Submission No 117

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Organisation: Central NSW Joint Organisation

Date Received: 12 September 2019

Inquiry into sustainability of energy supply & resources in NSW

September 2019

The CNSWJO member councils are; Bathurst Regional, Blayney Shire, Cabonne, Cowra Shire, Forbes Shire, Lachlan Shire, Oberon, Orange City, Parkes Shire and Weddin Shire. Associate members are Central Tablelands Water, Department of Premier and Cabinet (DPC) and Regional Development Australia, Central West.

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Chairman: Cr John Medcalf, Mayor, Lachlan Shire Council

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13 September 2019

The Chair
Committee on Environment and Planning
Parliament House
Macquarie Street
Sydney NSW 2000.

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To whom it may concern,

Re: Inquiry into sustainability of energy supply & resources in NSW

By proclamation dated 11 May 2018 the Central NSW Joint Organisation of Councils (CNSWJO) was created. The members are Bathurst, Blayney, Cabonne, Cowra, Forbes, Lachlan, Oberon, Orange, Parkes and Weddin. Central Tablelands Water is an Associate Member. The Board also values working with key stakeholders, importantly the NSW Government.

Under the amendments to the Local Government Act to enable Joint Organisations, the CNSWJO Joint Organisation must have a Statement of Strategic Regional Priority. The priorities resolved by the Board to be progressed through advocacy, intergovernmental cooperation, prioritisation and other activities are:

- Inter-council cooperation
- Regional Prosperity
- Transport and infrastructure
- Regional Water

The region's vision is to be a vibrant, prosperous and welcoming place of seasonal landscapes that is recognised in the nation for it agricultural heart.

The region's policy position is that we need to do things differently if we are to get a different result and there is already activity in region moving in that direction. Alignment with and support from other levels of government, preferably in some type of genuine collaboration, would be welcomed.

We understand the terms of reference to be:

1. The capacity and economic opportunities of renewable energy.

2. Emerging trends in energy supply and exports, including investment and other financial arrangements.
3. The status of and forecasts for energy and resource markets.
4. Effects on regional communities, water security, the environment and public health.
5. Opportunities to support sustainable economic development in regional and other communities likely to be affected by changing energy and resource markets, including the role of government policies.
6. Any other related matters.

This region welcomes the opportunity to provide input on economic opportunities of renewable energy in NSW.

1.3 Members are provided with value for money from collaboration on energy related projects

No.	Activity	Responsibility	Timeframe	Key performance indicators
a)	Southern Lights	Executive Officer	May 2020	Rollout of LEDs well progressed in the region commencing with Orange and Bathurst
b)	Energy Management Program	Executive Officer	Ongoing	Quarterly reports to Board
c)	Electric Vehicles policy and toolkit	Executive Officer	August 2019	Members resolve policy and procedure
d)	Solar Panel and Battery Innovation	Executive Officer	August 2019	Board receives report regarding this opportunity for consideration
e)	Innovation in the energy market emergent opportunities	Executive Officer	Ongoing	Board receives reports on innovative approaches to the energy market for consideration

As identified in the Central NSW Joint Organisation Strategic Plan section 1.3, you will see that this region is well abreast as a region on ways we can better enhance the level of energy supply & resources already in our region.

Each of the projects below are explained in more detail.

Southern Lights

Project Description
In late 2018, the Southern Lights Group submitted a business case to the NSW Government requesting full funding of the Southern Lights Project which consists of an upgrade to LEDs and the installation of smart controls on all 75,000 streetlights in NSW.

In early June 2019, advice was received from Department of Premier and Cabinet that the NSW Government is currently unable to commit funds to the Program as an investment decision for the Snowy Hydro Legacy Fund would not be made until 2020.

Further meetings of the Southern Lights Group were held since the letter was received to discuss alternate funding options to ensure the Project progresses in line with the Essential Energy Bulk Replacement Schedule (BLR).

While the region was disappointed with the outcome, it is important to note the key achievements for the Southern Lights Projects and recognise the importance of continuing to pursue other opportunities in this space.

Key achievements of the project to date:

1. AER Pricing Review – Council street lighting charges are to decline by an estimated $7 million (about 33%) from 1 July with about 50% of this flowing to Southern Lights NSW member councils as recurrent savings. A significant fraction of this was due to Southern Lights NSW advocacy.
2. Sinking Fund Recognition – It emerged in 2017-18 that Southern Lights NSW was the only party aware of the history of funding for Tariff 2 lights and successfully argued with the new Essential Energy management team for recognition of this in the negotiations of an LED upgrade (and in the context of the AER Pricing Review). As per the Southern Lights NSW Business Case, this is worth $5,614,344 for the 41 councils in Southern Lights NSW.
3. Joint LED Modelling – The jointly developed model for LED upgrades has not only allowed councils to understand the cost and benefits of an LED upgrade (and prompted Essential Energy to develop a similar model properly incorporating all the costs and benefits) but it is believed that this was also instrumental in the last few weeks in getting Essential Energy to reconsider a proposal to greatly increase the costs of LED lighting upgrades.
4. NSW Public Lighting Code – Southern Lights NSW was the only party from regional NSW involved in the Departmental consultations on the NSW Public Lighting Code. A compromise position was successfully negotiated by Southern Lights NSW with Essential Energy on key items under debate (e.g. on repair times and penalties) that led to the Department being willing to mandate the Code from 1 July 2019 as a license condition on Essential Energy. The Code, for the first time, will see a legally defined service level for street lighting in NSW with maximum repair times, higher penalties, mandatory reporting and a greater council say over technology choice. This is a big win for councils on an issue which has languished for years and was only pushed over the line last year by councils organising successfully to work together.
5. Acceptance of LED & Smart Controls in Essential Energy – While Essential Energy was less than convinced about the need for a large LED upgrade two years ago, our understanding is that Essential Energy's Executive Manager, David Salisbury is now firmly behind a wholesale replacement of all legacy lighting with LEDs (and likely with smart controls). Southern Lights NSW was clearly the primary driver of Essential Energy's reconsideration of its technology approach to lighting.
6. LED Tender Complete – A completely revamped and updated portfolio of LEDs has been agreed as a result of the tender prompted by and contributed to by Southern Lights NSW, approved by the EE Board and under which contracts were signed for LEDs that are more efficient, smart controls ready and have Zhaga-based options across all lighting classes.
7. Smart Controls Tender Process Underway – Joint specification (based on submission by Southern Lights NSW) largely agreed and likely to proceed to tender within weeks.
8. Funding – While DPC said "no" to funding LED lighting, there remains a clear interest in and possibility of funding the smart controls and connectivity aspects of the project (~$16m or 27% of project costs). Councils now need to work together to try to secure this, to secure better rules for OEH funding to suit regional NSW and to explore RMS funding for upgrades to Traffic Routes.

Barriers

- Funding – despite this project being described as a "no brainer" and the region being encouraged to provide a business case to government – this was unsuccessful. The funding framework for streetlights is only for mercury vapour of which there are few in this region. While other funding has been sought eg Snowy Hydro this has also proved unsuccessful. Councils are now borrowing money for State owned assets to deliver this project.

- The mismatch between the Australian Energy Regulatory framework, the technology, streetlighting ownership arrangements in NSW and Councils' regulatory role as the roads' authority.

Energy Management Program

Project Description
Undertaken by staff of the CNSWJO on behalf of its members to ensure we are getting the best possible savings for member communities. Working with Key stakeholders and all levels of Government.

Barriers
Poor and variable energy policy.
Funding - Councils are under resourced and so energy management is challenging for them and different in every Council.

Electric Vehicles policy and toolkit

Project Description
The overall objective of the project is to enable member councils of the Central NSW Joint Organisation to capitalise on the sustainability and business opportunities presented by electrification of transport by developing a toolkit for the councils and local businesses that enables them to efficiently and economically install or host electric vehicle chargers.

Creating logical approaches to charging infrastructure and related planning, investment, tourism and implementation will ensure that electric vehicle drivers have the most logical journey enablement approach within the region and that the electric vehicle industry has more certainty when dealing with the region in terms of local capacity to deal with the issues relating to infrastructure implementation.

The purpose of the toolkit is to empower local government and tourism operators with the information they need to ensure that installations occur in areas that are most appropriate for journey enablement, stimulating local business activity and enhancing the tourism industry across the region in the timeliest and most cost-effective manner possible.

A big part of the focus is on internal and external communications to ensure that council officers and the proponents that they deal with clearly understand the issues and processes related to the installation of charging infrastructure.

To date an inception meeting has been held where the project base level of understanding and key concepts were established and understand "why" the project and develop a sense of excitement and engagement

Barriers
No incentives and a policy vaccuum for electric vehicles means Australia is biggest emitter per capita for transport and is likely to be a back water for this potentially exciting new industry.

Solar Panel and Battery Innovation

Project Description
A project that was undertaken for a comprehensive options analysis and site preparation assessment for participating member councils.

The following options will be taken into consideration during the analysis for each site:

- Local Electricity Trading (LET) with 'netting off' between Council buildings
- Local Network Credit (LNC) and Local Electricity Trading (LET)
- Private wire
- Solar PV Installation and behind the meter solar installation
- Power Purchase Agreement (PPA)
- Storage and storage options
- Combination of any of the above.

Based on the above findings a provider was engaged to undertake an alternative energy options analysis and a preliminary site preparation assessment for feasible sites for its interested member councils.

The objective was to provide Centroc members with considerable savings on the procure of an alternative energy options analysis and preliminary site preparation assessment for feasible sites due to the collective purchase by this group.

As a result an Alternative Energy Audit report was produced and will from part of any funding for this.

Barriers
Funding. Ideally Joint Organisations would be supported in the delivery of innovative projects to inform an orderly transition to a renewable energy framework.
The regulatory framework for electricity which does not allow for netting off.

Innovation in the Energy Market to take up renewable energy emergent opportunities

Project Description
Central NSW Joint Organisation (CNSWJO, formerly Centroc) and its member councils, Riverina Eastern Regional Organisation of Councils (REROC) and its member councils, along with Tamworth Regional Council have combined forces to identify appropriately licensed electricity retailers, or consortia of retailers and renewable energy projects, to supply electricity to their large market, public lighting and small market sites from 1 January 2020.
18 Councils are participating in this process.

- CNSWJO – Bathurst, Blayney, Cabonne, Central Tablelands Water, Cowra, Forbes, Hilltops, Lachlan, Oberon, Orange, Parkes and Weddin
- REROC – Bland, Coolamon, Cootamundra-Gundagai, Greater Hume and Temora
- Tamworth Regional Council.

The objective is to provide participating councils with considerable savings on the purchase on electricity due to the collective purchase by this group.

Notably, Councils in region have elected to procure 20-35% renewable energy through this process – subject to pricing.

Barriers
Energy procurement is not a good fit with procurement guidelines under the Local Government Act.

Further advice:

In the recent submission to the Inquiry into Jobs for the Future in Regional Areas from the Central NSW Joint Organisation. The following comments were made.

The number of existing jobs in regional areas in clean energy technology and ecological services and their future significance

This region has no data in this regard, though has deep concerns for the way that the various carbon banking and biodiversity offset schemes will be administered into the future.

Lessons learned from structural adjustments in the automotive, manufacturing and forestry industries and energy privatisation and their impact on labour markets and local economies.

This region is experiencing ongoing challenges arising from the privatisation of energy and its perverse and deleterious outcomes for our communities. Further, it is apparent that there is no orderly transition to a renewable energy future. It is extraordinary that the Councils of Central NSW are looking at an energy market where black power is being increasingly subsidised and yet we can buy renewable energy with better pricing. Local businesses are being hit by both the drought and energy pricing and the response from the Federal Government seems to be more around seeing this as some type of structural adjustment piece when it is in fact policy absence or failure.

Deep thought, informed and collaborative strategy and staying the course on implementation needs to be applied to wicked problems like climate change, drought and energy. While this region is thankful for the support it gets, broader strategic and policy work needs to be undertaken.

If you require further information or clarification on comments in this submission please do not hesitate to contact me on [redacted].

Yours sincerely,

[redacted]

Jennifer Bennett
Executive Officer
Central NSW Joint Organisation (CNSWJO)

Attachments

1. **Southern Light Business Case**

Southern LIGHTS

PROPOSAL FOR THE DELIVERY OF SOUTHERN LIGHTS

BROKEN HILL CITY COUNCIL

CANBERRA REGION CITY · COAST · ALPINE · TABLELANDS | Canberra Region JOINT ORGANISATION

CENTRAL NSW COUNCILS

REROC RIVERINA EASTERN REGIONAL ORGANISATION OF COUNCILS

Riverina And Murray Joint Organisation

Footpath lit by LED Lighting, Bathurst LED Trial, October 2018 (photo: David Roma)

Contents

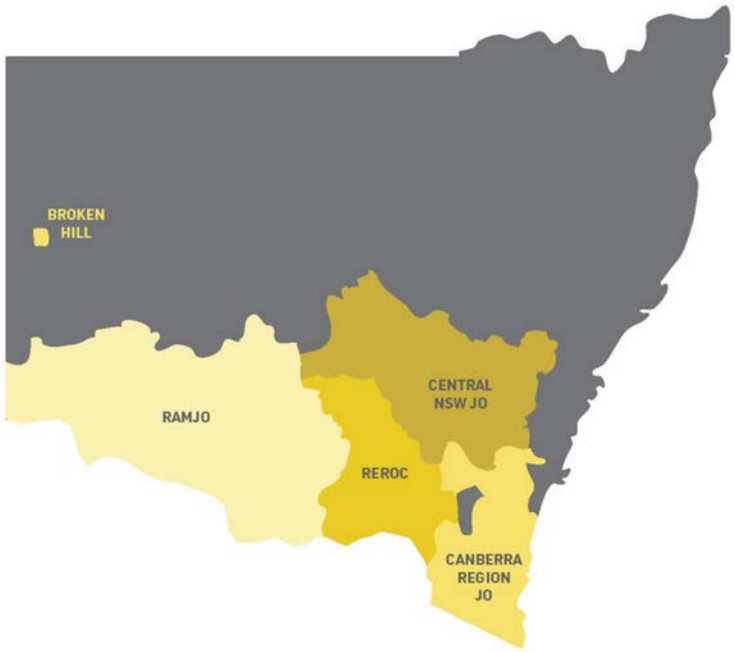
Enabling infrastructure that delivers better, safer, cheaper lighting and smarter, connected communities

The Southern Lights Project

Executive Summary

Southern Lights proposes to deliver over 80,000 smart, connected LED street lights and a low to medium bandwidth Internet-of-Things communications network to communities encompassing over 1.1 million people living in country NSW. This enabling infrastructure will provide better, safer, cheaper lighting and connectivity that will act as a catalyst for participating councils and others to invest in smart community technologies; technologies that will increase efficiencies and improve service delivery.

Eighteen months in the making, Southern Lights is the largest proposed deployment, by geographic area, of smart enabled LED street lighting in the Southern Hemisphere. Covering an area slightly larger than the United Kingdom, the project stretches from Bega to Broken Hill, encompassing 41 Local Government Areas (LGAs), 8 Regional Cities and numerous regional and rural towns and villages.



The enabling infrastructure that Southern Lights provides will not only deliver better, safer and cheaper lighting it will also empower those cities and towns both large and small who want to take the step forward to become a smarter connected community.

The Southern Lights Group of Councils represented by Riverina Eastern Regional Organisation of Councils (REROC), the Riverina and Murray Joint Organisation (RAMJO), Central NSW Joint Organisation (Central NSW JO), Canberra Region Joint Organisation (CBRJO), Broken Hill City Council (who are now part of the Far West JO) and our highly experienced and qualified consultants, Next Energy have worked closely with Essential Energy to prepare a robust Southern Lights Business Case (Business Case), that demonstrates the clear financial and other community benefits of the project. In addition to preparing the Business Case, The Southern Lights Group of Councils have also worked collaboratively with Essential Energy on a set of specifications for the procurement of leading edge LED street lights and have already concluded a joint EOI process for the delivery of smart controls and the communications backbone that will support the deployment of other smart community technologies.

The Southern Lights project will deliver this enabling smart lighting and smart community infrastructure at an efficient cost that individual councils could not possibly achieve. Beyond vitally needed LED lighting upgrades, Southern Lights will leave decisions to individual council about which smart technologies they and their communities decide to deploy. It will also give them the opportunity to deploy these technologies at the lowest possible marginal cost. As a result of the LED deployment and the associated communications infrastructure, councils will have low cost options to add a wide variety of emerging smart community sensors directly into the street lights and in other locations in the public domain.

As a result of its comprehensive Business Case development process the Southern Lights Group has determined that that the total cost to deploy the project is $71.2 million with a roll-out period of 2-3 years, commencing in April 2019.

The 2-3 year roll-out is predicated on the project being funded by the State Government. If the participating councils are required to provide the necessary funding, then we expect that deployment will be delayed as most councils will need to seek loans to fund their participation. If this is the case, then not only will deployment be delayed but the project will also lose the efficiencies that are created through a mass roll-out because the deployment will be determined based on which councils are able to fund it. Further we recognise that some councils may never be in a position to provide the funding, which will undermine the overall effectiveness of the project.

The Southern Lights Group is requesting that the State provide $61.4 million towards the deployment of the LED lighting and supporting communications. In addition Essential Energy has agreed to make a contribution of $9.8 million towards the project based on its existing obligations to fund the first replacement of each Tariff 2 light on its network and also includes an avoided Bulk Lamp Replacement (BLR) credit. Councils will fund the subsequent deployment of smart community technologies that will leverage off the communications backbone.

The Southern Lights project estimates that some $4.1m in NSW Energy Savings Scheme Certificates could be generated from this proposed deployment. This revenue has not, at this stage, been factored into the business case on the assumption that grant funding may preclude also claiming ESCs. However, if appropriate, Southern Lights would be pleased to work with the Government to see that these ESCs are claimed and any revenue returned to the Government as a way to reduce the required grant funding.

The investment in the Southern Lights project will:

- ✓ Install approximately 83,000 LED street lights, the project allows for a 10% increase in the number of lights to enable councils to address additional lighting needs such as in-fill;
- ✓ Deliver low to medium bandwidth communications that supports smart community deployments, including smart controls for LED lighting;
- ✓ Reduce the energy use in street lighting by 57% generating direct savings for rural and regional councils of $46.3M over 10 years;
- ✓ Produce significant Greenhouse Gas (GHG) savings by reducing electricity by 20,500 MWhrs per year and consequently CO^2 emissions by 19,500 tonnes per year;
- ✓ Dramatically improve lighting reliability while reducing the maintenance cost of lights by 47%, generating direct savings for rural and regional councils of $31.4M over 10 years;
- ✓ Increase efficiencies and improve service delivery for the participating councils and others through the use of smart community technology innovations such as remote metering and remote sensing;
- ✓ Improve community safety by providing better and safer lighting that allows communities to raise lighting levels in areas where crime or anti-social behaviour is a problem;

- ✓ Allow residents to feel safer on the streets at night and support crime detection by providing brighter, whiter lighting with better colour rendition;
- ✓ Jump start the *20-year Vision for Regional NSW*, by delivering on the promise of providing connectivity to rural and regional areas 10 years ahead of the scheduled time frame; and
- ✓ Be a legacy project that empowers rural and regional communities

The Business Case shows a payback period of 8.8 years and a BCR of 1.01, however, this only factors-in the returns delivered through lower energy and maintenance costs from LEDs. The efficiencies that will result from the deployment of smart lighting controls and other smart community technologies will further improve the payback period as the impact that new higher quality lighting is expected to have on crime and anti-social behaviour which has not been factored in.

The Southern Lights Group's preferred deployment approach is for the JOs to jointly lead procurement of both LEDs and smart controls to specifications mutually agreed with Essential Energy.

The JOs are comfortable with Essential Energy leading deployment of the LEDs (and associated light point controllers) but would like to be given the flexibility to work with the growing pool of specialist street lighting service providers in the event that Essential Energy is unable or unwilling to deploy the project to the timeframes agreed with government.

The JOs have a strong preference to manage the deployment and/or contracting of the communications network supporting the smart controls and other smart community devices

As a result of the significant period of consultation, planning and negotiations that have taken place in order to finalise the Business Case, the Southern Lights Group is extremely confident that the project can be delivered for the funding sought and in the advised timeframe.

Background

In late 2016 the Regional Organisations of Councils (ROCs) operating in southern NSW (REROC, RAMROC, CENTROC and CBRJO) met to talk about issues of common interest. One of the many issues that were discussed was the rapidly rising cost of street lighting and concerns about service levels. Many of the ROCs member councils were discussing the benefits of installing LED street lights because of the known energy savings they generated and their lower maintenance costs.

The ROCs agreed that this was a project that was appropriate for a collaborative approach and after consulting with their Boards, the ROC Executive Officers met again in early 2017 to discuss ways in which an LED street lighting project could roll out across southern NSW. Southern Lights was born.

At about the same time Essential Energy's interest in utilising LED street lighting gained momentum with the utility writing to councils with a financial proposal to replace current street lights on residential roads with LED lighting when Bulk Lamp Replacements (BLRs) were undertaken in individual Local Government Areas (LGAs).

It was clear to the ROCs that if the project was to progress in a more comprehensive fashion they needed to open negotiations with the owner of the assets, Essential Energy. Meetings with Essential Energy about the project commenced in mid-2017 and at the same time the Southern Lights Group (the four participating ROCs) engaged Next Energy to provide the Group with expert advice on street lighting. Next Energy are advisors to the Commonwealth Department of the Environment & Energy, RMS, IPWEA and more than 70 local governments on public lighting and smart city issues.

Determined to get to a point where the Southern Lights Group and Essential Energy could embark on meaningful discussions about the Southern Lights Project, a facilitator was brought in at the end of 2017 to assist the parties to reach a common vision for the project. All parties recognised that the key to getting the project off the ground was a robust Business Case and this could only be delivered if there was sufficient trust in place for all parties to share concerns and information openly.

Work commenced in earnest on the Business Case in early 2018. Next Energy was charged with preparing the Business Case and the firm brought its formidable international expertise to the development of what could be one of the largest roll-outs of smart LED technology in the Southern Hemisphere. The Southern Lights Group met the full cost of the preparation of the Business Case, while Essential Energy engaged staff and contractors to determine the costs from their side.

In March 2018, it was agreed that the project needed to be better co-ordinated if it was to reach its goal. REROC, the council-owned organisation with the longest history in street lighting, took on the day-to-day management of the project. Also in March 2018 Broken Hill City Council expressed its interest in joining the project. All the parties agreed to the proposal and consequently by April 2018 a formal project management structure was put in place for a project now covering an area stretching from Bega to Broken Hill.

There are currently 75,557 lights in the Southern Lights Region; therefore, a robust Business Case was never going to be easy to produce. The challenges were further compounded by a 2009 Australian Energy Regulator (AER) Determination which dictated that Essential Energy was responsible for the first replacement of a Tariff 2 light when it reached its end-of-life that resulted in a financial liability for Essential Energy. Other tariffs involved residual values creating a liability for councils. With a complex tariff history, preparation of the Business Case slowed while Essential Energy calculated how much money it was obligated to contribute to the Project to take into account the replacement of Tariff 2 lights and the council liabilities for residual values of other lights. This calculation for every light was finalised in late

September 2018 and amounts to $9.8 million which includes the avoided BLR credit and sinking fund amount.

Concurrently with the development of the Business Case, the Southern Lights Group's consultants, Next Energy worked closely with Essential Energy to develop tender specifications for the purchase of the LED lighting. Meetings have been held with eight leading technology providers to ensure that the specifications were informed by the latest developments. A collaborative approach to the development of the specifications was essential because it ensured that councils, who are the Road Authority and therefore the body accountable for adequate and compliant street lighting, to exercise some control over the technology that will be deployed in their LGAs. This approach also ensures that if the Joint Organisations manage or co-manage the procurement of the LED lights that there is an agreed specification already in place.

In mid-September 2018, Southern Lights, through REROC released an EOI for Street Lighting Smart Controls and the associated communications network(s). The EOI had a two-fold purpose, the first was to gauge the likely cost of the equipment and communications services for incorporation into the Business Case and the second was to clearly test whether suppliers had a technical solution that would provide adequate connectivity across rural and remote locations in country NSW. The EOI was an outstanding success with 20 responses received including 8 of the 10 leading global suppliers of smart street lighting controls responding. The EOI will also significantly inform the writing of the final tender specifications for the project.

The level of commitment to the project by the Southern Lights Group of Councils is very high. There has been a substantial investment in terms of finances and human resources by the Group in the delivery of the project including providing our consultants to Essential Energy to assist them to develop their technical specifications for the lighting and to resolve issues relating to their pricing for the Business Case. In addition' the Southern Lights Group's leadership team and Essential Energy management have been holding regular monthly meetings at Sydney Airport supplemented by weekly project management meetings.

The Southern Lights Group believes that this is an ideal project for implementation by the Joint Organisations because it clearly demonstrates the capacity of the new organisations to identify a grass-roots need in local government, work with key stakeholders to develop a collaborative response, jointly engage the necessary expertise to inform that response and then deliver a solution across multiple LGAs.

The Benefits of the Project

The direct benefits that Southern Lights will generate are:

- ## Reduced Energy Usage Results in Operational Savings for Councils

LED technology will reduce the energy used by street lights. Modelling of each light has established a 57% saving in energy use, saving 20,500 MWhrs of electricity and 19,500 tonnes of CO^2 per year.
Notably this includes an allowance for the deployment of up to 10% additional lights to remedy gaps in lighting layouts in regional communities where lighting may have been installed on an ad hoc basis many decades ago.

The lower energy usage generates direct operational savings for the participating councils; savings which can then be utilised to improve services for the communities they represent.

It is rare that councils, particularly rural and regional councils, are able to generate operational savings of the magnitude that the installation of LED lighting will provide. The project offers these councils the opportunity to deliver more without needing to seek Special Rate Variations or source grant funding.

- ## Improved Service Levels and Lower Maintenance Costs

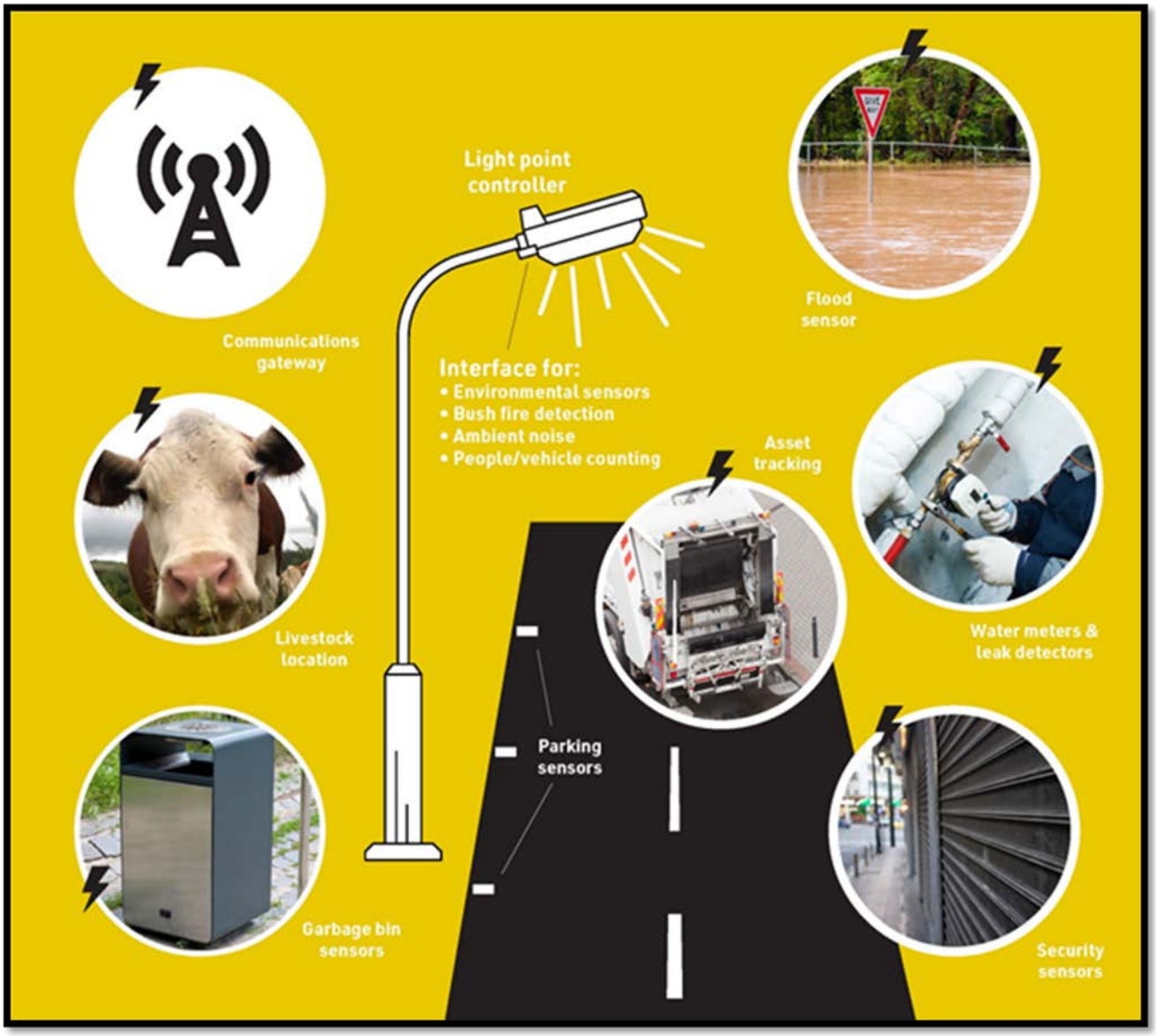
An LED roll-out when accompanied by smart controls technology can dramatically improve service levels because of the improved reliability of the LEDs and because the lights notify the operator of outages and other faults using the smart controllers on each light and the associated communications network.

Overall, the improved lighting reliability will reduce the maintenance cost of the lighting by 47% generating direct savings for rural and regional councils of $31.4m over 10 years. Further maintenance savings are expected from the deployment of smart controls (e.g. as a result of eliminating the need for night patrols and having the capacity to more efficiently organise maintenance planning). These savings have not been included in the Business Case because they are difficult to quantify at this time, however they represent further likely savings for councils and Essential Energy.

- ## Connectivity – A Backbone for Smart Community Deployments

Using low to medium bandwidth communications technology together with smart LED lighting, communities will have the foundation upon which to build Smart Community deployments. This is consistent with the State's goal in its *20 Year Vision for Regional NSW* of delivering digitally connected communities.

Networking of smart, connected street lights is increasingly recognised as a key enabler of Smart Community deployments. This is because once installed they are able to support a range of other devices in the public domain at low marginal cost. The diagram below demonstrates the breadth of technologies that can be operated using smart, connected street lights that are proposed for the project.



Southern Lights will enable councils to use the LED street lights as enabling infrastructure to support devices such as environmental sensors, bush fire detectors, ambient noise detectors and people / vehicle counting sensors (see illustration below showing new open architecture allowing light point controllers

from multiple vendors to be installed on lights along with sensors from multiple vendors).

Courtesy of Signify & Eaton

More broadly, councils will be able to use the associated low to medium bandwidth communications network to support devices in other locations such as flood level indicators, leak detectors, water meters, security sensors, asset location devices and many others.

Smart technologies like remote metering and remote sensing offer opportunities for councils and other third parties such as Water Authorities to use Southern Lights connectivity to achieve more efficient service outcomes.

- ## Improved Lighting Outcomes and Positive Impacts for Community Safety

LED lighting delivers high quality white light, with much better colour rendition than is found in current lighting.

A trial site in Bathurst undertaken jointly by council and Essential Energy shows the stark difference between high colour rendition LEDs, the much lower colour rendition and the distinctly yellow light of high pressure sodium. The photographs on page 10 show streets in Bathurst before and after the implementation of their recent LED Trial. The image on the left is a street before the LED upgrade was undertaken (HPS lighting); the image on the right is after LED lighting was installed. *(Photos: David Roma*)

Situational crime prevention and interventions such as improved street lighting and CCTV are widely used as ways to deter crime. Within the Southern Lights Region this assumption has been tested by Orange City Council as part of its planning for upgrading its CBD. As part of the upgrade project the City Council engaged the Western Research Institute to undertake modelling that would quantify the safety benefits of streetlighting and CCTV upgrades.

The Western Research Institute's modelling was developed based on overseas' research. The Institute used a Glasgow-based case study which found a conservative 3% reduction in crime, when these types of interventions were implemented, this was adopted for use in the Orange model. The Institute then took the 2017 Bureau of Crime Statistics and Research's (BOSCAR) work on average costs per incident to evaluate the costs associated with crime in the Orange CBD, with a view to estimating the likely savings that would accrue through improved interventions.

The Institute also factored-in court costs and included estimates of the possible reduction in justice system costs if the crime rate in the Orange CBD was reduced by 3%. The total benefits of reducing crime rates by installing CCTV and improved lighting was valued at $419,369 per year as shown below:

Reduced costs to victims based on average cost per crime	$28,849
Reduction in costs associated with fewer incarcerations	$380,907
Reduction in costs associated with fewer finalisations	$9,612
Total per annum reduction in crime related costs	**$419,369**

Thanks to Orange City Council and Western Research Institute for this advice.

The above savings to State and Local Governments have not been included in the Business Case again we note that Southern Lights is only proposing the installation of bandwidth that supports smart LED lighting and not CCTV, however we believe that the benefits that will accrue to community safety should be taken into account in determining the overall value of the Southern Lights project.

- ## Empowering Small Rural Communities

The deployment of smart enabled technologies across small rural communities is expected to empower those communities. Too often these communities are the last to have access to the latest technologies as their procurement volumes are low and the cost supporting them for suppliers is high. As a consequence, they generally face much higher costs and lower service levels and therefore are not of commercial interest.

Southern Lights will give these communities the same access to both advanced LEDs and low to medium bandwidth communications technology as the regional cities that are a part of the project and they will receive the technology at the same time. This enabling infrastructure will be a catalyst for the introduction of new services and facilities that depend on this increased connectivity. This is expected to increase efficiencies across LGAs not just for the participating councils but also for third parties like county councils that can use remote metering and agricultural enterprises that want to make use of technologies like remote sensing.

Cowra Main Street following LED Lighting Installation

The Business Case

The Southern Lights Group, led by consultant Next Energy, have worked closely with Essential Energy to prepare a robust Business Case to support the deployment of the Southern Lights project.

The Business Case is the result of Next Energy developing an individual case for every one of the 75,557 lights within the Southern Lights Region. This approach ensures that every participating council will have access to its own individual business case that is based on calculations that relate specifically to the lighting inventory for their LGA. It also allows the case for replacement of specific lights, lighting types, streets or areas to be considered in isolation.

The key conclusions of the business case are that the total cost to deploy the project is $71.2 million with a roll-out period of 2-3 years, commencing in April 2019. This would include the deployment of 75,557 replacement LED lights with smart controls and associated communications infrastructure. It also includes allowances for:

- Moderately higher lighting levels on residential roads;
- Up to 10% additional lights to fix gaps and other legacy issues;
- Specialist lighting, communications and probity advice; and
- Project management costs of ROCs/Joint Organisations

The simple payback for the project including all these allowances and contingencies is estimated at 8.8 years with 10 year NPV savings of $7.6m (including accounting for capital costs of deployment). The project has a Benefit Cost Ratio of 1.01 on a like for like basis (e.g. excluding lighting upgrades and additions that individual councils elect to deploy).

Importantly, the Business Case includes the cost of the smart controls and the associated communications infrastructure but has not assumed financial benefits yet as many are subject to validation in the field. However, it is clear that additional financial benefits should flow to all parties from, for example, the ability to eliminate night patrols, the optimisation of maintenance scheduling and the ability to dim and trim excess lighting.

The Southern Lights Group is requesting that the State provide $61.4 million towards the deployment of the LED lighting and supporting communications infrastructure. In addition, Essential Energy has agreed to make a contribution of $9.8 million towards the project based on its existing obligations to fund the first replacement of each ‘Tariff 2’ light on its network and the avoided BLR credit.

Councils will fund the subsequent deployment of smart community technologies that will leverage off the enabling communications backbone.

The Southern Lights project estimates that some $4.1m in NSW Energy Savings Scheme Certificates could be generated from this proposed deployment. This revenue has not, at this stage, been factored into the business case on the assumption that grant funding may preclude also claiming ESCs. However, if appropriate, Southern Lights would be pleased to work with the Government to see that these ESCs are claimed and any revenue returned to the Government as a way to reduce the required grant funding.

The following table presents some of the key modeling assumptions in the business case and the basis for these:

ASSUMPTION	BASIS FOR ASSUMPTION
Additional Lighting	In contrast to metropolitan areas, there are a substantial number of streets in rural and regional towns with light at long spacings and in ad hoc locations installed over many decades. Achieving reasonable lighting levels on these residential streets so that residents feel safe and so that lighting meets minimum standards may require some lights to be moved and others to be added. As recognised internationally, a large LED deployment is the ideal time to clean up a variety of historical lighting anomalies The Southern Lights business case model allows for up to 10% additional lighting and includes an allowance for the design and approvals costs associated with this.
Higher Lighting Capability for Residential Roads	While not proposing generally higher lights levels, Southern Lights has reached the conclusion that installing lights with higher output capability at a modest additional capital cost is prudent and is again backed by international precedent. Lights of slightly higher output capability on residential roads, when combined with smart controls, will be capable of not just being tuned exactly to compliance levels but also capable of raising lighting levels in response to local concerns about crime, during bad weather events and during times of higher traffic. This capability will again enhance community safety.
Higher Capability Communications Infrastructure	There are a wide array of options for smart street lighting controls and the associated communications infrastructure. While the capabilities of the smart street lighting controls are substantially similar across offerings, the capabilities of the supporting communications infrastructure to support other smart community devices varies. The Southern Lights business case model allows for costs at the higher end of indicative offers received in a recent joint EOI with Essential Energy that is currently being evaluated.
Specialist Advice	Southern Lights recognises that it will have an on-going need for specialist lighting, smart city, communications and probity advice during the project and the business case makes allowance for this.
Project Management Costs of ROCs/Joint Organisations	Southern Lights recognises that successfully delivering a large project like this across an enormous array of stakeholders requires dedicated project management effort and the business case makes allowance for this.

The business case is available for review on request noting that appropriate confidentiality arrangements will have to be put in place as it includes both commercially sensitive aspects and customer-in-confidence information that has come from a range of suppliers, Essential Energy and councils.

Deployment

The Southern Lights Group and Essential Energy have considered and discussed a number of options for the deployment of the Southern Lights project. It has been agreed that there will be two separate procurements; one for the LED Lights and one for the communications backbone. Splitting the procurements is the most efficient way of delivering the project and is likely to result in the most cost-effective outcomes.

The procurements need to be split because not all suppliers are able to provide both services. Combining the procurement may exclude some highly qualified providers from submitting a tender. This decision has been informed in part by the recent ACT LED tender process which did combine the two procurements and resulted in a substantial delay to the deployment.

There are four viable options for the deployment of the LED lights and three viable options for the deployment of the communications backbone. They are discussed below.

1. Deployment of LED lights

Below is a summary of the options that the parties have agreed on for the deployment of the LED lights. The Southern Lights Group's preferred deployment option is *Option One* highlighted below in yellow.

DEPLOYMENT OF LED LIGHTS

Option	Funding Recipient	Who Leads Procurement of Lights	Who Leads Installation of Lights	Responsibility for Maintenance of Lights	Ownership of Lights after Deployment
1	JOs	JOs to a mutually agreed specification	Essential Energy	Essential Energy	Essential Energy
2	JOs	JOs to a mutually agreed specification	Specialist Contractor	Specialist Contractor	With special purpose vehicle of JOs
3	JOs	Essential Energy to a mutually agreed specification	Essential Energy	Essential Energy	Essential Energy
4	Essential Energy	Essential Energy to mutually agreed specification	Essential Energy	Essential Energy	Essential Energy

Option One:

JOs are the Funding Recipient, demonstrating that the State recognises that they are key players in the delivery of infrastructure projects for Regional NSW. It also recognises that as the Road Authority councils should be taking the lead for the delivery of the project. The total funding sought for the project encompasses both the LED deployment and the street lighting smart controls and the associated communications network(s) deployment, the Business Case does not envisage a situation where the funding is split.

The procurement is led by the JOs as this is the most efficient way to get a swift roll-out of the project. The Southern Lights Group is working with Essential Energy to reach mutually agreed specifications for the purchase of the LED lights. Consequently whatever product is purchased will meet Essential Energy's requirements. In addition, consultants Next Energy have been active contributors to the development of the IPWEA's new Model Specification for LED lighting. Therefore, the Group believe that it has cutting edge knowledge in relation to the procurement of LED lighting and this coupled with the Southern Lights Group's substantial experience in aggregated procurement means that it is well positioned to take the lead for the procurement. Indeed, the Group believes that to embark on an accelerated deployment of the lights it is imperative that the JOs lead procurement.

Essential Energy would lead the installation of the lights using a combination of service providers they already have contracted to provide Bulk Lamp Replacements (BLRs), additional approved contractors to facilitate an accelerated deployment and their own staff. This approach has the potential to provide the most efficient installation regime because of Essential Energy's knowledge and understanding of remote and rural NSW.

On installation, ownership of the lights would be transferred to Essential Energy, who would also retain responsibility for their maintenance. The maintenance would be delivered using Essential Energy staff and contractors, with the pricing to be determined under the current AER regime. This approach would ensure that the maintenance remained within a well understood pricing regime.

Option Two:

JOs are the Funding Recipient, demonstrating that they are key players in the delivery of infrastructure projects for Regional NSW. Again, procurement of the LED lights would be led by the JOs using a mutually agreed specification.

In this Option a specialist contractor would be engaged to install and maintain the lights. This is a model that has been successfully used in Tasmania and the ACT, a type of "design, build and maintain" approach to the delivery of the project. There are a number of world class companies, who in their submissions to the EOI for street lighting smart controls and the associated communications network(s), indicated an interest in taking on this type of delivery mode. There are benefits that could accrue particularly with regard to an accelerated deployment.

However, the Option would require that the councils through the JOs take back the ownership of the street lights, possibly through a Joint Venture entity. In addition, it is understood that changes would need to be made to legislation to allow the maintenance of the lights to become contestable. It is the Group's belief that both of these requirements would significantly delay the deployment of the LED lights which is not in the best interests of the participating councils. Therefore it is not currently supported; however it may be in the future depending on Essential Energy's ability to carry out installations in accordance with the agreed Deployment Schedule.

Option Three:

JOs are the Funding Recipient, demonstrating that they are key players in the delivery of infrastructure projects for Regional NSW. The procurement would be led by Essential Energy, using the mutually agreed specifications for the purchase of the LED lights.

Essential Energy would lead the installation of the lights using a combination of service providers they already have contracted to provide BLRs, additional approved contractors to facilitate an accelerated deployment and their own staff.

Essential Energy would own the lights and also retain responsibility for their maintenance with pricing to be determined under the current AER regime. This approach would ensure that the maintenance remained within a well understood pricing regime.

Option Four:

Essential Energy is the Funding Recipient and procurement is led by Essential Energy, using the mutually agreed specifications for the purchase of the LED lights.

Essential Energy would lead the installation of the lights using a combination of service providers they already have contracted to provide BLRs, additional approved contractors to facilitate an accelerated deployment and their own staff.

Essential Energy would own the lights and also retain responsibility for their maintenance with pricing to be determined under the current AER regime. This approach would ensure that the maintenance remained within a well understood pricing regime.

The Southern Lights Group is concerned that this approach could result in councils, who to this point have been the project's leaders, becoming side-lined because all control would rest with Essential Energy. The Southern Lights Group has a very clear vision for this project and invested considerable funds and human resources over the last 18 months in its development. Therefore, it is important to the Group that it retains some control over the deployment of the project and believes that this is best achieved if the JOs jointly receive the funding and lead the procurement. **It is for this reason that we prefer Option One.**

More broadly, it is again noted that councils and not the DNSPs are the Road Authorities and have the exclusive right to determine whether to light, what level to light to and in what manner to light. Similarly, as the local government, councils should be seen as the appropriate party to make decisions about what smart community technologies are deployed within their LGAs.

2. Deployment of Communications Backbone

Below is a summary of the options that the parties have agreed on for the deployment of the communications backbone. The Southern Lights Group's preferred deployment option is *Option One* highlighted below in yellow.

DEPLOYMENT OF COMMUNICATIONS BACKBONE					
Option	**Funding Recipient**	**Who Leads Procurement of Comms Technology**	**Who Leads Installation of Comms Technology**	**Responsibility for Maintenance/ Operation of Comms Technology**	**Ownership/Control of Comms Technology after Deployment**
1	JOs	JOs to a mutually agreed specification	JOs and successful contractor	Successful Contractor	JOs on behalf of their Member Councils. Data sharing arrangements with Essential Energy
2	JOs	Essential Energy to a mutually agreed specification	Essential Energy and successful contractor	Successful Contractor	Essential Energy. Data sharing arrangements with councils through the JOs.
3	Essential Energy	Essential Energy to a mutually agreed specification	Essential Energy	Essential Energy	Essential Energy. Data sharing arrangements with councils through the JOs.

Option One:
JOs are the Funding Recipient, demonstrating that the State recognises that they are key players in the delivery of infrastructure projects for Regional NSW. It also recognises that as the Public Authority councils should be taking the lead for the delivery of the project. The total funding sought encompasses both the LED deployment and the street lighting smart controls and the associated communications network(s). The Business Case does not envisage a situation where the funding is split.

The procurement is led by the JOs, using a mutually agreed specification as this is the most efficient way to get a swift roll-out of the project. The EOI undertaken for the street lighting smart controls and the associated communications network(s) showed that there is substantial interest from providers to supply cutting-edge technology to the project. Given the size of the Southern Lights Region, the Group is likely to have a hybrid approach to the technology – there will be a need to choose technology that best fits the needs of councils.

Essential Energy's major goal in choosing the communications backbone is to deliver smart controlled street lighting, whereas the Southern Lights Group wants to deliver connectivity capable of supporting a wide range of smart devices, far beyond just street lighting. It is for this reason that the Group believe the procurement should be led by the JOs because they share a broader and longer-term vision for the use of the communications backbone – one that empowers communities.

The installation would be led by the JOs working with the successful contractor and in consultation with Essential Energy.

In this option the communications would be maintained and operated by the communications provider under a contract with the councils through the JOs. Essential Energy would also be part of those contractual arrangements, ensuring that they too had a voice at the table in relation to the service provision that also underpins the delivery of smart LED lighting. The arrangement would include options for data sharing and a regime to ensure access to the communications technology to allow for growth in smart technology deployments by the parties.

Essential Energy would, in consultation with the Southern Lights Group, operate and maintain the Customer Management System (CMS) that would operate the smart LED lighting. The CMS arrangement, must not create undue restrictions in relation to access to the communications technology particularly for small communities. Councils would have access to the CMS in order to obtain information about the operation of the street lights in their LGA and also to manage lighting e.g. dimming functionality.

Option Two:
JOs are the Funding Recipient, demonstrating that the State recognises that they are key players in the delivery of infrastructure projects for Regional NSW. It also recognises that as the Road Authority councils should be taking the lead for the delivery of the project. The total funding sought encompasses both the LED deployment and the street lighting smart controls and associated communications network(s).The Business Case does not envisage a situation where the funding is split.

The procurement is led by Essential Energy using a mutually agreed specification, working collaboratively with the Southern Lights Group. Again, the Group want to ensure that whatever technology is chosen will deliver Smart Community capability to all councils that comprise the Southern Lights Group.

The installation would be led by Essential Energy working with the successful contractor and in consultation with Southern Lights Group.

In this option the communications would be maintained and operated by the communications provider under a contract with Essential Energy. The councils through their respective JOs would also be part of those contractual arrangements, ensuring that they too had a voice at the table in relation to the service provision that would also underpin the delivery of smart communities' technologies. The arrangement would include options for data sharing and a regime to ensure access to the communications technology to allow for growth in smart technology deployments by the parties.

Essential Energy would, in consultation with the Southern Lights Group, operate and maintain the Customer Management System (CMS) that would operate the smart LED lighting. The CMS arrangement, must not create undue restrictions in relation to access to the communications technology particularly for small communities. Councils would have access to the CMS in order to obtain information about the operation of the street lights in their LGA and also to manage lighting e.g. dimming functionality.

Option Three:
Essential Energy is the Funding Recipient. The total funding sought encompasses both the LED deployment and the street lighting smart controls and the associated communications network(s) deployment, the Business Case does not envisage a situation where the funding is split between entities. Therefore, this option would require the choice of Option Four for the LED deployment.

All other arrangements would be the same as for Option Two.

Deployment Schedule

We are agreed that the deployment of the project should commence in April 2019 and that it will take 2-3 years to complete.

However, the 2-3 year roll-out is predicated on the project being funded by the State Government. If the participating councils are required to provide the necessary funding, then we expect that deployment will be delayed as most councils will need to seek loans to fund their participation. If this is the case, then not only will deployment be delayed but the project will also lose the efficiencies that are created through a mass roll-out because the deployment will be determined based on which councils are able to fund it. Further we recognise that some councils may never be in a position to provide the funding, which will undermine the overall effectiveness of the project.

Almost every council in the Southern Lights Group will want to be amongst the first to benefit from smart controlled LED lighting and the low to medium bandwidth Internet-of-Things communications network. Consequently, the Southern Lights Group and Essential Energy have considered and discussed what principles might apply for the deployment of the project.

Deployment should commence in April 2019 with the highest priority going to those councils that are overdue for a Bulk Lamp Replacement (BLR). Deployment that is co-ordinated with the BLR has been factored into the Business Case because the installation fits into a planned maintenance cycle, thus reducing the cost of the deployment and maintenance.

Subject to final agreement by councils and Essential Energy, the indicative schedule for commencement of deployment in major towns is as follows:

Council	Number of Lights	Indicative Schedule
Wagga Wagga City Council	6,562	31/08/2018*
Albury City	7,718	27/11/2018**
Orange	4,541	23/02/2019**
Bathurst	5,749	03/04/2019
Queanbeyan-Palerang	4,914	13/07/2019
Goulburn-Mulwaree	3,030	23/08/2019
Cabonne	781	17/01/2020
Total	33,295	

**Delayed to accommodate Southern Lights*

***Will be delayed for a April 2019 commencement for Southern Lights*

The above deployment represents 44% of the lights in the Southern Lights Region. Deployment in smaller communities is to be scheduled in coordination with local resource availability and bulk lamp replacement schedule in each LGA.