Parramatta City Council

Accelerating Energy Efficiency
Improvements to Parramatta’s Central Business District (CBD)

CEEP 1207

This activity received funding from the Australian Government.
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1. EXECUTIVE SUMMARY

The Parramatta CBD is the vibrant heart of Sydney's Greater West, which is an area with 2 million residents. The CBD has a workforce of 45,000 with a high proportion of quality jobs in areas such as banking, IT and insurance. Over the next 20 years it is anticipated that the CBD workforce will expand by another 27,000.

The Project aims to fast-track significant energy efficiency improvements to major Council energy consuming sites within the Parramatta CBD, and to become a leading example of energy efficiency that will motivate and encourage all who visit, live and work in Parramatta. It serves to address the Federal Government’s requirement for a Final Report under the Funding Agreement.

Parramatta City Council has a strong commitment to energy efficiency across its entire asset portfolio. The project learnings highlight the importance for Council to continue to focus on, and investment in, improving the energy efficiency of our operations. The key learnings included:

- The need to appoint an experienced project manager in energy efficiency works and ensure they remain for the duration of the project;
- Estimates of energy savings at the commencement of the project are limited by the technology at the time and assumptions made by the specialist consultant during the audit;
- Ensure contractors verify expected savings during early stages of implementation and at key stages of the project to manage expectations and or modify activities; and
- The scope of works can change throughout a project depending on staging, duration and the inclusion of complimentary works that make sense to bundle into one tender package, such was the case at Riverside Theatres. On the flip side, scope creep can affect the project timing and the delivery of key milestones.

The results of this program make it clear that such upgrades are of significant operational and financial importance, as well as one of environmental and social responsibility.

CEEP assisted Council to increase the energy efficiency of three community facilities, through the installation of new energy efficient technologies, and promoted improved energy management practices through a series of educational workshops and marketing and communication materials.

Across the three target sites, the project successfully produced the following outcomes:

- An overall average energy efficiency improvement of 37% at the two CBD car parks
- An interim energy efficient improvement of 11% at Council’s Riverside Theatres, with further savings expected after the recent commissioning of a new HVAC
- Energy cost savings that met the original target, and have provided more than $96,000 in savings over the past 12 months
- The combined payback of all initiatives is 4.9 years to date
- Energy consumption savings of 295,032 kWh per year, equivalent to 237 tonnes CO2
• An opportunity for new conversations with staff, residents, businesses and patrons by raising **awareness about energy efficiency**
• **Improved energy efficiency practices** and behaviour change amongst staff and residents

Delays in the delivery of the project have resulted from expanded scopes and variations for both the car park and Riverside Theatres. Despite the extended timeframe, the works have resulted in good outcomes for energy and cost saving for Council and a demonstration of how asset upgrades can be packaged together to achieve multi-objectives beyond just energy efficiency.

The activities undertaken and the resulting energy and cost savings would not have been possible without the generous support and funding provided by both the Federal and NSW State Government. The support provided through programs such as CEEP encourage local government to continue and improve services to the community in both a sustainable and more cost effective manner.

The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.
2. PROJECT OBJECTIVES

The *Accelerating Energy Efficiency Improvements to Parramatta’s CBD* Project aims to fast-track significant energy efficiency improvements to major Council energy consuming sites within the Parramatta CBD, and to become a leading example of energy efficiency that will motivate and encourage all who visit, live and work in Parramatta.

The original objectives of the project were to:

1. Deliver energy efficiency improvements to the Riverside Theatres and two multi-storey car parks located at Wentworth Street and Erby Place within the Parramatta CBD, resulting in a reduced consumption of 928,612 kWh p.a. (37% energy reduction of targeted buildings);

2. To accelerate energy efficiency improvements to Paramatta’s CBD and deliver energy efficiency savings that would translate to cost savings for use elsewhere in the council budget; and

3. To inform, influence and empower key stakeholders on the benefits of energy efficiency achieved by the project through translation to their residential and working lives.

The objectives of the Community Energy Efficiency Program (the Round 1 Program) were to:

- support a range of local councils and community organisations increase the energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting
- demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community.

In addition to the objectives above, the Program intends to provide the following benefits:

- better services and improved amenity of buildings and community facilities
- minimising energy consumption and costs
- building the knowledge and capacity of the energy services and construction industry,
- and supporting competitive Australian energy efficiency technology and equipment manufacturers
- contribute to the national effort to reduce greenhouse gas emissions.

There were clear synergies between the project and the Program objectives stated above. The overall energy efficiency of the two car parks improved by 37%, whilst the series of energy efficiency workshops for residents and businesses ensured that the broader community were encouraged to consider energy management practices based on the demonstrated achievements of this project.
3. PROJECT ENERGY EFFICIENCY ACTIVITIES

The following sites were selected for upgrade and retrofit based on them being identified within the top 10 energy using assets within Council’s building portfolio. The original lighting and HVAC technologies within these assets was inefficient and in need of improvement.

Riverside Theatres

The Riverside Theatres, which is the 2nd largest Council power consuming site in the CBD, where over 125,000 patrons from all across Sydney and beyond attend 1815 performances and events each year.

The Riverside Theatres (www.riversideparramatta.com.au/) includes three theatres with seating capacity for 1,086 people, a courtyard used for events and performances, office space, dressing rooms, a foyer, bar, and amenities for performers and patrons. Patrons of the Theatre come from all across Sydney. The Riverside Theatres were constructed for the 1988 Bicentennial anniversary and will be celebrating their 25th Anniversary in 2013. The Theatres host an exceptional line-up of local and international theatre, music and film, including a range of performances as part of the annual Sydney Festival program. Additionally, the venue hosts a wide variety of programs, courses, workshops and community events and is available for hire for the corporate sector, community arts organisations, community cultural groups, and schools.

Technologies Selected and Results

- Lighting upgrade (Loggia – undercover walkway) to reduce and replace 20 ‘Porta’ flood lights (500w each) and 70 x 100w PAR38’s;
- Replacement of 14 more efficient hand dryers;
- Solar hot water system with heat pump;
- Lighting upgrade (other exterior/interior lights, T12s, down lights). Recipient will de-lamp approximately 100 twin fluro’s (from twin to single) and replace a further 180 T12 fluro’s with LEDs. Auditorium - replace 78x100w halogen PAR38 down lights with approx 78x13w LEDs (or alternates). Recipient will also replace lights throughout building 87x75w down lights with 15w CFL or LEDs
- New HVAC system and BMS
- Note: Power Factor correction and Voltage Optimisation unit had also been installed prior to commencement of these grant works

Two Geoclima Chilled Water Units Product Model THM1C400WT-34 (including all accessories and fittings and BacNet communication protocol for BMCS) were supplied and craned into place on 15 June 2015 and commissioned on 26 October 2015. The selected type Geoclima from Italy is considered having current technology in terms of energy savings in combination with appropriate VSD motors and BMCS.

The upgrade works were delivered in two stages. The first stage involved staff working closely with Council’s contracted electrician in seeking quotations for supply and installation of all lighting, solar hot water and hand dryer procurement. Stage 2 involved the preparation of detailed tender specifications for the HVAC, BMCS and associated fire/electrical upgrades required for the facility. The tender was awarded in December 2014 with commissioning completed by October 2015.

**CBD Car Parks**

**Erby Place** - This car park was constructed in 1981 and is currently operated 24 hours, 7 days a week (168h/wk). It has 575 car spaces and is 85% occupied during the daytime, and low occupancy during the night. It has 4 levels and a rooftop and covers 19,595m2. The following improvements were completed:

- Replace 62 existing fluorescent luminaires with 23w LEDs, and install an additional 22 x 23w LEDs to comply with Australian Standards (AS)
- Replace 179 existing fluorescent luminaires with 48w LEDs, and install an additional 18 x 48w LEDs to comply with Australian Standards (AS)
- Replace 66 existing emergency fluorescent luminaires with emergency LEDs
- Install additional 16 low bay LED luminaires at the entrance to comply with AS.
- Supply and install 13 x 126w LED floodlights to car park roof top
• Supply and install 45 Clipsal C-Bus motion detector (sensor) control system to control lighting on 4 levels of the car park plus roof top lights.
• Note: Power Factor correction had also been installed prior to these grant works.

Wentworth Street - This car park was constructed in 1986 and is currently operated 109h/wk (closed 59h/wk). It has 1150 car spaces and the upper levels are generally vacant and the lower levels half-full to full. It has 8 levels and a rooftop and covers 24,279m2.

![Wentworth Street (Parramatta Station) carpark entrance](image)

The following improvements were completed:

• Replace 320 existing fluorescent luminaires with 23w LEDs
• Replace 207 existing fluorescent luminaires with 48w LEDs, and install an additional 2 x 48w LEDs to comply with Australian Standards (AS)
• Replace 103 existing emergency fluorescent luminaires with emergency LEDs
• Install additional 6 low bay LED luminaires at the entrance to comply with Aust. Stds
• Supply and install 13 x 126w LED floodlights to car park roof top
• Note: Power Factor correction had also been installed prior to these grant works.

The these works involved staff working closely with Council’s contracted electrician in seeking quotations for supply and installation of all lighting upgrades.
Council’s electrician retrofitting the new LED lights

Procurement of Goods and Services

A variety of complementary technologies were selected on the basis that they could:
- Match or improve existing levels of service;
- Be available for supply within the project timeframe;
- Be considered a proven technology; and
- Demonstrate an acceptable payback.

A specification was produced for each technology and multiple quotes were obtained from selected suppliers. Suppliers and installers were evaluated against the following weighted criteria:
- Timeframe for supply and installation
- Value for money
- Warranty and after sales support
- Referee check - track record

Parramatta City Council has commissioned Haron Robson in 2013 to assist in providing lighting upgrade recommendations at both the Erby Place and Wentworth Street Car Parks. As part of our review they provided information on: analysis of existing installation; proposed solutions; drawings for typical levels of the Car Parks showing approximate light locations; lighting design calculations; specification for release to tender; and a luminaire schedule. As a result, Sylvannia Lighting were engaged to supply the lights and Argyle Electrical contractors to manage installation and commissioning.

In 2012, Council engaged ENVIRON Australia to assist in providing the lighting upgrade requirements for the River Theatres. The engagement was done as part of the NSW Office of Environment and Heritage’s (OEH) Energy Saver program. Subsequent lighting installation works were completed by Argyle Electrical following the supply of luminaires by a number of
specialist lighting companies. Specifications in relation to the HVAC and BMS were provided by Green Star Building Automation and Norman Disney and Young. The resulting tender for supply and installation was awarded to AG Coombs (NSW) P/L.

4. PROJECT DEMONSTRATION AND COMMUNICATIONS ACTIVITIES AND OUTCOMES

The main objectives of the project communication plan was to identify and organise the following activities:

- Demonstrate the project’s results;
- Raise awareness of energy efficiency;
- Engage with target stakeholders to share knowledge, experiences and lessons; and
- Ensure the widest dissemination of knowledge from the project.

The planned communications activities identified the need to engage, involve and inform a number of stakeholders from across the Parramatta local government area in energy management to ensure that the lessons and benefits of the project are shared and maximised beyond the life of the project.

Specific initiatives that will be used to communicate and raise the profile of the project include:

- Use of internet and intranet
- Media press releases
- Use of audio visual technology for stakeholders
- Articles prepared for Council’s own publications
- Articles prepared for specialist publications
- Community workshops

A majority of the communication activities have been conducted in the past 6 months in order for savings and efficiencies to be confidently demonstrated.

Internet and Intranet

Information regarding energy efficiency outcomes has been included on a number of stakeholder websites including Parramatta City Council, Riverside Theatres and Secure Car Parking. Evidence of this information includes:
Energy efficient carparks

Parramatta City Council has recently completed energy saving upgrades to four of its CBD multi level car parks.

We have installed new lighting systems with sensors, timers and more efficient LED light globes, as well as technologies for power factor correction and voltage reduction. These works have resulted in reductions of 20% to 40%, saving up to $25,000 per year per car park on electricity costs. Funding of the upgrades has been provided by the Federal Department of Industry, Innovation and Science and the NSW Government’s Waste and Sustainability Payment.

Riverside Theatres website
Media Releases

Council’s Communication’s Team have issued a number of media releases at both the time of grant offer and more recently regarding energy efficiency performance outcomes. Media releases are issued to:

- The Parramatta and Holroyd Sun (circulation: 37,982)
- The Parramatta Advertiser (circulation: 79,598)
- The Northern District Times (circulation: 58,430)

Social media was also utilised through Council’s Facebook (14,000 friends) and Twitter (6,000 followers) accounts. Messages and images were pushed out in early November highlighting the energy efficiency savings to date achieved through the upgrade works. Staff were captured holding up “percentage saving” signs for each of the upgraded facilities in order to give the story character and interest. The following images show examples of the messages distributed through social media.
Examples of Facebook and Twitter messages distributed by Council

Articles within Council publications

An article highlighting the upgrades, savings to date and acknowledgement of the funding partners was included in the October-December 2015 edition of Parramatta Pulse which was circulated to every ratepayer (over 60,000 properties).

Signage and Digital Displays

Signage has been placed at strategic locations within all four CBD multi-level car parks including the Erby Place and Wentworth Street car parks which are the subject of this grant funding. A3 poster signage was placed within the car park lifts, on pay stations and entrance foyers.

Digital displays of the energy efficient upgrades are showing in the foyer of Riverside Theatres alongside coming attractions. Interactive touch screen technology has been piloted with staff and patrons (see image below) with arrangements to have permanent technology based at the theatres before Christmas 2015.
A3 posters in the car parks

Example of poster for Erby Place car park

ENERGY EFFICIENCY IMPROVEMENTS

- New energy efficient LED lights use less energy
- Stairwell lights dim until you need them
- Sensor controlled lights make sure lights aren’t on when not needed

These upgrades have reduced energy consumption in Erby Place Car Park by 42%, saving an average of $24,000 per year.

For more information on how you can improve energy efficiency in your home or at work, please call Council’s Sustainability & Waste Team on 9560 6091.
Workshops for Community and Business

During October and November 2015, Council has conducted a series of energy efficiency workshops for interested residents of the local government area. The three workshops discussed energy saving initiatives for the home; the installation of solar hot water and panels; and investing in renewable energy technologies. The workshops were attended by 36 participants and delivered by consultants Positive Charge who have significant industry and local government experience and credibility across energy management. Further workshops for local businesses are scheduled in February 2016. The workshops covered basic topics such as:

- Understanding electricity bills and pricing;
- Calculating energy costs;
- Energy saving opportunities at home from quick wins to larger investments;
- Behaviour change as a key solution;
- One-on-one sessions with experts;
- A free home (basic) energy assessment and action plan; and
- A free LED lighting starter packs.

The workshop feedback was positive with all participants expressing gratitude combined with a pledge to make a change and to be more energy smart.

Energy saving workshop and example of give-aways

Council staff managing the upgraded facilities were consulted and informed throughout the whole process. As owners of the operating budgets, these staff have seen the real outcomes of energy efficiency and ultimately cost savings associated with the upgrades. Management of the car parks have applied the learnings and justified investment of energy upgrades into two further CBD multi-level car parks (Horwood and Erby Place). Staff at Riverside Theatres have likewise experienced the tangible benefits first hand and will continue to play a role in future energy monitoring of the facility following the commissioning of the new HVAC system.

5. OUTCOMES AND BENEFITS OF THE PROJECT

The project will focus on actions that will deliver the following energy efficiency outcomes:

1. Reduce energy consumption (original target of minimum 37%)
2. Reduce greenhouse gas emissions
3. Reduce energy costs to the Parramatta community
4. Motivate and encourage those who visit, live, and work in Parramatta to improve their own energy management practices.

The project will also improve amenity to users and patrons of the sites, and combined with an education and engagement program become an example of energy efficiency best practice for all Sydney thus substantially multiplying the direct benefits of the project.
Energy Efficiency outcomes

The following energy efficiency improvements were forecasted at the commencement of the project:

1. **Riverside Theatres** - 513,757 kWh p.a. (38% reduction in electricity use). **Result:** Not Achieved. Only 11% reduction to date (excludes new HVAC)

2. **Wentworth Street Car Park** - 89,012 kWh p.a. (22% reduction in electricity use) **Result:** Achieved a 32% reduction to date.

3. **Erby Place Car Park** - 80,341 kWh p.a. (33% reduction in electricity use) **Result:** Achieved a 42% reduction to date

Overall across all sites an average 37% reduction in electricity use was projected to be saved per year. Prior to the commissioning of the new HVAC at Riverside Theatres, only a 28.3% average reduction had been realised. This outcome is expected to be closer to the original forecast following the first 12 months of HVAC operation. It should also be noted that the estimates of energy savings at the commencement of the project, are limited by the technology efficiencies at the time and assumptions made by the consultant during the audit process back in 2011. A small margin of error can thus be expected.

There has also been a number of ancillary benefits to the community resulting from the energy efficiency upgrade works. According to Council’s Annual Community Satisfaction Survey, patrons have reported a greater sense of safety and comfort in the carparks from the better lighting quality in 2015 (score=3.5) compared to 2014 (score=3.39). Council’s asset managers have also taken the lessons learnt from this project and applied them to more recent upgrades of other CBD multi-level car parks at Horwood Place and Hunter Street Parramatta.

*Riverside staff......11% reduction and counting!!*
**Property: Riverside Theatres**

Prior to the commissioning of the HVAC system in late October 2015, the site had improved energy efficiency by 11%, reducing electricity consumption from an average of 86,546kwh per month to 77,312 kwh per month. Annual cost savings are $53,748 to date. Consumption and savings are expected to be further improved as a result of the more efficient HVAC. Further results will be forwarded to the Department in May 2016 showing the first 6 months of electricity consumption under the new HVAC. Therefore the payback period for lighting, solar hot water and hand dryers (excluding HVAC costs) has been calculated at 3.9 years.
Property: Wentworth Street Parking Station

This site had improved energy efficiency by 32%, reducing electricity consumption from an average of 19,863 kwh per month to 13,472 kwh per month, resulting in annual cost savings of $18,120 to date. The payback period has been calculated at 6.3 years.
Property: Erby Place Parking Station

This site had improved energy efficiency by 42%, reducing electricity consumption from an average of 21,575kwh per month to 12,614 kwh per month, resulting in annual cost savings of $24,480 to date. The payback period has been calculated at 4.45 years.

Baseline Year: 1 July 2010 to 30 June 2011

Energy Efficiency Measure #1: Energy consumption per square metre per day

Baseline: \[
\frac{240,089}{19,595} / 365 = 0.0336 \text{ kWh per square metre per day}
\]

Energy Efficiency Post-upgrade (2014/15): 0.021 kWh per sq.m/day

Measure #2: Energy consumption per car space per day

Baseline: \[
\frac{240,089}{575} / 365 = 1.14 \text{ kWh per car space per day}
\]

Post-upgrade (2014/15): 0.721 kWh per car space/day
Issues Faced and Lessons Learnt

Riverside Theatres

The broad scope of works proposed for Riverside Theatres posed a number of challenges in terms of procurement and timing. The supply and installation of the hand dryers and solar hot water system was straightforward and was completed with minimal disruption to the busy schedule of shows at the theatres. Lighting upgrades posed a substantial challenge by fact of the sheer number and different types of existing lights across the theatres and the specific lighting requirements of each.

While it would be simple to find replacement lighting technology to reduce energy consumption, it is important to work with the Riverside Theatres staff to find lighting that achieves the right “look” so that the customer is satisfied. The intent was to find a technology that was not a one-for-one replacement of both the PAR38s and the 500w porta-floods, but a single lighting type that substitutes for both. This was an extensive process involving nighttime viewing of demonstrations on-site, followed by calculations of quantities, quotations and assessment of the potential financial and energy savings. For the PAR38s within the Riverside Theatre (which light the columns in the main theatre), they required a technology that dims down to zero to meet WHS regulations. Staff tested many LED PAR38s, but few met the dimming requirement – typically, they dim down to 10% and then switch off, though one dimmed down all the way but could not lighten smoothly. Finally a supplier was sourced that could manufacture a product to meet Council’s specific needs.

In June 2014, at least two houselights delivered to the Theatres were damaged in transit. These were returned and replaced accordingly within 3 weeks.

In August 2015, Riverside staff were alarmed by a number of LED foyer lights that had failed and ceased to work after only 5 months. The supplier was subsequently contacted and agreed to replace the faulty luminaires under warranty.
The biggest delay was associated with the design, tender and installation of the HVAC and integrated specifications to review and assess the feasibility of a BMCS to improve energy efficiency. This was because Council’s building asset manager wanted to also incorporate an upgrade to the existing electrical and fire safety systems as part of the same tender, since the items had failed to meet the requirements of the Annual Fire Safety Compliance Tests. The expanded scope of the tender resulted in an increased level of specifications and input of specialist advice. The tender was awarded in December 2014 with commencement of works originally proposed for February 2015 and completion in June 2015. Further delays and variations throughout the installation period were caused by a number of factors including:

- Procurement and delivery of the chiller units;
- Working around the Riverside theatres booking schedules (show commitments);
- The nature and scale of the rectification and upgrade of the fire protection system;
- Variations to the mechanical, hydraulic and associated electrical services; and
- Rectifications required prior to the issuing of the practical completion.

The original scope of the BMCS only covered the mechanical services and not lighting due to budget limitations at the time. However, the selected system GreenStar - Niagara (equivalent to Schneider platform and protocols) has the flexibility to accommodate the lighting management system (LMS) at a later stage and Council has requested the contractor to provide an additional price for this item.

**Car parks**

Prior to the supply and installation of the new lights to the car park entry, Council investigated several options from lighting suppliers to identify a slim light fitting which could produce a high lux level of lighting knowing that clearance to vehicles was a prime criterion in the selection process. Such fittings were not available on the market. As a consequence Council engaged the services of Haron Robson (lighting consultants) to design the entry lighting so the new lighting would be compliant with Australian Standards and the current clearance height would not be reduced. The current standard requires a high daytime lux level at the entry. To achieve this, the entire entry area is required to be 800lx which could only be achieved by installing lights within the vehicle travel path. Due to the low ceiling height, the compliant lux level could not be achieved by installing lights on the outside of the vehicle travel path. If lights were installed on the sides the light beam would have been at a low level and resulting in the light directed into the eyes of the vehicles’ drivers.

As a consequence the lighting design required an additional 18 off x 80watt light fittings which were additional to the replacement of the then current light fittings. It should be noted that these new 18 lights are only required to be operational during daylight hours and have been wired accordingly. The new lights are the same dimensional depth as the previous lights so the clearance to the floor remains unchanged. The eventual outcome, whilst not entirely achieving all the initial goals is an acceptable compromise and the car park entry lighting now meets current Australian Standards.
Entrance to Wentworth Street car park

New LED lighting in action
## 6. BUDGET

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<th>Budget</th>
<th>Dept. Funding</th>
<th>Other Contributions - cash</th>
<th>Total ex-GST</th>
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<td>Approved Variation</td>
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<td>Final</td>
<td>$392,270</td>
<td>$3,208,263*</td>
<td>$3,600,533</td>
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*Note: Parramatta City Council has contributed $2,899,504 (or 90%) of this total

### Budget Breakdown by Activity (per Deed of Variation 4 Nov 2014)

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<th>Expenditure Item</th>
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<th>Other Contributions (cash)</th>
<th>Budget</th>
<th>Actual Expenditure</th>
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<td>Riverside Theatres - replace hand dryers, Building Management System upgrade</td>
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<td>$165,000</td>
<td>$212,660</td>
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<td>$1,264,450</td>
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<td>Wentworth Street car park lighting</td>
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<td>Erby Place car park – sensors and lighting works</td>
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<td><strong>$2,079,120</strong></td>
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From the table above, it can be seen that there is a large increase in reported expenditure between the last Deed of Variation and the end of the project.

The “Other Contribution” costs funded by Council was increased as a result of several factors. The major factor was attributable to the expanded scope of works within the tender involving the supply and installation of the HVAC / BMCS and the additional fire safety / electrical systems upgrades which were not in the original scope of works. It was decided to package all of the upgrade works at Riverside Theatres into one tender in order to get the economies of scale and to minimise disruption to the theatre booking schedule. The scope of works was also expanded for the two car parks with an additional 26 LED area floodlights being installed to existing poles on each roof top.

The Department also reduced their original funding by $125,000 based on a delay in delivery of agreed milestones during the course of the project. The original Milestone 4 payment was withdrawn and a Deed of Variation was formulated to extend the remaining milestone delivery dates, resulting in a reduction of total milestones from 8 back to 7. As a result, contributions from funding partners namely Parramatta City Council and the NSW Environmental Protection Authority (via their Waste and Sustainability Payment – WaSIP) were used to cover the expanded project scope.
7. PROJECT OPERATION, MECHANISMS AND PROCESSES

Approach to project management

Implementation of the energy efficiency upgrades was project managed internally. Two Project Control Groups (PCG’s) were established, one for the car parks and the second for Riverside Theatres. The PCG’s met frequently throughout the project with key stakeholders invited and minutes taken.

Issues and milestone checks were managed through this process via the nominated project manager. The structure allowed us to keep check on the budget and progress being made on each work site. The Project Manager was responsible for:

- Confirming site work times with the contractor (within the pre-defined installation period);
- Ensuring the contractor was properly inducted according to site-specific requirements;
- Ensuring the contractor obeyed all Work, Health and Safety obligations when on site;
- Ensuring the contractor had appropriate access to required areas including electrical switchboards, metering boards, and roof spaces;
- Providing technical instruction;
- Assessing and certifying claims for payment;
- Assessing claims for extensions of time;
- Assessing claims for variation to the contract or works to be performed;
- Keeping both the business owner and asset owner up to date on timing of works and budget expenses; and
- Inspecting completed works, overseeing testing and commissioning and issue of the practical completion certificate.

The Business Owner was responsible for administration of the CEEP grant including correspondence, reporting and budget accountability.

Council’s monitoring and reporting service acquired through Planet Footprint was used to obtain the energy usage baseline and energy efficiency figures for the sites in this application. Planet Footprint is comprised of data analysts and sustainability advisors who work with both Councils and their Energy Retailer to ensure streamlined council access to billing data and performance information.

Issues faced and lessons learned – project management

The duration of the project over a two year period resulted in a number of staff changes within each Project Control Group including project management. Two key staff responsible
for both technical advice and implementation of the communications plan went on maternity leave in early 2014 only months apart. The engineering project managers responsible for the delivery of both the car parks and Riverside Theatres upgrades also changed once each during the course of the project. Whilst the original risk management plan identified any change of project team members as a low risk, every effort was made to ensure the core project team remained constant throughout the project delivery period including the initiation of appropriate hand-overs and inductions.

Similarly there were eight different employee contacts from the Department administering the grant throughout the project’s duration, as well as three department name changes. This presented challenges for Council in relation to personal project familiarity, continuity of conversation/project understanding and ensuring all media releases/invoicing made reference to the correct department at the time of issue.

We anticipate the internal issues discussed may occur again in future energy efficiency projects, and the learning we can take from this project is to consider the possible appointment of an external project manager for future grants involving multiple sites upgrades simultaneously.

The learnings from this project have left us better equipped in the following ways:

- Knowing what kind of upgrade activities provide the best return on investment
- Understanding and allowing for the main challenges that arise during implementation
- Better positioned to develop a standard approach to rolling out energy efficiency across other Council assets.

Part of contract works is to monitor and report on the energy consumption over the first 12 month period with a further option of another 6 months at Council’s discretion to ensure that as a minimum, four seasons are monitored and recorded for comparison. For Riverside Theatres a workshop is scheduled for December 2015, between Council staff and the contractor to discuss the procedural and training requirements to commence this activity. Results of the monitoring at the theatres can be forwarded to the Department in May 2016 as requested.

Good Project Management is essential.
8. CONCLUSION

Parramatta City Council has a strong commitment to energy efficiency across its entire asset portfolio. The Community Energy Efficiency Program (CEEP) learnings highlight the importance for Council to continue to focus on, and investment in, improving the energy efficiency of our operations. The results of this program make it clear that such upgrades are of significant operational and financial importance, as well as one of environmental and social responsibility.

CEEP assisted Council to increase the energy efficiency of three community facilities, through the installation of new energy efficient technologies, and promoted improved energy management practices through a series of educational workshops and marketing and communication materials.

Across the three target sites, the project successfully produced the following outcomes:

- An overall average energy efficiency improvement of 37% at the two CBD car parks
- Energy cost savings that met the original target, and have provided more than $96,000 in savings over the past 12 months
- The combined payback of all initiatives is 4.9 years to date
- Energy consumption savings of 295,032 kWh per year, equivalent to 237 tonnes CO2
- Raising awareness and education about energy efficiency for all relevant staff, residents, businesses and patrons
- Improved energy efficiency practices and behaviour change amongst staff and residents

Delays in the delivery of the project have resulted from expanded scopes and variations for both the car park and Riverside Theatres. Despite the extended timeframe, the works have resulted in good outcomes for energy and cost saving for Council and a demonstration of how asset upgrades can be packaged together to achieve multi-objectives beyond just energy efficiency.

The activities undertaken and the resulting energy and cost savings would not have been possible without the generous support and funding provided by both the Federal and NSW State Government. The support provided through programs such as CEEP encourage local government to continue and improve services to the community in both a sustainable and more cost effective manner.
9. DECLARATION

The Authorised Officer of the organisation makes the following declarations:

X I declare that I am authorised to submit this Final Report (including any attachments) on behalf of
       ...........Parramatta City Council................................. (Name of organisation)

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

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

X 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: ....12.../....11....../...2015........

Name: ............Anthony Collins

Position: .....Manager Sustainability and Waste...... Organisation: ......Parramatta City Council....

Witness Signature: ........................................... Date:. .12...../....1 1....../....2015.......

Name: ..........Bernadette Riad......

Position: ......Corporate Sustainability Officer...... Organisation: .....Parramatta City Council...

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.
### ATTACHMENT A

**Project Energy Efficiency Improvement**

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>Accelerating Energy Efficiency Improvements to Parramatta’s Central Business District (CBD)</th>
<th>PROJECT ID</th>
<th>CEEP1207</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNDING RECIPIENT</td>
<td>Parramatta City Council</td>
<td>DATE</td>
<td>2 Nov 2015</td>
</tr>
</tbody>
</table>

#### BUILDING, FACILITY OR SITE 1

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site 1</th>
<th>Riverside Theatre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
<td>Cnr Church and Market Streets Parramatta NSW 2150</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Theatre</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of HVAC system, lighting, timers, hot water system, BMS and hand dryers</td>
</tr>
<tr>
<td>Energy Efficiency Estimate Method</td>
<td>2011 Audit by Environ Australia in accordance with requirements of s.14 of AS/NZS 3598:2000</td>
</tr>
<tr>
<td>Baseline Energy Usage</td>
<td>1,334,258 kWh (4,803,329 MJ) in 2010/11 Fin. Year</td>
</tr>
<tr>
<td>Baseline Energy Efficiency</td>
<td>117.43 MJ per m2 per operating hour or (431,058 MJ/m2/yr)</td>
</tr>
<tr>
<td>Energy Efficiency Improvement</td>
<td>Reduction of 406,514 kWh = 35.92 MJ per m2 per operating hour or (131,854 MJ/m2/yr)</td>
</tr>
<tr>
<td>Reporting Data (Measuring Energy Efficiency and Additional Data)</td>
<td>A total area of 4070 m2</td>
</tr>
<tr>
<td>Operational occupancy is variable depending on performances</td>
<td></td>
</tr>
<tr>
<td>Average daily operation = 10.05 hours</td>
<td></td>
</tr>
<tr>
<td>Building construction date 1988</td>
<td></td>
</tr>
<tr>
<td>Cost of Activity</td>
<td>$208,966*</td>
</tr>
<tr>
<td>Actual Cost Savings</td>
<td>$53,748 per annum*</td>
</tr>
</tbody>
</table>

- Excludes HVAC costs and resulting savings (to be monitored from Nov 2015)

#### BUILDING, FACILITY OR SITE 2

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site</th>
<th>Wentworth Street Carpark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
<td>15-17 Wentworth Street Parramatta NSW 2150</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Multi-level Carpark</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade Lighting to LED</td>
</tr>
</tbody>
</table>
### Energy Efficiency Estimate Method

2010 Audit by Environ Australia in accordance with requirements of s.14 of AS/NZS 3598:2000

### Baseline Energy Usage

317,489 kWh (1,142,960 MJ) in the 2008/09 Fin year

### Baseline Energy Efficiency

3 MJ per m² per operating hour or (17,094 MJ/m²/yr)

### Energy Efficiency Improvement

Reduction of 155,825 kWh = 1.47 MJ per m² per operating hour or (8,376 MJ/m²/yr)

### Reporting Data (Measuring Energy Efficiency and Additional Data)

A total area of 24,279 m² over 8 levels
Average daily operation = 15.6 hours
Building construction date 1986

### Cost of Activity

$114,156

### Actual Cost Savings

$18,120 per annum

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### BUILDING, FACILITY OR SITE 3

**Name of Building, Facility or Site**  
Erby Street Carpark

**Location (address)**  
30 George Street Parramatta NSW 2150

**Type of building, facility or site**  
Multi-level Carpark

**Activity Type and Measure**  
Upgrade Lighting to LED and install sensors

**Energy Efficiency Estimate Method**  
2010 Audit by Environ Australia in accordance with requirements of s.14 of AS/NZS 3598:2000

**Baseline Energy Usage**  
252,700 kWh (909,720 MJ) in the 2008/09 Fin year

**Baseline Energy Efficiency**  
1.9 MJ per m² per operating hour or (16,655 MJ/m²/yr)

**Energy Efficiency Improvement**  
Reduction of 101,332 kWh = 1.13 MJ per m² per operating hour or (9,906 MJ/m²/yr)

**Reporting Data (Measuring Energy Efficiency and Additional Data)**  
A total area of 19,595 m² over 5 levels
Average daily operation = 24 hours
Building construction date 1981

**Cost of Activity**  
$108,936

**Actual Cost Savings**  
$24,480 per annum