

The Cleaner Greener Challenge

*An application of 'green' technologies that benefit Remote
Communities*

Project ID: CEEP2134

FINAL REPORT

This activity received funding from the Australian Government.



Australian Government

Department of Industry,
Innovation and Science

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Attachment A: Project Energy Efficiency Improvement Template

Attachment B: CEEP Final Energy Audit 080915

Executive Summary

Communities all over the world are feeling the effects of climate change through more extreme weather events, loss of biodiversity, risks to food security and the potential of rising sea levels. Australia has paid a high price recently with extended drought periods, extreme bush fire seasons and floods along the eastern seaboard and Victoria.

Australia has amongst the highest level of emissions per person in the developed world, and is known to be one of the world's top 20 polluting countries. With the world moving to tackle climate change, the Productivity Commission has found Australia is currently in the '*middle of the pack*' in terms of action on climate change.

There is a strong impetus on Australians, including local government organisations, to act to reduce climate change. Whilst the challenges we face from climate change are enormous, so are the opportunities. Roper Gulf Regional Council (Council) believes that we as an organisation can contribute to reducing the organisation's carbon footprint, and to promote and encourage energy efficiency in the Council's workplaces and communities across an area of 186,000km.

Key purpose

Council is a local government authority working towards improving the energy efficiency of non-residential community buildings and facilities which will benefit residents in low socio-economic communities. Council have set goals in place to reduce carbon emissions and energy costs to improve service delivery in remote, regional Northern Territory. Energy efficiency upgrades and the introduction of technology for all Council administration offices and pool complex sites ensures a positive start to the Council reaching its energy efficiency goals and embracing cleaner, greener technologies that improve the wellbeing of all residents.

The impact of our current lifestyle will have an impact on the future costs. We relish in the benefits of today's production and this puts the environmental cost onto future generations. The project assisted Council in mitigating and sustaining environmental and economic costs for future generations.

The buildings and facilities upgraded with Energy Efficient Technologies were the Council Offices in Barunga, Beswick, Borroloola, Bulman, Jilkmnggan, Manyallaluk, Mataranka, Ngukurr and Numbulwar. Upgrades in the offices included replacing ageing air conditioning wall units and non inverter units with energy efficient inverter / split-systems, repairs and installing door closers on all doors and adequately seal all windows, installing time control switches on all air conditioning units and light circuits, replacing and repairing all lighting fluorescent tubes with LED lighting, applying sun reflective paint on all suitable roof surfaces and lowering ceiling levels for improved air conditioning operation. The two Council pool facilities in Ngukurr and Borroloola were also

include in the project where the pool pumps were replaced with more efficient pumps.

Outcomes

Through promoting Council staff and community education, and introducing energy-efficient technologies and upgrades at all nine Council administration offices and two swimming pool complexes, this project delivered:

- tangible and immediate reductions in energy consumption and financial costs for the Council;
- a business case and blueprint for introducing similar technologies and upgrades to all its buildings and infrastructure;
- a positive example to Council staff and the community about the importance and ease of reducing energy usage;
- the total project has cost \$811,081 with Council contributing \$270,360;
- Council has saved \$53,617.50 on electricity cost since the energy efficient technologies were introduced in the facilities; most facilities have not had the technologies implemented for the full year;
- Council will recover the cost of the project in just over 5 years;
- reduced energy consumption by 142,854 kwh in the previous 12 months; and
- reduced energy efficiency by 1,878 mj/sq.m over the past 12 months.

Issues

The following feedback was received from the projects Council Service Managers in relation to the retrofits at their administration building:

- Numbulwar Council Service Manager – “..the length of time between installing the cassette aircons and when the refurb is due to take place has taken far too long, thus loosing the momentum created at the beginning of the project”
- Beswick Council Service Manager – “We still need windows sorted in the office area, I don’t want to use the air cons with windows open and not being able to close them or other windows we cant open and should rather than have air cons on.”
- Ngukurr Council Service Manager – “The only issue we have is that we now have quite a few areas to turn lights off whereas before it was only one switch.

The changes from the original upgrades has created a problem in the SASO’s office where there is no Air-conditioning now and there is a ceiling aircon with the ceiling not lowered in the IT Room!!There was no manhole included in the upgrades and lights were not included for removal on the lowering of the ceiling.”

Learnings

The following feedback was received from the projects Council Service Managers in relation to the retrofits at their administration building:

- Numbulwar Council Service Manager – “..there could have been better communication by all as to how the changes would affect our consumption of energy”
- Jilkminggan Council Service Manager – “...installing time switches on the aircon and lights have to be a positive in my books”
- Beswick Council Service Manager – “The lighting in the Board room is really good with the natural light tubes rather than having to use the electric lights. Still not enough to work from but enough that you don’t automatically turn the light on as you enter the room.”
- Ngukurr Council Service Manager – “There is still quite a bit of upgrades required to have full effect for efficiency in power savings, suitable customer space and working environment. However the lowering of the ceiling and installing LED lights has certainly improved lighting in the Office.”
- Borroloola Council Service Manager – “..(energy efficiency technologies used) I think it’s a great way of conserving energy usage.”.... “Could do more in other areas of council”

"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."

Project Objectives

Through promoting Council staff and community education, and introducing energy-efficient technologies and upgrades at all nine Council administration offices and two swimming pool complexes, this project delivered:

- tangible and immediate reductions in energy consumption and financial costs for the Council;
- a business case and blueprint for introducing similar technologies and upgrades to all its buildings and infrastructure; and
- a positive example to Council staff and the community about the importance and ease of reducing energy usage.

The project also allowed for works to commence the immediate action to reduce Council's environmental impact by more effective use of electricity in our nine administration offices and two swimming pool complexes.

The project provided preparation, communication and monitoring tasks which included:

- Energy usage audit prior and post project upgrade;
- Staff and community consultation and education regarding energy usage and energy saving initiatives;
- Installation of building upgrades and energy-saving technologies; and
- Monitoring future energy usage in all Council buildings.

The project has contributed to the CEEP objectives by:

1. Supporting Roper Gulf Regional Council in the Northern Territory to increase the energy efficiency of council and community-use buildings and facilities. The project has benefited low socio-economic and disadvantaged communities; and supported energy efficiency for Roper Gulf Regional Council.

[In]Sight 2014 data for Roper Gulf LGA shows that the region is extremely disadvantaged having a very low ranking for competitiveness: **Infrastructure and essential services** and specifically **road infrastructure** demonstrating limited transport infrastructure critical to efficient delivery of goods and services and ability to support the regions competitiveness in economic markets by reducing freight costs. **Human capital** almost the lowest ranking verifies the skills, health and education of the workforce are extremely low in the region which is fundamental to competitiveness. **Young dependency ratio** 45.3% of the population are under 14 years showing that infrastructure in the region needs to be developed and improved to match the future growth required by the population.

Under the ABS Accessibility Remoteness Index of Australia the communities are "very remote" having diseconomies of scale, restricted

access to services, social interaction, jobs and employment opportunities, and lower quality of transport infrastructure.

2. Assisted Roper Gulf Regional Council to adopt improved energy management practices and the broader community. Council has met key priorities outlined in the Council 2013-16 Green Plan. RGRC Green Plan is a four year document detailing Roper Gulf Regional Council's environmental priorities and strategies towards sustainability. Key energy efficiency strategies of the Green Plan are reduce power and water usage by 10%; investigate alternative energy technology; assist with community education and awareness energy efficiency programs in all towns; managers to monitor quarterly use of power and water and to apply strategies to reduce use; and incorporate energy efficiency designs and new technology into building upgrades eg. Install timers on aircon and lights.

Project Energy Efficiency Activities

Project Operational and Construction Tasks

1. Replacing ageing air conditioning wall units and non inverter units with energy efficient inverter / split-systems
2. Repairs and installing door closers on all doors and adequately seal all windows
3. Installing time control switches on all air conditioning units and light circuits
4. Replacing and repairing all lighting fluorescent tubes with LED lighting
5. Applying sun reflective paint on all suitable roof surfaces
6. Lowering ceiling levels for improved air conditioning operation
7. Replacing pool pumps with more efficient pumps

Buildings and Facilities Upgraded/Retrofitted with Energy Efficient Technologies

1. Barunga Council Office Lot 198 Derrkolo Road Barunga NT 0852
2. Beswick Council Office Lot 31 Balandi Street Beswick NT 0852
3. Borroloola Council Office Lot 384 Broad Street Borroloola NT 0854
4. Borroloola Swimming Pool Complex Lot 920 Robinson Road Borroloola NT 0854
5. Bulman Council Office Lot 6 Bulman NT 0852
6. Jilkminggan Council Office Lot 17 Jilkminggan NT 0852
7. Manyallaluk Council Office Lot 36 Eva Valley Road Manyallaluk NT 0852
8. Mataranka Council Office Lot 120 Stuart Highway Mataranka NT 0852
9. Ngukurr Council Office Lot 293 Balamurra Street Ngukurr NT 0852
10. Ngukurr Swimming Pool Complex Lot 381 Rainbow Street Ngukurr NT 0852
11. Numbulwar Council Office Lot 93 Numbulwar NT 0852

Technologies at Each Site

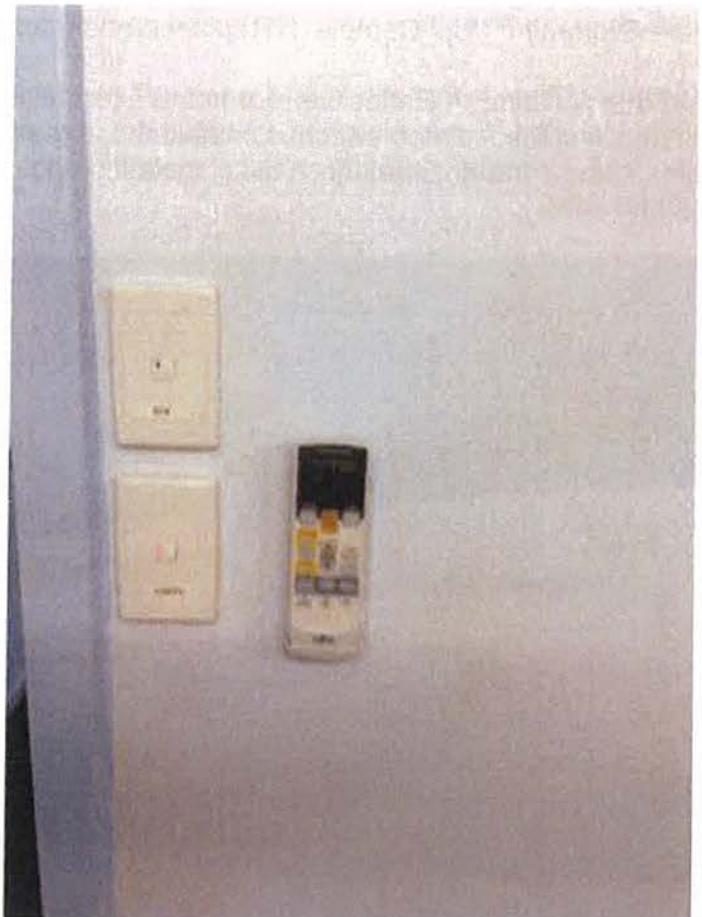
1. Barunga Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).



2. Beswick Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights.

3. Borroloola Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights.





4. Borroloola Swimming Pool Complex - Replaced pool pump
5. Bulman Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).

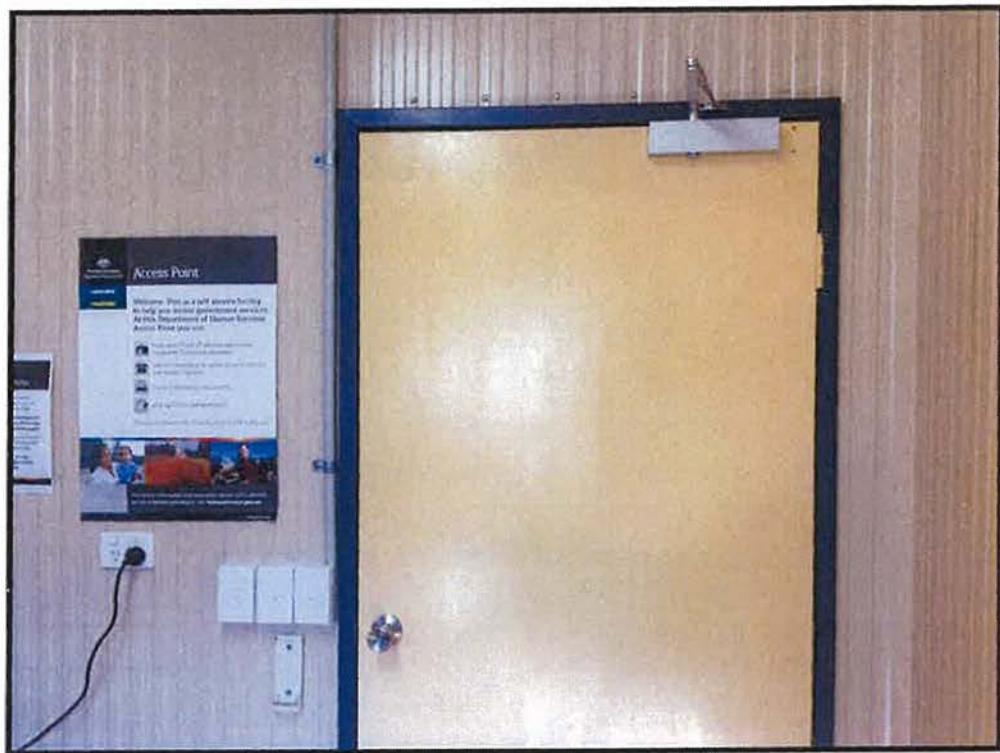


6. Jilkmangan Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).

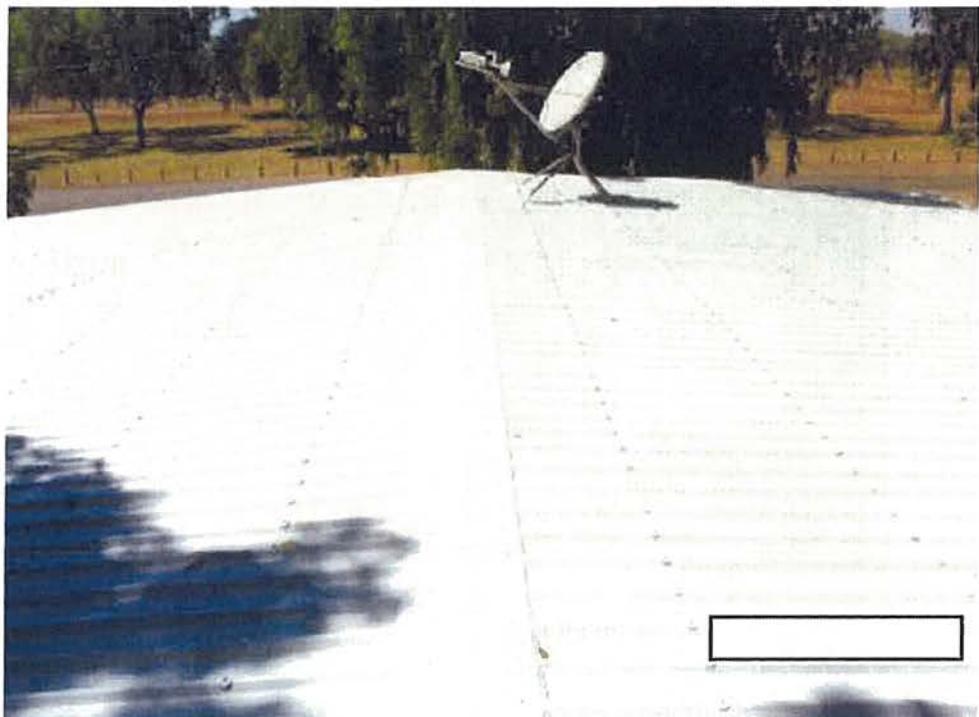




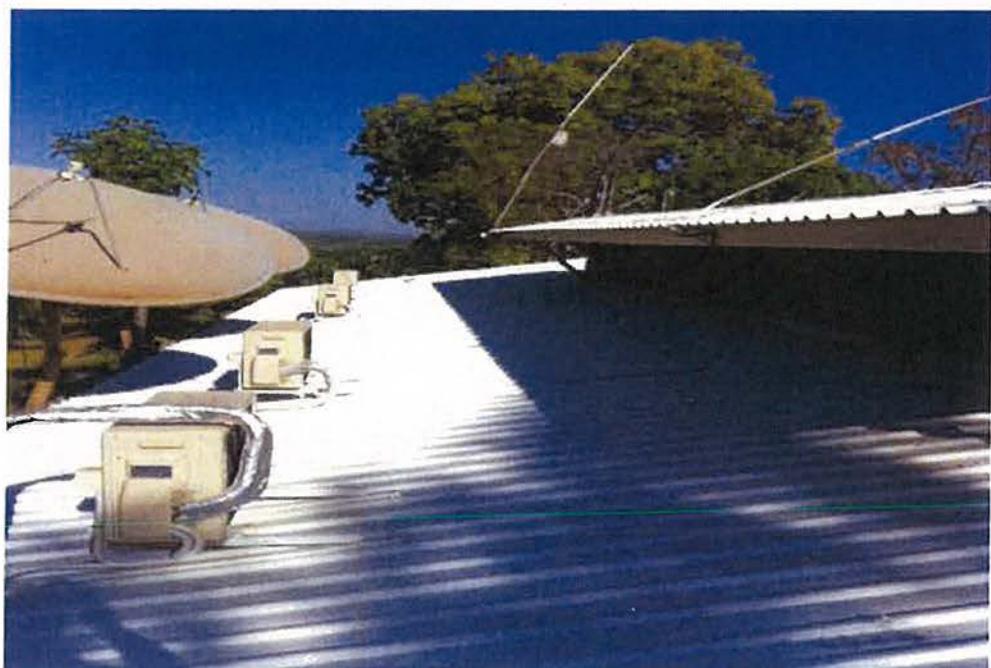
7. Manyallaluk Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).



8. Mataranka Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).

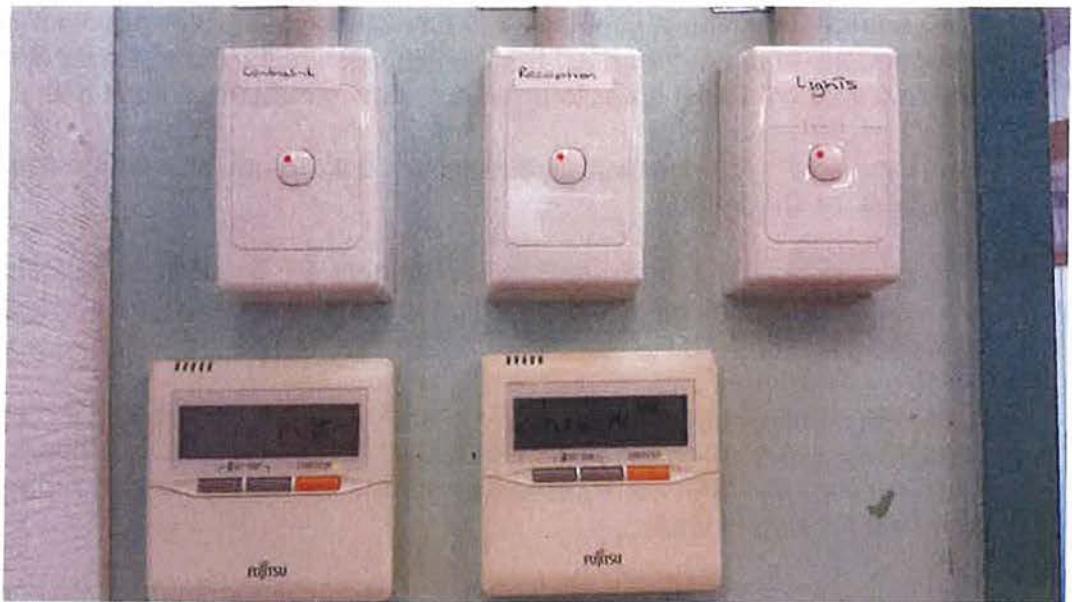


9. Ngukurr Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, draught proofing aids installed (door and window closures and seals) and lowering of ceiling.



10. Ngukurr Swimming Pool Complex – Replaced pool pump
11. Numbulwar Council Office – Reflective roof paint, air conditioners replaced, LED lighting installed, timer switches installed for the air conditioners and lights, and draught proofing aids installed (door and window closures and seals).





The energy efficient technologies were chosen for the project after an independent audited report of the buildings showed these to be the most effective way on a cost basis to provide energy reduction at each site.

The Council Project Manager project plan and scope of works through the "Request for Quotation".

Council received 5 quotations from contractors for the Reflective Roof Paint works, 6 contractors for the electrical works and 1 contractor for the draught proofing.

The panel consisting of 3 Council Director/Managers assessed the contractor responses and made a recommendation to the Council CEO. Upon the final decision by the CEO the successful contractors were awarded the contract and Council was notified.

The only issues occurring over the project time was the interruption of access to communities due to the wet season.

The CEEP project encountered some issues during the project and is best reflected through the feedback quotes from the on-the-ground Council Service Managers which included:

- Numbulwar Council Service Manager – ".the length of time between installing the cassette air-conditioners and when the refurbishment was due to take place took far too long, thus loosing the momentum created at the beginning of the project"
- Beswick Council Service Manager – "We still need windows sorted in the office area, I don't want to use the air conditioners with windows open and not being able to close them or other windows we can't open and should rather than have air conditioners on."
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The changes from the original upgrades has created a problem in the SASO's office where there is no Air-conditioning now and there is a ceiling air-conditioner with the ceiling not lowered in the IT Room!! There was no manhole included in the upgrades and lights were not included for removal on the lowering of the ceiling."

- All issues were appropriately managed by the Director Council Services and Infrastructure to ensure the CEEP project was completed as per the agreement.

Learnings taken

The CEEP project provided Council with many energy saving and project management learnings during the project and is best reflected through the feedback quotes from the on-the-ground Council Service Managers which included:

- Numbulwar Council Service Manager – “.there could have been better communication by all as to how the changes would affect our consumption of energy”
- Jilkminggan Council Service Manager – “...installing time switches on the air-conditioning units and lights have to be a positive in my books”
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- Borroloola Council Service Manager – “(energy efficiency technologies used) I think it's a great way of conserving energy usage.”.... “Could do more in other areas of council”
- All learnings of the CEEP project will and are being used by Council in all infrastructure projects.

Project Demonstration and Communication Activities

Regular focused communication was essential for the efficient operation of the project activities and recognised both internal and external stakeholders who require various forms of effective communication.

Residents and Council staff were continually updated and informed of any activities impacting on their day to day activities. Notifications were carried out face to face and traffic management disruptions explained and sign posts effectively.

Methods of project communication:

- Council and Local Authority meetings monthly
- Council Newsletter
- Community Radio Stations
- Community newsletters
- Community Noticeboards
- Council Staff

All communications with stakeholders and project team was directed through the Directorate Infrastructure and Council Services. The Governance team were responsible for the media releases throughout the project.

The stakeholder groups were:

- Residents
- Business owners/ operators
- Community and church groups
- Tourists / visitors
- Agencies
- Media
- Commonwealth and NT Government representatives
- Health providers
- Schools
- Roper Gulf Regional Council Councillors and Local Authorities
- Roper Gulf Regional Council staff

The Northern Territory Power and Water Corporation was a project partner offering support and cooperation on community and staff education regarding energy usage and energy-saving techniques and practices. Although the company was contacted numerous times throughout the project no communication activities occurred from the company during the project period. Council will pursue contacting and enforcing the need for there support to educate the Roper Gulf Region about energy efficiency more generally.

Today's Weather Forecast

Just as we start to settle into the dry season comes word from the Bureau of Meteorology that the surface water in the south west Pacific Ocean is warming, an indicator of an El Nino weather pattern in the early stages.

An El Nino weather pattern is marked by reduced rainfall particularly to the east and north of Australia. We are unlikely to notice this until the next "wet" when we could experience less than average rain, again.

With the recent wet season bringing well below average rainfall and previous seasons being poor we need to carefully consider how we prepare for lower than average rainfall particularly as our demand for water continues to grow.

Living where we do it is hard to imagine water becoming scarce but we only need to look at the western side of north Queensland to see the effects of drought. The recent prediction is not good news for western Queensland. The main rivers of the Roper Gulf region discharge about the equivalent of 23 Sydney Harbours* annually much of which comes from rain fall run

off. Much of this is seasonal during the wetter months between November and May. A smaller but substantial part of annual flows also comes from aquifers (also filled by seasonal rainfall) and these are of critical importance in maintaining streams and rivers during the dry season.

Every time we leave a tap running or a toilet flushing that water has to come from somewhere, usually a bore or a river that is fed by aquifers (slow fill underground water). This overflow is usually lost to the system as we do not recycle waste water.

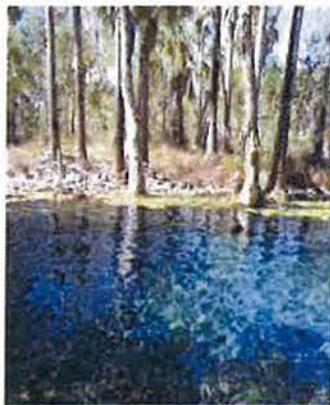
Agricultural and mining use of bore water is the main demand on the aquifers but domestic usage as well can place heavy demand on what is a limited resource. Northern Territorians are the biggest consumers of domestic water in Australia per capita

If the rainfall is below average for several years in a row the normal replenishment and refilling of the aquifers that feed the rivers, bores and springs, does not fully occur.

Heavy human usage places extra strain on river environments in drought periods in ways ranging from degraded water quality to decrease in fish populations and other river ecology.

Roper Gulf Regional Council with the Power and Water will be running a series of workshops to show ways of saving both water, reducing energy usage and saving money that otherwise is just gurgling down the plug hole. Dates and locations will be advertised soon.

*1 Sydharb = 500 Gigalitres = 200,000 Olympic swimming pools



Message from the Mayor

It is budget time for all levels of Government and our own budget and draft Regional Plan will be presented at the June 24th Ordinary Council meeting. This will set a framework for our Council over the coming financial year.

I invite you to read the Plan and to be involved in the public consultation, after the 24th of June.

The recent Commonwealth and the Territory budgets are strong on infrastructure promises, so important in developing the north of Australia, but also hold some disappointments when examined in detail.

The refusal of the Commonwealth to index the Financial Assistance Grants is a real reduction of the value of these grants which fund a range of core council services. Their value will be eroded if they are not indexed to allow for inflation. This is cost shifting from the Commonwealth to Local Government. Remote Local Government does not have the luxury of strong rate bases to easily compensate for the loss of income from core Government funding. As such Local government will have to reduce some services to cover this real reduction in income.

Both levels of Government have

the ability to raise revenue and both expect Local Government to provide basic municipal services and other local programs at a cost well below what they or the private sector could provide, yet they are underfunding Local Government.

Roper Gulf Regional Council however is still in very good financial order and with careful planning will continue to maintain quality services for our residents and ratepayers but this is still dependent on government providing adequate funding for grass roots services.

Have a look at our Regional Plan draft to see the range of our services and their operational cost.

I was disappointed that the first round of the Commonwealth Stronger Regions funding was largely focused on Darwin and that sound projects in the remote regions of the Northern Territory were largely ignored. I hope that coming rounds recognise important local projects that will strengthen our regions, rather than appear to play to the local politics of large urban areas.

The CEO of Roper Gulf Regional Council, Michael Berto and myself have spent some time this month visiting our towns across the region and I was excited by



the good works occurring in these towns. I am especially pleased to see Local Authorities taking up their roles of representing their communities in planning and advocacy.

In good news, the success of our Community Energy Efficiency Program in our nine Regional Services Centres. Simple actions like retrofitting energy efficient air conditioning, replacing door and window seals, improving insulation and painting roofs with reflective paint has balanced the internal temperature which means we do not need to use as much energy. These upgrades have already produced a 50% reduction in our power usage in these buildings. The money saved will be put other good projects. The saving achieved in our service centres could also be made in your home. Watch out for information sessions on power and water savings ideas coming soon.

Community Energy Efficiency Program nears completion

A half million-dollar Community Energy Efficiency Program is nearing completion in the Roper Gulf region having upgraded and massively improved the energy efficiency of Roper Gulf Regional Council business offices that serve the nine towns of the region. Comparative figure of electricity usage shows a nearly 50% reduction in power usage in Council's Service offices since the program began last year.

"We can already see significant changes in the environment of these offices, they are better places to work in and have reduced energy usage and therefore power costs", said Roper Gulf Regional Council Mayor Tony Jack.

"Simple actions like retrofitting energy efficient air conditioning, replacing door and window seals, improving insulation and painting roofs with reflective paint has balanced the internal temperature which means we do not need to use as much energy to maintain a good working temperature" Mayor Jack



explained.

"This in turn gives us a real saving in our power bills, money we can redirect to other community projects".

The consistently high temperature experienced in the top end makes air-conditioning a necessary part of life. Improving building energy efficiency has reduced the loss of cool air and the amount of radiant heat that penetrates the buildings. We do not need to continuously run air conditioning to maintain a comfortable temperature.

Many of the old air-conditioners were ineffective relics of a time when there was not the current awareness of energy costs.

Energy efficient air conditioning units have been fitted in all buildings. Passive energy saving methods like fitting door closers and sealing windows to reduce drafts means that insulation is more effective. Sealing air leaks in roofs and painting to reflect radiant heat also greatly improves the insulation.

Low wattage fluoresce lights have also been fitted in all buildings with an estimated saving of about \$300 at each service centre. Fitting new pumps at the Borroloola and Ngukurr swimming pools have also significantly reduced the power costs.

Sharon Hillen, Council's Director of Council Services and Infrastructure is enthusiastic about the program outcomes. The savings are real and measurable and in line with Council's Green Plan for 2013-2016 which aimed for 10% reduction in power and water over the three years. We will easily exceed this.

The real secret weapon in our energy saving has been the fitting of timer switches which means that lights and air conditioning are not left on unnecessarily. We are also encouraging staff to take responsibility for their energy efficiency which they now monitor."



Council uses grant for energy efficiency

ROPER Gulf Regional Council will speed up improvements to the energy efficiency of its nine regional offices, thanks to a funding boost from the Federal government.

The \$500,000 grant will be used for the upgrading of insulation, energy-efficient lighting and airconditioning, timer switches and tank hot water.

The upgrades will provide both an improved working environment and long-term cost savings for the council in the operation of the facilities.

In a positive move, the upgrades will also act as a model to disseminate the benefits of improved energy management practices for the broader community.

Mayor Tony Jack said he believed the investment would pay dividends for the council.

"Today's cost will be tomorrow's benefit," he said.

"As well as the obvious cost saving for council in both the short and long term, we are starting to manage what has been a costly and ultimately wasteful use of energy.

"We are also showing the community the benefits of reducing our carbon footprint.

"Very remote and regional councils do not normally have the economic base and disposable income to fund these important projects."

"Without this project funding, our improvements would have been a much slower process."

Power savings while keeping cool

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"This in turn gives us a real saving in our power bills, money we can redirect to other community projects."

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Improving building energy efficiency has reduced the loss of cool air and the time air conditioners need to be running.

Low wattage fluoresce lights have also been fitted in all buildings with an estimated saving of about \$300 at each service centre.

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Sharrn Hilton, Council's Director of Council Services and Infrastructure is enthusiastic about the program outcomes.

"The savings are real and measurable and in line with Council's Green Plan for 2013-2016 which aimed for 10 percent reduction in

power and water over the three years.

"We will easily exceed this. "The real secret weapon in the energy saving has been the fitting of timer switches which means that lights and air conditioning are not left on unnecessarily.

"We are also encouraging staff to take responsibility for their energy efficiency which they now monitor."

The project will also share information with local communities on how to improve home energy efficiency, reduce power and water bills.

This will be done with the Power and Water Corporation over the next few months.

Roper Gulf Regional Council Service Offices are now bright and comfortable places to visit and work in and are helping make Council's dollar go further in a time of rising energy costs.

The activity received funding from the Australian Government.

Outcomes and Benefits of the Project

Through promoting Council staff and community education, and introducing energy-efficient technologies and upgrades at all nine regional administration offices and two swimming pool complexes, this project delivered:

- tangible and immediate reductions in energy consumption and financial costs for the Council;
- a business case and blueprint for introducing similar technologies and upgrades to all its buildings and infrastructure; and
- a positive example to Council staff and the community about the importance and ease of reducing energy usage.

The project was very successful in meeting the project outcomes. **Council has saved \$53,617.50 on electricity cost since the energy efficient technologies were introduced in the facilities.** These technologies have also:

- reduced energy consumption by 142,854 kwh in the previous 12 months; and
- reduced energy efficiency by 1,878 mj/sqm over the past 12 months.

Project Contribution to CEEP Objectives and Benefits

1. *Support local councils to increase the energy efficiency of council and community use buildings and facilities in low socio economic communities*

Council's Region is located to the east of Katherine and adjoins the Queensland border. The overall land mass is nearly three times the size of Tasmania and 80 % of Victoria.

Much of the road network is subject to seasonal closure due to flooding and is predominantly unsealed making travel often long and tenuous. Public transport is very limited and expensive. Private vehicle ownership levels are low.

The Region has a wet season roughly between December and May when most of the region's rain falls. The Region also experiences a cooler dry season ending with a short build up of higher temperatures and humidity towards the end of the year. The coastal region has a high cyclone probability during the wet.

It's a huge area with a relatively small population of around 6100, roughly 1 person for every 26 sq km. Most people live in the region's eleven towns (61%) and nearly 80% are Indigenous. Only 30% speak English at home with nearly 50% speaking Kriol and 15% local and other languages.

The Socio-Economic Indexes for Areas (SEIFA) data ranks the Region in the 1st decile for disadvantage. It is ranked the 10th most disadvantaged Local Government Association (LGA) in Australia and 4th in the Northern Territory (NT). The SEIFA index for economic resources also ranks the Region's LGA in the 1st decile. It is the 11th most disadvantaged LGA in Australia and the 3rd most disadvantaged in the NT when it comes to economic resources.

Like all the NT, the Region is dependent on public sector grants and funding having only a low rates base. Personal average income is \$279 per week less than half of the NT average and half the Australian average.

The Region is very young demographically with a median age of 24 years. 31.5% of the total population is under 15 years of age. Despite this young demographic, growth is only around 1.5% indicating migration out of the region is high. Mortality rates are higher than the Australian average and life expectancy is much lower.

Significant health issues affect the region especially amongst Indigenous residents. This reflects the relative poverty of the region and life style issues such as high alcohol consumption, high smoking rates, overcrowded social housing and poor nutrition. There is a high level of endemic diseases such as Diabetes, RHD, Chronic Heart and Kidney disease.

The finding of the project has allowed for Council to introduce necessary energy efficient upgrades to Council and community use facilities in a very remote region of the NT. The project has also made everyone and extended families in other areas aware of the need for introducing energy efficiency technologies as it is so expensive for electricity and with less than minimum incomes the technologies can help people live. The simple technologies used have reduced the cost of electricity to Council providing the savings dollars to provide better services in the remote region.

2. Demonstrate and encourage the adoption of improved energy management practices with council, organisations and the broader community

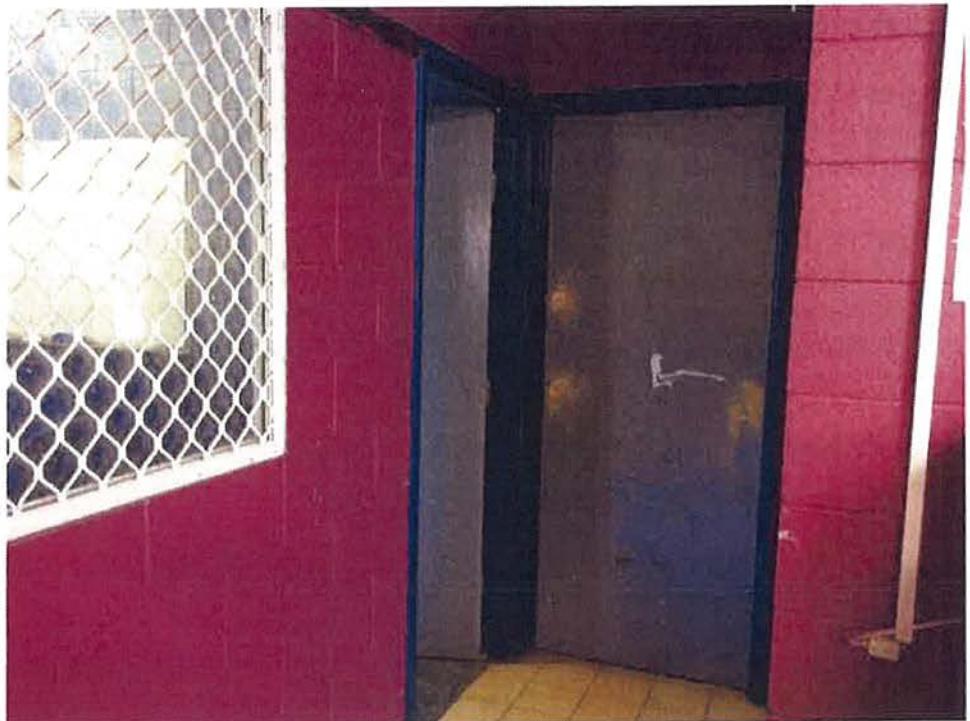
The project has injected energy saving practices into the NT by using simple technology upgrades that can be and are being accomplished across the NT. Council has communicated well with the region and broader community about the project and the energy saving opportunities out there with just a couple of simple upgrades.

3. Better services and improved amenity of buildings and community facilities

The project has seen the introduction of technologies improve the amenity and better working environments for the staff. Council took the opportunity to combine with the project to completely upgrade some of the offices that were involved in the project. These have proven to ensure cost savings and better services in the remote communities of the region.

Beswick Office Upgrade 2015

Before Upgrade



After Upgrade





4. *Minimise energy consumption and costs to manage the impacts of the carbon price*

The project has reduced Councils energy costs at the facilities by 35% since installation of the technologies. In 2012 Council was paying \$125,881.65 per year for electricity at these facilities. The project has reduced the annual electricity cost to \$72,264.15.

Energy consumption has reduced by 43% in the past year. In 2012 Council was consuming 358,950 kwh per annum of energy at these facilities. The project has reduced the annual energy consumption to 227,805 kwh.

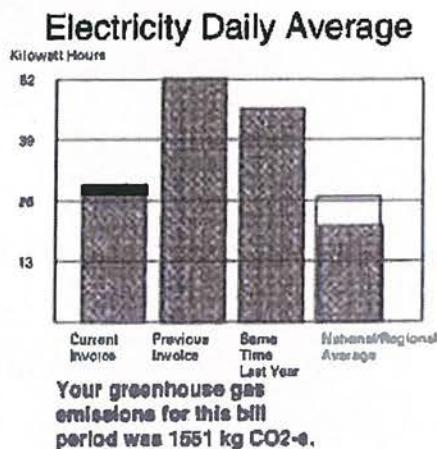
5. *Build the knowledge and capacity of the energy services and construction industry, and support competitive Australian energy efficiency technology and equipment manufactures*

Council are now more aware of energy saving technologies that can be used to reduce the cost of the assets that Council manages. Energy saving technologies are included as a priority when upgrading assets.

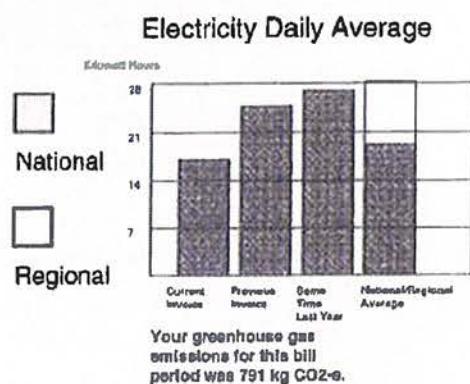
6. Contribute to the national effort to reduce greenhouse gas emissions

Greenhouse gas emissions have reduced since installing the technologies for example:

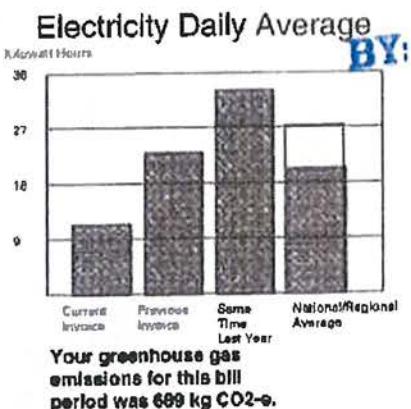
- Barunga - reduced by 39% (15,520 kg CO₂-e per year to now 9,470 kg CO₂-e over the past year)



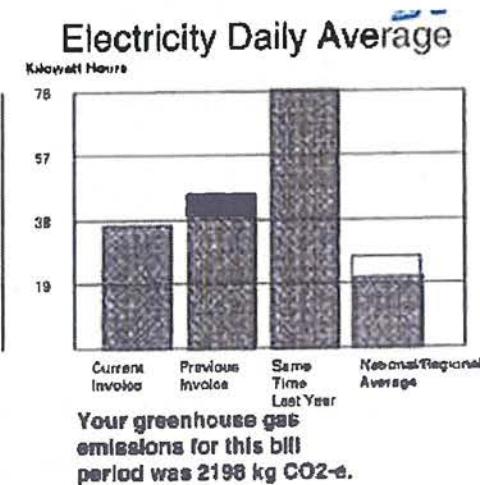
- Beswick - reduced by 30% (10,781 kg CO₂-e per year to now 7,543 kg CO₂-e over the past year)



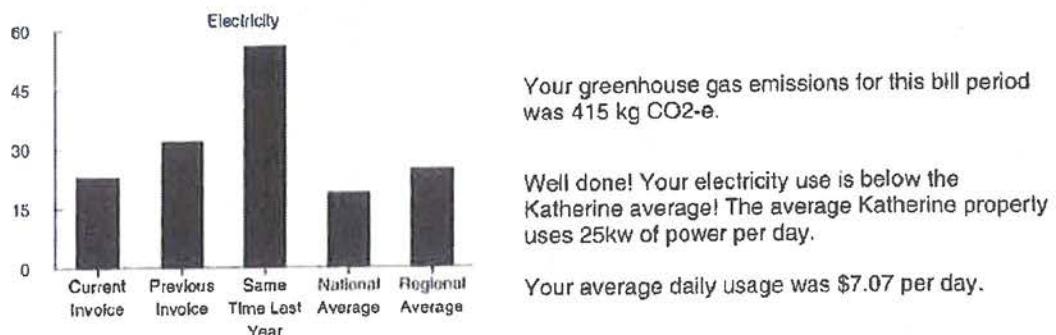
Bulman - reduced by 44% (9,605 kg CO2-e per year to now 5,359 kg CO2-e over the past year)



- Jilkminggan - reduced by 49% (18,403 kg CO2-e per year to now 9,457 kg CO2-e over the past year)



- Borroloola - reduced by 13% (2,530 kg CO2-e per year to now 2,193 kg CO2-e over the past year)



Energy Efficiency outcomes

A summary of the energy efficiency outcomes for the project are:

- Forecast energy efficiency = 2,659 mj/sqm per annum
- Forecast cost savings improvements = \$34,435.27
- Actual energy efficiency = 1,878 mj/sq.m per annum
- Actual cost savings = \$53,617.50

Council has saved \$53,617.50 on electricity cost since the energy efficient technologies were introduced in the facilities. These technologies have also:

- reduced energy consumption by 142,854 kwh in the previous 12 months; and
- reduced energy efficiency by 1,878 mg/sqm over the past 12 months

The project has reduced Councils energy costs at the facilities by 43% since installation of the technologies. In 2012 Council was paying \$125,881.65 per year for electricity at these facilities. The project has reduced the annual electricity cost to \$72,264.15.

Energy consumption has reduced by 39% in the past year. In 2012 Council was consuming 358,950 kwh per annum of energy at these facilities. The project has reduced the annual energy consumption to 227,805 kwh.

Targets for energy efficiency were met and above the energy efficiency target for Bulman, Manyallaluk, and Jilkminggan. The other offices reduced but not to expectations. The pool pump upgrades did improve energy consumption which slightly improved energy efficiency. BUT energy consumption has reduced by 39% and the cost of energy has reduced by 43% save Council just over \$50,000 per year.

Council took the opportunity to combine with the project to completely upgrade some of the offices that were involved in the project. These have proven to ensure cost savings and better services in the remote communities of the region.

The project has seen the introduction of technologies improve the amenity and better working environments for the staff.

The following feedback was received from the projects Council Service Managers in relation to the Ancillary benefits of the project:

- Borroloola Council Service Manager – “Improved amenity of buildings, greater comfort, better lighting quality, improved health outcomes. Its 30 degrees at the moment and I don’t have the airconditioning on in the office, its cool enough. Health benefit in not having to have cold air circulating all the time and fresh air coming through the open windows.”

Demonstration and Communication outcomes

Council evaluated the reduction in energy costs due to the upgrades and communicated this widely through community, indigenous radio stations, newsletters, website, Facebook and newspapers.

The many uses of communication have ensured maximum reach to the community within the Roper Gulf Region, Katherine Region, NT and Local Government across Australia.

Overall the changes were well received by the community.

The following feedback was received from the projects Council Service Managers in relation to the feedback received from the community on the project:

- Borroloola Council Service Manager – “feedback, good use of resource, often air-conditioners are not used just fans. The use of lights is kept to a minimum because staff are conscious of the energy efficiencies.”

This project has contributed to the broader uptake of energy efficiency activities as all council infrastructure upgrades now include an energy efficiency component when deciding the technologies to be used.

It is hard to say at this time if there been indications of improved energy management practices in the community more broadly arising from the demonstration of this project and its benefits.

The following feedback was received from the projects Council Service Managers in relation to the community uptake following the project:

- Numbulwar Council Service Manager – “...been very minimal, the only ones who have tried to reduce the consumption of energy are those who occupy staff housing”

As outlined earlier in this report Council’s Region is one of the highest low socio-economic areas in Australia. Reducing the cost of running infrastructure for Council ensures the ability to provide more essential core services required.

Budget

The whole project was achieved within budget but some variations were needed over the life of the project which was approved by the department prior to completing works.

The causes of these changes were Jilkminggan office did not require a new solar hot water system as per the application as this was replaced under LGEEP grant funding.

Borroloola office did not require draft proofing as this was previously done through Council's repairs and maintenance budget. Beswick office did not require draught proofing due to whole office works upgrade funded by Council and Centrelink being completed after the CEEP project.

Reporting on the budget to the department was changed from a technology breakdown to a location break down as this was the way invoices were received from contractors.

There were no unexpected costs but variations in costs between facilities due to different requirements for example bigger air-conditioning units required in Jilkminggan.

There were no changes in technology that affected the budget as the chosen energy efficient technologies for the project were all budgeted inline with actual expenditure.

The project has successfully achieved value for money for Council. All upgrades were achieved within budget. Council used a very competitive procurement process to ensure value for money from contractors and the technologies they used for the upgrades in the project.

Council expenditure of \$270,360 proved valuable to contribute to the project as by the savings in energy cost in the last 12 months of almost \$54,000 will mean that Council will recoup this cost in just over 5 years. Without the contribution of the funding from the Australian Government the energy efficient technologies may never have been implemented into the facilities just repairs and maintenance as usual. The project has provided Council with the opportunity to move forward in the energy efficiency world.

Income and Expenditure Table

INCOME	Approved Budget	Final Project Budget	Variance
CEEP Funding	\$572,221	\$540,721	-\$31,500

RGRC / other contributions	\$285,750	\$270,360	-\$15,390
TOTAL INCOME	\$857,971	\$811,081	-\$46,890

EXPENDITURE		Approved Budget	Final Project Budget	Variance
	Lighting	\$66,000		
	Air-conditioning	\$203,300		
	Doors and Windows	\$16,820		
	Roof restoration, solar reflector paint application and ceiling works	\$195,301		
	Fan installation	\$500		
	Hot water system installation	\$2,000		
	Pool Pumps	\$15,000		
Barunga	lighting + time control switches, A/C + time control switches, doors & windows, roof		\$45,815	
Beswick	lighting + time control switches, A/C + time control switches, doors & windows, roof		\$53,257	
Bulman	lighting + time control switches, A/C + time control switches, doors & windows, roof		\$47,259	
Manyallaluk	lighting + time control switches, A/C + time control switches, doors & windows, roof		\$40,147	
Mataranka	lighting + time control switches, A/C + time control switches, doors & windows, roof		\$33,102	
Jilkminggan	lighting + time control switches, A/C, fans, hot water system, roof		\$51,598	
	1 A/C unit + all A/C time control switches		\$5,500	
Borroloola	office - lighting + time control switches, A/C , doors & windows, roof, pool pump		\$38,886	
	A/C time control switches		\$2,800	
Ngukurr	Office - lower ceiling, lighting + time control switches, doors, roof, pool pump		\$86,021	
	A/C + time control switches		\$11,400	
Numbulwar	lighting + time control switches, doors & windows, roof		\$39,196	

	A/C + time control switches		\$26,200	
	Capital sub-total	\$498,921	\$481,181	-\$17,740
Planning, monitoring and logistics		\$167,900	\$167,900	
Monitoring, Evaluation & Reporting		\$21,360	\$21,360	
Project Management & Contract Administration		\$100,640	\$103,640	
Communication Activities	RGRC	\$37,000	\$37,000	
Communication Activities	PAWA	\$32,150	\$0	
	Operational sub-total	\$359,050	\$329,900	-\$29,150
	Project Total	\$857,971	\$811,081	-\$46,890

Project Operation, Mechanisms and Processes

Council under the Director Council Services has a project management team who managed the project. The Council Finance Team managed the financial aspects and grant agreement compliance.

The management of the project by Council worked well from application, procurement to reporting. Council manages \$28 million worth of funded grant programs and projects every year. Council is extremely professional and has the ability to manage like the CEEP project and many others. Some similar recent projects managed by Council that involved using energy efficient technologies include:

- Wugularr Creche upgrade \$515,000 for the Department of Social Services
- Borroloola Staff house upgrade \$90,000 from Department of Local Government and Community Services
- Solar light installation in dark spots of the communities \$179,224 from Department of Local Government and Community Services
- Ngukurr Contractor Quarters upgrade \$249,500 from Department of Local Government and Community Services
- Numbulwar Indigenous Broadcasting facility upgrade \$175,521 from Department of Local Government and Community Services

Council has enough resources and a very professional team to implement and complete projects such as CEEP.

Council has a greater understanding of the need to implement energy efficient technologies into all capital infrastructure projects across the region and is leading the way in the NT.

The main difficulty Council has when implementing projects is securing quality contractors to complete the work in the time frame required from the funding agreement. Delays occur due to the wet season limiting access to most communities for 6 months of the year and limited contractors available to do the work in the Northern Territory.

Using simple energy efficient technologies in Council facilities saves on energy costs.

Conclusion

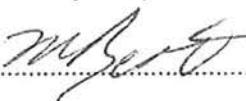
The CEEP project enabled Council to upgrade community administration offices in nine communities and two pools within the Roper Gulf Region of the Northern Territory with energy efficient technologies. Technologies included air conditioning, lighting, timer switches, roof reflective paint, draft proofing and pool pumps. The project has reduced Council's energy expense at these facilities by \$53,617.50 in the first year. Council now includes energy efficient technologies in all repairs, improvements and upgrades for infrastructure across the Roper Gulf Region.

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 Roper Gulf Regional Council (*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 offence under the *Criminal Code Act 1995*.
- 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:
26.11.2015.....

Name: Michael Bento.....

Position: CEO Organisation:
Roper Gulf Regional Council

Witness Signature:  Date:
20.11.2015.....

Name: Lokesha Anand.....

Position: Finance Manager Organisation:
Roper Gulf Regional 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 Template

PROJECT TITLE	CEEP RGRC Cleaner Greener Challenge	PROJECT ID	CEEP2084
FUNDING RECIPIENT	Roper Gulf Regional Council	DATE	24/08/15

Building, Facility or Site 1

Name of Building, Facility or Site 1	Barunga Council Office
Location (address)	198 Derrkolo Road Barunga NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	25,198 kwh per annum
Current Energy Usage	15,581 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	174.45 mj/sq.m per annum
Current Energy Efficiency	107.87 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	66.58 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 520sq.m Daily Hours of operation = 8am to 4.30pm Occupants = 8.5 FT
Cost of Activity	\$45,815
Estimated Cost Savings	\$1,729.16 per annum
Actual Cost Savings	\$2,802.55 per annum

Building, Facility or Site 2

Name of Building, Facility or Site	Beswick Council Office
Location (address)	22 Balandra Street Beswick NT 0852

Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	30,148 kwh per annum
Current Energy Usage	12,364 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	484.52 mj/sq.m per annum
Current Energy Efficiency	198.71 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	285.81 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 224sq.m Occupants = 3.5 FT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$53,257
Estimated Cost Savings	\$2,818.45 per annum
Actual Cost Savings	\$5,658.09 per annum
Building, Facility or Site 3	
Name of Building, Facility or Site	Bulman Council Office
Location (address)	6 Bulman NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	9,174 kwh per annum
Current Energy Usage	6,784 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	254 mj/sq.m per annum
Current Energy Efficiency	109.03 mj/sq.m per annum (August 14 to July 15)

Energy Efficiency Improvement	144.97 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 130sq.m Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$47,259
Estimated Cost Savings	\$1,369.96 per annum
Actual Cost Savings	\$2,723.02 per annum

Building, Facility or Site 4

Name of Building, Facility or Site	Manyallaluk Council Office
Location (address)	36 Eva Valley Road Manyallaluk NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	5,588 kwh per annum
Current Energy Usage	3,513 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	211.75 mj/sq.m per annum
Current Energy Efficiency	56.46 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	155.29 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 95sq.m Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$40,147
Estimated Cost Savings	\$725 per annum
Actual Cost Savings	\$2,865.09 per annum
Building, Facility or Site 5	

Name of Building, Facility or Site	Mataranka Council Office
Location (address)	120 Stuart Highway Mataranka NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	30,954 kwh per annum
Current Energy Usage	28,932 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	663.29 mj/sq.m per annum
Current Energy Efficiency	464.97 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	198.32 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 168sq.m Daily Hours of operation = 8am to 4.30pm Occupants = 4.5 FT
Cost of Activity	\$33,102
Estimated Cost Savings	\$3,857.00 per annum
Actual Cost Savings	\$4,300.34 per annum
Building, Facility or Site 6	
Name of Building, Facility or Site	Jilkminggan Council Office
Location (address)	17 Jilkminggan NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof, solar hot water system
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	30,170 kwh per annum
Current Energy Usage	15,504 kwh per annum (August 14 to July 15)

Baseline Energy Efficiency	646 mj/sq.m per annum
Current Energy Efficiency	249.17 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	396.83 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 168 sq.m Occupants = 5 FT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$57,098
Estimated Cost Savings	\$3,871 per annum
Actual Cost Savings	\$3,512.51 per annum
Building, Facility or Site 7	
Name of Building, Facility or Site	Borroloola Council Office
Location (address)	384 Broad Street Borroloola NT 0854
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	17.047 kwh per annum
Current Energy Usage	14,718 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	118.02 mj/sq.m per annum
Current Energy Efficiency	101.89 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	16.12 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 520sq.m Daily Hours of operation = 8am to 4.30pm Occupants = 2 FT
Cost of Activity	\$41,686
Estimated Cost Savings	\$2,242.64 per annum
Actual Cost Savings	\$691.47 per annum

Building, Facility or Site 8	
Name of Building, Facility or Site	Ngukurr Council Office
Location (address)	283 Balamurra Street, Ngukurr NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.
Baseline Energy Usage	107,360 kwh per annum
Current Energy Usage	62,917 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	688.94 mj/sq.m per annum
Current Energy Efficiency	403.75 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	285.19 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 561sq.m Occupants = 11 FT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$97,421
Estimated Cost Savings	\$8,640.95 per annum
Actual Cost Savings	\$15,211.44 per annum
Building, Facility or Site 9	
Name of Building, Facility or Site	Numbulwar Council Office
Location (address)	93 Numbulwar NT 0852
Type of building, facility or site	Office administration building
Activity Type and Measure	Energy efficiency works – lighting, air-conditioning, reflective roof paint, draft proof,
Energy Efficiency Estimate Method	Energy consumption per square metre of floor area.

Baseline Energy Usage	49,500 kwh per annum
Current Energy Usage	34,808 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	342.69 mj/sq.m per annum
Current Energy Efficiency	240.98 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	101.71 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area 520sq.m Occupants = 15 FT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$65,396
Estimated Cost Savings	\$2,845.02 per annum
Actual Cost Savings	\$5,017.01 per annum
Building, Facility or Site 10	
Name of Building, Facility or Site	Borroloola Swimming Pool
Location (address)	645 Robinson Road Borroloola NT 0854
Type of building, facility or site	Swimming Pool
Activity Type and Measure	Energy efficiency works – pool pumps
Energy Efficiency Estimate Method	Energy consumption per square metre of area.
Baseline Energy Usage	48,048 kwh per annum
Current Energy Usage	23,705 kwh per annum (August 14 to July 15)
Baseline Energy Efficiency	332.64 mj/sq.m per annum
Current Energy Efficiency	164.11 mj/sq.m per annum (August 14 to July 15)
Energy Efficiency Improvement	168.53 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area sq.m Occupants = 3 FT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$ included in expenditure of Borroloola office due to invoice not stating expenditure for pool pump separately

Estimated Cost Savings	\$7,455.91 per annum
Actual Cost Savings	\$8,158.70 per annum
Building, Facility or Site 11	
Name of Building, Facility or Site	Ngukurr Swimming Pool
Location (address)	381 Balamurra Street Ngukurr NT 0852
Type of building, facility or site	Swimming Pool
Activity Type and Measure	Energy efficiency works – pool pumps,
Energy Efficiency Estimate Method	Energy consumption per square metre of area.
Baseline Energy Usage	17,472 kwh per annum
Current Energy Usage	8,979 kwh per annum (August 14 to July 15) <input type="radio"/>
Baseline Energy Efficiency	120.96 mj/sq.m per annum
Current Energy Efficiency	62.16 mj/sq.m per annum (August 14 to July 15) <input type="radio"/>
Energy Efficiency Improvement	58.80 mj/sq.m per annum
Reporting Data (Measuring Energy Efficiency and Additional Data)	Building Area sq.m Occupants = 2 PT Daily Hours of operation = 8am to 4.30pm
Cost of Activity	\$ included in expenditure of Borroloola office due to invoice not stating expenditure for pool pump separately
Estimated Cost Savings	\$2,667.71 per annum
Actual Cost Savings	\$2,677.28 per annum <input type="radio"/>