LGNSW Research and Innovation Fund 2020/2021

Expressions of Interest
Awarded projects

December 2020

Contents

Lead Organisation	**Campbelltown City Council**
Project Leader	Kelly Williamson
Job Title	Sustainability and Resilience Coordinator
Contact details	kelly.williamson@campbelltown.nsw.gov.au 0400 475 045
Project name	**Creating a Spark – energy sharing communities**
Focus of research	Net zero emissions in energy generation & use, transport, waste and/or land management Net zero emissions through a place-based approach Overcoming barriers to implementing net zero emissions

Project description – a summary of the project, outlining the need, project location, expected outcomes and how these will be achieved

The NSW Government together with NSW Local Governments are providing the critical leadership required to act on climate change. Rapid population growth combined with significant investment in infrastructure has provided a once in a generation opportunity to shape a cleaner, greener and more prosperous future. The time to act is now.

This project seeks to provide a catalytic opportunity to enable residents and businesses, with and without the amenity or funding, to access locally generated, low cost, low emission and renewable energy, specifically, through utilising residential energy sharing schemes and micro grids.

New legislation and technology is beginning to enable precincts and their communities to collaborate and derive benefits from aggregating and sharing renewable energy. However, there is still a lack of consolidated and easy-to-understand resources to guide councils and developers on ways to achieve this, particularly in NSW.

This project will:

- Develop guidelines for NSW local governments and the development sector that provide practical advice and solutions for enabling shared locally generated, low cost, carbon neutral precincts for NSW communities.
- Leverage Landcom's Macarthur Garden's North project (Campbelltown LGA) as the case study to test the guidelines, and where possible continue beyond the scope of this grant to implement the guidelines as a living example of a residential energy sharing scheme at the project.

Project objectives

To develop a useful guideline and a blueprint that will enable the sharing of locally generated, low cost, zero emission energy, with a focus on offsite zero carbon electricity supply, on-site zero carbon electricity generation and onsite energy storage, including preparedness for electrical vehicles (EV) to be part of the Vehicle-To-Everything (V2X) technology.

The guideline and blueprint will, at a minimum:

- Provide examples of how to successfully share renewable energy within a connected precinct, a community beyond the precinct, and between communities. This will include various land and building uses, e.g. mixed use and residential

dwellings, institutional buildings, public buildings, and public spaces. Implementation advice for developers will be included.
- Examine the evolving regulations, rules and local government guidelines to enable the practical application of residential energy sharing schemes in new and existing precincts.
- Determine the prerequisites to successfully enable renewable energy sharing via planning controls, approvals, utility-stakeholder input, developers and future homeowners.
- Identify potential risks, roadblocks and challenges, and provide mitigating solutions for each.

Project methodology – outline the steps and actions that will be taken to achieve your objectives

STEP 1: Confirm the scope:

- Undertake a needs assessment in collaboration with local councils and developers to understand key requirements, opportunities and challenges to inform the guideline. This will be undertaken through a webinar/s and survey/s.
- Determine the prerequisites for successful renewable energy sharing outcomes.

STEP 2: Compile the information:

- Review relevant and evolving legislation, regulation, rules and local government guidelines.
- Review similar projects nationally and internationally, for example the Community Energy Hub in Yackadandah, Victoria.
- Review and compare business models, technology and systems and provide potential criteria for selection by councils and developers.

STEP 3a: Structure the information:

- Establish a risk register covering risk likelihood, impact and mitigating actions.
- Draft a reference guideline.

STEP 3b: Test the information

- Test the practical application of the draft guidelines with Landcom's Macarthur Gardens North project, or an alternative Landcom development.
- Utilise the proposed Macarthur Gardens North concept masterplan to test the practicalities of including a residential energy sharing scheme in a master planned precinct.

STEP 4: Deliver a resource for local government and the development sector

- Circulate the draft guideline for review and assessment to stakeholders and potential users.
- Incorporate feedback received into final version.

Project milestones, outputs and outcomes

ACTIVITY 1. Project, governance, probity and risk management plans developed
Deliverable 1: Project Plan
Deliverable 2: Probity and Governance Plan
Deliverable 3: Risk Management Plans and risk register

ACTIVITY 2. Survey of NSW councils regarding the status, needs and appetite for energy sharing
Deliverable 1: NSW councils renewable energy sharing survey and needs assessment results

ACTIVITY 3: Research of relevant legislation and regulation completed
Deliverable 1: Legislation and regulation data and its interpretations

ACTIVITY 4. Research on existing similar and innovative trials and business models
Deliverable 1: Qualitative and quantitative research
Deliverable 2: Case study examples

ACTIVITY 5. Assessment of application to local government and communities using standardised criteria covering costs, benefits risks, management/resourcing burden and technology
Deliverable 1: Assessment of available models
Deliverable 2: Identification of best practice and preferred solutions

ACTIVITY 6. Provision of initial advice for implementation within Macarthur Gardens North new build estate project (following which ongoing advice will be provided as challenges arise and the outcomes will be then incorporated into a case study)
Deliverable 1: Practical advice for new build project
Deliverable 2: Identification of prerequisites for success

ACTIVITY 7. Development of a council roll-out strategy designed to optimise and streamline take up by local communities.
Deliverable 1: 'How to' guideline and plan

ACTIVITY 8. Drafting and refining guideline content based on above research and deliverables
Deliverable 1: Draft guideline

ACTIVITY 9. Initial guideline drafted available for review
Deliverable 1: Draft guideline

ACTIVITY 10: Stakeholder review and feedback on guideline approach and content vs project objectives
Deliverable 1: Draft guideline

ACTIVITY 11: Design of guide pedagogy and artwork
Deliverable 1: Guideline layout

ACTIVITY 12:Release guideline
Deliverable 1: Release version

Project risks – identify any key risks and propose risk management measures

RISK 1: Incorrect or inaccurate information is published in the final document
Risk mitigation 1: Appropriately qualified and experienced consultant to author the document
Risk mitigation 2: There are appropriate engagement points between the author(s) and experts from organisational partners
Risk mitigation 3: Document is checked by relevant experts from organisational partners during the final editing stages

RISK 2: No uptake/interest in the final document/output
Risk mitigation 1: Relevant sectors are canvassed/surveyed to provide meaningful direction to the project, and to ensure relevance

Risk mitigation 2: Early engagement with relevant sector representatives across the project, in order to ensure support at completion
Risk mitigation 3: There is a clear promotional/distribution plan developed to support dissemination and sector engagement/uptake

RISK 3: Poor performance of a project partner, possibly causing project failure
Risk mitigation 1: Clear roles, responsibilities, inputs, milestones and outcomes agreed at project outset in writing
Risk mitigation 2: Building in some contingency and redundancy by having enough access to expertise and resources in wider project group
Risk mitigation 3: Initial scenario planning to document pivot actions for one or more poor partner performance ("if", "then")

RISK 4: Reputational risk to partners (particularly local government partners) from perceived partner selection bias
Risk mitigation 1: Engage probity advice to provide a transparent Memorandum of Understanding.
Risk mitigation 2: Provide the opportunity for all major developers to participate in the needs analysis webinar/s and survey/s.
Risk mitigation 3: Ensure objectivity and transparency of partner selection, as well as of the guidance and solutions offered.

RISK 5: Regulatory risk where some or all of the information in the guideline is rendered obsolete or incorrect by a regulatory change
Risk mitigation 1: Ensure the most up to date and evolving legislation is addressed and clearly referenced in the guideline.
Risk mitigation 2: Where possible, provide links/contacts for finding or monitoring updates.

RISK 6: Technology risk where some or all of the information in the guideline is rendered obsolete through new or newly adopted technology
Risk mitigation 1: Ensure the broadest possible survey is made of applicable technology solutions for inclusion in the guideline.
Risk mitigation 2: The technology solutions available for energy sharing and trading have been in existence for some time and it is more the regulatory limitations that have prevented the take up of energy sharing and so significant changes in software functionality are unlikely.

How does the project generate new knowledge or innovation?

Local and renewable energy sharing is a developing field of knowledge and practice. It has many tangible benefits for consumers and community resilience, but has yet to be realised at scale in Australia. A mosaic of policy and technical challenges currently hinder these approaches in NSW, which affects the ability of local government bodies, developers and builders who may wish to support their implementation and uptake. A few challenges in the NSW context include the business model that is not core to typical developers in NSW, which has to be adopted to enable energy sharing as well as the policy barriers (such as the strict export limits for example) to be overcome.

As such, this project aims to bring together a range of case studies, research, analysis and technical data in order to generate a genuinely new and innovative resource.

At its completion, the resource will also enable significant flow-on state-wide innovation by supporting the trial and adoption of local and renewable energy sharing, including the following:

- Provide a practical resource that directly aligns with NSW Government's Net Zero Plan and makes a significant contribution to reducing emissions by empowering households to

access renewable energy that is locally sourced and at a lower cost.
- Enable locally-generated renewable energy to be shared with households and businesses that cannot currently afford it, or do not have the amenity to generate it.
- Innovation in economic models. It is possible that when shared energy is traded or transacted, it may offer a better return on investment for those who are able install it. A sale of generated energy for more than the available feed-in tariff from energy retailers is also a possible outcome.
- Test energy sharing's impact on, and contribution to, wider network capacity and stability.
- Enable progress towards larger generation or storage projects through energy sharing networks.

How does your project align with existing strategies or policies to reduce emissions, in particular the NSW Government's Net Zero Plan?

This project directly responds to a number of outcomes sought by a diverse variety of key strategic documents.

From a Campbelltown City Council perspective, these documents include Reimagining Campbelltown CBD Master Plan, the Campbelltown-Macarthur Place Strategy, the Campbelltown 2027 Community Strategic Plan and the Campbelltown Local Strategic Planning Statement. Together these documents promote a bold vision for the future of Campbelltown that:

- Acts on opportunities to create better social, economic and sustainable outcomes.
- Incorporates a smart city approach.
- Places people at the heart of decision-making.
- Reduces the exposure to shocks and stresses.
- Supports a stronger, more connected and resilient community.
- Increases local job opportunities by attracting more knowledge and high skilled jobs.
- Provides infrastructure and services that supports a low resource, low carbon and low waste future.
- Delivers design excellence in build form, public realm and infrastructure.

With regard to the NSW Government's Net Zero Plan, this project addresses all four of the net-zero priorities by:

- Showcasing investment in our universities and businesses that seek to deliver sustainable developments and communities including our partner Landcom in accordance with its Sustainable Places Strategy.
- Demonstrating opportunities to remove unnecessary regulatory and cost barriers.
- Empowering households to choose renewable energy that is locally sourced and at a lower cost.
- Accelerating the research, development and demonstration of low emissions technologies.
- Creating job opportunities in the manufacturing and deployment of renewable technologies.
- Promoting a local economy founded on renewable technology, in line with Landcom's Productive Places Leadership goal.
- Celebrating innovation and early-mover opportunities.
- Contributing to a more resilient energy supply network.
- Providing households with alternative opportunities to source reliable and affordable electricity energy, in line with Landcom's Climate Resilient Places Leadership goal to enable carbon neutral outcomes by 2028 at all new communities.
- Ensuring the NSW Government leads by example, with the involvement of the state-owned corporation Landcom in accordance with its Strategic Directions and aim to delivery more affordable and sustainable communities.

How will you project benefit the NSW Local Government Sector?	
This guideline will support the NSW Local Government sector in transitioning its operations and communities to net zero emissions. It will provide solutions for both existing and new build community precincts and will aim to accommodate variations in technology and legislation. This will provide both cost and emission savings for Councils and communities, and renewable energy sharing will offer councils additional opportunity to support the delivery of low cost renewable energy for community groups, low income and disadvantaged consumers.	
What is your organisation's role in this project?	
Campbelltown City Council will be the key project lead, providing high level governance and administration. This includes bringing together key partners and stakeholders to add collaborative value to the development and outcomes of the project.	
How much are you seeking from the LGNSW Research & Innovation Fund?	$20,000
Your organisation's Cash Contribution	$0
Your Council's In-kind Contribution	Council's in-kind contribution will include providing the staff resources required for the project, as well as effective leadership and project governance. It is anticipated that this will be to the value of approximately $12,000.
Describe the type/s of In-kind contributions your Council will make.	
Council's Sustainability and Resilience Team will be responsible for coordinating the project to ensure that it is managed and delivered on time and within budget. The team will undertake high level project governance and administrative duties	
Policy Principles	Infrastructure
	Planning
	Environment
	Economic
	Social and community
	Governance
	Accountability
Council partners	COUNCIL PARTNER 1. Blacktown City Council: Provide supplementary support to Campbelltown City Council's Sustainability and Resilience Team. While the specifics of this support are currently being confirmed, the project would be used to inform Blacktown City Council's low carbon Blacktown plans for its large-scale north-west growth area and its urban renewal precincts. The project and its outputs offer the opportunity for distributed renewable electricity innovation. This would assist in meeting Blacktown's relevant obligations under the Central City District Plan and in achieving Blacktown's ambitious, aspirational target of zero net emissions for

	Blacktown City by 2040. Contact: Senior Coordinator Environmental Services, Dr Helen Burnie on 9839 6371 or at helen.burnie@blacktown.nsw.gov.au COUNCIL PARTNER 2. The Local Government sector: Through participation in a needs analysis webinar/s and survey/s, the local government sector will contribute to finalise the scope of works by directing the type of information to be included in the resource.
Research Partners – indicate whether discussions about this project have been held with these partners	**RESEARCH PARTNER 1. Landcom**: *Providing $30,000 financial contribution to the project* Landcom is the NSW Government's land and property development organisation. Landcom is a State Owned Corporation working with government and the private and not-for-profit sectors to deliver exemplary housing projects that provide social and economic benefits to the people of NSW. Our mission is to deliver more affordable and sustainable communities that demonstrate global standards of liveability, resilience, inclusion, affordability and environmental quality. Landcom ranked 4th in the Global Real Estate Sustainability Benchmark in 2018, demonstrating the quality of our developments. Guided by three Strategic Directions of Housing, Partnerships and Leadership, Landcom has an extensive tradition of partnering with local councils to deliver exemplary projects, and with universities through the Landcom Roundtable (created in 2017) to advance knowledge and innovation in our communities. We also have bold public commitments as part of our Sustainable Places Strategy to enable carbon neutral outcomes across our communities by 2028. We see this collaboration with Campbelltown Council as pivotal to achieving that outcome. Landcom's communities span many LGAs right across Greater Sydney and both Western Sydney University and Campbelltown City Council are long standing partners. This is why Landcom, through the Macarthur Gardens North project, is very well placed to be involved in such a project. Landcom's involvement in the project will be followed by Jeff Bannerman, Assistant Development Director Macarthur Projects, Lauren Kajewski, Director of Sustainability and Learning, Alex Sommer, Sustainability and Research Manager, and Diane Delaurens, Research Officer. **RESEARCH PARTNER 2. Sourced Energy:**

	Sourced Energy is an advisory firm that specialises in energy markets and renewable energy. Working with over 40 councils in NSW, Sourced Energy's mission is to help people use energy more productively and make clean energy and storage available and affordable for all. Sourced Energy's services help their commercial and government clients reduce energy cost, management burden and environmental impact. Sourced Energy consultants have worked with the major energy users and innovators in Australia and have procured over $5 billion in renewable and regular grid energy over the last 5 years. In 2017/18, Sourced Energy advised Southern Sydney Regional Organisation of Councils (SSROC) in a landmark Power Purchase Agreement for 18 NSW councils, which resulted in an award for Leadership and Innovation from the Local Government Association of NSW. **RESEARCH PARTNER 3. Western Sydney University:** Ranked amongst the top two percent of universities in the world, Western Sydney University values academic excellence, integrity, and the pursuit of knowledge. WSU is located in the heart of one of Australia's fastest growing economic regions, which hosts an increasingly important, dynamic and culturally diverse hub of business, communities and innovation. WSU is globally focused, research-led, and committed to making a positive impact with, and on the communities that we engage with. Western Sydney University welcomes the opportunity to collaborate with Campbelltown City Council, Landcom, Blacktown Council and Sourced Energy for mutual benefit. In doing so, we aim to combine our respective resources to drive innovation in the transition to net zero emission and assist NSW Government's Net Zero Plan. Western Sydney University and Campbelltown City Council have a long-standing established partnership. The University is uniquely positioned to deliver on this collaboration to inform how Campbelltown LGA can harness and pursue opportunities for business innovation, environmental sustainability, and community benefit. Our community of researchers has significant experience in informing policy development and in engaging with our regional communities. Our four research themes cross many of the values that the EOI has expressed – namely: - Environmental sustainability - Urban living and society - Health and wellbeing - Education and aspirational change

	Furthermore, we aim to understand and guide economic, social, and infrastructure change via transdisciplinary scholarship. For this reason, we have purposed configured a research team to harness the complementary value of disparate disciplines. The Western Sydney University through the Urban and Regional Research Program (URRP) team is comprised of highly experienced scholars and practitioners with backgrounds in strategic planning, urban and environmental economics, environmental science, and community engagement. Our interdisciplinary team brings theoretical and practical knowledge (nationally and internationally) on how to provide a blueprint for residential energy sharing and deliver net zero emissions in the longer term. We welcome the opportunity to deliver robust evidence that will enable Campbelltown City Council, Landcom, Blacktown Council and Sourced Energy to advance their continuous innovation to better serve the communities and areas in which it operates. The research team will be led by Nicky Morrison, the Professor of Planning at Western Sydney University, who has over 28 years of experience leading interdisciplinary research team. The URRP team have an excellent track record of working with Campbelltown, and also across Sydney, Australia and internationally, with demonstrable impacts. See https://www.westernsydney.edu.au/urrp/people
Is this application supported by the GM/CEO of this organisation	Supported by the General Manager/CEO
Supporting documents	
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Entry Id: 9	

Lead Organisation	**Lake Macquarie City Council**
Project Leader	Bryn Hernandez
Job Title	Senior Asset Optimisation Officer
Contact details	bhernandez@lakemac.nsw.gov.au 0436 642 001
Project name	**To investigate the stacked benefits and scalability of Vehicle-to-Grid charging for Council's fleet vehicles**
Focus of research	Net zero emissions in energy generation & use, transport, waste and/or land management

Project description – a summary of the project, outlining the need, project location, expected outcomes and how these will be achieved

Electric Vehicles and Facility/Grid Impacts
How V2G can Transform the Business Case for Electrification of Fleet

Background
The emergence of electric vehicles (EVs) as a cost comparable transport option compared to combustion engine or hybrid variants for fleets presents an opportunity to significantly reduce greenhouse gas emissions and improve air quality for metropolitan centres. However, it also presents two significant uptake barriers to fleets:
1. As the number of electric vehicles increases, the parking facility's electrical load increases linearly, and;
2. If the vehicles are attached to a high-density commercial space (e.g. Administration Building or Hospital where pool-cars are used throughout the day by staff for work purposes) then this electrical load will also impact the building and subsequently the grid.

Project description
The proposed project is to purchase a minimum of 3 x Nissan Leaf hatchbacks and install 3 x V2G (Vehicle to Grid) capable charging stations. Council's car-park has been installed with number plate recognition CCTV to monitor the entry and exit of all pool vehicles to gather car-park car occupancy vs car time 'off-site'.

Earlier this year, Lake Macquarie City Council developed and upgraded an existing staff car-park located in close proximity to the main administration building in Speers Point. Solar Shading structures capable of generating 150 kW of electricity have been installed over 53 car spaces, the car-park is connected to the main administration building via underground power/communications. Within the car-park itself, during disturbance works, provisioning has been made within the car-park to allow for the modular expansion of electric vehicle charging with power and communications conduits laid to each parking bay for eventual electrification. Council has envisaged the eventual replacement of combustion engine and hybrid vehicles to full electric and laid the groundwork to allow for this future state.

Project Need
Council needs to commence testing V2G charging with real pool vehicles that will be utilized during the day for normal staff duties. The interaction of these cars with the facility through bi-directional charging will inform Council and others on important variables and considerations which come into play when considering fleet electrification. This is an area where more information is needed;

1. Using the outputs from the trial to give Council and partners the data required to design

a successful control and scheduling strategy for a large number of EVs connected to a large facility where V2G is involved
2. Determining the level of reliability can be expected from V2G support services from electric vehicles that are connected to a facility and the grid.
3. Quantifying how responsive V2G chargers and vehicles are to the power needs of a facility, especially during grid outage (disaster) events.
4. Confirming how successful the economic modelling has been for the combined energy eco-system solution that has been designed at Council's Blue car-park. The intent of the energy eco-system is to avoid upgrading the network when widely electrifying fleet by: having a building connected to grid, have significant onsite solar, have a significantly sized electric fleet which is connected to the main facility with the option to utilise the "batteries on wheels" as well as stationary battery storage.
5. What impact does driver/user behavior have on the availability of cars for V2G services when they are needed?
6. What interface, programming, control structure and algorithms need consideration and design work to successfully link EV batteries into a more comprehensive energy eco-system which involves; the cars, local solar PV, facility load limits, stationary battery storage and grid services? (refer to diagram)

Project Location
85-87 Lakeview Street, Speers Point - LMCC's Staff Blue Car-Park

Project Outcomes
Real world data on Council fleet vehicles being utilized for both battery support/load support for the facility they are connected to and their ability to function as a fully utilized pool vehicle for Council's fleet. Supporting data for the outlined business case and roadmap of how Council's should best prepare and invest in the electrification of fleet and charging hardware.
1. Real world data on pool cars to provide a breakdown between; Time spent connected to V2G Charger, time spent disconnected from V2G charger and a comparison of time spent off-site.
2. Experimenting with the level of charge within vehicles to support building load and monitoring the effect on the transport usage impact on vehicles and to assess this through differing periods of the day
3. Determine whether machine learning benefits assigning charging locations to specific vehicles; e.g. Vehicle A has relatively low usage per day, or low km travelled and so is a candidate for more extensive usage of the battery for building load purposes compared to Vehicle B which has high usage/day and low occupancy in the car-park

Project objectives

Procure, install and trial the integration of multiple V2G chargers (and vehicles) connected to a Council facility in conjunction with on-site solar generation. To trial the parameters of the V2G chargers under a variety of operational scenarios and to extrapolate the data to confirm that full electrification of the car-park is not only viable, but in fact improves the business case for EVs, while avoiding upgrades to the local grid infrastructure and improving local grid stability and grid health.

Project methodology – outline the steps and actions that will be taken to achieve your objectives

Council has already undertaken initial conversations and planning with Ausgrid, Jet Charge, an Australian Manufacturer of V2G hardware and the Institute for Sustainable Futures (who also assisted Council in the development of our Electric Vehicle Charging Strategy for the city).

Step 1: Firm up involvement with proposed partners and progress from NDAs to written agreements outlining the specific roles, responsibilities and financial commitments of the respective partners
Step 2: Develop detailed project schedule and key milestone dates
Step 3: Commence procurement of vehicles and other long lead-time equipment
Step 4: In parallel, desktop design scenarios and control strategies to test for effectiveness during the trial period
Step 5: Install V2G hardware, test software, train staff in the use of vehicles and charging stations and commence trial.
Step 6: In parallel during the trial, monitor and analyse the data from the trial and meet monthly to review information and propose modifications to trial methodology.
Step 7: Complete trial, compile data, analysis and modelling.
Step 8: Draft Report and findings and share with LGNSW

Project milestones, outputs and outcomes

Milestones
1. Research and Innovation Agreement between proposed Partners and Council
2. Procurement approval of vehicles and hardware
3. Arrival of vehicles and hardware
4. Installation and commissioning
5. Testing and verification of trial scenarios
6. Data analysis
7. Draft Report
8. Final Report

Outputs: Final Report, and data analysis on the effect of V2G in supporting wider electrification of fleet to minimize network impacts and avoid infrastructure costs.

Outcomes:
A roadmap for Councils to invest in electrification of fleet that comes with a supportive economic modelling package (targeting <10 year return on investment).

Useful data and analysis to guide suitable control strategies and machine learning algorithms for effective V2G scheduling for local government fleet and their usage.

Verification on the utility and responsiveness of V2G battery services for both Council buildings and the grid.

Validate whether V2G improves peak demand and grid health for the DNSP

Determining the best fleet V2G model/configuration for local government

Demonstrating a replicable model for other local governments to adopt

Project risks – identify any key risks and propose risk management measures

RISK: Impacts of COVID on vehicle or hardware procurement
MITIGATION: Early engagement with suppliers to understand lead-times and to commence initial engagement with minimum two V2G suppliers to ensure that at least one company's product timeline suits the project timeline as COVID or other factors may influence their V2G technology progress

RISK: DNSP (Distributed Network Service Provider) approval to conduct a V2G trial is difficult to acquire, or is refused (in the absence of a national standard for V2G hardware)
MITIGATION: Ausgrid have already indicated interest in supporting the trial, have been

engaged with to be a trial partner and are proposing to consider 'in-kind' contribution of key staff time to support Council's V2G trial.

RISK: Electrical Safety
MITIGATION: Adherence to Australian standards, work conducted by qualified electrical contractors and designs undertaken by qualified electrical engineers. For trial equipment; bench-testing and proof of safety results for equipment that is yet to be certified under the relevant Australian Standard (e.g. Trial V2G hardware)

RISK: Equipment failure
MITIGATION: Minimum 3 units to be installed and tested; discuss with hardware supplier and ensure critical spares are held to replace any equipment that develops a fault.

How does the project generate new knowledge or innovation?

To the best of Council's knowledge, this trial breaks new ground by generating real data on the economics and utility of fleet conversion to electricity. The other benefit is the practical economic pathway for improvement in fuel security to Council's operations in light of COVID, whilst also making significant steps to reduce emissions from the transport sector. The eco-system design of car-park, on site renewables, EVs providing battery storage and modular expansion of vehicles from combustion to electric is also innovative and shows how Council can align spending on renewables to achieve positive greenhouse gas reduction measures with real operational cost savings. This trial will provide information that will assist decision-making in the design of fleet-hosted car-parks that are electric vehicle ready in a cost effective manner.

How does your project align with existing strategies or policies to reduce emissions, in particular the NSW Government's Net Zero Plan?

In 2009 Lake Macquarie City Council adopted its Greenhouse Gas Reduction Policy to reduce emissions from a 2008 baseline by 3% per annum for Council and 3% per capita/ annum for the city. These targets have recently been restated as a 57% reduction by 2027 in the LMCC Environmental Sustainability Strategy and Action Plan (ESSAP) (adopted in 2020)

The transition to a zero-emission transport for Council fleet and the city are key actions within the ESSAP to support the achievement of the emission reduction targets. Recognising the role of fleet electrification, Council developed a dedicated EV charging strategy (adopted in 2020). It provides a framework for decision making regarding charging infrastructure for the fleet and the city. This strategy was recently recognised as the successful finalist at the Cities Power Partnership award for Sustainable Transport. These Council adopted policies and strategies are closely aligned with the goals of the NSW Net Zero Plan.

Along with the transition to zero emission vehicles, the project allows multiple value streams for EV Technology to assessed. The technology and control strategies to be tested are designed to facilitate the greater integration of distributed solar at facilities through use of vehicles battery storage to absorb and make renewable energy available to not only support zero emission transport but also improve local energy security and resilience for the hosting facility and the wider electrical grid.

How will you project benefit the NSW Local Government Sector?

By providing a replicable model, with real-world supporting data that demonstrates how to electrify Council's light passenger and commercial fleet in a cost effective manner. The data aims to validate the importance of investing in V2G capable vehicles and charging infrastructure, whilst reducing greenhouse gas emissions, the value stack is important to present a compelling business case as well as environmental case. The project site and installation is a live site, a testing sandpit aiming to prove the benefit of an energy eco-system design where Council facilities are a coordinated system of solar PV, battery storage on wheels, stationary battery storage and capable of operating without grid power

during a disaster (which is a compelling investment consideration for a local government wishing to maintain service levels during disasters to support affected communities). The outputs of the trial should strengthen the fuel security of Local Government vehicles, show that trust in local government is warranted by demonstrating savings on operational costs. The project aims to provide an approach to fleet transition to electric vehicles that meet the state's greenhouse gas reduction targets, yet provides a host of other benefits some of which are financial and operational by making the transition in the manner outlined above.	
What is your organisation's role in this project?	
Project lead, main investment partner and coordinator	
How much are you seeking from the LGNSW Research & Innovation Fund?	$25,000
Your organisation's Cash Contribution	$188,780
Your Council's In-kind Contribution	$25,200
Describe the type/s of In-kind contributions your Council will make.	
Senior Council Officer Project Management & Coordination: 120 hours, data analysis and report writing: 100 hours, Comms and media packages 16 hours	
Policy Principles	Infrastructure
	Economic
	Environment
Council partners	Ausgrid - Smart Grids and Demand Management 'In Kind' Staff time has been verbally discussed to support a Council led V2G trial in Lake Macquarie. David Dawson - Program Development Manager Phone: 0408 725 792 Email: david.dawson@ausgrid.com.au Robert Simpson - Smart Grids and Electric Vehicles Email: robert.simpson@ausgrid.com.au Rectifier Technologies V2G Charging Hardware Supplier Contribution: Staff time and trial V2G hardware Stephanie Lai - Business Development Manager Email: stephanie.lai@rtl-corp.com
Research Partners – indicate whether discussions about this project have been held with these partners	UTS Institute for Sustainable Futures Research, data analysis and report writing Dr Scott Dwyer: Research Principal Phone: 0451 596 030 Email: scott.dwyer@uts.edu.au Yes discussions have been held with this research partner
Is this application supported by the GM/CEO of this organisation	Supported by the General Manager/CEO
Supporting documents	

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Entry Id: 8

Lead Organisation	**Bathurst Regional Council**
Project Leader	Raymond Trevorah
Job Title	Waste Management Coordinator
Contact details	raymond.trevorah@bathurst.nsw.gov.au 0417 065 578
Project name	**Closing the Gap on Food Waste**
Focus of research	Net zero emissions in energy generation & use, transport, waste and/or land management

Project description – a summary of the project, outlining the need, project location, expected outcomes and how these will be achieved

This project will trial new models of domestic and commercial food waste collection with the aim of significantly increasing the diversion of food waste from landfill. Bathurst Regional Council (BRC) has a residential Food Organics and Garden Organics (FOGO) kerbside collection for standalone properties, but audits have demonstrated that only (7-8.5%) of food waste is being recovered through this system. This compares with 92% of garden waste which is recovered through the same collection system. There is no council collection of commercial food waste in Bathurst and most food waste from commercial kitchens and restaurants is lost to landfill. NSW Councils have, to date, not established a viable model for the collection of commercial and kitchen waste due to several barriers including: the weight of food waste generated, the potential for odour issues from putrefying food waste, space requirements for the multi-bin system and lack of engagement.

Emissions from landfill is the largest contributor to greenhouse gas emissions from the operations of Council. On average over the last five years, 68% of Council emissions were from landfill. To implement a net zero emissions from organic waste by 2030 Council must identify methods to divert more food organics from the waste stream as identified in NSW DPIE Net Zero Plan. Food waste lost to landfill from the kerbside residential collection in Bathurst is estimated to be ~2,300,000 kg emitting an estimated 4,800,000 kg of CO2 equivalence in greenhouse gas emissions per annum. While no audit data is available it is estimated that at least as much again is emitted from commercial food waste disposed of at landfill.

This project will involve empirical studies of:

1. A Central Business District (CBD) commercial food waste collection. This trial will comprise a daily food waste collection from a range of restaurants and kitchens. Participants will be provided with a 60L kitchen insert bin and 120L FOGO collection bin as well as educational material to support the correct classification of organic materials.
2. Domestic food waste collection models derived from a four-factor trial which includes Business As Usual (BAU) weekly collection with caddy but no liners provided), frequency and size of collection of red general waste bin, use of different caddy liners. Participants will be provided kitchen caddy, caddy liners as well as educational material to support the correct classification of organic materials

Results from the trials will be analysed and used to inform the development of an improved food waste collection service for Bathurst that achieves best practice diversion of food waste.

Council will partner with ANL to process the trial material. The trials will utilise Council's

own waste collection vehicles.

Council has identified University of Sydney as a research partner who have proposed an intern student to assist with trial design, implementation, and analysis.

The FOGO model developed will be presented to the NetWaste group of Councils, RENEW NSW group and learnings will be transferable across NSW.

Project objectives

To identify best practice models for diversion of domestic and commercial food organics from landfills in regional NSW.

To produce a strategic transition plan for BRC to reach best practice diversion of domestic and commercial food organics from landfill.

Share learnings of the project with NSW regional councils

To increase understanding of key drivers of community behaviour which will support increased diversion of food organics

Project methodology – outline the steps and actions that will be taken to achieve your objectives

Commercial
1. Finalise trial design
2. Engage with businesses, establish trial participants, define collection route, collect baseline survey data of waste management for participating businesses
3. Purchase materials and provide to participants
4. Run trial and collect data (lift data, weights, post-trial survey)
5. Analyse data and model the financials
6. Final report including business case

Residential
1. Finalise trial design
2. Identify testing areas and allocate treatments
3. Engage with participating residents, baseline survey
4. Run trial and collect data including conducting a minimum two material audits of the red and green bin (lift data, weight data, etc)
5. Analyse data and model the financials
6. Final report including business case

Project milestones, outputs and outcomes

This project will have 4 major milestones through its timeline with a final report as its output and the outcome being findings that guide Councils and NetWaste on what is the best practice for commercial and residential organic waste management.

Projected Timeline:
Project inception -Dec 2020
Preplanning -Jan-March 2021
Delivery of MGBs, Caddies and Liners- March 2021
Trial operation - April -Aug 2021
Analysis of Trial and Report Drafting- Sept- Nov 2021
Project Completion - Dec 2021

Outputs
From this project a final report and business case will be generated on both the commercial and residential trials.

The findings of these reports will be shared between NetWaste group and other councils

to aid achieving best practice organic waste capture.

The project will provide a mechanism to identify business champions for future food organics program development.

Outcomes
The business cases generated through this project will be used to guide Councils future waste services and waste policy as we strive to achieve best practice in organic waste diversion.

The project will identify barriers and behaviours which must be addressed for successful capture of FOGO in regional communities.

The project will result in improved relationships between businesses and Council in relation to waste management and resource recovery.

The project will support the development of a local circular economy for food organics engaging both residents and businesses.

Project risks – identify any key risks and propose risk management measures

1. Businesses and industries could contaminate or abuse the trial food waste diversion service. Audits will allow for this to be reviewed throughout the project timeline. Issues will be addressed by engagement with the businesses concerned.

2. Residents may abuse or misuse the service following the implementation of the trial areas. This will be monitored and where issues occur, they will be responded to through targeted education

3. Lack of take up by businesses to participate in trial. Communicate short- and long-term benefits of diversion of food waste including cost reduction to the business. Introduction of a recognition system for businesses which perform well in food waste diversion

4. Student withdraws or is unable to complete project. Council would use internal capacity to complete onground trials and seek assistance from local CSU marketing or business students for rolling out of predetermined communications and engagement strategy.

How does the project generate new knowledge or innovation?

This project will identify a new food organics collection model to allow city-wide diversion of commercial food waste from landfill. To Council's knowledge this has not previously been achieved in NSW.

The scientific approach to the trials will provide evidence that is not currently available as to the efficacy of different model components in achieving higher food organic diversion rates from the commercial waste stream. -.
This crucial information will greatly help define what is best practice for implementation of food waste diversion programs for regional towns and cities within NSW.

Findings from these works will be presented in a case study report and potentially be presented at the next available Waste EXPO or Waste Conference.

The project will also design and trial a new recognition system for businesses which achieve high food waste diversion (similar to NSW Food Authority, scores on doors program).

How does your project align with existing strategies or policies to reduce emissions, in particular the NSW Government's Net Zero Plan?

This project strongly aligns with the NSW Governments Net Zero Plan by supporting Priority 1 "Net Zero Emission from Organic Waste". The NSW plan states that it will

support councils to provide “best-practice food and garden waste management”. To achieve this for Bathurst and the rest of regional NSW it must first be determined what is “best-practice” for regional NSW. To date councils have adopted a wide range of models for delivery of FOGO services with varying success. Through this project it is hoped that a best practice service delivery model for residents and business can be empirically demonstrated to achieve the greatest levels of organic waste landfill diversion and reduction in subsequent emissions.	
How will you project benefit the NSW Local Government Sector?	
The findings of the work will provide a strong framework of how regional councils can best implement food waste collection programs to minimise food waste to landfill.	
What is your organisation’s role in this project?	
Council will oversee the project and operate the collection of the food waste trials. Council will assist in communication with both local businesses and residents on the program and aid in the educational component of the research project.	
How much are you seeking from the LGNSW Research & Innovation Fund?	Total $22,800 $8,300 to fund purchase of • Commercial kitchen bins • Mobile Garbage Bins • Caddies • Liners $14500 to fund 50% of the costs for a Sydney University intern student
Your organisation's Cash Contribution	$40,500
Your Council's In-kind Contribution	$26,625
Describe the type/s of In-kind contributions your Council will make.	
• Standard staff time $10,400 • Use of council’s collection vehicles $4,000 • Staff guidance and mentoring of intern student. $10,400 • Use of Council land and offices for project basing and storage. $1,825	
Policy Principles	Infrastructure
	Planning
	Environment
Council partners	Bathurst Business Chamber- participation of businesses who will be part of the trial. ANL- Undertake the composting and assisting with material audits

Research Partners – indicate whether discussions about this project have been held with these partners	Sydney University- provision of intern student who will assist in the research and analysis of the works
Is this application supported by the GM/CEO of this organisation	Supported by the General Manager/CEO
Supporting documents	
letter_of_support_bathurst_business_chamber.pdf 290.49 KB · PDF	
Entry Id: 7	