



Adelaide Showground Solar Power Generator South Australia

INFORMATION FACT SHEET

The Adelaide Showground Solar Power Generator is the largest urban solar power project to date in Australia, with a power generating capacity of one megawatt (1MW).

Funded by the State Government of South Australia, the \$8 million installation has the capacity to generate in excess of 1,400 mega-watt hours of solar electricity each year – the equivalent of powering 250 South Australian homes – and provide 40% of the entire Showground's power needs. It will also save around 1,400 tonnes of greenhouse gas emission annually.

The project is the first MW-scale industrial rooftop solar plant in Australia, and the first commercial installation of First Solar Cd-Te thin film technology. The initiative shows that solar panels can supply electricity on a commercial scale.

Installation of the solar panels and associated systems was managed by building and engineering company Built Environs in partnership with grid-connect solar systems provider Solar Shop Australia. The installation, which comprises 12,720 panels, took just three months to complete. All work was conducted while the Showground – South Australia's most popular public venue attracting over 1.3 million visitors each year – remained open to the public.

The project introduced a number of construction innovations. A special rack-loading system was devised, with the solar panels stacked on pallets, lifted onto the roof by crane and then distributed via trolleys on framing rails. A clip-on extrusion framing system minimised the number of holes that needed to be drilled in the roof. To install the panels, drilling rigs were custom-made for each of the major roofs, while cloth and mesh screens prevented drilling waste from entering the stormwater collection system.

Frequently asked questions

What is the total value of the Solar Project?

It is expected that the final cost of the Solar project will be in the vicinity of \$8 million.

Where are the panels installed?

The solar panels are installed on six buildings – Goyder, Jubilee, Wayville, Alpaca, Dairy/Goat.

How big is the installation?

The total area of the panels is 9,239 square-metres.

What types of panels have been used?

12,612 FIRST SOLAR 77.5 Watt Thin Film CdTe modules, manufactured in Malaysia. 108 SUNTECH 210 Watt Polycrystalline Si modules, manufactured in China, were installed on northern facades, Jubilee and Goyder Pavilions, and screens. The system is divided into 184 sub-systems, each of which is monitored for power production

What is the total output of the system?

1,000,110 watts peak rated. The annual expected output is 1400 MegaWatt-hours. The installation will generate 40% of the total average annual power needs of the Adelaide Showground.

What is the expected reduction in greenhouse gas emissions?

1400 tonnes annually.

Where does the power go?

It's used within the Showground facilities or exported to the grid when excess is being produced. When the Showground is not hosting large events, the system will export and provide power to neighbouring houses and businesses.

What is the orientation and incline of the panels?

The most common arrangement for installing large-scale rooftop solar PV systems is to install them flat to the incline of the existing roof. This lowers the overall cost of installation by reducing structural work on strengthening the roof, reduces the amount of framing required, and reduces the maintenance costs throughout the life of the system. All the panels (other than the Screen and Facades) have been installed flat to the existing roof. Most panels are close to flat which will maximize their summer electricity production.

How long is the payback for the panels?

The panels pay back the energy used to produce them within two years, are warranted for 25 years and are expected to operate for 30-40 years. The time to payback the cost of the solar system depends on how quickly the cost of electricity increases over the next 10-20 years. It is estimated the cost will be covered in less than 20 years.

What are the optimum weather conditions for operation?

Bright sun and cool temperatures are best for solar production. The highest production will occur over the summer months due to the high amount of solar radiation (light energy) hitting the Showground at that time. However, the increased temperature also reduces the efficiency of the panels. The Thin Film technology chosen for this project has better temperature tolerance than typical mono or poly crystalline panels.

What is the life expectancy of a panel?

The panels are warranted for 25 years, however we expect them to last for 30-40 years.

What are the maintenance requirements?

Typically, the panels will be washed once a year. To ensure all structural and electrical components are functioning correctly, maintenance will be contracted for the first ten years by the systems integrators, Solar Shop Australia Pty Ltd.

What Financial Agreement & Return can be expected from the solar installation?

It is estimated that the rooftop solar installation will produce on average 1,400 MWh annually which will generate a gross saving of approximately \$126,000pa. In addition, as an Accredited Power Station, Renewable Energy Credits (REC's) will be received for each MWh generated, which would generate a further \$46,000 (traded at market value).

What is the role of the Inverters?

Inverters convert Direct Current (DC) from the solar panels into usable electricity known as Alternating Current (AC). It's then used to power lights, air-conditioning units and other appliances. Looking at an inverter it will display how much power the panels are producing and how much energy has been produced for that day.

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