

SOLAR CASE STUDY: LIBRARY AT THE DOCK

Library at The Dock shows how City of Melbourne is taking the lead on solar



With a goal to secure 25 per cent of electricity from renewable sources by 2018, the City of Melbourne has been working hard to encourage large-scale solar installations on commercial buildings in the municipality.

Now the city's newest library and community centre, Library at The Dock, is demonstrating the benefits of solar on public buildings too. On the roof is an 85 kW system, supplying up to 35 per cent of the building's electricity needs. Bookish customers would appreciate the symbolism: if the library were the whole municipality, the renewables target would have already been reached.

The building has achieved a six star green star rating under the public buildings ratings tool from the Green Building Council of Australia including the fit-out

Features:

The solar panel system stands out for another reason. In Australia, the vast majority of rooftop solar panels are tilted north to receive optimum sunlight but Library at The Dock's panels are positioned perfectly flat, facing up.

It ensures the maximum amount of solar array coverage possible,' explains Ian Winter, Manager of Design with the City of Melbourne. When panels are tilted they achieve a greater efficiency, but they must be spaced further apart so that the row in front does not cast a shadow on the row behind.

After looking at two models – flat and tilted – consultants found that although flat panels were marginally less efficient, more of them could be fitted into the space, maximising the output.

Location:

107 Victoria Harbour Promenade

System Size:

85 kWp

Estimated Annual Production:

105 MWh

CO2 Avoided Annually:

127 Tonnes

Solar inverter:

3 x ABB TRIO-27.6

Solar panels:

260 x Sunpower E20-327

Mounting system:

Clenergy

Funding model:

Tri-Partite Funded

Installation date:

March 2014

Installer:

Sun Power

Public education:

The solar panels are silent but they're far from secret. Downstairs, digital screens display the operation of the Building Management System (BMS), including the output of the panels. Ian says it's important for customers to learn the story of the building, of which solar is an integral part. 'The idea is that this building educates as well.'

One way it educates is by showcasing passive design principles, which make the most of natural light and air flow. The ground floor has full-height glazing with climate controlled fresh air vents below, These assist in shedding excess heat during hot days and nights via a thermal chimney in the central stair atrium .

Sustainability is another key message. The roof collects rainwater and discharges it to a 55,000-litre tank for storage, the outside decking was made with timber reclaimed from the Victoria Harbour wharf. Ian says the overriding architectural philosophy was 'to do more with less'. Or even to do without. 'If you don't need door handles to open something, don't put them on. Because the embodied energy in a door handle just adds to the issue of creating carbon emissions.'

The building's most important innovation, however, is the use of Cross Laminated Timber (CLT), which is 30 per cent lighter than traditional structures – a crucial feature given the library rests on a 75-year-old wharf. CLT also has a much lower carbon footprint. Rather than hiding this structural component, it's been left visible to the public in the elevator shaft and the underside of stairs. 'That's about being honest,' says Ian. 'When I talk about education, this is actually showing the product at work in its rawest form.'

Key challenges:

The project was the result of a tri-partnership arrangement between Lend Lease, City of Melbourne and Places Victoria and arose from extensive community engagement as part of the Docklands Community and Place Plan which added to the complexity of the project. This was a unique and innovative tri-partnership, with all parties sharing the objective of providing world-class, fit-for-purpose infrastructure for the Docklands community.

Dealing with utilities also posed a challenge because of their linear processes. 'You can't do things side by side. You have to get to the end of a singular process before you can move onto the next one,' says Ian. There has been months of delay between installing the solar panels and getting them fully commissioned.

Challenges aside, Ian highlights the benefit of having a supportive council. 'You don't get these sorts of projects happening unless you've got a Council that's right behind you, a Council that has the vision and commitment to deliver sustainable outcomes'

Other benefits:

Library at The Dock has already proven very popular. More than 60,000 people have walked through the doors in less than four months since opening, and staff have conducted more than 400 tours for designers, architects, other councils and the general public. 'When the City of Melbourne does something, there is enormous interest,' says Ian.

Hopefully that interest will inspire a new chapter in sustainable building design. 'This library is not just about the City of Melbourne demonstrating environmental credentials but leadership in addressing the community's current and future needs,' says Ian.