



**Australian
PV Association**

PV IN AUSTRALIA 2012 EXECUTIVE SUMMARY

Prepared for the International Energy Agency
PV Power Systems Programme

BY

Australian PV Association
May 2013

AUTHORS:

**Dr Muriel Watt, University of NSW
Dr Rob Passey, IT Power (Australia)**

Supported by

ARENA



Australian Government

**Australian Renewable
Energy Agency**



INTERNATIONAL ENERGY AGENCY CO-OPERATIVE PROGRAMME ON PHOTOVOLTAIC POWER SYSTEMS

Task 1

Exchange and dissemination of information on PV power systems

National Survey Report of PV Power Applications in Australia, 2012

The Australian PV Association

The objective of the APVA is to encourage participation of Australian organisations in PV industry development, policy analysis, standards and accreditation, advocacy and collaborative research and development projects concerning solar photovoltaic electricity.

APVA provides:

- Up to date information and analysis of PV developments in Australia and around the world, as well as issues arising.
- A network of PV industry, government and researchers who undertake local and international PV projects, with associated shared knowledge and understanding.
- Australian input to PV guidelines and standards development.
- Management of Australian participation in IEA SHC and PVPS Programmes, including:
 - PV Information Exchange and Dissemination
 - PV System Performance
 - High Penetration PV in Electricity Grids.

The Association receives funding from the **Australian Renewable Energy Agency (ARENA: www.arena.gov.au)** to assist with the costs of IEA PVPS Programme membership, Task activities and preparation of this report.

ACKNOWLEDGEMENTS

This report is prepared on behalf of and with considerable input from members of the Australian PV Association and the wider Australian PV sector, especially:

Warwick Johnson, SunWiz Pty Ltd

Ric Brazzale, Green Energy Trading Pty Ltd

Ted Spooner, University of NSW

Nigel Morris, Solar Business Services

COPYRIGHT This report is copyright of the Australian PV Association. The information contained therein may freely be used but all such use should cite the source as "Australian PV Survey Report 2012, APVA, June, 2013".



EXECUTIVE SUMMARY

Installed PV power

A total of 1038 MW of PV were installed in Australia in 2012. Of this 98% was grid-connected, taking the cumulative grid-connected portion to 95%, up from 88% last year. Total installed capacity in Australia is now over 2.4 GW. PV power has now reached grid parity in many areas and government support programs are winding down.

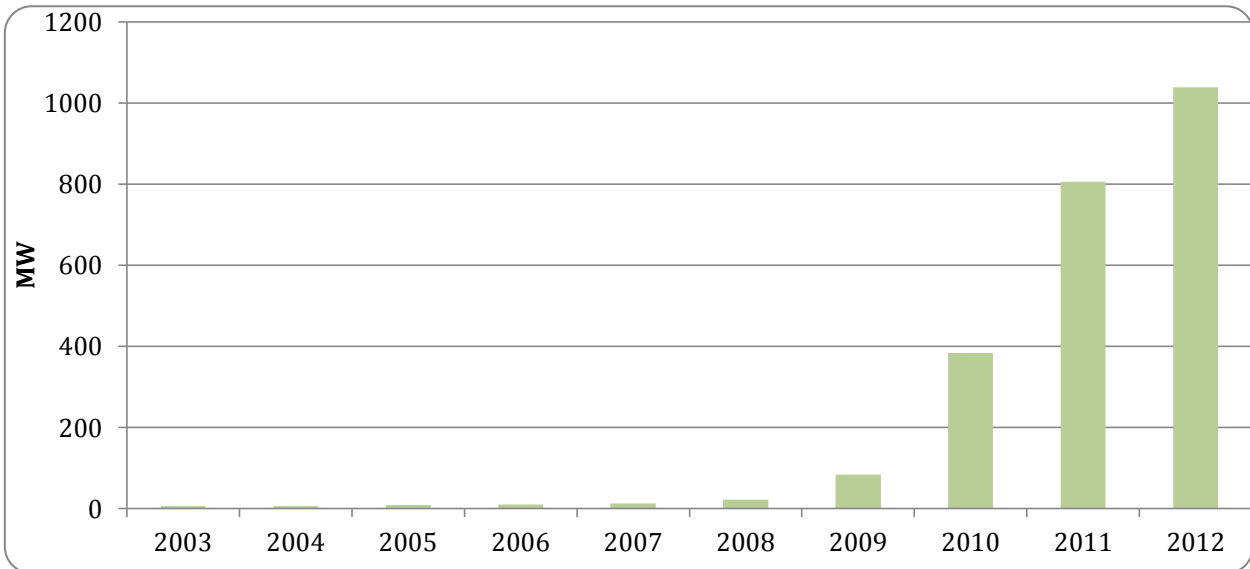


Figure 1: Annual PV installations, Australia 2003-2012

Costs & prices

Typical module and system prices continued to fall in 2012, with balance of system prices now equivalent to module prices. Module prices averaged AUD 1,8/Wp, but were as low as AUD 0,9/Wp, due partly to the high AUD exchange rate. Grid system prices averaged AUD 3,0/Wp, down from AUD 3,9/Wp last year.

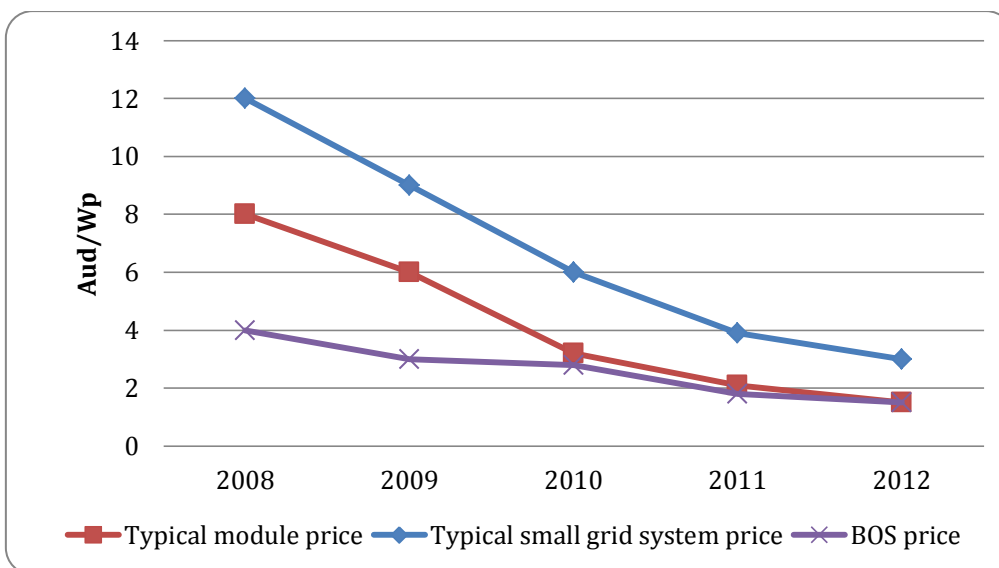


Figure 2: Typical module, system and balance of system costs Australia 2008-2012



PV production

A new module manufacturer, Tindo Solar, started operation in Adelaide, South Australia. Dyesol Ltd continues to produce dyes for the international dye solar cell market from its factory in Queanbeyan, New South Wales and Solar Systems has installed a demonstration CPV plant in Victoria. A range of array frames, switch-gear and inverters are also manufactured in Australia.

Budgets for PV R&D

A total of AUD 104,6 million was spent in 2012 by the Australian and State & Territory Governments on PV R&D, demonstration and market stimulation. State and Territory funding accounted for 46% of total expenditure.



Figure 3: The 10 MW Greenough River PV Power Station, Western Australia (Photo: First Solar)

THE GREENOUGH RIVER SOLAR FARM

The 10 MW Solar power station is powered by more than 150,000 First Solar advanced thin film PV modules and will generate 22 GWh of electricity a year. This will displace over 20 000 tons of CO₂ equivalent emissions per year, the equivalent of taking over 4000 cars off the road. The Western Australian Water Corporation, which is the State's primary supplier of water, wastewater and drainage services, is purchasing 100% of the power generated by the solar farm for their Southern Seawater Desalination Plant. Verve Energy, the leading generator of electricity in WA, and GE Energy Financial Services each own 50% of the solar farm. The project is funded with 100% equity, with the WA Government providing AUD 20 million, including AUD 10 million from the WA Royalties for Regions program.

In addition to supplying the solar modules for the project, First Solar provided engineering, procurement, and construction services, and is providing operations and maintenance support now that the solar farm is operational.

Local contractor, WBHO Civil, provided site preparation services, underground electrical services and civil works, generating millions of dollars for the City of Greater Geraldton. The company's local expertise and extensive network across WA ensured that the Greenough River Solar Farm was built to the highest possible standards. Up to 100 people were onsite at any one time throughout the construction phase, with jobs lasting for up to nine months.



TABLE OF CONTENTS

	Definitions, Symbols and Abbreviations	iv
	Foreword	vii
	Executive Summary	viii
	Installed PV power	viii
	Costs & prices.....	viii
	PV production	ix
	Budgets for PV R&D	ix
1	Introduction	1
2	The implementation of PV systems in Australia	2
	2.1 Applications for photovoltaics.....	2
	2.2 Total photovoltaic power installed	2
	2.3 PV implementation highlights, major projects, demonstration and field test programmes	3
	2.3.1 The Renewable Energy Target.....	3
	2.3.2 The ACT Large-scale Solar Auction.....	7
	2.3.3 Solar Cities	8
	2.3.4 National Solar Schools Program	10
	2.3.5 Solar Flagships.....	10
	2.3.6 Bushlight.....	10
	2.3.7 Remote Indigenous Energy Program (RIEP).....	11
	2.3.8 State and Territory Support.....	11
	2.4 Highlights of R&D	14
	2.4.1 CSIRO.....	14
	2.4.2 Australian National University	17
	2.4.3 Swinburne University of Technology.....	18
	2.4.4 University of NSW	19
	2.4.5 University of Queensland	21
	2.4.6 Dyesol Limited	22
	2.5 Public budgets for market stimulation, demonstration / field test programmes and R&D	23
3	Industry and growth.....	25
	3.1 Production of photovoltaic cells and modules.....	25
	3.2 Prices and Trends.....	25
	3.3 Manufacturers and suppliers of balance of system components	26
	3.4 Labour places.....	28
	3.5 Business value	29



4	Framework for deployment (Non-technical factors).....	30
4.1	Solar Leasing	30
4.2	Indirect policy issues.....	30
4.3	Interest from electricity utility businesses.....	31
4.4	Interest from municipalities and local governments.....	31
4.5	Standards and codes.....	31
5	Highlights and prospects.....	33
	Annex A: Background information – Australia 2012.....	34