Solar Case study: Retail business

Edgeworth Town Square, Edgeworth, NSW

We saved a lot of money. The solar system combined with energy efficiency measures, meant that we didn't have to upgrade our electrical infrastructure to meet growing electricity demand.

Facility Manager, Edgeworth Town Square

Project summary

The solar system has improved the energy security of the shopping centre and is on track for a payback period of 3.8 years.

This case study highlights the ability of a solar system, combined with energy efficiency measures, to reduce the need for expensive infrastructure upgrades to electrical systems for growing businesses with increasing energy needs.

Fast Facts

Solar system	o A rooftop solar system (99.4 kW) o 375 x 265W polycrystalline panels, connected to 3 x 25kW inverters o The system is located at Edgeworth, near Newcastle
Results	o 40% (65 MWh) of annual electricity is generated by the solar system o Long-term deferment of electrical infrastructure upgrades o Exported energy receives a feed-in tariff (FiT) of 12.5 c/kWh
Costs/savings	o Installation cost $116,000 ($1.19/W) after a small-scale technology certificate (STC) rebate of $76,000 o Self-funded and on track for a payback period of 3.8 years o Annual electricity savings of $31,000
Environmental benefit	o Created 2,021 STCs at the time of installation o Saves 2,275 tonnes of carbon dioxide (CO_2) over the system's lifetime

About the business

Edgeworth Town Square is a retail shopping centre at Edgeworth NSW, near Newcastle. The property is owned by Primewest. The shopping centre hosts a major supermarket and 24 speciality shops.

Energy needs

The main electricity use is for common area air conditioning, lighting and general power. These consume almost 180MWh of electricity per year.

Solar strategy

Why solar?

In early 2016, Edgeworth Town Square was operating at close to full electrical capacity and needed to take action to either upgrade their electrical transformer connection to the grid, or limit their use of grid electricity.

The centre investigated a variety of energy saving measures in combination with a solar system that would allow them to avoid a costly transformer upgrade.

Since the project also required energy efficiency measures, an expert consultant was hired to conduct a cost benefit analysis. The analysis confirmed that a combined solar and energy efficiency approach was the best option for the centre.

Solar system design

The main motivation of the project was to reduce dependency on the grid.

Optimising energy self-consumption and matching the usage profile were important considerations during the design process.

The inverters chosen included a solar monitoring system, allowing solar generation to be observed in real time and analysed.

The size of the solar system was limited to 100kW in order to create small-scale technology certificates (STCs), to ensure the rebate was received upfront. The installer was selected through a tender process.

The final system cost was $116,000.

Challenges

Three key challenges were faced:

1. Load bearing capacity of the centre's lightweight roof structure was required before installation.
2. Negotiation with multiple tenants was required for roof access and the electrical shutdown required for the grid connection.
3. The most time-consuming part of the process was the application required by the network operator, Ausgrid. A large solar system requires a special connection process to the network.

Result

In 2017, the solar system supplied around 40% of the annual electricity consumption of the shopping centre. The remaining 60% of electricity consumed by the centre comes from the grid.

The system is on track to achieve a simple payback of 3.8 years with $31,000 in annual electricity savings.

The system saves the equivalent of:

- 2,275 tonnes of carbon dioxide (CO_2) over its lifetime, or
- 2,365 tree seedlings planted and grown for 10 years.