Northcott has successfully adopted a range of communication strategies and used a variety of communication channels to promote the Community Energy Efficiency Program (CEEP).

News stories on the project and CEEP have been run in both the News Corp and Fairfax suburban newspapers where the project is taking place, reaching a combined audience of more than 100,000 individuals. The story also appeared on these newspapers’ websites, further widening the reach and communicating the positive benefits of the CEEP.

Stories about the project that incentivise energy efficiency measures for households, businesses and community groups have also attracted thousands of views and positive feedback on the Northcott website.

Once the project is complete, phase two of the Communications Plan will kick in and we will compare and contrast electricity usage data pre and post project. This will show the reduction in the energy costs incurred by Northcott and significant carbon emission reductions, which will provide a further incentive for consumers to adopt energy efficiency measures.

Past and future key communication milestones are outlined in the following table.

The past and future measures conveyed in the table compliment the objectives of the CEEP.
INTRODUCTION

Northcott have been successful in gaining a grant of $133,990 from CEEP in May 2013 to fund energy upgrades at Fennell St Parramatta.

In February 2013 Northcott submitted an application for funding under round two of the Community Energy Efficiency Program (CEEP) for upgrade works related to the Replacement of chiller thermostatic expansion valves with electronic expansion valves. Replacement of HVAC control system with new BMS including sub-metering and energy monitoring system, new control strategies, VSD on CHW pump and VSD on car park exhaust fan with carbon monoxide monitoring system. Retro-commissioning and fine-tuning of HVAC system. Lighting Upgrade.
PROJECT BACKGROUND

The Northcott building sits within a B4 mixed use (current LEP) lot totalling 7,370m$^2$. It is comprised of 3 floors totalling 4,433m$^2$ all served by the central Air-conditioning plant. In addition to this there is a workshop and basement totalling 1,400m$^2$ and a 4 level secure car park. The site’s core operating hours are Mon - Fri 7.00am to 6.00pm. With the conference facility being used after hours and weekends. The site serves as the head office for the Northcott Society and the primary operations and administration are run out of this facility. In addition the day programs are accessed by 60 plus clients per day with some level of disability. The conference facility has a capacity of 300 in addition to the 200 staff working out of this site.

The project included upgrading HVAC and lighting systems to current generation, proven technologies to reduce the energy consumption of the building. Reduced energy costs will allow Northcott to direct additional funding towards our core services, namely providing support to more than 11,400 people with a broad range of disabilities and their families and carers across NSW and the ACT by providing a range of services which promote a genuinely inclusive society. Some people with rare or lesser known disabilities find Northcott to be the only provider of appropriate support and services.

Northcott have and will continue to distribute information about the project to the community through our existing information streams and make the site available for walk-throughs and demonstrations.

The project has improved the comfort levels through improved air-conditioning and lighting for those who occupy the building, including the local disabled community.

Details of the project and outcomes are freely available as a Case Study for the energy services industry. While there are no specific Australian technologies utilised, the project has been implemented by Australian providers and system integrators and has supported the local energy efficiency sector.
A Level 2 Energy Audit generally in accordance with AS 3598 was conducted by an Accredited Auditor whereby various solutions were investigated. The proposed energy efficiency solutions are those that were found to provide significant energy savings and provide the fastest financial paybacks using proven technologies while taking into consideration the system types and equipment types and ages. For example, the chiller still has many years of economical service remaining so rather than replace it with a more efficient unit at high capital expense, we installed electronic expansion valves to improve the efficiency of the existing unit. The BMS was upgraded with a current generation system with additional sensors and control strategies to run the existing plant more efficiently. The web based system and head end provides improved visibility into the ongoing operation of the HVAC system allowing on site facility management staff to better monitor and manage its efficient operation. Low hanging fruit such as a lighting upgrade, VSDs and a carbon monoxide monitoring system for the car park ventilation were also utilised. An energy management system including sub-metering and reporting software allows proactive management of the energy consumption in the building to ensure energy savings are achieved and maintained over the long term and to identify further potential savings.
PROJECT TIMELINE

Following acceptance of the Project Plan, the project followed the agreed timeline with procurement
commencing in August 2013. Contractors were appointed, the detailed design phase commenced and long
lead time equipment was ordered. The majority of disruptive works were carried out over the December /
January period when staff numbers were lowest to minimise the impact on operations. Once systems
were installed, commissioned and fine tuned by late February, the 60 day monitoring and evaluation phase
was completed.

PROJECT PLANNING PHASE

Following advice that the CEEP Application was successful, detailed project planning was undertaken to
ensure the project outcomes would be achieved in accordance with the Funding Agreement, with minimal
disruption to the occupants of the building.

A comprehensive Risk Assessment was conducted to identify and manage all aspects of the project which
may cause the outcomes to be unmet or delayed and a Responsibility Matrix was developed to clearly
define the roles and responsibilities of those involved in the project.

All stakeholders were consulted with to ensure the success of the project.

A Monitoring and Evaluation Plan was devised to measure and report on the outcomes of the project.

A Communications Plan was developed to aid in spreading the word on the outcomes of the project to
similar organisations, the local community and other interested parties.

A detailed Workplace Health and Safety Plan was implemented to ensure the safety of installation workers
and staff and clients on the site.

DETAILED DESIGN PHASE

Much of the design work was already completed in the preliminary stages of determining energy savings
and budgeting for inclusion in the funding application. Once the project began, detailed engineering of the
complex BMS and final selections of equipment were completed by our specialist contractors.

TENDERING PROCESS

Northcott engaged AE Smith to perform the works both as a consultant and contractor as they are
currently under contract for all HVAC works at 1 Fennell St, the engagement of another 3rd party contactor
was considered a risk as the potential for conflict arising as a result of works associated with the
modifications resulting in potential demarcation and delegation issues in the event of system failures and
warranties.

MLJ Electrics were engaged on the basis of proven cost effectiveness and their detailed working knowledge
of the electrical reticulation system at 1 Fennell St, Northcott also believe risk was mitigated by using a
long term contractor over another 3rd party based on the same logic used in engaging AE Smith.

INSTALLATION

Electronic expansion valves

The main chiller’s thermostatic expansion valves were replaced with electronic expansion valves
incorporating smart controllers and drivers. These valves provide improved control of refrigerant flows
within the chiller, resulting in reduced energy consumption.
Electronic expansion valves are stepper motor driven valves optimised for control of refrigerant mass flow. The controllers provide stable superheat control minimising hunting and providing improved efficiency. They assist in preventing refrigerant oil being trapped in the evaporator coil, further improving system efficiency.

**New BMS including VSDs, CO monitoring & sub-metering**
The BMS was upgraded utilising existing equipment where possible to minimise costs while improving the visibility of the system and providing improved control of the HVAC systems. The new BMS is a truly open protocol BACnet system with a dedicated head end with graphical user interface located in the facility management office. The previous system had no head end or graphical user interface and was therefore not useful for staff for monitoring and managing the HVAC system. The new system provides improved transparency into every aspect of plant control and allows staff to make adjustments as required on an as needs basis without intervention by specialist contractors.

BMS control strategies were updated to the latest generation of control methodologies to ensure efficient operation of the existing equipment.

A VSD was installed on the chilled water pump to allow reduced energy consumption as power is proportional to the square of the speed.

A VSD was installed on the car park exhaust fan and carbon monoxide sensors were placed throughout the car park to monitor air quality and control fan speed accordingly, reducing energy consumption in times of low usage.

A sub-metering system was installed and connected to the BMS monitoring to allow proactive management of the energy consumption on the site over the long term.

**Retro-commissioning**
Air and water systems in the HVAC system were then re-balanced to optimal levels to ensure the most efficient operation and to improve comfort levels.

**Install new lighting**

**TESTING AND COMMISSIONING**
The lighting and HVAC systems were commissioned by February 2014. Initial fine tuning of the HVAC system is complete and this will continue over the first 12 months of operation as this system experiences the various seasons.
COMMUNICATION
Northcott has successfully adopted a range of communication strategies and used a variety of communication channels to promote the Community Energy Efficiency Program (CEEP).

News stories on the project and CEEP have been run in both the News Corp and Fairfax suburban newspapers where the project is taking place, reaching a combined audience of more than 100,000 individuals. The story also appeared on these newspapers’ websites, further widening the reach and communicating the positive benefits of the CEEP.

Stories about the project that incentivise energy efficiency measures for households, businesses and community groups have also attracted thousands of views and positive feedback on the Northcott website.

Once the project is complete, phase two of the Communications Plan will kick in and we will compare and contrast electricity usage data pre and post project. This will show the reduction in the energy costs incurred by Northcott and significant carbon emission reductions, which will provide a further incentive for consumers to adopt energy efficiency measures.

Past and future key communication milestones are outlined in the following table.

<table>
<thead>
<tr>
<th>Communications Activity Description</th>
<th>Communication Channel(s)</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Press Release:</strong> ‘Cleaner, greener and cheaper future for Northcott’ distributed to more than 1000 journalists announcing the CEEP grant, explaining economic and environmental benefits of project and acknowledging the Australian Government’s funding contribution through the CEEP.</td>
<td>Media outlets across NSW and the ACT including newspapers, radio, television and online news blogs.</td>
<td>12 July 2013</td>
</tr>
<tr>
<td><strong>News Story:</strong> Announced the CEEP grant, explained economic and environmental benefits of project and acknowledged the Australian Government’s funding contribution through the CEEP.</td>
<td>Northcott’s website (which has around 11,000 hits per month) and social media channels, including Facebook (2,200 friends) and Twitter (950 followers).</td>
<td>15 July 2013</td>
</tr>
<tr>
<td><strong>Report:</strong> Explained the work involved in the project, outlined economic and environmental benefits and acknowledged the Australian Government’s funding contribution through the CEEP in the section headed ‘Environmental Performance’</td>
<td>Page 85 of Northcott’s 2012-13 Annual Report (includes 3,300 print editions distributed to key stakeholders and electronic version on Northcott’s Website (which has around 11,000 hits a month).</td>
<td>25 October 2013</td>
</tr>
<tr>
<td><strong>Article</strong> focusing on benefits available to local councils, community organisations and the broader community by undertaking energy efficiency infrastructure upgrades, with</td>
<td>Northcott’s website (which has around 11,000 hits a month) and social media channels, including Facebook (2,200 friends) and Twitter (950 followers).</td>
<td>30 June 2014</td>
</tr>
<tr>
<td><strong>Press Release</strong> focusing on benefits available to local councils, community organisations and the broader community by undertaking energy efficiency infrastructure upgrades, with emphasis on carbon emission reductions and electricity bill savings achieved by Northcott following project completion.</td>
<td>Media outlets including newspapers, radio, television and online news blogs.</td>
<td>30 June 2014</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Story</strong> demonstrating organisational benefits of undertaking energy efficiency infrastructure upgrades by focusing on carbon emission reductions and electricity bill savings achieved by Northcott following project completion.</td>
<td>AE Smith ‘Cool Breeze’ newsletter (which has a circulation of around 1,300).</td>
<td>31 July 2014</td>
</tr>
<tr>
<td><strong>Report</strong> highlighting how Northcott and the environment has benefited from this project being delivered, emphasising carbon emission reductions, expected increase in National Australian Built Environment Rating System from 2.5 to 3 stars and electricity bill savings achieved following project completion.</td>
<td>Northcott’s 2013-14 Annual Report (includes 3,300 print editions) and electronic version on Northcott’s website (which has around 11,000 hits a month).</td>
<td>27 October 2014</td>
</tr>
</tbody>
</table>

All external communications generated by Northcott did comply with the “Acknowledgement of Support” terms pursuant to the Funding Agreement. This includes, but is not limited to, obtaining relevant permission from the Department prior to the public release of media releases and the inclusion of the following statement in written materials, “This activity received funding from the Australian Government as part of the Community Energy Efficiency Program.”

The past and future measures conveyed in the table compliment the objectives of the CEEP.
PROJECT CHALLENGES

One of the biggest challenges of this project involved the planned shutting down of the HVAC system to allow the retro fitting of components, this meant that large areas of the building would be without climate control.

The Engineers at AE Smith in conjunction with Northcott Facilities Management devised a plan to manually operate certain valves and redirect air flow to areas effected by the shutdowns. This allowed an increased degree of comfort to the clients and employees. Through careful planning the system was programmed to operate for extended periods leading up to shutdowns allowing cooling of the building to be increased more than a normal cycle would allow, this combined with the manual operation of various system components and in most cases the system shutdown went largely undetected or noticed by the staff and clients.

Northcott operates many day programs at the Fennell Street facility that involve clients with an intellectual and/or physical disability. These programs include:

- Transition to work (TTW)
- Job Match (Northcott employment)
- Community Participation Program (CPP)
- Various Therapy groups
- NECAS (Autism)
- Aboriginal groups

These programs can total over 300 individual clients per week. The project improved the comfort levels through improved air-conditioning and lighting for those who occupy the building, as a large proportion of the clients are confined to motorised wheelchairs and have great difficulty in regulating their body temperatures due to their physical disability and the bulk and construction of the motorised equipment.

PROJECT STRENGTHS

The main strength of the project was using specialist contractors who were able to firstly identify and quantify the energy saving opportunities, assist us with our funding application and then finally work with us to overcome the project challenges outlined above.

Careful planning by the project team meant that the project was delivered on time and on budget with little to no disruption in an occupied building.

Using contractors who were already familiar with the site and the unique requirements of our clients was important in managing the project while continuing to provide important services.

PROJECT OUTCOMES

The following objectives identified for the project have all been met:

- Improving energy efficiency

The installed systems are anticipated to save $70,000 per annum including energy, maintenance and administration costs. Maintenance and administration costs have significantly reduced due to the improved reliability of the HVAC systems and the long life and reliability of the LED lights.
An analysis of electricity usage was conducted from 1 February to 30 April 2014, comparing usage to the same period in previous years. The assessment found an average efficiency improvement of 582,000MJ per annum, or 153MJ/m², and a 10% reduction in kW demand.

As the measurement and verification period was relatively short, the actual annual savings may vary. These savings will be redirected towards meeting the needs of our clients.

✓ Improving comfort levels for the occupants of the building

The project was completed with very little disruption to building occupants and has resulted in a significant reduction in thermal comfort and lighting related complaints.

The lighting levels throughout the building have improved beyond expectations as evidenced by positive feedback from staff.

The visibility and transparency of the HVAC system operation now afforded by the new BMS allows Facilities Management to respond immediately to the few remaining thermal comfort complaints.

While not measured, there is a general feeling of improved staff productivity and an improvement in the experience of our clients while on site.

✓ Improving Energy Management

The installation of the sub-metering system and monitoring system will allow us to better manage energy consumption. Wastage can be reduced and additional energy saving opportunities can be identified and verified for years to come.

✓ Raising community awareness of energy efficiency

The project benefitted from local media coverage as evidenced by the Communication section of this report. Stories about the project have had a high number of hits on our website and we plan to continue promoting the success of this project into the future through our newsletters, website and annual report.

✓ Capacity building in local energy efficiency technologies amongst local businesses

All contractors used in the project are Australian owned and operated and have increased their knowledge and experience in the energy efficiency technologies utilised in the project, which can now be confidently deployed across other sites.

**PROJECT BUDGET**

The project was delivered on budget with a total cost of $271,730 excluding GST. The full amount was expended inline with the funding application.

Table of costs
<table>
<thead>
<tr>
<th>Description</th>
<th>Budgeted Costs</th>
<th>Actual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Audits</td>
<td>$9,750</td>
<td>$9,750</td>
</tr>
<tr>
<td>Project Management, Admin and Communications</td>
<td>$3,680</td>
<td>$3,680</td>
</tr>
<tr>
<td>HVAC Upgrade</td>
<td>$208,200</td>
<td>$208,200</td>
</tr>
<tr>
<td>Lighting Upgrade</td>
<td>$47,220</td>
<td>$47,220</td>
</tr>
<tr>
<td>Post-upgrade Energy Audit</td>
<td>$2,880</td>
<td>$2,880</td>
</tr>
<tr>
<td>TOTALS</td>
<td>$271,730</td>
<td>$271,730</td>
</tr>
</tbody>
</table>
CONCLUSION

The project met the objectives of the CEEP programme and the systems are now providing improved lighting and thermal comfort and can be better managed while reducing overall running costs.

By improving the thermal comfort and lighting levels in our facility we are improving the learning and general experience of our disabled clients, their carers and other visitors while improving the workplace indoor environment quality and productivity of our fantastic staff who work tirelessly to provide these services. The operational savings generated by this project will be redirected to our core services.

As a not-for-profit organisation, this project would not have achieved these outcomes without the funding from the CEEP
## PROJECT TITLE
Upgrade of chiller expansion valves, HVAC controls and lighting and retro-commissioning at the Northcott Centre, North Parramatta

## FUNDING RECIPIENT
The Northcott Society

## DATE
15 May 2014

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site</th>
<th>The Northcott Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
<td>1 Fennell Street, North Parramatta</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Office administration and disability services</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of HVAC and lighting systems</td>
</tr>
<tr>
<td>Energy Efficiency Estimate Method</td>
<td>Level 2 Energy Audit utilising NABERS benchmarks</td>
</tr>
<tr>
<td>Baseline Energy Usage</td>
<td>3,464,535MJ per annum</td>
</tr>
<tr>
<td>Baseline Energy Efficiency</td>
<td>910MJ/m² per annum</td>
</tr>
<tr>
<td>Energy Efficiency Improvement</td>
<td>153MJ/m² per annum</td>
</tr>
</tbody>
</table>
| Reporting Data (Measuring Energy Efficiency and Additional Data) | 757MJ/m² per annum  
16,014MJ / full time occupant per annum  
A Rated area under NABERS of 3804m² and 180 average full time occupants  
90% average occupancy  
48.2hrs of operation per week plus after hours functions  
Building constructed 2003 |
| Cost of Activity                  | $271,730 |
| Estimated Cost Savings            | $70,000 per annum |

## Building, Facility or Site 2

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
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<tr>
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<td>Baseline Energy Usage</td>
</tr>
<tr>
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</tr>
<tr>
<td>Energy Efficiency Improvement</td>
</tr>
<tr>
<td>Reporting Data (Measuring Energy Efficiency and Additional Data)</td>
</tr>
<tr>
<td>Cost of Activity</td>
</tr>
</tbody>
</table>
DECLARATION

The Authorised Officer of the organisation makes the following declarations:

☐ I declare that I am authorised to submit this Final Report (including any attachments) on behalf of
   The Northcott Society

☐ I declare that the information provided in this Final Report is true and accurate.

☐ I understand, and acknowledge that giving false or misleading information in this Final Report is

☐ I understand that final payment will only be made in accordance with the Funding Agreement
   including on satisfactory completion of Milestones.

Authorised Officer Signature: ................................................ Date: 15/07/2014

Name: Ray Winfield

Position: Facilities Services Manager    Organisation: The Northcott Society

Witness Signature: ................................................ Date: 15/07/2014

Name: Steve Jesson

Position: Maintenance Supervisor    Organisation: The Northcott Society

The use and disclosure of information provided in this Final Report is regulated by the relevant provisions and penalties of the
Public Service Act 1999, the Privacy Act 1988, the Freedom of Information Act 1982, the Crimes Act 1914 and the general laws
of the Commonwealth of Australia.

Information contained in the Final Report may be disclosed by the Department for purposes such as promoting the program
and reporting on its operation and policy development. This information may also be used in answering questions in Parliament
and its committees. In addition, the selected project information will be made publicly available. Public announcements may
include the name of the grant recipient and of any project partners; title and description of the project and its outcomes; and
amount of funding awarded.