

Case Study



Image Courtesy of Solar Inverters Pty Ltd

Coffs Harbour City Council Art Gallery and Library Powered by the Sun

Largest Public Building Solar Installation in NSW

Project Overview

Coffs Harbour City Council was awarded a grant from the Department of Environment, Climate Change and Water under the Climate Change Fund: Public Facilities Program in November 2008. As part of this grant Council installed a photovoltaic (PV) solar power system on the Rigby House rooftop that will generate approximately 175 MWh per annum and supply green energy to the building. This public building houses several tenants including the Coffs Harbour Regional Art Gallery and City Centre Library, Coffs Harbour City Council offices, Centrelink offices and a Café. At the time of installation, it was the largest regional network connected PV array in New South Wales.

Education

A key component of the project is to educate and raise awareness across the general community and business and industry networks about implementing energy conservation measures and the key role that photovoltaic solar technology can play as part of the energy solution to the reduction of CO₂ emissions. Information on energy and water conservation and technology as well as a Sustainable Living collection of resources are available to be borrowed from the Library.

Challenges

Several challenges were identified in planning the project including: mounting the system onto a ridge-lined roof; retrofitting the building for increased energy efficiencies; reducing power and noise disruptions to tenants; choosing gross or net metering; and software engineering data logger information into a readable format for our community education program.

Sustainability Initiatives

Coffs Harbour City Council has incorporated a number of sustainability initiatives. These include the retrofitting of all the lighting systems in offices, the library, gallery, carpark and external lights with high efficiency and low wattage lights, reflectors, timers and motion and daylight sensors. Changed light locations also improved light output. This resulted in approximately a 50% reduction in lighting power consumption. The old air conditioning system was replaced with a more energy efficient system and energy efficient hand dryers were installed in the toilets.

Project snapshot:

Location: Duke Street Coffs Harbour

Rooftop area: 1200m²

Solar array covers an area of:
965m² equates to 2 basketball or netball courts

Generation technology:
136.5 kW photovoltaic array

System Components:
650 x 210 Watt Kyocera Photovoltaic solar panels, 22 x 6000 Watt inverters

Commissioning date: October 2010

Annual output: approximately 175 MWh

Capital cost: \$808,500

Operation and maintenance cost:
minimal maintenance costs

Annual cost savings:
\$30 000 in avoided electricity costs

Annual greenhouse emissions savings:
175 tonnes

Owner: Coffs Harbour City Council

Facilities Manager:
Coffs Harbour City Council

Commissioning:
Solar Inverters Pty Ltd and Country Energy



Solar Array on Rigby House rooftop

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Performance

The 650 Kyocera high efficiency multicrystal panels across the rooftop produce around 175 MWh each year. The energy produced by the panels is used by the building during periods of high demand. During periods of low energy demand excess energy is fed to the grid. There is a gross export electricity meter installed to capture the total amount of solar energy produced. There is also a load meter to measure the amount of energy consumed by the building. The system provides a proportion of the building energy needs, Coffs Harbour City Council and other tenants pay for additional energy. Council has applied to the Australian Government's Office of the Renewable Energy Regulator to create renewable energy certificates (RECs) as an accredited power station. As an accredited power station generating renewable energy Council will receive a second revenue stream from the sale of these RECs for the power generation output.

Solutions

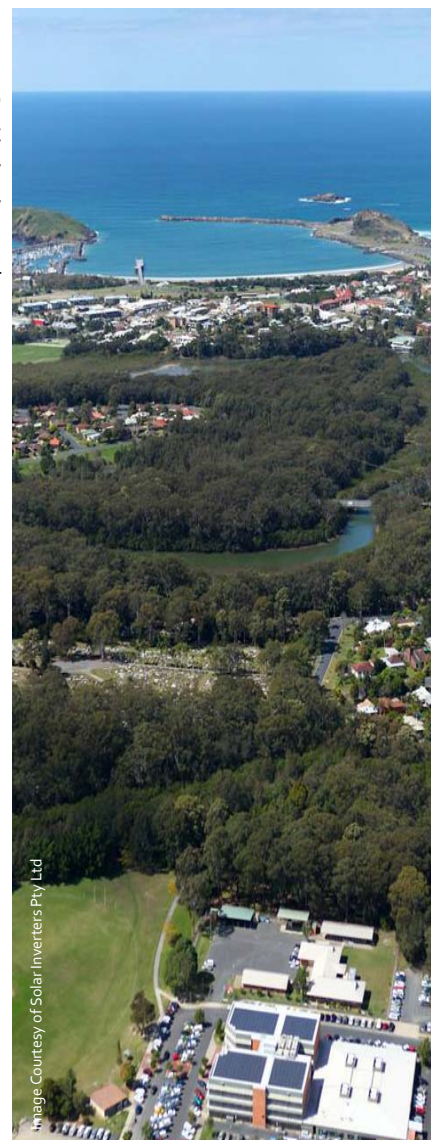
An engineered mount and tracking system fixes the array to the rooftop. This connects the 11 solar panel strings to 22 inverters in the inverter hut.

A data logger in the rooftop inverter hut is connected to a display in the foyer of Rigby House to provide visitors a real time energy production display of the solar power being produced. Visitors can view how much power (kW) is currently being generated, and the greenhouse emissions that have been avoided since the system was commissioned. The system allows staff to monitor the performance of the PV array.

Benefits

As part of its commitment to environmental sustainability, the Coffs Harbour City Council has incorporated key activities including conserving energy and reducing carbon emissions and community education programs including the Sustainable Living Festival. Coffs Harbour City Council is cutting more than 175 tonnes of carbon dioxide (CO₂) emissions each year.

In a typical year, the system will provide approximately 175,000 kWh of electricity (clean, green renewable energy) - enough to power more than 25 typical homes connected to the electricity grid. The powered roof generates up to 30% of the building's power requirements on a daily basis with an annual saving of \$30,000 in electricity costs. This Coffs Harbour City Council initiative is encouraging businesses and residents to install solar energy and thus reduce carbon emissions.



Coffs Coast and the Solar Array

October 2010