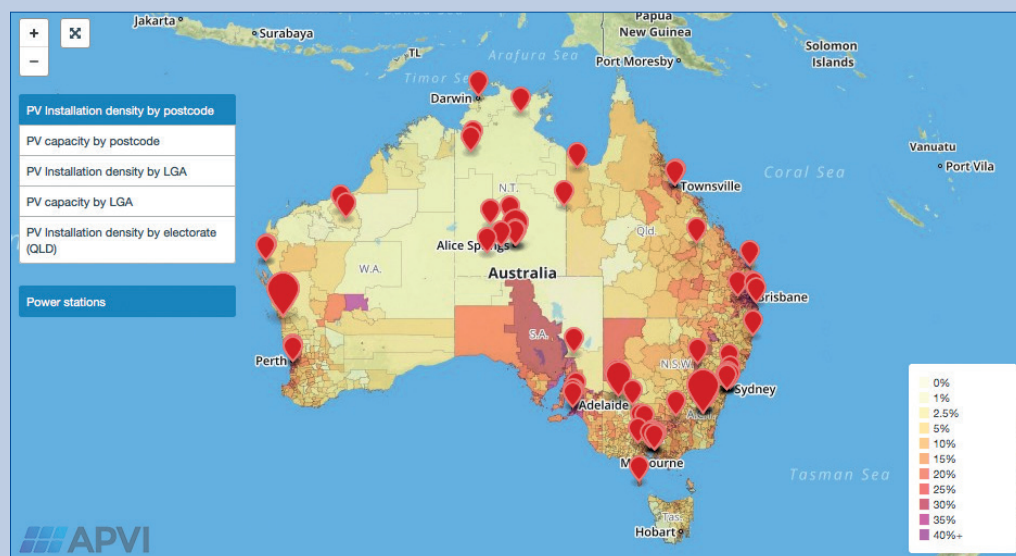


Fig. 1 – PV Density by Post Code in Australia. Image from the APVI Australian Solar Map <http://pv-map.apvi.org.au/>

### GENERAL FRAMEWORK AND IMPLEMENTATION

Solar power is hugely popular in Australia. 1.4 million Australian homes now have a PV system. Residential penetration levels average 17 % of households and reach well over 40 % in some urban areas. Strong community support for solar energy has resulted in governments and utilities dropping proposed retrospective cuts in feed-in tariffs and charges for PV connections in three Australian states.

State incentives have been wound back to voluntary feed-in tariffs offered by electricity retailers. Where available, these are close to wholesale electricity prices and well below the retail cost of electricity in all but one Australian state. Australia's PV market is therefore increasingly focussed upon self-consumption. The main remaining incentive for PV is under review as the Federal Government negotiates proposed changes to the Renewable Energy Target.

Despite this, the Australian PV market expanded slightly in 2014, with installation levels increasing from 810 MW installed in 2013 to around 910 MWp. Installed capacity has reached 4,1 GWp, accounting for 7 % of electricity capacity and 2 % of electricity generation.

Installation restrictions are being imposed by electricity network operators in some areas to cope with potential issues arising from high penetration levels. The major issue arising, however, is economic, not technical. With revenue for electricity networks and retailers dependent largely on kWh sales, PV uptake has contributed to revenue reductions. Large central generators have also been impacted by the overall reductions in energy sales, with several plant closures. A debate about tariff reform has begun, but may take years to play out. Meanwhile many distribution network operators have singled out PV for punitive requirements such as export-limiting technologies, or otherwise restricted system sizes, particularly for non-residential systems.



Fig. 2 – IKEA's 3,6 MW Commercial PV Roll-out in Rhodes, NSW (Photo: Canadian Solar, Australia).

### NATIONAL PROGRAMME

The Australian Government repealed the carbon price mechanism in 2014, so that the main support for PV at a national level remains the Renewable Energy Target (RET). Support for large systems is via the Large-scale RET (LRET) which at present increases each year to 41,000 GWh of renewable electricity by 2020, maintained to 2030. It operates via a market for Large-scale Generation Certificates (LGCs), with 1 LGC created for each MWh of electricity generated. Support for small-scale systems is via an uncapped Small-scale Renewable Energy Scheme (SRES), for which 1 MWh creates 1 Small-scale Technology Certificate (STC). All PV systems up to 100 kWp are also able to claim STCs up-front for up to 15 years of deemed generation, based on location. This means that the STCs for small systems act as an up-front capital cost reduction. The Government has proposed significant reductions to the RET and two separate reviews of the mechanism were completed in 2014. Combined with the Government's proposals to reduce the target, the reviews have created uncertainty that dampened investment in the Large-scale RET. The outcome of the reviews and the proposed reductions in the Target are not yet clear.



Fig. 3 - PV Outdoor Research Facility at the CSIRO Energy Centre in Newcastle Australia.

### RESEARCH, DEVELOPMENT & DEMONSTRATION

PV research, development and demonstration are supported at the national, as well as the State and Territory level. In 2014, research grants were available through the Australian Research Council and the Australian Renewable Energy Agency (ARENA). 43 % of ARENA's funding has been directed towards PV projects, in which 64 PV projects have been supported to date, in addition to 75 scholarships and fellowships. Major projects supported included: Additional financial support for the 155 MW Solar Flagship, building Australia's first off-grid solar farm (6,7 MW) to power a Bauxite mine and nearby township. 2014 also saw 21 MAUD invested in 12 solar research excellence projects, complementing a portfolio of solar research projects with a combined value of 230 MAUD.

In 2014, the Clean Energy Finance Corporation has supported Innovative Solar Leasing Programs worth 120 MAUD for three PV companies, and 13 MAUD for a 3 MW expansion of Uterne solar power station in Alice Springs.

### INDUSTRY AND MARKET DEVELOPMENT

After contracting in 2013, the solar industry stabilised in 2014 and even experienced modest growth. After years of instability caused by rapidly shifting government incentives, the market for sub-100 kW PV has stabilised. Australia's small-scale PV market has experienced a shift towards commercial systems, as many households already have a solar power system. The nascent commercial PV market has grown considerably to represent 20 % of the market by volume. Companies such as IKEA have installed PV on each of its stores. Hence, average system size has climbed to reach 4,7 kW/system by the end of 2014. Module prices stabilised at around 0,75 AUD/Wp in 2014 and installed prices for small residential systems also stabilised slightly below 2,50 AUD/Wp.

2014 saw the utility-scale market develop strongly in Australia. Driven by the government Solar Flagship program, that awarded funds some years ago, installation of several large-scale PV systems finally began. 31 MW was completed of a 100 MW solar farm in New South Wales, with another 3 MW project installed in Queensland as part of a related research program. Under a separate program which followed a reverse auction process, a 25 MW solar farm was completed in the Australian Capital Territory. The private sector also started to invest, though mostly foreign firms were involved: Belectric installed a 3 MW solar farm to test the waters in Australia.



Fig. 4 - Sydney Theatre Company rooftop system (Photo: SF-Suntech).

The trends that commenced in 2014 are likely to continue into 2015. A gradually-declining residential PV sector continues to be offset by a rapidly growing commercial PV sector. Major utility-scale projects are also expected to continue in 2015, though this will represent the fruition of the government's historic one-off investment in utility-scale PV via the Solar Flagship program. A new Direct Action program has been introduced, whereby incentives will be provided for emissions reductions activities across the Australian economy – one such program that directly benefits PV is Solar Towns, a 2 MAUD program to support installation of PV in six electorates and two other areas of Australia.

Meanwhile there is ever increasing customer interest in on-site storage. Although not yet cost effective for most customers, a market for storage is already developing. This trend could exacerbate issues faced by incumbent electricity sector businesses, even if it offers a means to manage supply intermittency and peak demand, since it would facilitate the installation of larger PV systems and may also see a trend to self-sufficiency and disconnection of customers from main grids.