



Photo: J Kalute/OEH

**We achieved great energy savings and the capital cost was reduced significantly by the ESCs generated.**

**Luke Simkins,**  
Head Building Services,  
Art Gallery of NSW

# Art Gallery of NSW: painting an energy savings picture

## ABOUT US

The Art Gallery of NSW, opened in 1896, is Sydney's premier art gallery and the fourth largest in Australia. As a significant cultural organisation and a major tourism destination for local, interstate and international visitors it attracts an average 1.3 million visitors each year.

## OUR SITUATION

We need a well-functioning heating, ventilation and air conditioning (HVAC) system to ensure a constant indoor climate to maintain our art collection, valued at more than \$1 billion, and to protect borrowed art works. Operating our HVAC is expensive, so ensuring it is running efficiently was the main driver for our decision to upgrade the system.

Our three chillers were approaching or had exceeded their usable life and were inefficient and struggled to maintain required temperatures on very hot days. They also were not fitted with variable speed drives (VSDs) meaning they were operating at full capacity all the time, so upgrading was a high priority for us.



Photo: J Kalute/OEH

## BY THE NUMBERS

**Cost of efficiency actions:** \$1.65 million

**Verified energy savings:**  
1208 megawatt hours (MWh) per year  
– 15.4% of total site energy use

**Total annual electricity cost savings:**  
approximately \$140,000

**Estimated Energy Savings  
Certificates:** 12,228



New chiller controls make managing internal climate easy



New high efficiency chillers

## OUR ENERGY SAVING PROJECT

To improve the efficiency and performance of our HVAC system and reduce costs, we upgraded our two rotary-screw chillers to high efficiency units with variable speed drives and reconfigured the cooling tower pipe-work to improve performance. We also installed variable speed drives on the existing chilled water pumps and a new control system for our chillers that makes it is easier to regulate and monitor energy consumption.

## WHAT IS MEASUREMENT AND VERIFICATION

Measurement and verification (M&V) provides a way for businesses to calculate energy savings from efficiency projects using internationally recognised standards. Savings are determined by comparing energy use before and after a project is implemented whilst closely monitoring its key drivers. When designed and implemented correctly, M&V quantifies energy savings with high accuracy. The Office of Environment and Heritage (OEH) has [more information](#).

## WHY DID WE MEASURE AND VERIFY?

In order to claim energy saving certificates through the NSW Government's Energy Savings Scheme (ESS) and to confirm with a high degree of confidence, the return on our investment, we needed to measure and verify the energy savings from the project.

## OUR VERIFICATION PROCESS

Working with the Office of Environment and Heritage (OEH) we engaged an Accredited Certificate Provider (ACP) to conduct our M&V and manage our application for energy saving certificates from start to finish. The consultant used the project impact assessment with measurement and verification (PIAM&V) method which allows us to forward create certificates for the next 10 years.

The consultant used actual energy consumption data and meteorological data to develop baseline and operational energy use models for a typical year of operation. When these were compared, the consultant was able to calculate our energy savings for a typical year.

## INFORMATION

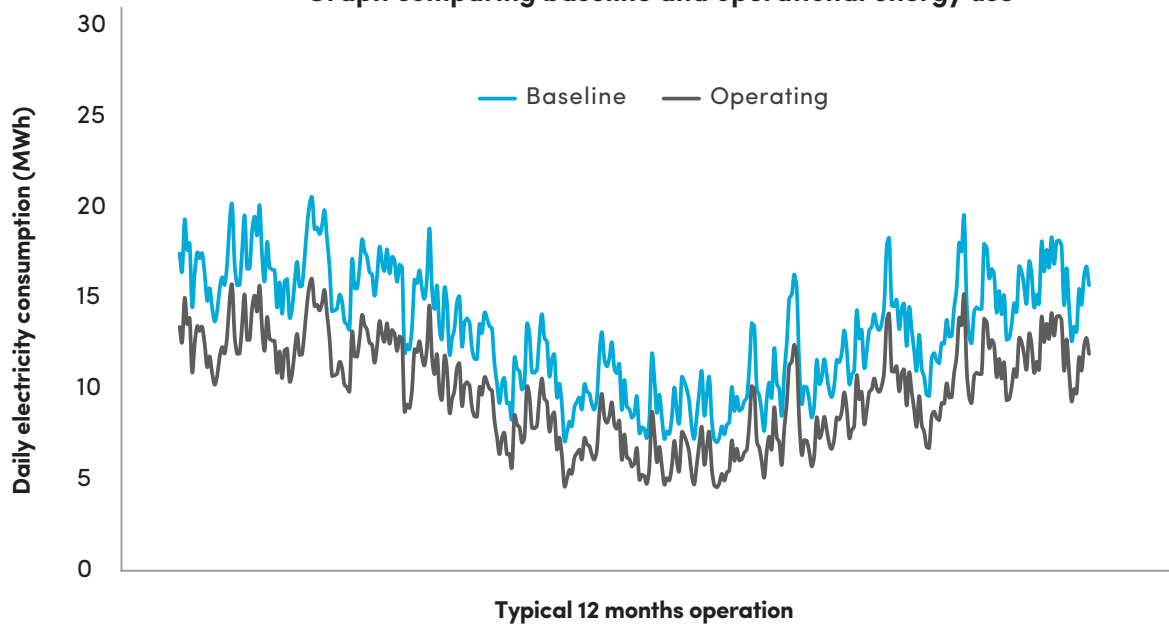
### Creating ESCs using an accredited certificate provider

Businesses wishing to claim ESCs under the ESS should engage a suitable accredited certificate provider (ACP) who is familiar with the scheme and its requirements, and the energy efficiency project. The ACP manages the certificate creation process from start to finish, including all the administrative and [M&V requirements](#) established by the scheme regulator. The ACP's fee is often success-based and typically quoted as a percentage of the certificates with the balance traded and payable to the business. The NSW Government has a list of [ACPs](#).

### Heating, ventilation and air conditioning optimisation

The Office of Environment and Heritage has [information](#) and [training courses](#) in heating, ventilation and air conditioning (HVAC) optimisation.

**Graph comparing baseline and operational energy use**



## THE RESULTS

The M&V verified a reduction in annual electricity use of approximately 1200 Megawatt-hours (MWh) or more than 15%, representing a cost saving of more than \$100,000, and by reducing plant load during peak demand times we saved a further \$30,000. Our project generated more than 12,000 energy saving certificates and reduced our annual greenhouse emissions by approximately 1700 tonnes carbon dioxide (CO<sub>2</sub>). We also expect gas savings associated with the upgraded HVAC system, although this has not been quantified.

Previously during hot summers, our chillers would struggle to keep constant temperatures, the new system coped easily with recent extreme summer temperatures.

We have reduced our carbon footprint and made our operations more sustainable, but we still feel there are more energy savings to be had and will continue looking for ways to improve the HVAC operation.

## TAKE ACTION

To find out more about reducing energy costs, contact the Business Support team at the Office of Environment and Heritage.

### EMAIL

[energy.saver@environment.nsw.gov.au](mailto:energy.saver@environment.nsw.gov.au)

### CALL

1300 361 967 (ask for the Business Support team)

### VISIT

[environment.nsw.gov.au/business](http://environment.nsw.gov.au/business)