

SOLAR CASE STUDY: FEDERATION SQUARE



Melbourne's iconic Federation Square now boasts two new solar systems – showcasing that solar works for complex buildings too.

Federation Square installed two solar systems with a total size of 24.6kW as part of its overall energy management initiative and goal to become carbon neutral.

Features:

Federation Square has incorporated a 16.4kW system onto the roof of the Ian Potter Gallery and an 8.2kW system on the Alfred Deakin Building. The systems will generate 30 megawatt hours of solar electricity each year and partially offset the electricity usage of each building – reducing Federation Square's power costs and enhancing its reputation as a sustainability leader.

Funding model and business case:

The system at Federation Square was financed through an Energy Performance Contract; a funding model that uses the money saved from lower energy bills to pay for facility upgrades.

Energy Performance Contracts are typically structured to fund upgrades that reduce energy and maintenance costs, generating savings for the building. This enables modernisation of existing building infrastructure, while improving building performance at the same time. At Federation Square, this approach was undertaken through the Victorian State Government Greener Government Building Program.

The economic benefits and achieving its aim of carbon neutrality were ultimately the key drivers for Federation Square installing solar.

Victor Anastasiadis, Federation Square's Mechanical Services Manager, says "The implementation of Solar at Federation Square has offered a unique mix of operational and educational benefits for the site. We've been able to expand upon the site's existing energy efficient infrastructure, such as the Labyrinth Passive Air Conditioning System, and use solar to reduce our power costs."

Location:

Federation Square, Melbourne

System Size:

16.4kW & 8.2kW

Estimated Annual Production:

30 MWh

CO2 Avoided Annually:

39.5 tonnes

Levelised cost:

\$0.20/ kWh

Solar inverter:

SMA STP8000TL

SMA STP17000TL

Solar panels:

105 X REC 235W

Mounting system:

Sunlock system

Payback period:

8 Years

Funding model:

Energy Performance Contract

Installation date:

2012

Installer:

Energy Matters & Siemens

CITY OF MELBOURNE ECO-CITY

Key challenges:

Limited access to the site and the complexity of the building structure were both major challenges that needed to be overcome to successfully install the system.

Federation Square is a hive of activity most hours of the day, hosting major cultural events, public gatherings and people visiting galleries, restaurants and bars in the area. This presented a challenge for the installers as it restricted their access to the site and meant that a crane could not be used to transport components. The solution was to move all materials, including solar panels, inverters, and other components, manually up the flights of stairs and across the rooftops to the installation site.

Jeremy Rich, CEO of the installer, Energy Matters, says despite the challenges it was a fantastic opportunity to work on an iconic Australian building. "We hope it will increase awareness of the environmental and economic benefits of going solar and inspire others to do the same."

Another challenge was Federation Square's complex façade and equally intricate roof, which Victor says was the most significant associated with the project. "We needed to ensure that the installation didn't damage the existing zinc roofing or impact the architectural design of the roofs," he explains.

The zinc roof presented a particular challenge as material could not be penetrated with regular installation bolts due to water ingress concerns. Energy Matters found a solution by sourcing of special S-5 clamps. This meant the installation work was more technically difficult, but resulted in a securely installed system while maintaining the integrity of the roof surface.

"If we could overcome the challenges to installing solar at Federation Square, it ought to be possible to meet the challenges of any complex installation," says Victor.

The result is a system secured as reliably as a traditional bolted down structure while preserving the architectural design of Federation Square's iconic buildings.

The solar systems have now been operating successfully for over 12 months and are reducing power-related carbon emissions by approximately 40 tonnes per year.



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