

The Australian PV sector: performance, prospects and promise

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Abstract: As in other countries, the Australian PV sector has seen enormous changes over recent years. Businesses face both challenges and opportunities; market support mechanisms are struggling to match the dynamics of the market; and the Australian public has finally seen PV arrive as a serious electricity option. Across the PV value chain, innovative developments are anticipated and required in the years ahead.

Background

PV sectors in most countries have become increasingly enmeshed with the activities of other PV countries – as a consequence of the globalisation of industry and markets, and also the sharing of experiences with both successful and deficient policies and business models. While Australia's PV sector has possessed many unique elements in the past, having developed a vibrant off-grid market and then a very competitive residential grid-connect market, the future of PV in Australia will clearly benefit from shared knowledge and co-operative business approaches, especially in the larger-scale market sector.

PV is now very much on the global agenda as a serious source of power generation. If we look at PV's contribution to newly installed electricity power generation capacity in 2011, the numbers are impressive - in Australia 36%, France 57%, Italy over 60%, Korea almost 6% and the US approaching 10%¹.

During 2012, low module prices resulted in the number of manufacturers decreasing from around 750 to around 150², and the consolidation is expected to continue. Australian production is now limited to a 60 MW plant in South Australia producing AC modules.

Historical development of the Australian PV market

Traditionally, the Australian market for PV, and associated expertise, lay in the off-grid sectors - residential systems in which PV displaces diesel in hybrid power systems or provides power directly for lighting, and industrial and agricultural applications, such as telecommunications, signalling, cathodic protection, water pumping and lighting. Significant markets also exist for fuel saving and peak load reduction on diesel grid systems in remote towns and mine sites. It is only recently – since 2009 – that the grid-connected capacity has exceeded off-grid applications, as shown in Figure 1.

¹ IEA-PVPS, 2012, *Trends in PV Applications*, PVPS, T1:21-2012.

² Groom, N and Steitz, C, 2013, "Dark clouds threaten solar's sunny spell", *Climate Spectator*, 11 January 2013.

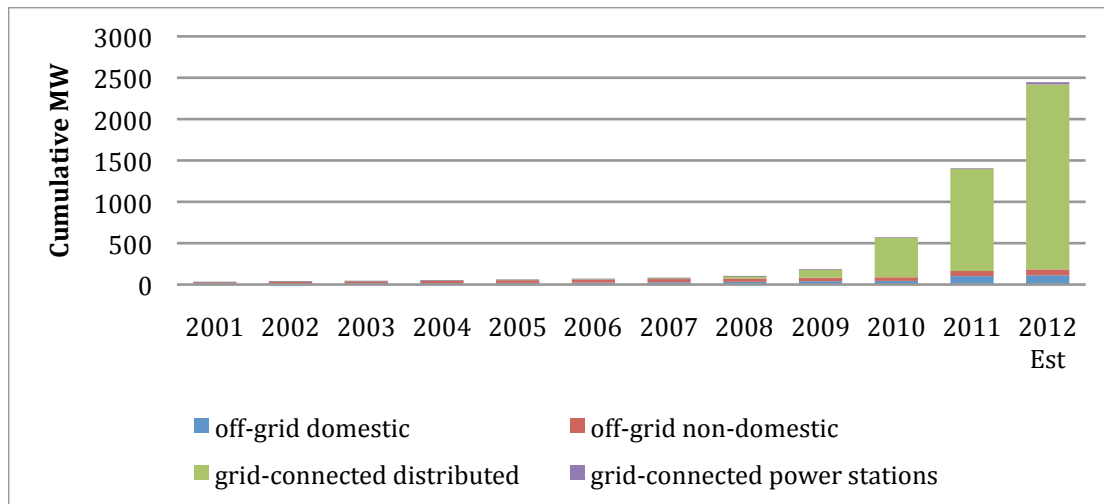


Figure 1: PV installations in Australia 1992-2012³

The main applications are now rooftop systems for private residences, which have been supported by various government programs, but are now cost effective without subsidy in many areas. PV electricity reached grid parity against retail electricity tariffs in many parts of Australia in 2011. The commercial and light industry sector has grown more slowly than the residential sector to date, with support available only to selected projects in certain areas. However, commercial sector interest in PV is increasing as PV prices fall and electricity tariffs increase. Recently, the first community solar project has been announced. It will allow individuals who may not be able to install PV on their own properties to buy shares in a system on a commercial building.

Australian Government support programs have impacted significantly on the PV market in recent years⁴. The Solar Homes and Communities Plan provided rebates for PV installed on residential buildings and community buildings. This scheme ran from 2001 to 2008 and stimulated interest in grid connected applications. The Renewable Energy Target (RET) commenced in 2001 and operates via a renewable energy certificate market and an obligation on electricity retailers to purchase an increasing number of certificates over time. This is the main support program for PV in Australia at present. For a short period, a range of State-based feed-in tariffs applied across Australia and have now essentially been wound up, some after having created explosive market demand and considerable political angst within a very short time. Solar Cities demonstration programs operated in selected cities across Australia. The National Solar Schools Program assisted with PV installations in most schools and familiarised school children with PV. The Solar Flagships Program supports the installation of large (utility-scale) PV plants and is ongoing despite some early setbacks. Previously, a significant amount of PV was installed in remote areas of Australia under the Renewable Remote Power Generation Program. Bushlight was part of that program and installed renewable energy systems in remote Indigenous communities.

³ Australian PV Association PV Annual status reports www.apva.org.au/status_reports)

⁴ More detailed information about the various programs can be found in the annual 'PV in Australia' reports, available from the APVA website (www.apva.org.au).

The Australian PV sector today

The Australian PV market remained strong in 2012, with installation levels reaching over 1 GW - again dominated by small-scale residential systems. Cumulative installations are now well over 2 GW. Due to global module price decreases, coupled with a high Australian dollar exchange rate, module prices dropped by about 40% and installed system prices by around 25% from 2011 to 2012, as shown in Figure 2. Residential PV has become a mainstream energy option, with a number of regional towns and suburbs now having more than 20% of their households with PV installed, some more than 25%⁵.

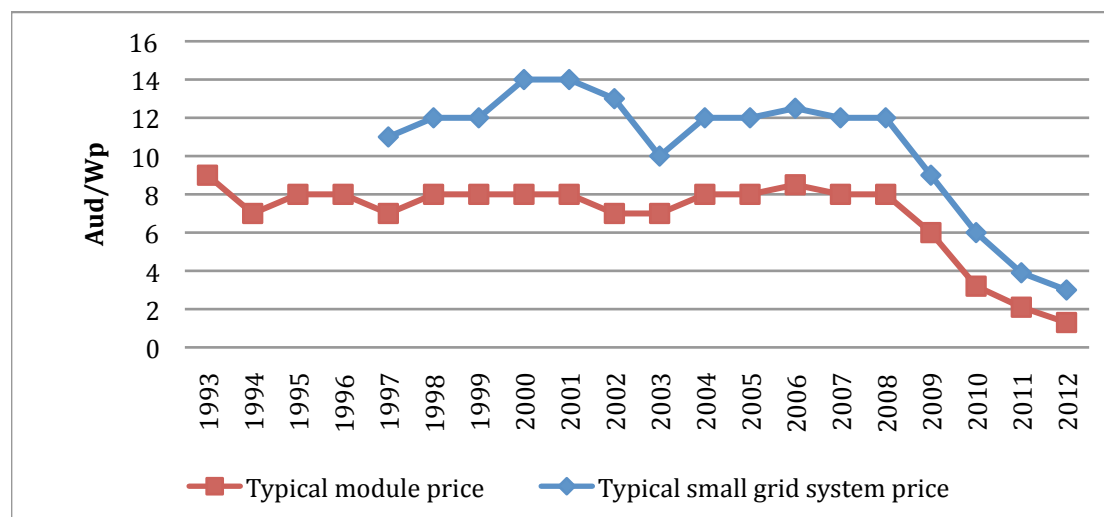


Figure 2: Trends in typical module and small PV system prices in Australia⁶

Support for PV continues in the form of certificates created under the RET. For small systems, certificates can be created up-front for 15 years' worth of deemed generation and thus can act as an up-front capital cost reduction. Solar Credits were used from 2008 to 2012 to multiply the number of certificates that small PV systems would be eligible to create. A review of the RET has recently been completed and is now before government, with a proposal to reduce the deeming rules, amongst other changes.

Several larger-scale centralised PV systems are now under construction or have been installed. All involve local electricity utilities. A 10 MW system was installed in Western Australia with funding support from the State Government, while the Australian Capital Territory ran a solar auction process in 2012 for 40 MW of PV, with the first project awarded to FRV Royalla Solar Farm for a 20 MW installation. AGL and First Solar were the successful bidders for the Round 1 Flagship grant and will construct 100 MW in Nyngan and 50 MW in Broken Hill, NSW. The systems are expected to be operational from 2014.

PV research, development and demonstration are supported at the national, as well as the State and Territory levels. Research grants have been available through the Australian Research Council and the Australian Solar Institute (ASI). Funding has been provided for PV research including new manufacturing techniques, hybrid system technologies, building integrated PV, a new US-Australia Institute for Advanced Photovoltaics and other collaborative projects with the US and Germany.

⁵ Clean Energy Council, April 2012, based on data from the Clean Energy Regulator

⁶ Australian PV Association

The ASI will be absorbed into a new Australian Renewable Energy Agency from 2013.

The challenges

Retail electricity prices in Australia are expected to continue to rise, due largely to network refurbishments and upgrades, and a carbon price was introduced from mid-2012. Consequently, PV is now a very attractive option for homeowners in many parts of Australia and is of increasing interest to the commercial sector. However, PV is being incorrectly apportioned blame for politically sensitive electricity cost increases, while development of the commercial market is hampered by the lack of standardised procedures or rights to connect. With wholesale electricity prices still relatively low, larger-scale PV systems continue to require policy support.

In common with many other countries, a more sustainable PV market with less reliance on subsidies is now being established in Australia. Ideally, support policies will begin to shift from handouts of public money to focus more on enabling strategies, appropriate regulation and development of innovative business models. Sustainable building regulations are an emerging force and will significantly grow the commercial sector building market that has hitherto been under-represented. Local jurisdictions in Australia as elsewhere are demonstrating a rapidly growing interest in PV technology. Activities take the form of greenhouse gas reduction and renewable energy support programs, as well as reductions of entrenched permitting barriers. Third party financing schemes (including leases and power purchase agreements) that address up-front capital requirements are becoming more common, sometimes through the banking sector and sometimes promoted by other organisations. A number of Australian PV installation companies offer financing or leasing options, especially for commercial systems.

As PV penetration levels rise, installation restrictions are being imposed by electricity network operators in some areas to cope with potential issues arising from sudden changes in demand and to voltage rises in residential feeders. New grid connect standards are under consideration to assist with high penetration levels and are likely to be introduced in 2013. Network operators, however, will also need to change their control strategies to cater for a new generation of supply and demand options, including PV, other distributed generation technologies, demand management devices, energy efficiency and storage. Changes are also needed to retail electricity market structures as these new options are already resulting in significant reductions in revenue to electricity retailers and network operators.

Australian electricity utilities have been involved in some demonstration programs and retailers must obtain renewable energy certificates under the RET. Some have installed their own PV systems for the RET or for their Green Power customers, others have established solar businesses and sell PV systems to their customers. Utility business models – particularly subsidiary businesses, ownership of assets, financing of assets, community programs and power purchase arrangements – are creating increasing interest. It is likely that the electricity utilities, particularly the evolving electricity network businesses, will have an even more significant role to play in PV deployment in coming years, but Australia will need to rethink the way its electricity market is regulated for its full potential to be realised.