

The Australian Solar Electricity Atlas

The Australian Solar Electricity Atlas makes use of the spatial relationship between the location of solar electricity output, electricity demand and the high voltage (HV) electricity infrastructure connecting the two to identify and rank the optimum locations for commercial solar electricity generation zones. The Atlas aims to identify the locations of the preferred zones throughout Australia for the least cost and most profitable generation of electricity using solar energy. The Atlas will be available as a digital analytical tool and as a printed hardcopy.



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The Solar Electricity Atlas is being built in a number of stages -

	Activities	Date completed
Stage 1	HV infrastructure geodatabase compilation	December 2008
Stage 2	Solar data compilation and assessment	July 2009
Stage 3	Hourly solar-PV output throughout Australia	September 2009
Stage 4	Hourly demand and return for electricity throughout Australia	*October 2009
Stage 5	Integration of the solar output, infrastructure and demand into a dynamic electricity source/sink model	*December 2009
Stage 6	Ranking of solar generation zones according to commercial viability	*January 2009

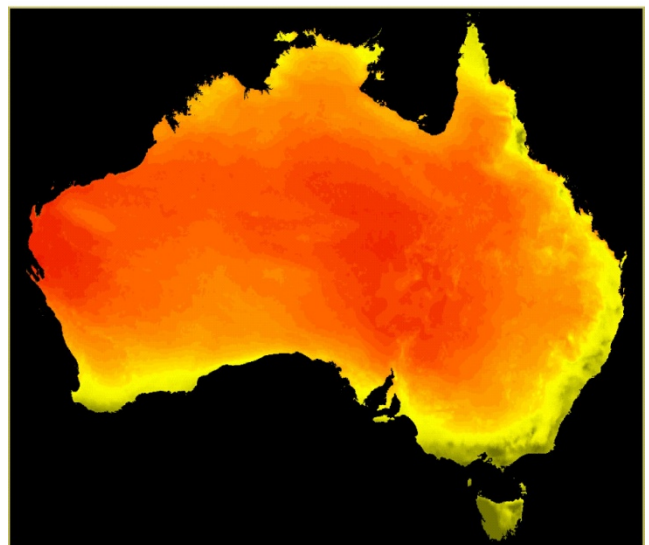
* Anticipated completion dates.

To date, three quarters of the work required to build the Atlas has been completed. The work completed so far includes a geodatabase of the entire high-voltage transmission network throughout Australia; compilation and quality assessment of ten years' worth of satellite and ground station data of global, direct, diffuse, direct normal and global normal solar radiation and temperature data at a resolution of 4000m for the whole of Australia; plus a model of solar-PV output for the whole of Australia. The solar-PV model can provide the user with an expected hourly, monthly or annual electricity production per kilowatt of installed photovoltaic modules.

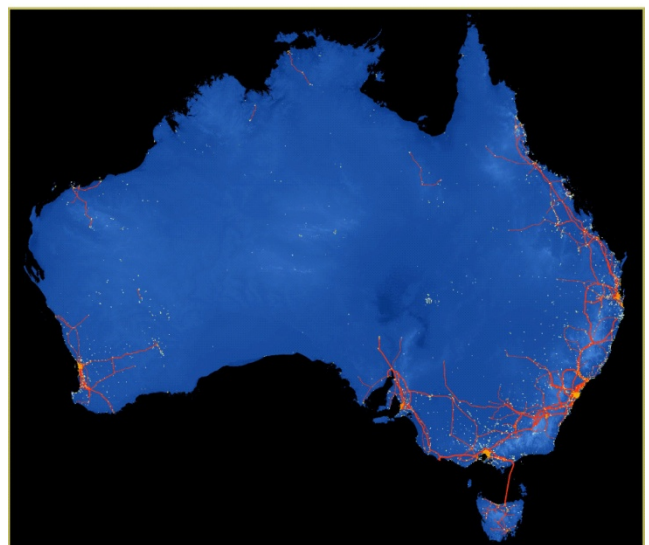
Underpinning the spatial aspects of solar generation in the Atlas is background information on the solar electricity industry, the solar models and demand models. This background information includes solar farm design considerations, module tilt angle, output from different module types, solar electricity costs, anticipated year when grid parity is likely to be reached and the hourly location of demand for electricity.

The principal data sources used to compile the Atlas include solar and weather data provided by the Bureau of Meteorology; the Australian Solar Radiation Data Handbook; electricity demand and price data provided by the Australian Energy Market Operator; census data provided by the Australian Bureau of Statistics; nighttime lights satellite imagery provided by the US Government's National Geophysical Data Centre; module performance specifications provided by the US Department of Energy SANDIA National Laboratories and various solar equipment manufacturers; and a wide variety of sources used to compile the electricity high voltage infrastructure geodatabase.

The Solar Atlas is phase 1 of the construction of a comprehensive Australia Electricity Model which will progressively include other energy systems, such as wind, biomass, landfill gas, natural gas, coal, and carbon capture and storage (CCS), as the individual energy models become available.



Annual solar-PV output
1700 kWh/kW_p 2400



Annual electricity demand
0.1 MWh/km² 103

HV powerlines

— 66 - 136 — 137 - 223 — 224 - 279 — 280 - 332 — 333 - 500

September 2009.

