

SOLAR CASE STUDY: POSITIVE ENERGY PLACES



AN AUSTRALIAN FIRST - SYNERGETICS 'POSITIVE ENERGY PLACES' 23.6kW SOLAR ARRAY HAS MADE IT AUSTRALIA'S FIRST CARBON NEGATIVE BUILDING.

A vision for cities filled with carbon neutral buildings led Synergetics to transform its own building into a positive energy showcase. An energy efficiency overhaul of the building coupled with the installation of a 23.6kW solar system has the building generating 121 per cent of average annual energy demand.

Features:

Positive Energy Places is a two storey (eight metres high) 1980s tenanted office building with approximately 200 sqm of roof area. A 23.6kW solar array containing 117 panels was installed on the roof in 2010 and now generates more energy than the building consumes each year.

Dr Dave Collins, Managing Director of Synergetics Environmental Engineering and building owner, says "Our vision is for cities filled with positive energy buildings, so it made sense to start with our own and show how it could be done."

A huge effort went into making the building energy efficient with an integrated retrofit that upgraded the lighting and mechanical systems in Positive Energy Places. The reduced energy use meant that with the addition of the solar array, the building has produced 121 per cent of energy needs each year and enabled Synergetics to claim Positive Energy Places as Australia's first positive energy office building.

Funding model and business case

The solar array was purchased outright by Synergetics with the main drivers being the business case, the reputational benefits, and a desire to inspire other building owners to do the same.

Location:

West Melbourne, Melbourne

System Size:

23.6kW

Estimated Annual Production:

25-30 MWh

CO₂ Avoided Annually:

33-40 tonnes

Levelised cost:

Installation is cost positive

Solar inverter:

Sunny boy

1 x three phase 10kW peak

2 x single phase 5kW peak

1 x single phase 3.6kW peak

Solar panels:

810 x 1580mm 190W ZnShine brand and 990 x 1660mm 215W Aeol brand panels

Mounting system:

Clipped to aluminium channels at 10 degrees inclination and northwest orientation.

Payback period:

~7 years

Funding model:

Outright purchase

CITY OF MELBOURNE ECO-CITY

Dave explains that the decision to install solar on Positive Energy Places made good business sense. “The end result is not only a fully functioning commercial office building that generates more energy than it uses, but is has also greatly increased the building value at an affordable cost,” he says.

The solar array generates enough power to run every facet of the building, including the building’s electric car and electric bicycle, with the excess energy used to off-set business travel to provide a zero GHG emissions business.

Two years of validated energy consumption data was been assessed by Monash University to determine the actual performance of Positive Energy Places. The study found that it generated between 9 to 21 per cent more renewable energy than it consumed during the first two years of operation. With continued energy efficiency improvements and the mild winter, Synergetics is hoping to achieve 150 per cent of average annual energy demand in 2013. Importantly, the building’s solar and energy efficiency improvements are delivering a 50 per cent return on investment.

“We wanted to make a real difference with our building and showcase the benefits of positive energy design to other businesses,” explains Collins.

Key challenges:

Dave says the secret to overcoming challenges and making the project a success was a sustained vision and perseverance in every decision that affected building energy. His advice to other business’ is to make the most of the low cost of solar and cover as much roof space as possible with panels. This provides energy generation benefits and will help reduce solar loads, and air-conditioning needs during the summer months.

melbourne.vic.gov.au/solar



Lord Mayor Robert Doyle visiting the solar installation at Positive Energy Places