

Renewable Energy and Environmentally Sustainable Design Case Studies

PV Noise Barrier for the Tullamarine-Calder Interchange

- **Australia's First Solar Noise Barrier on a Freeway**
- **Award Winning Project:** This project won the 2008 Clean Energy Council Award for Excellence for Grid-Connect Photovoltaic System under 5kW

Site: Tullamarine-Calder Interchange, adjacent to Essendon Airport, Melbourne

Dates:

- Initial Enquiry Received: January 2006
- Feasibility Study Provided: January 2006
- Tender Won: June 2006
- Installation Completed: July 2007

Client:

Tullamarine-Calder Interchange Alliance, a partnership between Parsons-Brinkerhoff, Baulderstone, and VicRoads.

Project Goals:

Design and installation of a freeway noise-wall (sound barrier) constructed of a 500m length of vertically-inclined PV panels, totalling 24kW of peak power output.

Project Features:

As visitors to Victoria drive to Bendigo or Melbourne's international airport, they are farewelled by the site of the first solar noise barrier in Australia. Going Solar has put solar panels to their most innovative use atop a 500m length of noise-wall. Noise reduction is achieved by the BIPV glass' density acting to deflect sound from the neighbouring houses. The power produced feeds into the electrical grid, where it offsets energy used by the streetlights and CCTV.

Vertical inclination, whilst sub-optimal for solar production, suffers only 37% reduction in energy yield when compared to an optimally inclined system. However, vertical inclination achieved the noise-wall's height requirement with the least resources, and as such was the most cost-effective solution. The support offered by Sustainability Victoria's Renewable Energy Support Fund made this project even more attractive.

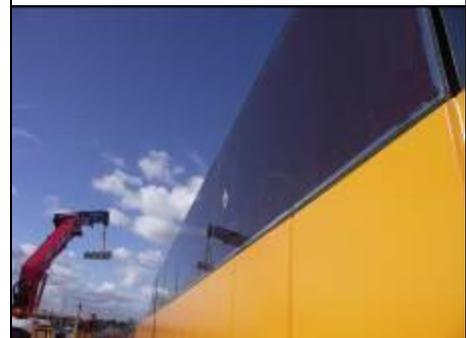
Using shade-tolerant amorphous silicon is a critical requirement of this application. Although shading was minimised by the placement of light poles and gantry uprights behind the solar panels, the shadow cast by the way-finding sign was unavoidable. Fortunately, Schott Solar's ASI-glass product tolerates shade, and the impact of shade upon the system output was minimised by Going Solar's clever system design. Amorphous silicon also produces energy even from indirect light,



Initial Concept



During Installation



During Installation



During Installation

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making the panels more tolerant of vertical inclination than their crystalline silicone equivalents.

An integrated design process imposed larger upfront design effort and meeting attendance, in order to successfully achieve a smooth installation.

A data monitoring system collects the performance data and transmits it to VicRoad's control centre via GSM modem, and also to public display located 1km away via an optic fibre.

Project Team:

- Stephen Ingrouille, Principal, Going Solar
- Warwick Johnston, Senior Project Engineer, Going Solar
- Steve Cook, Accredited Installer
- Jo Bradley, Administration Manager, Going Solar

Further Information:

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The Park Side of the Wall



The Freeway Side of the Wall