This report has been produced as a milestone requirement of the Australian Government under the Community Energy Efficiency Program Round One grant funding agreement with Bankstown City Council.

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1.0 Executive Summary

The Bankstown Generation Project commenced in 2012 with funding assistance from the Australian Federal Government under the Community Energy Efficiency Program Round One.

Bankstown City Council (BCC) saw this an opportunity to place Bankstown City Council as a leader in innovation and Sustainability. The project consisted of the following three (3) components:

1) A 310 kW trigeneration generator and a 217 kW absorption chiller to supply electricity to supply electricity and heat to the Civic Tower.
2) Civic Tower lighting upgrade, with a focus on the carpark, base building and Council occupied floors.
3) Project communications strategy with a focus on community, local businesses, and building tenant engagement

In 2013, AECOM Consulting was engaged to review feasibility studies and develop designs for the proposed works as well as ensure the scope of works was kept in line with the overall project budget and timeframes established by the CEEP agreement conditions.

In 2014, Cundall Consultants were engaged to carry out a third party peer review of all the trigeneration plant documentation developed to date.

Based on these review, a number of risks were identified:
- Overall Project Capital cost
- Operation cost and gas price
- Electrical demands and tenants engagement
- Other potential building issues

It was clear then to Council, that there were project risks identified that needed to be resolved. It was also uncertain if these risks could be addressed without having further financial strain on the project. Although mitigating measures were discussed and implemented as the project progressed, it is believed that the remaining risks of installing the trigeneration plant outweighed the benefits.

However, the Bankstown Generation Project delivered some significant improvements and achievements, including:
- Civic Tower new upgraded lighting throughout. Preliminary results already show a 30-40% energy saving in the car park resulting in a significant reduction in greenhouse gas emissions.
- Successful Community and local business engagement, including:
  I. Energy and lighting expo,
  II. Business breakfast,
  III. Children festival energy efficiency photo booth,
  IV. Community workshops including culturally and linguistically diverse groups,
  V. Trigeneration technology kiosk, and
  VI. Educational material and sustainability video.
Council has gained a wealth of information from this project regarding energy efficiency and are better positioned for future projects and the tools necessary for this technology to be implemented.

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.
2.0 Project Objectives

The Community Energy Efficiency Program (CEEP) was a competitive merit-based grants program under the Federal Government’s Clean Energy Future initiatives. It was aimed at reducing greenhouse gas emissions and addressing climate change.

The Bankstown Generation Project objectives included:

1) Component 1 – Trigeneration Plant
   (i) Become a leader in carbon emission reduction,
   (ii) Improve building energy efficiency (electricity cost reductions),
   (iii) Improve the Civic Tower’s environmental credentials, i.e. NABERS rating,
   (iv) Achieve long term commercial competitiveness and tenant attraction/retention,
   (v) Improve energy security and reliability.

2) Component 2 - Civic Tower lighting upgrade,
   (i) Reduce energy consumption,
   (ii) Reduce carbon emissions,
   (iii) Reduce building operational costs

3) Component 3 - Project communications strategy,
   (i) Share knowledge and experience with tenants, community and businesses,
   (ii) Empower the community and businesses,
   (iii) Encourage improved energy management practices across various sectors,
   (iv) Educate and build community capacity about climate change and energy efficiency.
3.0 Project Energy Efficiency Activities

3.1 Project Activities Overview
On implementation, the Bankstown Generation Project was designed to substantially reduce carbon emissions produced by Council operations, increase energy efficiency by reducing operational costs, ensure secured power supply, increase Civic Tower environmental credentials and improve business competitiveness.

The scope of works included the following:

i. 310 kW trigeneration engine,
   - To supply electricity to the Civic Tower base building and car park;
   - Associated 217 kW absorption chiller;
   - Heat recovered from the engine will be used for space heating, domestic hot water heating and conversion through;

ii. Civic Tower lighting upgrade with a focus on car park, base building and Council’s occupied floors;

iii. Communications strategy with a focus on community, local businesses, and building tenant’s engagement.

It is important to note that component number one did not proceed which will be discussed in section 3.2.

3.2 Bankstown Civic Tower Trigeneration Plant

The Bankstown Civic Tower (BCT) was built in 1989, is an eleven (11) storey office building located at 66-72 Rickard Road, Bankstown. The building contains sufficient electrical and mechanical infrastructure to provide comfort conditions to the occupants, however some of this equipment is reaching the end of useful life.

The anticipated outcomes from the Bankstown Generation Project are:

- To install a trigeneration system at 66-72 Rickard Road Bankstown.
- Reducing BCT C02 emissions to 445 tonnes per year,
- Improved NABERS rating of the Civic Tower from 2.5 to 4.5 stars,
- Improved building services and occupant experience,
- Implementation of sustainable technology that meets the needs of future generations.
- Provide a leading example of civic renewal incorporating clean energy technologies and energy efficient retrofits.

3.2.1 Design

AECOM Consulting was engaged in 2013 to review feasibility documentation, and to develop full designs for the proposed works as well as ensure the scope of works was kept in line with the overall project budget and timeframes established by the CEEP agreement conditions.

The AECOM concept included the following options for Council to consider:
Based on the current electrical demand for the base building and Council occupied tenancies, Option 2 would be the adequate plant size, with the generator operating at its ideal load for 94% of the operating time.

Designs for the recommended size plant were completed by AECOM in February 2015. During this process several issues were identified that were impacting on Council’s ability to deliver the project, including:

- The correct sizing of the plant,
- Uncertainty over the tenancy arrangements and connection to the trigeneration plant,
- Modifications to the existing building and services not identified previously.

### 3.2.2 Third Party Peer Review

To address these uncertainties Council engaged Cundall Consultants to carry out a third party peer review of all the trigeneration plant documentation.

The main aim of the review was to carry out a project health evaluation before Council committing the bulk of the project funds. The review also helped to confirm the correct sizing of the plant and
provided a better understanding of long term plant operational costs. This involved reviewing initial feasibility report and AECOM revised proposal and all updated documentation.

The main findings were:

- **Plant size** – Determining the correct size of the plant was critical in ensuring the plant operated efficiently. The review confirmed that a 310 kW tri-generation engine was the correct size.
- **Correct Design** – It was identified that the AECOM design provided specifications and designs as per Council requirements but there was insufficient information to determine if the specifications would achieve a successful outcome, this was later addressed by AECOM and plans were updated;
- **Maintenance** – The report identified the need to have expert maintenance resources available and highlighted the high level of risk on utilising in-house less experienced facilities which may result in the trigeneration system not operating to its maximum capacity, increasing probability of operational faults and as result, reduce the life of the system.
- **Financial Impact** – The most significant finding was that there were several financial risks as a result of the changing gas price market. Several scenarios were examined including different gas prices. It concluded that in order for the project to be financially viable, a reduction in the gas rate would need to be negotiated with the gas supplier.

Based on the review it was considered that there were still numerous risks in the project that had not been addressed, most noticeably relating to costs. These risks included;

i. Overall Project Capital Cost Risks
ii. Operational cost and gas price risk
iii. Electrical demand and tenants engagement
iv. Other Potential Building Issues

### 3.2.3 Project Risks/Challenges

#### i. Overall Project Capital Cost Risks

AECOM Consultants finalised the ‘For Tender’ documentation, including the ‘Pre-Tender’ estimate, this provided a more accurate view of the cost of the project. The Trigeneration plant cost estimate had increased to $4,034,985 excl. GST (design and construction). This represented an increase of $712,643 excl. GST over the ‘Council Contribution’ component of the project.
This cost increase was due to:

- Detail documentation allowing to estimate costs more accurately,
- Additional compliance works to switch room,
- Structural works to slab (access cut outs and reinforcement),
- BMU modifications.

This increase in capital cost was considered by Council to be significant, and had a substantial impact on the cost benefit previously assessed as part of the project development. While these costs included a 10% contingency it was also considered that there is further potential risks as there are unknowns as part of undertaking works on an existing building.

As a result it was considered that there is a risk that the project will exceed this forecast which is already over budget.

**ii. Operational cost and gas price risk**

As identified in the Cundall review, the gas cost was a key driver to the financial viability of the Trigeneration system. When the project was first developed in 2012 the price fluctuations in gas was not clearly evident. However with the opening up of the gas market, current indications point towards large increases in gas rates for Australian domestic customers due to the commissioning of major gas export infrastructure. Any dramatic increase in the price of natural gas would leave the system, coupled with high maintenance costs, as a more expensive way to generate electricity.

Cundall looked a two gas price scenarios, one being current rates $0.019 /MJ, in which case council will have to contribute and additional $38,000 annually toward the operation of the plant. This excluded the major overhaul cost required every 15 years ($120,000 or $8,000 annually).

Cundall also looked at the gas cost required to achieve a neutral operational cost impact:

- Gas cost required to be cost neutral at 10 years (pre-major overhaul): $0.0116/MJ
- Gas cost required to be cost neutral at 10 years (post-major overhaul): $0.0105/MJ
The probability of Council achieving these rates are uncertain. The report concluded that to ensure viability, a gas contract with a rate of more than half the existing rate would need to be achieved. As the potential of securing this is unlikely, there is a high risk of ongoing costs exceeding those first estimated when the project was developed.

The result of these increased ongoing costs significantly impact on the projects financial viability.

iii. Electrical demand and tenants engagement

Electrical demand is based on supplying electricity to the following areas:
- Car park all levels,
- Base building including lobby, fire stairs and plant rooms to all levels,
- Council occupied floors;

When the initial grant was prepared Council was occupying the 4th floor. Now that Council has consolidated its space there would be a requirement at a minimum to have the new tenant agree to source its energy from the Trigeneration Plant. There is no certainty that this will occur.

In addition, the Council’s Property Unit investigated the potential for other tenants in the building or Hoyts (adjacent property owned by Council) to be involved. Despite a meeting with the relevant parts of the State Government no outcome has been reached to date with other Civic Tower occupants.

As identified in Cundall’s review, the correct size for Trigeneration plant to match the demand is essential to deliver an efficient system. The loss of demand (4th floor) will impact on the overall running efficiency of the plant.

Furthermore, as part of the options investigated to increase the electrical demand for the Trigeneration plant connecting to the new Bankstown Library and Knowledge Centre building was reviewed. Although this was technically possible, further discussion with AUSGRID confirmed they will not accept the proposal. This was on the basis that the two buildings are currently connected to separate substations. If paralleled together and a problem occurred it could lead to a major shutdown of the local network.

In conclusion it is considered that there is still significant risk in there not being enough demand to ensure the plant runs at the required efficiency. This increases the ongoing maintenance costs and reduces the potential benefits.

iv. Other Potential Building Issues

While every effort has been made to resolve unknown building issues there are a range of other high risk factors that have the potential to significantly impact on the capital cost, construction or tenant conditions. These include:
- Required slab access cut outs area unknown
Vibration and noise from the plant has been designed based on known parameters however there is still the risk that the generator may create unforeseen noise and vibration in the building.

3.2.4 Outcome of the Review

It was clear, following the thorough review of the feasibility and design of the trigeneration plant that some significant risks identified in relation to the project remain. It is also unlikely that they will be able to be addressed without having further financial strain on the project.

When the project was first developed, expert external advice was provided from professional consultants who have been involved in many successful trigeneration projects in the past. Their advice was based on best available information at the time.

Given the complex nature of the project, the significant movement in gas and electricity market, and further information on the building and design being prepared, Cundall Consultants were engaged to carry out a third party peer review of all the Trigeneration project documentation. This was to ensure value for money before agreeing to proceed with construction.

Although mitigating measures have been discussed and implemented as the project has progressed, it is believed that the remaining risks of installing the Trigeneration plant outweigh the benefits.

On the 28 April 2015 at the Council Ordinary Meeting, Council resolved to discontinue the Bankstown Generation Project.

3.3 Civic Tower Lighting Upgrade

The Civic Tower is one of Council’s highest energy-consuming facilities. The Bankstown Generation Project included the lighting upgrade in the Civic Tower base building areas (car park, all foyers, toilets and fire stairs, plant rooms) and Council occupied floors. The works aimed to:
- Reduce energy use in the Civic Tower;
- Contribute towards improving the NABERS rating for the building; and
- Provide high quality and effective lighting levels to all building users.

The lighting proposed to be installed comprised a mix of new generation fluorescent and LED fittings.

The final lighting designs included a mix of T5’s, LED downlights and LED’s with motion sensors. Additionally motion sensors were placed in areas of infrequent or occasional use such as conference and meeting rooms and bathrooms. The mix of light fittings was chosen to achieve the optimal energy savings whilst ensuring that appropriate light standards for different situations were met.

There were some challenges with the lighting designers as on occasion there was divergent thoughts on how standards were interpreted when it came to LED lights with motion sensors. This highlighted that the standards were not yet dealing with up to date new technology lighting.
Continual communication and additional project team meetings were necessary to ensure we could reach agreement and move forward.

The project was undertaken in stages as per the project Activity schedule.

i. Prepared tender to engage electrical contractor to develop design documentation for the lighting upgrade (August 2012),

ii. Lighting consultants Haron Robson were engaged to prepare lighting designs for the Civic Tower; and provide Council with independent technical advice regarding the suitability of tenders to implement the lighting designs and comply with required lighting standards,

iii. Tender for lighting works prepared and exhibited from the 2 September 2014 to the 23 September 2014,

iv. In December 2014 Council accepted the recommendation of the Tender evaluation panel and engaged TES Total Energy Solutions to undertake the lighting upgrade,

v. Work to complete base building light installation (including electrical upgrades, testing and correct disposal of old lights) commenced in February and were completed in June 2015.

Council undertook some energy monitoring of lighting in the Civic Tower car parks before and after the works. The graph below shows a clear downward trend in electricity consumption during February and March.
4.0 Project Demonstration and Communications Activities

There were numerous activities throughout the life of the project aimed at demonstrating and communicating the energy efficiency activities and their effectiveness to various target groups. These activities included:

- Activity 1 - Develop communications plan
- Activity 2 - Civic Tower tenants
- Activity 3 – The Generation Project video
- Activity 4 - Interactive kiosk
- Activity 5 - Schools film competition / photo booth
- Activity 6 – Engagement with local businesses
- Activity 7 – Energy efficiency and lighting expo
- Activity 8 – Consultation for the community education
- Activity 9 – Community workshops
- Activity 10 – Staff Training
- Activity 11 – Councillors & senior staff
- Activity 12 – Case Study

4.1 Activity 1 - Develop communications plan

A project communications plan outline was prepared as part of the original grant application. The aim of the plan was “To encourage improved energy management practices across various sectors” and to educate various stakeholders about these energy efficiency benefits. This original two page plan identified the rational, broad objectives and community sectors as well as a strategic process for developing more comprehensive communications and evaluation plans for the project.

Once the grant was announced, an in-house workshop was held to further develop the communications plan for the Generation Project (based on the original submission). The overall goals of the communication plan were to:

- Encourage improved energy management practices across various sectors
- Educate and build community capacity about climate changes an energy efficiency
- Share outcomes and lessons with community, other councils and organisations

The aim of the Communications Plan was to showcase Bankstown’s City Council’s actions to lead and empower our Community to become more energy efficient. Multiple target audiences were identified and priority communication strategies were developed to assist in developing materials, assigning actions and budget as well as measuring outcomes.

The Following stakeholders were identified in the Communications Plan:
- Community of Bankstown (residents / householders/ ratepayers)
- Media
- Civic Tower Building tenants
- Businesses and business groups
- Educational Institutions
- Council Staff
- Councillors / Elected Officials
Other Councils and Government agencies.

4.2 Activity 2 - Civic Tower tenants

In order to engage tenants and managing agents of the Civic Tower in the Generation Project, and specifically to provide information about the lighting upgrades that were to take place a number of actions were implemented during the life of the project.

A static information directory in the foyer was replaced with a digital screen with programmable software. The screen graphics were prepared in house and provided the opportunity to share and update information about the project.

Additionally, project officers attended tenant and property manager meetings to inform them of the project activities and provide information about sustainability and energy efficiency within their operations. Furthermore, all tenants were invited to the Energy Efficiency and Lighting Expo and were also made aware of the opportunity to attend energy efficiency workshops.

Tenants were kept informed of the lighting upgrade works to the base building and also the car park areas they were being undertaken.

4.3 Activity 3 – The Generation Project video

The Generation Project has a significant communications component, focusing on energy efficiency and providing information about climate change. A video was developed to be used on a number of occasions and venues where Council wanted to share information about the project as well as Council's commitment to sustainability and energy efficiency.
The video target a number of audiences, including:
- General Community (via website, project kiosk and Civic Tower information board),
- Community visitors to the New Bankstown Library and Knowledge Centre, via large screen display,
- Civic Tower building tenants and visitors to the building, via foyer digital directory,
- Council staff, via induction training,
- Local Businesses, Energy Efficiency and Lighting Expo, video shown at Q&A Session,
- Staff at other Councils, as part of a case study sharing project experience.

The main objectives for the video was to:
- to explain The Generation Project, including the functioning and benefits of the Trigeneration plant
- To communicate Council’s commitment to energy efficiency and as a leader of sustainability in the local community.

4.4 Activity 4 - Interactive kiosk

Development of an interactive Kiosk was identified early in the project planning as a way of sharing information to the general community and youth in particular via a learning resource. In line with the grant communication priorities, content for the interactive kiosk focused on building community capacity about climate change and energy efficiency.

The opening of the new Bankstown Library and Knowledge Centre coincided with this phase, so it was decided that the ideal location for the kiosk would be in the foyer of the new building.
The identified outcomes for the Generation project kiosk were:

- Improved accessibility of quality information relating to energy efficiency,
- Information platform easy to access and well used by site visitors,

By installing this interactive kiosk and targeting predominantly youth including, students, teenagers and general community, this technology delivered an interactive experience which is user friendly, uses technology which is considered leading edge and at the forefront of internet technology, engages with and informs audiences on; sustainability, climate change, energy and provides an interactive game which educates children how to be more energy efficient.

Furthermore, Library staff promote and demonstrate the interactive kiosk to all School groups who visit the library. All new BCC Staff inductions are shown the Kiosk. Additionally, BCC have promoted usage through Council quarterly community newsletters.

Between 1/4/14 to 30/7/15, we had recorded 11,954 interactions (views and/or game playing):

<table>
<thead>
<tr>
<th>Number of videos views</th>
<th>466</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of PDF pages viewed</td>
<td>1126</td>
</tr>
<tr>
<td>Number of times games completed</td>
<td>3167</td>
</tr>
</tbody>
</table>

The Generation Project videos are available on the Kiosk. Additionally Council obtained approval from the Climate Commission to use the videos and information posters produced as part of

Images showing Community members using the Interactive Kiosk

Kiosk with updated sorround
their community education program. This material (with original branding) is now able to be viewed at the Kiosk, or a link can be emailed and accessed on the web later.

The following are accessible via the Generation Project Interactive Kiosk:

**Interactive Energy Saver Game**
- Choose the most energy efficient activity / appliance / transport mode etc. (27 randomly generated options)
- Race against a clock
- Energy rating STAR is achieved for every correct answer
- Top 5 scores invited to put initials on the Leader board for current month
- Option to sign up for the library newsletter
- Option to email link to videos and documents to self or others
- Connect with Council - View Tweets

**Documents to view and email**
- Sea Level Rise
- The Angry Summer
- Solar Energy
- Climate change and the water Cycle
- Greenhouse Effect
- Climate Change Risk
- Climate Change Feedback Loop
- The Critical Decade 2010- 2020
- Urban Heat Island Effect
- Climate Change in NSW
- Climate Change and Rain
- Ocean Acidification
- Effects of Climate Change

**Watch Videos**
- Australia’s future; Solar Energy
- Climate change fuelling wilder weather
- Bankstown Trigeneration Project
- The impacts of Climate Change
- Critical Choices in the Critical Decade
- Sustainable Bankstown City Council

*Examples of images, videos and screen shots from on the interactive kiosk.*

Urban Heat Island effect | Greenhouse Effect
---|---
Climate change and the Water Cycle | Ocean Acidification

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4.5 Activity 5 - Schools film competition / photo booth

Students and local educational institutions were identified as a specific target group for the project who could be engaged in energy efficiency through a short film competition. The Switch Flicks Film Competition was developed in conjunction with a number of officers across Council including children and youth specialists, school education specialists, Corporate Social Media and IT.

The Switch Flicks Film Competition was promoted to young people (9 to 24 years) in Bankstown via Councils website, posters at libraries, arts centre, community centres, Council buildings and also electronic images emailed directly to school by library members youth officers. Additionally, librarians contacted school teacher contacts directly to promote the competition.
Unfortunately, despite a concerted effort on behalf of the project team, the film competition failed to attract entries. The deadline for entries was extended by two weeks, with additional promotion via libraries, and repeating promotions to schools and contacting all school contacts. At the conclusion of the extension period the project team recommended that the Film Competition be abandoned and an alternative method for engaging youth be sought.

With approval from the grant provider, an alternative activity was held to engage youth in Bankstown with energy efficiency messages via a Photo Booth at the Annual Bankstown Children’s Festival on 13 September 2014. There were numerous exciting activities for children including scout adventures, lantern making, costume parades, arts and craft, rides, animal petting zoo and more.

A “Generation Project” photo both was hired and placed in the foyer of the New Bankstown Library adjacent to the park. The photo booth was equipped with props to promote energy efficiency and personal action. Over 4 hours there was a constant queue and 380 photos were taken, all participants received photos to take home - printed with project branding and the message “save energy, save money and save the environment”. BCC Staff attended and promoted energy efficiency through displays, discussions with participants and parents and distributed Council brochures and flyers about a range of energy efficiency options for households and individuals.
Photos of activity at the Generation Project Photo booth on Saturday 13 September 2014 at the Bankstown Children’s Festival.
Examples of photos taken on the day and posted online @ http://politeinpublic.com.au/11248_0021
4.6 Activity 6 – Engagement with local businesses

Local Businesses were engaged primarily through the Bankstown Business Advisory Service (BBAS) which is run by Council. The following activities were undertaken

- **Business Breakfast and Networking** with 80 local businesses representatives attending as shown below,
- **Short presentation to the audience about the project.** What Council is planning and how Council would like to engage them to participate in workshops and / or attending the Energy Efficiency and Lighting Expo as shown below,
- **Survey of businesses at the breakfast to gauge what type of information / training would be of most interest to them and what duration of sessions they would be interested in attending (e.g. 2 hr workshops, accredited training days, etc.),**
- **Offering training and energy efficiency workshops for local businesses,**
- **Holding the Energy Efficiency and Lighting Expo at Bankstown in October**

**Invitation to Businesses to attend the Networking Breakfast**

4.7 Activity 7 – Energy efficiency and lighting expo

The Energy Efficiency and Lighting Expo was held on 8 October 2014. The following invitation to businesses to attend the Expo and also bookings for workshops and the evening Q&A were distributed to over 10,000 Bankstown Businesses through the BBAS email data base. Bookings for workshops, networking session and Q&A could be made through Council’s website. Additionally staff made personal invitations to contact at local businesses to ensure they were aware of the Expo.

- **Approximately 200 people from over 120 businesses attended the Expo over the whole session from 1pm to 8pm**
- **45 businesses booked for workshops however only 24 businesses actually attended on the day.**
- **Follow up with businesses could not generate sufficient interest for additional workshops**
- Approximately 50 businesses attended the networking session and the Q&A session.
- 36 Energy Specialists exhibited at the Expo, including LED & lighting manufacturers and suppliers, solar specialists, energy auditors, NSW energy certificate certifiers and energy trainers.

Invitation emailed to the BBAS Businesses Database and the large banner displayed on the Bankstown Library and Knowledge Centre.

Bankstown City Council website shots and booking page for expo and workshops.
Advertisements were run in the local newspapers in the weeks leading up to the Expo. Digital media was also used to encourage businesses to attend.
EXPO "Passport" to encourage attendees to move around the Expo and engage with stallholders.
The following are images from the Energy Efficiency and Lighting Expo.

Q&A Session held at the conclusion of the Energy Efficiency & Lighting Expo, Hosted by James O’Loguighlin and featuring local businesses, OH & H and Council.

A 20 minute video of the Expo, workshops and Q&A was produced and can be viewed at: http://www.bankstownbusiness.com.au/index.aspx?NID=958
4.8 Activity 8 – Consultation for the community education

4.8.1 Community Forums

Bankstown City Council committed to engage and work with its community to determine the way forward to drive energy reduction at home, through the use of education. The consultation process identified that people in Bankstown are highly interested in reducing energy and not only because it saves them money. People in the Bankstown will be motivated to use less energy because: it saves money, protects the environment and cares for future generations and the future of the planet.

Images from Community Forums, May and June 2014

In May and June 2014 a total of 91 Bankstown residents attended five Council run community forums. Two workshops were held with members of the Bankstown Residents’ Panel. Three Workshops were held with people from a culturally and linguistically diverse background; two with Arabic-speaking people and one with Vietnamese-speaking people.

The forums were focused on:
- Gaining an understanding of what the residents of Bankstown are currently doing to reduce energy use and what motivates these behaviours;
- Identifying what the community sees as the barriers and drivers to change concerning energy use;
- Providing participants with information on energy efficiency, climate change and the Bankstown Generation Project.

4.8.2 What they told us

The groups brainstormed a range of innovative and interesting ideas which will form the basis of the energy efficiency education program. Some of the ideas are listed below:

- Design a face-to-face community education program, involving workshops on energy savings. This should target families, school and community groups and should provide easy to understand tips about how to save energy
- Run a community service program to inform people about how to save electricity. Provide specific education for renters and home owners
- In the library, run a school holiday program, group activities should be fun and interactive
- Run schools programs. Talk to teachers and train them, then the teacher teaches their class/classes. Encourage the children to come home and talk to their parents. Possibly lower secondary level. Develop assignment materials for use by teachers in the classroom.
- Run an energy reduction campaign in local newspaper, community radio etc. also incorporating a social media aspect to engage younger people.
- Other social marketing approaches include use of bus stops and train stations within the Bankstown LGA to carry messages.
- Identify which age group uses the most energy in Bankstown and target the program to educate them.

### 4.8.3 Key findings from Community Forums

The findings from the forums include:
- Bankstown residents are interested in energy reduction and motivated to find out more, to do more and to spread the news.
- People are motivated to use less energy for the following reasons:
  - Saving money
  - Protecting the environment
  - Consideration of future generations and the planet
- There is a need to provide base level education and information about energy reduction behaviours both printed and online. Information needs to be provided in community languages including: Arabic and Vietnamese.
- Residents need to be engaged face-to-face through workshops. A ‘reducing energy at my house’ type workshop should run from 90 minutes to two hours and target project partners, community groups and schools. At a fundamental level, there is still a need to educate people about the simple things they can do at home to reduce energy using a ‘top tips’ type of approach.
- For people already taking steps to reduce energy at home we should provide education about more challenging actions that might be considered, and possibly adopted by people at home i.e. installing a solar hot water system.
- Establish a community Working Group to help guide and inform program development.

Forum evaluation indicated that the intended outcomes were achieved across each workshop. All but one participant said they were ‘well achieved’ or ‘extremely well achieved’ which is positive. The information from the forums was used to develop a targeted education program that links with the requirements of the Bankstown Generation Project.
4.8.4 Working Group

Following the delivery of the focus groups 8 participants were selected to be involved in an Energy Working Group. The working groups was established to provide a platform for community participation and assistance with developing the Energy Efficiency workshop program in Bankstown.

The outcomes from the focus group workshop and working group meetings was used to develop the community education program, specifically inform the development of the workshop presentation and materials. The group has met twice and receives project updates via email.

Focus group invitation for the Arabic Community

General Community focus group 2014

Arabic focus group 2014
4.9 Activity 9 – Community workshops

The following stakeholders were identified and targeted in our communications activities:

- CALD groups (Arabic and Vietnamese)
- Seniors
- Families
- General community

To engage the identified stakeholders for participation in workshops we undertook the following recruitment and promotional actions:

- Targeted recruiting for participation in workshops – Working Group, networks and community groups.
- Communication promotions
- Community Link (Councils community newsletter)
- Newspapers
- Radio
- Social Media

The information from the forums (Activity 8) was used to develop a community education program focussed on energy efficiency in the home. Through the forums the Bankstown community told us that residents are motivated to use less energy because they want to

i. Save money
ii. Protect the environment
iii. Leave a legacy for future generations.
iv. They also identified barriers and drivers to energy reduction for renters and home owners.

4.9.1 Delivery of the Workshops Program

The objective of the workshops was to engage and educate the community on how to save energy and in turn money in the home. The workshops covered practical tips for saving both energy and provided information tailored for home renters and home owners.
The workshops were delivered to 7 community workshops across Bankstown

- 112 residents (+16 children) – A range of groups including: Parents, seniors, CALD community groups, including residents from Arabic, Vietnamese and Chinese backgrounds and the general community. Fourteen different language groups were represented from across the Bankstown LGA.
- Workshop evaluation results conveyed that the community were keen to learn more about saving energy and money around the home.
- 96% of survey respondents ‘strongly agree’ or ‘agree’ with the statement that I ‘left the event with information and ideas that will help me reduce my energy bills’.
- 97% of survey respondents strongly agree’ or ‘agree’ that they ‘would encourage other friends and family to attend future Energy Workshops run by Council.

Lighting was discussed as an option to reduce energy usage and save money. Council staff provided each group with an overview of what Council is doing to save energy across the LGA in terms of solar & lighting efficiency projects.

4.9.2 Participant Comments

- It was so relevant to me, I will change a lot of "switching on & switching off in future. I learnt quite a lot regarding "saving", THANKYOU!
- I learnt how much I can save on bills using the tips. I enjoyed the workshop very much. Could I have a soft copy of the slides so I can store it on my laptop email, so I can refer to it anytime? Thank you!

Seniors Week Workshop at the Bankstown Library and Knowledge Centre

Program promotion in Council’s Facebook Page

Program promotion in Local Newspaper
4.10 Activity 10 – Staff Training

Another important component of the program was extending the knowledge and capability of Council property management and maintenance staff. The starting point was building awareness of energy consumption and costs from lighting which are around $800,000 for Council facilities alone. As well as workshops about efficient lighting technology and practices, staff benefited from the opportunity for professional development through attending conferences on energy efficiency.

The Sustainability Team regularly hold sessions for relevant staff building on their knowledge and where possible arrange for external training to enhance knowledge of sustainability such as energy Efficiency. As well as workshops about efficient lighting technology and practices, staff benefited from the opportunity for professional development through attending conferences on energy efficiency.

All new staff joining Council are run through a comprehensive induction day, which includes a comprehensive overview of Council’s commitment to sustainability and current projects.

4.11 Activity 11 – Councillors and Senior Staff

Council and senior staff have been kept informed of the project in its entirety through reports, briefings and presentations.

Additionally senior staff and Councillors were encouraged to attend community engagements activities such as the Business Breakfast and Energy Efficiency and Lighting Expo, where the Mayor gave a short presentation during the Business Networking session. Elected representatives from Bankstown City Council and neighbouring councils in Southern and Western Sydney were encouraged to take part in community workshops and forums.

4.12 Activity 12 – Case Study

This Activity will not be completed as the grant has been terminated.
5.0 Outcomes and benefits of the Project

The outcome which intended for BCC was to install a 310 kW Trigeneration generator and a 217 kW absorption chiller to supply electricity to supply electricity and heat to the Civic Tower. The objectives of this project was to;

i. Become a leader in carbon emission reduction (around 60%),
ii. Improve building energy efficiency (electricity cost reductions),
iii. Improve the Civic Tower’s environmental credentials, i.e. NABERS rating,
iv. Achieve long term commercial competitiveness and tenant attraction/retention,
v. Improve energy security and reliability of plant

As stipulated in previous sections following a thorough review of the feasibility and design of the trigeneration plant, there were significant risks identified in relation to the project. Although mitigating measures were discussed and implemented as the project progressed, it is believed that the remaining risks of installing the Trigeneration plant outweigh the benefits.

However, Council achieved great part of the project objectives through the implementation of the Civic Tower Lighting Upgrade and the Communications Strategy that engaged and encouraged Council, local organisations and the broader community to improve current energy management practices.

The Generation Project delivered many benefits to the Civic Tower was despite the trigeneration not progressing. This includes:

- **New energy efficient lighting for the Civic Tower.**
  This includes new innovative motioned sensored integrated LED lights and over 2,000 new generation energy efficient lights throughout the building. Preliminary results already show a 30-40% energy saving in the car park resulting in a reduction in greenhouse gas emissions.

- **Improve Civic Tower’s environmental credentials**
  The lighting upgrade for the Civic Tower will provide an opportunity to improve the building NABERS rating. A higher energy efficiency rating for the Civic Tower is a requirement for leasing to government agencies.

- **Achieve long term commercial competitiveness and tenant attraction / retention.**
  The achievement of an improved NABERS rating in the commercial real estate market is perceived as an essential part of marketing to attract long term tenants, preserve the value of the office building and provide a healthier environment for the building occupants.

- **Successful engagement of Local businesses and the community.**
  Activities included:
  - Energy and lighting expo,
  - Business breakfast,
  - Children Festival Photo Both,
  - Community workshops including culturally and linguistically diverse groups,
- Installation of an interactive technology kiosk incorporating energy information and games. To date this has been viewed by over 15,000 individuals since the launch,
- Educational material and sustainability video.

As a result, the City of Bankstown including the community has been taken through a journey which has increased and educated the awareness of energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting as well as demonstrated and encouraged through all the successful activities undertaken throughout the project the adoption of improved energy management practices within councils, organisations and the broader community.
6.0 Budget

AECOM Consultants finalised the ‘For Tender’ documentation for the trigeneration component, including the ‘Pre-Tender’ estimate, this provided a more accurate view of the cost of the project. The Trigeneration plant cost estimate had increased to $4,034,985 excl. GST (design and construction). This represented an increase of $712,643 excl. GST over the ‘Council Contribution’ component of the project.

<table>
<thead>
<tr>
<th>Item</th>
<th>Project Budget FEASABILITY MPES Nov 2012</th>
<th>Pre-Tender Estimate CUNDALL + AECOM Feb 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Project Cost</td>
<td>$4,245,141</td>
<td>$5,057,783.50</td>
</tr>
<tr>
<td>Trigen/Mech incl. consultants</td>
<td>$3,320,125</td>
<td>$4,034,985.00</td>
</tr>
<tr>
<td>Lighting Upgrade</td>
<td>$368,000</td>
<td>$368,000.00</td>
</tr>
<tr>
<td>Communications</td>
<td>$225,000</td>
<td>$195,000.00</td>
</tr>
<tr>
<td>Contingency (10%)</td>
<td>$332,016</td>
<td>$459,798.50</td>
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<tr>
<td>CEEP Funding (Federal)</td>
<td>($2,012,450)</td>
<td>($2,012,450)</td>
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<tr>
<td>WASIP Funding (State)</td>
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<td>($800,000)</td>
</tr>
<tr>
<td>Council Funding Required</td>
<td>$1,532,691</td>
<td>$2,245,334</td>
</tr>
<tr>
<td>Variance</td>
<td></td>
<td>+$712,643</td>
</tr>
</tbody>
</table>

This cost increase was due to:

- Detail documentation allowing to estimate costs more accurately,
- Additional compliance works to switch room,
- Structural works to slab (access cut outs and reinforcement),
- BMU modifications.

This increase in capital cost was considered by Council to be significant, and had a substantial impact on the cost benefit previously assessed as part of the project development. While these costs included a 10% contingency it was also considered that there is further potential risks as there are unknowns as part of undertaking works on an existing building. As a result it was considered that there is a risk that the project will exceed this forecast which is already over budget.

The lighting component was completed with minimal variation to the original budget, please refer to financial report for details.

The communications component was completed up to April 2015, all activates after this date will not be claimed.
7.0 Project Operation, Mechanisms and Processes

On 13 June 2012 Council was notified that it was successful in the grant subject to negotiating an acceptable funding agreement with the Department. Following this, an internal team was formed to manage the process which included representatives from various sections of council.

Teams were broken down into smaller units based on the project type and the expertise internally relating to each individual project with an overall Project Manager for each component. A project Control Group (PCG) from council was established to meet on a regular basis for the ongoing monitoring of all projects. See Project Management Structure below;

On the 1st August 2013, Council executed the agreement with the commonwealth for the construction of a Trigeneration Plan in the Civic Tower.
Shortly after, MPES Consulting was engaged to review the initially proposed works in relation to the grant funding allocation, as well as to provide advice on a feasible scope of works in line with the overall budget and timeframe established by the CEEP agreement conditions.

MPES developed a comprehensive concept design scope of works and associated costing which identified priorities varying from work required fundamental to funding outcome to different levels of enhancements to the operational performance of the system.

In December 2013 AECOM Consulting was engaged to review the MPES report and to develop concept and full designs for the proposed works as well as ensure the scope of works was kept in line with the overall project budget and timeframes established by the CEEP agreement conditions. AECOM developed detailed designs for the works.

Cundall Consultants were engaged to carry out a third party peer review of all the Trigeneration project documentation.

The main aim of the review was to carry out a project health evaluation before Council committing the bulk of the project funds. The review also helped to confirm the correct sizing of the plant and provided a better understanding of long term plant operational costs. This involved reviewing initial feasibility report by MPES and AECOM revised proposal and all updated documentation.

Therefore, the project was managed internally with external consultants providing specialised and expert advice and services. This approach allowed Council to have access to independent expert advice as required while at the same time have the capability to monitor and review the processes when consider necessary. Council officer manage the day to day difficulties efficiently ensuring timely responses by external consultants to meet a specific deadline as well as changes amongst resources both internally and externally.

The uncertainty associated with the system was overcome by Council implementing a risk management process which anticipated these potential risks and applied treatments to mitigate these risks. Examples of this are:

- Ensuring program of works were updated regularly,
- Regular consultation between parties in the form of meetings and PCG meetings to ensure timeframes were met,
- Early engagement of Civic Tower maintenance coordinator,
- Third party documentation review.

Council is now better equipped to undertake future similar projects as there is an improved understanding of the requirements. Additionally, Council have understood that for a project like this to work effectively, there must be more preliminary work with various stakeholders such as tenants of the buildings, various departments within council to commit to this project to guarantee full commitment of all parts involved.

Council has gained a wealth of information from this project regarding energy efficiency and are better positioned for future projects and the tools necessary for this technology to be implemented.
8.0 Conclusion

Council resolved to discontinue the trigeneration component of the Bankstown Generation Project following a third party review of all the documentation produced to date. The review confirmed that there were numerous project risks that to be resolved will have an impact on the project bottom line, the cost. These risks included:

- Overall Project Capital Cost Risks,
- operational cost and gas price risk,
- electrical demand and tenant’s engagement and
- other Potential Building Issues

However, the Bankstown Generation Project delivered significant improvements and achievements for Council including the implementation of the Civic Tower lighting upgrade, with a focus on the carpark, base building and Council occupied tenancies; as well as a communications strategy which showcased Bankstown City Council actions to encourage the adoption of improved energy management practices within building tenants, local businesses and the broader community.

Specifically, local businesses and the community were engaged through a range of successful activities including:
- Energy and lighting expo,
- Business breakfast,
- Children festival event energy efficiency photo both,
- Community workshops including culturally and linguistically diverse groups,
- Installation of an interactive technology kiosk incorporating energy information and games,
- Distribution of educational material and sustainability video,

Council is now better equipped to undertake future similar projects as there is an improved understanding of the requirements. Additionally, Council have understood that for a project like this to work effectively, there must be more preliminary work with various stakeholders such as tenants of the buildings, various departments within council to commit to this project to guarantee full commitment of all parts involved.

Council has gained a wealth of information from this project regarding energy efficiency and are better positioned for future projects and the tools necessary for this technology to be implemented.
9.0 Financial Declaration

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

[Name of organisation]

☐ 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 an


☐ I understand that final payment will only be made in accordance with the Funding Agreement including

on satisfactory completion of Milestones.

Authorised Officer Signature: [Signature]

Date: 31/08/15

Name: Ingmar Basler

Position: [Position]

Organisation: Bankstown City Council

Witness Signature: [Signature]

Date: 31/08/15

Name: Helene Forsythe

Position: [Position]

Organisation: Bankstown 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.
### Project Energy Efficiency Improvement Template

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>The Bankstown Generation Project</th>
<th>PROJECT ID</th>
<th>CEEP1104</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNDING RECIPIENT</td>
<td>Bankstown City Council</td>
<td>DATE</td>
<td>31 July 2015</td>
</tr>
</tbody>
</table>

### Building, Facility or Site 1 (This component of the project was discontinued)

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site</th>
<th>Bankstown City Council Civic Precinct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location (address)</td>
<td>67-72 Richard Road, Bankstown, NSW</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Office administration building, base building only 12803.6m² NLA</td>
</tr>
</tbody>
</table>

**Activity Type and Measure**

- Installation of a tri-generation plant to supply base building services and comprising the following:
  - 1 x 300 kWe gas fired engine/ alternator generator
  - Electrical connection to the base building air conditioning system and car park light and power
  - Energy recovery system including thermal storage (atmospheric pressure low temperature)
  - 217 kWr absorption chiller
  - Replacement of the existing electric drive chillers
  - Replacement of the existing cooling towers
  - Replacement of the existing computer based building management system

**Energy Efficiency Estimate Method**

The simulation used is based on energy modelling carried out by Council consultants (MPES Consulting) is in line with NABERS guidelines.

**Baseline Energy Usage**

The Civic Tower base building baseline energy usage is based on billing data from July 2012 to June 2013. Annual consumption including electricity and gas was 7,411GJ (equates to 579MJ/m²/annum).

**Baseline Energy Efficiency**

The Base Building had a NABERS Energy rating of 2.5 Stars. Energy data recorded from billing data above:

- Base Building Electricity = 5097.4 GJ
- Base Building Gas = 2313.5 GJ
- Base Building Energy Performance Indicator = 579MJ/m²/annum

**Energy Efficiency Improvement**

Electricity consumption should reduce to 3 MWhrs (1.0 MJ/m²/annum) and increased gas consumption to 7,300 GJ per annum (571 MJ/m²/annum). The CO2 emission profile reduces from 128kg/m²/annum to 40kg/m²/annum.

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

Refer to attached MPES and AECOM Tri-generation reports for further details.

**Cost of Activity**

$4,034,985.00 Million

**Estimated Cost Savings**

$125,000 savings on the cost of energy.

### Building, Facility or Site 2 (This component of the project was completed)

| Name of Building, Facility or Site | Bankstown City Council Civic Tower |

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The Bankstown Generation Project - Final Report Bankstown City Council August 2015
<table>
<thead>
<tr>
<th>Location (address)</th>
<th>67-72 Richard Road, Bankstown, NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of building, facility or site</td>
<td>Office administration building Base Building and Council Tenancy 27,628.25 m²</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Internal lighting upgrades to offices, base building and car park including electrical upgrades, testing and correct disposal of lights in accordance with applicable Local, State, Territory and Commonwealth legislation including codes and policies.</td>
</tr>
<tr>
<td>Proposed Base Building light installation</td>
<td></td>
</tr>
<tr>
<td>Fitting Type</td>
<td>Quantity</td>
</tr>
<tr>
<td>Lift lobbies - LED downlights</td>
<td>154</td>
</tr>
<tr>
<td>Toilets – 1 x 28W T5 fittings</td>
<td>88</td>
</tr>
<tr>
<td>Stairwells – Chameleon Light</td>
<td>77</td>
</tr>
<tr>
<td>Carpark – 1 x 28W T5 fittings</td>
<td>540</td>
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<tr>
<td>Total</td>
<td>859</td>
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<tr>
<td>Proposed Bankstown City Council tenancies light installation Fitting Type and Location</td>
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</tr>
<tr>
<td>Quantity</td>
<td></td>
</tr>
<tr>
<td>Open plan offices:</td>
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</tr>
<tr>
<td>T5 Control Gear, Lamps and Diffusers</td>
<td>441</td>
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<tr>
<td>Segregated offices:</td>
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</tr>
<tr>
<td>T5 Control Gear, Lamps and Diffusers</td>
<td>75</td>
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<tr>
<td>General areas</td>
<td></td>
</tr>
<tr>
<td>LED downlights</td>
<td>128</td>
</tr>
<tr>
<td>Total</td>
<td>644</td>
</tr>
<tr>
<td>Baseline Energy Usage</td>
<td>The Civic Tower base building baseline energy usage is based on billing data from July 2012 to June 2013. Annual electricity consumption was 7,007.1 GJ (equal to 253.6MJ/m²/annum). Actual electricity consumption achieved to end July 2015 was 6,188.5 GJ (equal to 224MJ/m²/annum). This saving of 11.7% was achieved since February 2015 when works commenced.</td>
</tr>
<tr>
<td>Baseline Energy Efficiency</td>
<td>The Base Building had a NABERS Energy rating of 2.5 Stars and Council offices had a NABERS Energy rating of 4.5 stars. Energy data recorded from billing data above: - Tenancy Electricity – 1,909.7 GJ (Year to June 13) - Base Building Electricity - 5097.4 GJ (Year to June 13) - Whole building electricity – 7,007.1 GJ (Year to June 13) Tenancy and Base Building Energy Performance Indicator: 253.6MJ/m²/annum Actual electricity data recorded from billing data after works completed are: - Tenancy Electricity – 1,725.7 GJ (Year to July 15) - Base Building Electricity - 4,462.8 GJ (Year to July 15) - Whole building electricity – 6,188.5 GJ (Year to July 15)</td>
</tr>
</tbody>
</table>
| Energy Efficiency Improvement | With the recommended lighting retrofit program electricity consumption was estimated to reduce by 35.9 MJ/m²/annum (991.9 GJ*1000 / 27,628m²).  
Actual savings achieved to end July 2015 are as follows:  
- Reduction of 53.9MJ/m²/annum  
- Savings of $85,267 pa (year to July 2015) |
| Reporting Data (Measuring Energy Efficiency and Additional Data) | A total area of 27,628.25 m² and 1,130 FTE staff  
Daily hours of operation: 8am to 5.30pm  
Building construction date 1999  
NABERS rating (Base building) – 2.5 stars  
NABERS rating (Council offices) – 4.5 stars (w/o Green Power), |
| Cost of Activity | $368,000 |
| Estimated Cost Savings | $66,277 per annum  
Actual savings achieved are $85,267 pa (year to July 2015) |
Attachment B

References

Bankstown Community Plan 2021. Bankstown City Council Feb 2011

Bankstown Civic Tower Asset Management Plan 20 years. Prepared for Bankstown City Council by Altus Group Consulting 2012