Regional Greenhouse Alliance Neighbourhood Battery Investigation Project (RGA-NBI)

Business Case

Prepared by Indigo Power – August 2024

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Executive Summary

Background

The *Regional Greenhouse Alliance Neighbourhood Battery Investigation* (RGA-NBI) project is delivered by the Central Victorian Greenhouse Alliance (Lead Organisation), in partnership with the Goulburn Murray Climate Alliance, Gippsland Alliance for Climate Action, and Indigo Power (Project Contractor). This project responds to an identified need to enhance energy resilience at council-owned community facilities in regional and rural areas experiencing the impacts of climate-related events, and where energy reliability is in ongoing challenge.

Objectives

The project aims to support an expedient roll-out of neighbourhood batteries across regional Victoria through the development of a replicable model for neighbourhood batteries on council-owned community facilities, with a focus on community energy resilience.

The objective of the project is to develop an investment-ready business case for a pipeline of neighbourhood battery projects, while supporting broader knowledge sharing and learning on the role of councils in the roll-out of neighbourhood battery technologies.

Prioirty objectives for councils participating in this project reflect the community benefits that regional councils expect neighbourhood batteries to deliver, including:

- Energy resilience: providing backup power at critical community facilities during emergency events and extended grid outages.
- Environmental benefits: reducing greenhouse gas emissions, supporting electrification, and providing renewable energy to the site and community.
- Cost savings: driving down site energy bills for councils and community groups, with savings directed to community initiatives.

Outcomes

An overarching business case has been prepared for 21 market exposed, behind-the-metre neighbourhood batteries providing backup power to community facilities in participating local government areas. The proposed neighbourhood battery systems are designed to contribute to the decarbonisation, electrification, and climate resilience goals of participating councils and their communities. The business case assesses the financial, community, and network benefits that can be derived from the proposed neighbourhood battery systems, and provides an overview of system design specifications, cost breakdowns, and financial modelling results for each site.

Systems designed through this project range in size from 25kW/50kWh to 100kW/300kWh. With a focus on energy resilience, systems are designed to provide backup power to critical circuits at the host site for 2-3 days from the battery alone (15-60kWh per day), with the option to extend backup power through an add on management system to enable battery charging from solar in island mode.

The commercial and operating models outlined in the business case provides a low-risk and low-input solution that maximises energy resilience, environmental, and cost saving benefits for councils and communities. Two commercial options are modelled in the business case:

- Option A: Third-party ownership and operation via a site lease and Power Purchase Agreement (PPA).
- Option B: Host site ownership and third-party operation via an equipment lease and PPA.

14 of the 21 sites have a positive financial case for Option A and/or Option B, with cost savings achieved for the host site and a payback period under 10 years. This analysis assumes the availability of up to $300,000 in grant funding per battery, with a 10% cash contribution to the total cost of the project (including 100% of any solar PV capex to be covered by the proponent).[1]

The financial case for 7 sites is negative for both Option A and Option B. Factors contributing to poorer financial performance at these sites include:

- Larger battery systems designed to achieve energy resilience objectives resulting in higher project costs (over $300,000) and cash contribution amount.
- Larger site loads requiring installation of larger solar PV systems to supply both the load and charge the battery.
- Smaller site loads with greater market engagement increasing exposure to wholesale spot market prices.
- Sites with existing solar PV systems and/or batteries that capture most of the available financial benefits at the site (without achieving desired energy resilience objectives).
- Sites with technical constraints that increase installation costs.

Non-financial benefits can be achieved at all sites, if there is an appetite to invest in these outcomes.

Working across a variety of sites in 21 regional LGAs, this project has contributed to local governments' understanding of the factors that influence the business case for neighbourhood batteries on different types of council-owned community facilities, and the role that councils can play supporting the energy transition and uptake of distributed energy technologies in their communities.

Outlook

Financial modelling and analysis for this business case was completed prior to the release of Round 2 funding guidelines for the 100NB Program. Due to time and budget constraints, it was not possible to undertake detailed revised modelling, however, a high-level assessment indicates that the updated guidelines will materially strengthen the business case for the proposed neighbourhood battery systems (see the Addendum on p.44).

Up to $400,000 is available per battery, with a minimum 5% cash contribution to the total requested grant amount, through Round 2, Stream 3 of the 100NB Program. Based on these revised funding guidelines, the financial case for 20 of the 21 sites is likely to be positive for Option A and/or Option B. Projected electricity cost savings are expected to range from $892 to $232,132 across sites, with a median cost saving of $48,071. These sites are projected to have a payback period under 10 years, with the best performing sites expected to recover capital costs within 2-5 years.

Implementation of all or some of the 21 neighbourhood battery systems designed through this project would represent a significant contribution to scaling-up delivery of neighbourhood batteries in Victoria. Participating organisations are actively exploring next steps for an individual or joint grant application through the 100NB Program. Grant funding would provide an opportunity to test this model in practice, supporting ongoing innovation and learning, and demonstration of the role that local governments can play in deployment of distributed energy technologies. Delivery would allow councils to participate in the ownership and

[1] This assumption was based on CVGA and Indigo Power's broad interpretation of the funding guidelines for Round 1 of the Victorian Government's 100 Neighbourhood Batteries Program. Funding guidelines for Round 2 were release after modelling for the RGA-NBI project was completed. As such, the assumptions underpinning the financial modelling presented in this report are not consistent with current funding guidelines, and revised modelling will be required for any councils seeking to purse a grant application under Round 2 or Round 3 of the 100 Neighbourhood Batteries Program.

operation of neighbourhood batteries, and to assess the positive impact of battery technologies for replication at other council sites. Third party ownership and/or operation of the proposed neighbourhood battery systems on council-owned community facilities would also provide an opportunity to develop and test operational procedures (such as switching from financial performance mode to energy resilience mode, and reserving capacity in the lead up to extreme weather days) that balance commercial and community interests to achieve broader community benefit outcomes. This would be an important innovation of project delivery.

1. Introduction

1.1 Project Background

The Central Victorian Greenhouse Alliance (CVGA) in partnership with the Goulburn Murray Climate Alliance (GMCA), the Gippsland Alliance for Climate Action (GACA), and Indigo Power (IP), have been funded by the Victorian Government's Neighbourhood Battery Initiative (NBI) Round Three to deliver the *Regional Greenhouse Alliance Neighbourhood Battery Investigation (RGA-NBI) Project*.

An investment-ready business case and site-specific plans have been developed for 21 neighbourhood batteries in participating local government areas across regional Victoria, with a focus on behind-the-meter systems designed to support energy resilience at council-owned community facilities.

Twenty councils and one Alpine Resort have participated in this project.

Table One. Participating organisations and proposed battery sites

Participating Organisation		Proposed Battery Site
1	Alpine Resorts Victoria (Falls Creek)	Falls Creek Wastewater Treatment Plant
2	Alpine Shire Council	Bright Community Centre
3	Ararat Rural City Council	Pomonal Hall and Men's Shed
4	City of Ballarat Council	Ballarat Badminton Stadium
5	Baw Baw Shire Council	Neerim South Recreation Reserve
6	Benalla Rural City Council	Sir Edward Weary Dunlop Learning Centre
7	Greater Bendigo Shire Council	Epsom Huntly Recreation Reserve
8	Campaspe Shire Council	Echuca War Memorial Aquatic Reserve
9	Central Goldfields Shire Council	Maryborough Aquatic and Leisure Centre
10	East Gippsland Shire Council	Lucknow Recreation Reserve
11	Gannawarra Shire Council	Sir John Gorton Library
12	Hepburn Shire Council	Doug Lindsay Reserve
13	La Trobe City Council	Gippsland Regional Indoor Stadium
14	Mansfield Shire Council	Bonnie Doon Recreation Reserve
15	Mildura Rural City Council	Alfred Deakin Centre
16	Mount Alexander Shire Council	Wesley Hill Stadium
17	Murrindindi Shire Council	Marysville Community Centre
18	South Gippsland Shire Council	Korumburra Indoor Recreation Centre
19	Strathbogie Shire Council	Euroa Depot
20	Swan Hill Rural City Council	Swan Hill Basketball Stadium
21	Wangaratta Rural City Council	Wangaratta Spots and Aquatic Centre

The Victorian Government is funding 100 neighbourhood batteries over a three-year period through the 100 Neighbourhood Batteries (100NB) Program. Applications for 100NB Round 1 closed in 2023, with up to $300,000 project funding available per battery. 100NB Round 2 applications will open in August 2024, with a third and final funding round expected to open in the second half of 2025.

Neighbourhood battery technologies and business models are in the early stages of development and neighbourhood battery projects are not financially viable without the support of grant funding. Grant funding provides an opportunity to cover most of the costs associated with the installation of a neighbourhood battery, thereby mitigating financial risk and supporting innovation and learning.

This business case is designed to meet the objectives of the 100NB program and provide relevant information to support applications to this fund.

1.2 Project Objectives

100NB Program Objectives

The objectives of this business case are derived from the objectives of the 100NB Program (Round 1), with certain of these objectives foregrounded according to the priorities and requirements of participating organisations.

The 100NB Program seeks to deliver on the following objectives:

- Benefits from local renewable energy and energy storage are passed on to consumers, including lowering household energy bills.
- Increased energy reliability.
- Reduced costs of network upgrades.
- Support the ability of communities to personally contribute to Victoria's energy transition.
- Scale up the delivery of operational models for neighbourhood-scale batteries.

Priority will be given to projects that demonstrate one or more of the following attributes:

- Deliver benefits to low income and vulnerable households.
- Deliver benefits to households with no access to solar PV generation, such as renters and apartment dwellers.
- Contribute to completed or scheduled works that increase the electrification of the local community and/or the premises on which the battery is located.
- Demonstrate increased benefits for local electricity consumers via a novel battery operational and/or commercial models.
- Located in network areas with poor reliability, particularly in regional areas where addition of a neighbourhood battery will increase energy reliability.
- Located in constrained networks with solar export limits where addition of a neighbourhood battery will reduce network constraints and increase local hosting capacity for solar.
- Located within one or more of the 29 Local Government Areas (LGAs) committed to by the Victorian Government (See Appendix 1).
- Deliver a greater number of batteries and faster deployment timelines.

RGA-NBI Project Objectives

This project responds to an identified need to enhance energy resilience at council-owned community facilities in regional and rural areas experiencing the impacts of climate-related extreme weather events, and where energy reliability is in ongoing challenge. The project also aims to support the broader emissions reduction, decarbonisation, electrification, and climate resilience goals of participating organisations.

Priority objectives for neighbourhood batteries designed through this project were identified through a survey of participating organisations. These objectives include:

1. **Energy resilience:** providing backup power to host sites during an emergency or extended grid outage.
2. **Environmental impact:** reducing emissions and providing renewable energy to the site and the community.
3. **Cost reduction or budget saving measures:** reducing electricity costs at council-owned community facilities.

Survey respondents ranked their objectives from highest (1) to lowest (7). As Table Two below shows, resilience, cost savings, and environment were ranked the highest priorities by participating organisations (in that order). There is a clear gap to the remaining four objectives – providing locally generated energy to households, providing an investment opportunity, network benefits, and innovation.

Table Two: Results of survey on priority objectives

Neighbourhood Battery Objectives	**Average Priority Rating** 1=Highest Priority 7=Lowest Priority
Resilience: provide backup power to the host site during an outage	2.3
Cost savings: reduce electricity costs at host site	2.4
Environment: providing renewable electricity to host site and community	3.1
Innovation: establishing the case for neighbourhood batteries	4.6
Network benefits: improving grid reliability	5.0
Investments: providing financial returns to council or the community	5.3
Households: providing locally generated renewable energy to households	5.3

The following statement from one of the councils participating in this project is reflective of the views of many project participants:

Council is committed to emissions reduction through the … Climate Action Plan 2022-30. Moving the … Aquatic and Leisure Centre to 100% renewable energy would be a significant achievement. Increasing energy costs for this facility are a concern for its operator and Council. Reduced operating costs achieved through a battery would be very compelling for Council ... This facility is our Shire's largest relief centre. The ability to have a secure, renewable energy source in an emergency situation is also a high priority of Council. Council is unlikely to have the expertise, resourcing, or risk appetite to use this project as an investment opportunity seeking financial returns.

Based on these survey results, and further consultation with project participants, the objective of this project has been to develop a business case that details a commercial and operational model capable of increasing energy resilience and reliability at critical community sites, whilst reducing greenhouse gas emissions and site energy costs.

1.3 Neighbourhood Batteries

Desires for equity, resilience, and rapid decarbonisation are dominant in people's enthusiasm for neighbourhood batteries[2]

Australia is currently performing research and large-scale pilots to trial neighbourhood batteries. A neighbourhood battery is an electricity storage system, larger than a household

[2] https://reneweconomy.com.au/neighbourhood-batteries-if-you-want-to-bring-power-to-the-people-you-need-to-listen-to-what-they-want/

battery and smaller than a utility-scale battery, sometimes referred to as a 'community battery' or 'mid-scale battery'.

In addition to the services that larger utility-scale battery energy storage system can provide by participating in the energy and frequency control markets, a mid-scale neighbourhood battery can:

- Provide local network support services to support energy imports (e.g. discharging during peak demand, and phase balancing).
- Provide local network support services that enable energy exports (charging and/or absorbing reactive power during peak exports).
- Improve energy reliability and/or resilience (e.g. islanding the local low voltage or high voltage network to prevent interruptions to electricity supply).

Neighbourhood batteries are typically located 'front of meter' (FOM), outside of a property in front of the utility meter, with the absence of load at the connection point. FOM batteries can be installed on public land (such as road reserves and parks), on Distributed Network Service Provider (DNSP) owned infrastructure (such as power poles), or at a dedicated connection point on private land. To our knowledge, the first FOM battery trial was the Alkimos Beach Energy Storage Trial[3], which had a storage capacity of 1.1 MWh. FOM batteries are 'standalone', being situated at a connection point where there is no additional on-site load, and do not provide site islanding capability.

Another approach to the delivery of neighbourhood batteries is to install the battery 'behind the meter' (BTM) at an existing connection point on the customer's side of the utility meter where there is load and solar PV, and where the size of the battery exceeds on-site load allowing the site to engage with energy markets and services beyond the meter. This type of battery is sometimes referred to as a 'neighbourhood power plant' (NPP), which can be defined as follows:

A neighbourhood power plant is a medium-scale (50 kW - 5 MW) battery energy storage system connected to the distribution network, which primarily charges from co-located renewable energy generation that is surplus to load at its connection point, and primarily exports its stored usable energy into the distribution network.

This definition distinguishes an NPP from other neighbourhood batteries that exclusively or primarily charge from the grid. It also distinguishes NPPs from solar-battery systems which discharge either exclusively or primarily to load at the connection point. Importantly, an NPP battery energy storage system is situated behind an existing meter and connection point, can provide the site with backup power when the grid is down, and can engage with energy markets and services beyond the meter.

As energy resilience is a primary objective of this project a BTM NPP battery model has been designed for each of the 21 sites in this project. For participating organisations, the BTM NPP battery model offers the most practical solution to achieve project objectives compared to alternative solutions:

- A BTM NPP battery system is charged primarily from solar energy generated on site. It delivers daily environmental outcomes, while diesel generators do not.
- The charging of a BTM NPP battery system is automatic. Diesel generators require re-fueling and the handling of hazardous materials on a regular basis.

[3] https://arena.gov.au/knowledge-bank/alkimos-beach-energy-storage-trial-final-report/

- BTM NPP battery systems offer larger amounts of storage. This means they can provide greater energy resilience outcomes compared to the smaller solar-battery systems that are typically installed at council sites. These smaller, self-consumption only solar-battery systems are unable to provide material backup storage (days) without the support of diesel generators.
- With grant funding available, a market exposed BTM NPP battery system can deliver better financial outcomes by generating additional revenue to assist in the recovery of capital costs and to protect the host site from price increases in the electricity market.

1.4 Energy Resilience

The sites assessed as part of this project are situated in rural and regional local government areas where recent bushfires, floods and storms have caused extended power outages. In these areas, communities and councils are seeking to ensure that reliable power is available at critical community facilities, especially those that provide services in emergency events, Battery systems developed through this project are designed to backup power at strategic circuits to provide the highest impact, longest duration backup power at each facility.

This project builds on lessons from energy resilience projects in the Upper Murray and Tumbarumba communities following the 2019/20 Black Summer Bushfires, where three community scale batteries have been delivered at hospitals and evacuation centres, a further 42 smaller solar/battery/generator energy nodes have been installed, and a community battery is scheduled for installation at the Tumbarumba Showgrounds.

The project has also sought to balance energy resilience objectives with financial and environmental objectives, with battery systems designed to increase the provision of renewable energy to each site and maximise revenue generation potential. The balancing of these objectives in operation will require the development of operational procedures capable of foregrounding different imperatives in response to automatic or manual signals, for example, switching to energy resilience mode from financial performance mode, and directing the operator of the battery to reserve capacity in the lead up to extreme weather days.

The development of these operational procedures requires further stakeholder consultation and discussion of optimal site use that is beyond the scope of this business case. The availability of grant funding through the 100NB program allows for further design and development of procedures for balancing financial and resilience objectives, without additional upfront or ongoing cost to the project participants. There are no known examples of similar procedures, and associated commercial arrangements, and the development of an approach for balancing resilience and financial outcomes would be an important innovation of project delivery. These procedures would be developed in consultation with the selected operator of the batteries and tested during project delivery phase.

1.5 Industry Context

Neighbourhood batteries are in their early stages of commercial development. Although neighbourhood batteries are capable of delivering environmental, resilience, community, network, and financial benefits, they remain some way from an established commercial product or model. Neighbourhood battery systems installed under the 100NB program will contribute to further innovation and learning.

The rollout of early-stage neighbourhood batteries is occurring within the context of the transition of Australia’s energy system to renewable energy, which brings with it significant change. This transition means that the financial information presented in this business case is subject to material changes as developments in Australia's energy sector, and in neighbourhood battery operational models, continue.

This section provides a high-level account of changes underway, and how they are likely to impact the delivery and operation of neighbourhood batteries. Importantly, many of the changes underway support, rather than hinder, the commercial operation of neighbourhood batteries.

Technology

Battery technology is rapidly developing, resulting in new chemistry types and higher storage and power density. The commercial deployment of energy management system technology and associated software for distributed energy resources is in its infancy for behind the meter neighbourhood battery management. For instance, the development of a or procedure to balance resilience objectives with financial objectives would be an innovative output of battery delivery through the 100NB program.

Commercial

Commercial arrangements for delivering neighbourhood batteries are in early stages of development. Virtual power plant options are available from electricity retailers 'off the shelf', but these have a focus on supporting the operation of household batteries and are not optimised for the neighbourhood scale. There is no 'off the shelf' commercial option for neighbourhood scale batteries and commercial models are typically bespoke. This project has developed commercial options based on a survey of project participants.

Regulatory

The renewable energy transition is occurring alongside significant policy and regulatory change. Known regulatory changes include the termination of renewable energy certificates under the Renewable Energy Target in 2030. Other likely changes are not known but are expected to be in support of smaller scale renewable energy generation and storage, or distributed energy resources. More detail on these trends can be found on AEMO's website.

Financial

It is likely that the financial performance of neighbourhood scale batteries will improve over the long term.

Wholesale prices: Wholesale energy forward curves used in analysis in this project indicate a future pattern of low or negative spot prices during times of high solar production, and high overnight electricity prices, particularly as coal fired generation continues to exit the market. High prices are correlated at times of low renewable energy production, overnight and winter, and low prices are correlated with times of high renewable energy production, during the day and in summer. These changes will support battery financial performance allowing low-cost battery charging and higher electricity sell prices.

Capital costs: The National Renewable Energy Laboratory suggests that 4-hour utility scale battery costs could fall by as much as 47% by 2030[4]. These reduced capital costs are likely to flow through to neighbourhood batteries and be supported by lower installation costs due to increased contractor familiarity and competition.

Network tariffs: Especially in Victoria, network tariffs are poorly suited to neighbourhood battery operation. This is already changing in New South Wales, where the new network tariff regulatory period commences on 1 July 2024, and is likely to change in Victoria in the new regulatory period, which commences 1 July 2026. Network tariffs are likely to include

[4] https://www.nrel.gov/docs/fy23osti/85332.pdf

low-cost import tariffs during the day and increased import tariffs during the evening peak. From 2024 in New South Wales, some network tariffs also reward battery owners for exporting in the evening peak.

Additional value streams: There may be additional revenue streams for neighbourhood batteries in the future as markets for demand response and network support services are initiated or further developed.

Why invest in a neighbourhood battery now?

The changing energy system and industry context outlined above is likely to improve the financial performance of neighbourhood batteries over the long term, while negatively impacting sites that do not have battery storage installed. Sites without battery energy storage are likely to be exposed to higher evening electricity prices through higher wholesale prices and network tariffs.

The analysis carried out in this business case assumes that network tariffs remain unchanged, but in the likely event that tariffs do change, cost savings for sites with a neighbourhood battery installed are expected to be higher than the cost savings modelled in this report.

Delivery of a behind the metre neighbourhood battery now, rather than at a later stage, allows for:

- Protection against ongoing increases in electricity prices.
- Reductions in installation costs through the available grant funding.
- Testing of battery storage outcomes, with grant funding support, for commercial replication at a later stage.
- Achievement of project benefits outlined in Section 3.4 below.

2. Methodology

2.1 Site Selection

The project has focused on sites that can generate and store a significant amount of renewable energy to be used to supply the local community with renewable energy on a day-to-day basis and to provide backup power to the site during an emergency event.

A long list of sites was created based on the following criteria, with each participating organisation selecting up to three sites for inspection in consultation with Indigo Power:

- **Energy Generation:** Sites that have large roof spaces, with good structural integrity, that can generate more electricity.
- **Energy Supply:** Sites with low daytime consumption that can export more renewable energy to the community on a day-to-day basis.
- **Energy Resilience:** Sites that provide critical community services during emergency events, such as relief centres, that stand to deliver the most benefit from the provision of backup energy supply.

Indigo Power inspected each site, assisting participating organisations to select one preferred site for development. A summary of the outcomes of the site inspection process, and applicable details about each of the 21 selected sites can be found in Appendix Two.

A site inspection report was prepared for the preferred site in each LGA, including the following information:

- Electricity supply details, including retail arrangements, NMI, meter data.
- Network details, including local transformer information, feeder, nearest zone substation.
- Current electrical infrastructure, including a single line diagram of existing electrical infrastructure.
- Maximum solar generation capacity according to solar design.
- Site coordinates.

2.2 Preliminary Modelling

Preliminary modelling was carried out to determine the optimal solar and battery system configuration given the site load, electrical infrastructure, available roof space, and availability of up to $300,000 in grant funding.

An autosizing modelling approach was used to determine the amount of solar panels (kW) and battery storage (kWh) that would maximise net present value (NPV), and shows the point at which an additional kW of solar panels or kWh of battery storage would not pay for itself over the modelling time frame. Autosizing considers hardware costs, network charges, price of imported and exported energy, project duration, and discount rate applied.

As the prices of solar panels and battery energy storage systems are expected to reduce over the medium term, the model is re-run with different hardware costs to determine what is financially feasible today, and what may be financially feasible with a reduction in capital costs. A recommended set of hardware is obtained for each pair of solar prices ($/kW) and battery prices ($/kWh).

Preliminary modelling reports provide further detail on the analysis carried out and the recommended system configurations for each site (based on NVP alone). See Appendix 3.

2.3 System Design and Costing

Solar and battery systems were designed and costed based on the preliminary modelling outputs, assuming the availability of $300,000 in grant funding per battery, with a cash contribution equal to 10% of the total project cost (including 100% of any solar capex).[5] Technical design briefs were created for each of the 21 sites, informed by Indigo Power's experience, providing details on:

- Maximum solar PV capacity
- Electrical infrastructure and its limitations
- Solar and battery design specifications
- Solar, battery, inverter and control specifications
- Design layout
- Health, safety and compliance considerations
- Indicative delivery timeline
- Delivery costs
- Site installation risks
- Decommissioning and disposal plan
- Maintenance requirements

2.4 Financial Modelling

Modelling of the designed neighbourhood batteries was performed to determine the financial outcomes of two possible ownership options detailed in Section 3.1 below.

The modelling was performed in two stages. The first stage modelled energy flows at the site, incorporating load, solar generation and battery energy storage. The battery operates optimally for all price signals (wholesale prices and network charges). This produces an operational model for the battery that maximises financial outcomes. Environmental objectives are incorporated by design, using behind-the-meter solar. This reduces battery charging from high emissions electricity overnight. Modelling provides an estimate of the revenue potential of the battery over a fixed time horizon. This modelling is carried out using the energy modelling software Gridcog.

In the second modelling stage, cashflows resulting from the Gridcog models were post-processed. This allows the potential terms of an agreement between the host site and a third-party owner or operator to be developed to demonstrate the business case for both parties. Estimated power purchase agreement and annual lease agreement fees are the output of this process, as well as host site cost savings.

The analysis includes grant funding up to $300,000 per battery, with a 10% cash contribution to the total requested grant amount (including 100% of any solar PV costs). Assumptions used in the energy flow modelling and the financial modelling are presented in Appendix One.

2.5 Stakeholder Engagement Plans

[5] This assumption was based on CVGA and Indigo Power's broad interpretation of the funding guidelines for Round 1 of the Victorian Government's 100 Neighbourhood Batteries Program. Funding guidelines for Round 2 were release after modelling for the RGA-NBI project was completed. As such, the assumptions underpinning the financial modelling presented in this report are not consistent with current funding guidelines, and revised modelling will be required for any councils seeking to purse a grant application under Round 2 or Round 3 of the 100 Neighbourhood Batteries Program.

With support from the Central Victorian Greenhouse Alliance, participating organisations completed a stakeholder mapping process to identify key stakeholders, their level of interest and influence over the project, and engagement needs and priorities.

Building on these maps, a stakeholder engagement plan was developed for each site, informed by councils' community engagement policies, and with reference to the International Association for Public Participation (IAP2) public participation spectrum.

Table Three summarises the key content in each engagement plan.

Table Three. Stakeholder engagement plans

Section	Content
1. Introduction	• Project Background • Purpose • Engagement Objectives • Engagement Approach
2. Stakeholder mapping and analysis	• Identification, mapping and analysis of stakeholders, their level of interest and influence, and engagement needs and priorities.
3. Engagement plan	• Scope • Methods • Messages • Implementation Plan • Risk Management Plan • Key Contacts
4. Monitoring and evaluation plan	• Objectives • Measures of Success • Methods

2.5 Overarching Business Case

This document provides an overarching business case for the 21 neighbourhood battery systems designed through this project, including the economic value of these systems and broader community, network, and council benefits.

Underpinning this overarching business case is an individual project plan for each of the 21 proposed neighbourhood battery sites, comprised of the following reports:

1. **Site Inspection Report:** the outcomes of detailed site inspections.
2. **Preliminary Modelling Report:** analysis identifying the system specifications that maximise net present value.
3. **Site Design and Costing Report:** details on the recommended system design, layout, estimated costing, and delivery.
4. **Site Business Case – Financial Modelling Report:** presenting the results of a financial analysis of commercial model options for each site.
5. **Stakeholder Engagement Plan:** identification of key stakeholders and recommended engagement activities for the delivery of the proposed project.

Links to individual reports for each site are provided in Appendix 3.

It is important that site-specific documents are read in conjunction with this overarching business case, which contains contextual details and information held in common across all 21 sites.

3.Results

3.1 Commercial Models

The commercial and operational arrangements required for the realisation of neighbourhood battery outcomes are detailed in Table Three below. There are no known 'off the shelf' services for delivering all these functions. Service offerings are typically bespoke and could include any combination of the functions listed in Table Four below.

Table Four. Description of the commercial arrangements necessary to realise neighbourhood battery outcomes

Outcome	Commercial/operational requirements
Energy Trading and Sharing	The solar and battery system can supply renewable energy to the host site and share energy (informationally) with the community. There are no known examples of commercial products or offerings within the National Electricity Market where customers can notionally store energy in the battery, draw down on that storage during the evening and benefit from a bill reduction.[6] Other services in the market include informational energy sharing, which connects a community battery facility to electricity consumers in the community.[7] Both energy sharing and trading requires the involvement of an electricity retailer able to aggregate and process data on customer consumption and community battery export. Doing this in a meaningful way requires additional software to match local consumption with the site's export.
Electricity sales	Improved electricity sales outcomes are achieved by linking the facility to the National Electricity Market and managing the battery to capture high electricity prices. This requires an arrangement with a third party market participant with appropriate licences and registrations. The sale of electricity behind the meter requires a power purchase agreement. This can be done through an electricity licensing exemption through the Essential Services Commission.[8]
Frequency control ancillary services sales (FCAS)	Additional revenue streams for battery storage are through the provision of services that moderate the frequency of electricity in the network, referred to as FCAS. Access to contingency FCAS[9] revenue requires an arrangement with a third party market participant and aggregator with appropriate licences and registrations.
Energy Resilience	Sites with large battery energy storage systems can provide access to energy for the community during an emergency outage. This outcome requires an

[6]Although this model has be trialled in pilot studies e.g. https://www.ausgrid.com.au/In-your-community/Community-Batteries/Community-battery-trial.
[7] See https://indigopower.com.au/community-energy-hub/ for an example.
[8]https://www.esc.vic.gov.au/electricity-and-gas/licences-exemptions-and-trial-waivers/electricity-licensing-exemptions/how-register-electricity-licensing-exemption
[9] Community batteries cannot participate in regulation FCAS markets.

	appropriate software platform linked to an onsite control device to switch between day-to-day and emergency functioning. Emergency operation typically involves charging the battery and holding its capacity for emergency use only. Energy resilience outcomes are dependent upon high system reliability. It is important that the system isn't out of order during an emergency event. This requires an arrangement with an appropriate electrical services provider to ensure the system is monitored and maintained, and good stakeholder engagement with site users and managers. Energy resilience outcomes are also dependent upon a commercial arrangement with the battery operator to ensure backup power is available when needed. These arrangements would be negotiated as a part of project implementation and incorporated in any lease agreements with the battery operator.
Network support	Batteries can provide network support services to the local electricity grid, including demand raise and lower services and voltage control. There is no ready market for the delivery of these services. However, network support opportunities for small scale storage infrequently occur from time-to-time and could occur more frequently in the future, which would require an arrangement with an appropriate aggregator to control and deploy storage according to a network support contract or market-based system.

This project has considered both commercial and operational requirements for neighbourhood batteries, and the interests of project participants. A survey of project participants was conducted to understand their risk appetite and ownership preferences to inform commercial model options developed for financial modelling. Survey results showed that project participants:

1. Have a low appetite for taking on the risk associated with neighbourhood batteries;
2. Show a general trend towards a lower appetite for investing in neighbourhood batteries (with a small cohort seeking internal budget for delivery, and a larger cohort undecided at this stage);
3. Have low to no appetite for allocating existing staff resources to the management and maintenance of neighbourhood batteries; and
4. Show a slight trend towards a lower desire for flexibility and decision control.

Based on this feedback, two commercial options were designed to deliver a simple, low risk, and low input neighbourhood battery solution that maximises environmental, resilience and cost/budget savings. These options are outlined in Table Five below.

Table Five. Commercial model options

Option A: **Third party ownership**	An appropriately qualified third party invests in, builds, owns, operates and maintains the proposed solar and battery facility and leases the necessary space from the host site on commercial terms. The third party uses excess generation and storage capacity to trade in markets managed by the Australian Energy Market Operator (AEMO). Low-cost renewable energy and a resilience service are provided to the site through a site-specific power purchase agreement (PPA). The third party insures the battery and is responsible for management and maintenance. No cash contribution is required from the host site, who achieves environmental and resilience outcomes at no cost.
Option B: **Host site ownership**	The host site invests in the facility and procures services from an appropriately qualified third party for the installation of the battery. The host site owns the battery and engages an appropriately qualified third party to operate and maintain the battery under an equipment lease agreement. It is recommended that the installation and operating party are the same entity. This allows for the operating party to ensure installed technology is compatible with operating technology and software. Either a fixed or variable rent fee is paid to the owner of the battery and there is no operating or maintenance cost for the owner. Low-cost renewable energy and a resilience

	service is provided to the host site. The third party uses excess generation and storage capacity to trade in markets managed by AEMO. The host site insures the battery. The host site funds the capital cost of the battery and seeks to recover these costs through equipment lease rental payments.

Both options involve the operator of the system selling electricity to the host site to meet all the site's electricity needs through a power purchase agreement (PPA).[10]

It is assumed that sites currently under the Victorian Energy Collaboration (VECO) PPA would be removed from this agreement via the supply address being leased to a third party, and that there would be no cost associated with removing a site.[11]

The assumed PPA price, which is applicable for both options, is presented in Section 3.3 below. PPA prices are modelled as fixed, increasing annually in line with inflation. These rates are designed, where possible, to provide a reduction in the host site's electricity costs, whilst maintaining a commercial return for the owner of the solar and battery system.

For Option A, a lease agreement and PPA are required to allow the third-party owner to operate the solar and battery facility. Analysis assumes that any third party provider of the system would be seeking at least an 8% internal rate of return on its investment. The lease agreement could include commercial rent. However, for this analysis, lower cost PPA rates have been modelled in lieu of a commercial rent payment to the host site. Commercial rent could be calculated by:

1. Determining the square metre area leased by the battery owner;
2. Calculating the value of the site per square metre by dividing the total value of the site by the size of the site in square metres;
3. Applying a factor of 1 for ground space rental (battery) and a factor of 0.66 for air space rental (solar); and
4. Applying a commercial rate of return of 5%.

For Option B, an equipment lease and power purchase agreement are required to allow the third-party operator to commercially operate the system. The fee for leasing the equipment has been modelled based on a net surplus share arrangement whereby the third party and the host site share the operational net surplus for the facility. Current modelling assumes the third party pays an annual equipment lease fee (rent) to the battery owner which is based on 50% of the annual operating margin of the battery. The operating margin is calculated by:

1. Taking the operating revenue;
2. Subtracting the operating costs of the battery from the revenue, which are paid for by the battery operator; and
3. Excluding depreciation, grant funding, and financing costs from the calculation.

The net surplus share arrangement has been modelled in this business case as it allows the battery owner to share in any potential upside gains and receive detailed information regarding the financial performance of the battery to support learning and replication.

Alternative fee models include the payment of a fixed flat fee to the battery owner. This model allows the host site to recover the financial cost of the battery system but limits any upside potential. A fixed flat fee model has been included in individual site business cases

[10] The PPA is required for both ownership models to ensure simplicity and the alignment of incentives for the operator of the battery.
[11] These assumptions are based on information provided by the VECO retailer in response to inquiries made by the Central Victorian Greenhouse Alliance.

and was determined as the monthly payment sufficient to recover the installation cost of the battery system over a fifteen-year period with a 3% interest rate to account for inflation.

3.2 System Design and Capital Cost

Design specifications and cost breakdowns for each of the 21 selected neighbourhood battery sites is presented in Table Six below.

Across the 21 sites, recommended battery sizing ranges from smaller 25kW/50kWh systems to larger 100kW/300kWh systems. New or additional solar PV is recommended at 18 of the 21 sites, with the integration of existing solar systems at the other 3 sites.

Grant and co-contribution estimates assume the availability of up to $300,000 in grant funding with a 10% cash contribution to the total requested grant amount (including 100% of any solar PV and related installation costs). Cost breakdowns also include an option to install an energy management system to allow charging of the battery from on-site solar in island mode. This optional add-on has not been included in the financial modelling for each site but can be considered by participating organisations seeking to extend the duration of backup power at the selected site.

Table Six. System design and cost breakdown.

Project Participant & Sites	Design specifications	Cost breakdown for 100 NB grant program
Alpine Resorts Victoria (Falls Creek) **Site:** Falls Creek Wastewater Treatment Plant	**Existing:** The main switch board is in good condition and offers a suitable connection point for a neighbourhood battery. There is limited roof area available for solar at the site. **Proposed:** 17kW Solar PV 25kW/50kWh battery storage **Justification:** Based on the electricity use profile of the site and the available solar PV system, this system sizing offers the most suitable return on investment. **Comment:** This site is complicated because of the general layout of the site however the electrical infrastructure is in generally good condition. Consideration to being in a snow driven area also needs to be taken into account.	**Solar:** $23,824 **Battery:** $118,460 Total: $142,284 **Grant:** $118,460 **Co-contribution:** $23,824 **Additional cost to charge from solar in island mode:** $18,000
Alpine Shire Council **Site:** Bright Community Centre	**Existing:** The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 63 Amps. **Proposed:** There is an existing 5kW solar PV system installed and a 5kWh battery (to be repurposed elsewhere). An additional 10 kW solar PV system and 25 kW/50 kWh battery storage system has been designed for the site. **Justification:** The site has suitable amenities to allow it to be a place of last resort in an emergency therefore energy resilience is a key benefit. This makes the battery oversized, and the return on investment is not as great. **Comment:** This site has small electrical infrastructure and limits the size of the system capacity.	**Solar:** $10,736 **Battery:** $112,440 Total: $123,176 **Grant:** $110,858 **Co-contribution:** $12,318 **Additional cost to charge from solar in island mode:** None
Rural City of Wangaratta	**Existing:** The site connects directly to a 500kVA transformer this transformer supplies others in the HP Barr Reserve. The Main Switchboard (MSB) is presently capable of 1250 Amps with the switch at base of	**Solar:** $141,500 **Battery:** $595,750 **Grant:** $300,000

Wangaratta Sports & Aquatic Centre	the transformer set at 800 Amps supplied to WSAC MSB. It is expected the site export capacity to be around 400kW at any one time. The site has a 92kW solar PV system. **Proposed:** A 100 kW/300 kWh battery storage system and an additional 100kW solar PV has been designed for the site. **Justification:** A 100kW/300kWh battery has been selected to meet the grant funding maximum requirements and to fit the battery as closely to the preliminary modelling as costings will allow. **Comment:** This site has very high electricity usage and preliminary modelling suggests optimal system specifications 1039kWh of new battery storage.	**Co-contribution:** $437,250 **Additional cost to charge from solar in island mode:** $16,000
Benalla Rural City Council **Site:** Sir Edward 'Weary' Dunlop Learning Centre (Benalla Library)	**Existing:** The site has a 60kW solar PV system. The site connects to a shared 500kVA transformer. The Main Switchboard (MSB) is presently capable of 160 Amps. This location has a Distribution Board (DB) that the system is connected to. It has a 160A main switch that connects back to the Main Switchboard (MSB). **Proposed:** 60kW/170 kWh battery storage system has been designed for the site. **Justification:** The site offers a good return on investment and the site has suitable amenities to allow it to be a place of last resort in an emergency therefore energy resilience is a key benefit. **Comment:** This site has a large existing solar PV system and this will allow recharging of the battery providing a good return.	**Solar:** $0 **Battery:** $234,800 Total: $234,800 **Grant:** $211,320 **Co-contribution:** $23,480 **Additional cost to charge from solar in island mode:** $16,000
Mansfield Shire Council **Site:** Bonnie Doon Rec Reserve	**Existing:** The site has a 10kW solar PV system with a 6kWh battery system. An additional 8kW solar PV system is available with existing roof space. **Existing:** The site connects to a shared 100kVA transformer. The Main Switchboard (MSB) is presently capable of 63 Amps. It is expected that the site will be limited to 40kW export capacity at any one time from both the solar and battery system. **Proposed:** 8 kW solar and 25kW/50kWh battery storage system has been designed for the site. **Justification:** The site has suitable amenities to allow it to be a place of last resort in an emergency therefore energy resilience is a key benefit. This makes the battery oversized and the return on investment is not as great. **Comment:** This site has small electrical infrastructure and limits the size of the system capacity.	**Solar:** $11,982 **Battery:** $107,834 Total: $119,816 **Grant:** $97,051 **Co-contribution:** $22,765 **Additional cost to charge from solar in island mode:** $16,000
Murrindindi Shire Council **Site:** Marysville Community Centre	**Existing:** The Marysville Community Centre can host an additional 18kW requiring tilt frames to optimise the solar generation. There is an existing 15kW solar PV system installed The site connects to a shared, 200kVA transformer. The Main Switchboard (MSB) is presently capable of 400 Amps located in the carpark. There is a Distribution Board (DB) that the energy system can be connected to. It has a 160A main switch that connects back to the Main Switchboard (MSB). **Proposed:** Additional 18kW solar PV system & 30kW/120 kWh battery storage system has been designed for the site. **Justification:** The site has suitable amenities to allow it to be a place of last resort in an emergency therefore energy resilience is a key benefit and the battery is oversized. **Comment:** This site has an existing solar PV system, allowing for lower investment..	**Solar:** $18,434 **Battery:** $198,100 Total: $216,534 **Grant:** $194,881 **Co-contribution:** $21,653 **Additional cost to charge from solar in island mode:** $16,000

Strathbogie Shire Council **Site:** Euroa Council Depot	**Existing:** There is an existing 5kW solar PV system installed. The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 63 Amps. It is expected that the site will be limited to 40kW export capacity at any one time from the combination of the solar and battery system. **Proposed:** Additional 30kW solar PV system & 40kW/170 kWh battery storage system has been designed for the site. **Justification:** The site is intended to be an emergency control facility in emergencies therefore energy resilience is a key benefit and the battery is oversized relative to preliminary modelling results. **Comment:** This system has been designed to allow for whole site operation in a power outage for the intended use of a control facility which increases electricity costs at the site.	**Solar:** $35,140 **Battery:** $227,680 Total: $262,820 **Grant:** $227,680 **Co-contribution:** $35,140 **Additional cost to charge from solar in island mode:** $18,000
Campaspe Shire Council **Site:** Echuca War Memorial Aquatic Reserve	**Existing:** The site connects directly to a 375kVA transformer. The Main Switchboard (MSB) is presently capable of 250 Amps. Indigo Power expects the site export capacity to be around 150kW at any one time. There is no existing solar or battery system at the site. **Proposed:** A 130 kW solar PV system and 100 kW/300 kWh battery storage system has been designed for the site. **Justification:** The site requires a 300kWh battery due to the high electricity use at the site maximising the grant funding available **Comment:** The site uses significant power. It is difficult to design a system that doesn't rely on draw from the grid as well as on site solar.	**Solar:** $167,500 **Battery:** $419,300 Total: $586,800 **Grant:** $300,000 **Co-contribution:** $286,800 **Additional cost to charge from solar in island mode:** $18,000
Central Goldfields Shire Council **Site:** Maryborough Aquatic and Leisure Centre	**Existing:** The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 100A located in the at the front entrance of the facility. There is a Main Distribution Board (MDB) that the energy system can be connected to. It has a 80A main switch that connects back to the Main Switchboard (MSB). **Proposed:** A 77kW solar PV system and 50 kW/200 kWh battery storage system has been designed for the site. **Justification:** The site requires a larger system as it plans to electrify the site through removal of the pool gas heating. **Comment:** The site is expected to use significant power. It is difficult to design a system that doesn't rely on draw from the grid as well as on site solar.	**Solar:** $74,504 **Battery:** $266,800 Total: $341,303 **Grant:** $266,800 **Co-contribution:** $74,504 **Additional cost to charge from solar in island mode:** $16,000
City of Greater Bendigo **Site:** Epsom Huntly Recreation Reserve	**Existing:** The site connects to a dedicated 400kVA transformer. The Main Switchboard (MSB) is presently capable of 800 Amps located in the carpark/turnaround area of the site. There is a Distribution Board (MDB) that the existing energy system is connected to. It has a 160A main switch that connects back to the Main Switchboard (MSB). The battery system would be directly connected to the MSB as the battery will be in close proximity. It is expected that the battery system has capacity to export approximately 100kW at any one time. **Proposed:** A 100 kW/300 kWh battery storage system only has been designed for the site. **Justification:** The site requires a 300kWh battery due to the high electricity use at the site maximising the grant funding available.	**Solar:** $0 **Battery:** $404,500 Total: $404,500 **Grant:** $300,000 **Co-contribution:** $104,500 **Additional cost to charge from solar in island mode:** $16,000

	Comment: This system has been designed to allow for back-up pavilion lighting circuits/air conditioning/critical power and domestic refrigeration circuits in case of a power outage.	
Mount Alexander Shire Council **Site:** Wesley Hill Stadium	**Existing:** The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 63 Amps located in an electrical room under the cricket pavilion. There is a Distribution Board (DB) that is connected to the stadium via the MSB. It has a 160A main switch. The battery system would be connected to the DB It is expected that the battery system has capacity to export approximately 25kW at any one time. A 25 kW/50 kWh battery storage system and 15kW solar PV has been designed for the site. **Justification:** The system design is best matched to the site operation and offers a positive return on investment according to preliminary modelling. **Comment:** This system has been designed to allow for back-up office, toilets and multi-purpose power and lighting circuits/ one air-conditioning unit onsite at Distribution Board 1 in case of a power outage.	**Solar:** $13,870 **Battery:** $117,620 Total: 131,490 **Grant:** $117,620 **Co-contribution:** $13,870 **Additional cost to charge from solar in island mode:** $8,000
Ararat Rural City Council **Site:** Pomonal Community Hall & Men's Shed	**Existing:** Pomonal Community Centre has a 5kW ac solar PV system on each building being the hall and the men's shed. This is a total 10kW solar PV in size. The roof area has more available space and additional solar however it is partly shaded and the electrical infrastructure is at its maximum capacity. **Proposed:** The site has suitable amenities to allow it to be a place of last resort in an emergency therefore energy resilience is a key benefit and the battery is oversized. **Justification:** The site requires a 50kWh battery due to potential use in emergency outages and so is oversized relative to preliminary modelling results. **Comment:** This system has been designed to allow for back-up Hall lighting circuits/air conditioning/critical power circuits including kitchen excluding Men's Shed in case of a power outage.	**Solar:** $0 **Battery:** $114,900 Total: $114,900 **Grant:** $103,410 **Co-contribution:** $11,490 **Additional cost to charge from solar in island mode:** $8,000
City of Ballarat **Site:** Ballarat Badminton Stadium	**Existing:** The site does not have any existing solar PV or battery storage system. The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 80 Amps located at the front of the facility along with the site's metering. **Proposed:** A 25kW/50kWh battery storage system and a 25kW solar system has been designed for the site. **Justification:** The site uses electricity at night. A 50kWh battery allows for this regular load to be covered and provides resilience benefits during an emergency. **Comment:** This system has been designed to allow for back-up office, toilets and multi-purpose power and lighting circuits/ one air-conditioning unit in case of a power outage.	**Solar:** $19,578 **Battery:** $116,900 Total: 136,478 **Grant:** $116,900 **Co-contribution:** $19,578 **Additional cost to charge from solar in island mode:** $8,000
Hepburn Shire Council **Site:** Doug Lindsay Recreation Reserve	**Existing:** The site has an existing 15kW solar PV. The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 160 Amps, along with the site's metering, located approximately 15 metres from the facility building. **Proposed:** A 30 kW/120 kWh battery storage system and an additional 23kW solar system has been designed for the site. **Justification:** The site uses electricity at night. A 50kWh battery allows for this regular load to be covered and provides resilience benefits during an emergency.	**Solar:** $25,202 **Battery:** $211,500 Total: $236,752 **Grant:** $211,500 **Co-contribution:** $25,202 **Additional cost to charge from solar in island mode:** $8,000

	Comment: This system has been designed to allow for back-up lighting circuits/critical power circuits pavilion at Distribution Board 1 in case of a power outage.	
Gannawarra Shire Council **Site:** Sir John Gorton Library	**Existing:** The site has a 10kW solar PV system. The site connects directly to a standalone 100kVA transformer. The Main Switchboard (MSB) is presently capable of 250 Amps. We expect the site to be limited to 160kW export capacity at any one time from the combination of the solar and battery system. **Proposed:** A 30kW/100 kWh battery storage system and a 16kW solar system has been designed for the site. **Justification:** The system size closely aligns with preliminary modelling results. **Comment:** This system has been designed to allow for back-up reception power and lighting, multipurpose power and lighting including office and one hot water circuit at Main Switchboard. in case of a power outage.	**Solar:** $20,470 **Battery:** $164,200 Total: $184,670 **Grant:** $164,200 **Co-contribution:** $20,470 **Additional cost to charge from solar in island mode:** $16,000
Mildura Rural Council **Site:** The Alfred Deakin Centre	**Existing:** The site has a 99kW solar PV system. The site connects directly to a standalone 750kVA transformer. The Main Switchboard (MSB) is presently capable of 1200 Amps. We expect the site export capacity to be around 600kW at any one time. **Proposed:** A 100kW/300 kWh battery storage system only has been designed for the site. **Justification:** The site requires a 300kWh battery due to the high electricity use at the site maximising the grant funding available. Preliminary modelling recommends higher however grant funding upper limits cap the proposed battery size. **Comment:** This system has been designed to allow for back-up Community Centre DB-4 and Visitors Information Centre DB-3 Distribution Board power and lighting. in case of a power outage.	**Solar:** $220,000 **Battery:** $449,600 Total: $669,600 **Grant:** $300,000 **Co-contribution:** $369,600 **Additional cost to charge from solar in island mode:** $18,000
Swan Hill Rural City Council **Site:** Swan Hill Basketball Stadium	**Existing:** The site has a 15kW solar PV system. The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 160 Amps. **Proposed:** A 60 kW/170 kWh battery storage system and 50kW solar PV has been designed for the site. **Justification:** The site requires a 170kWh battery due to make best use of the battery in a long-term power outage. The battery is therefore large relative to preliminary modelling results. **Comment:** This system has been designed to allow for back-up the lights and power for the office, toilets and the court 1 sub-board at the Main Switchboard in case of a power outage.	**Solar:** $56,578 **Battery:** $253,000 Total: $309,578 **Grant:** $253,000 **Co-contribution:** $56,578 **Additional cost to charge from solar in island mode:** $18,000
Baw Baw Shire Council **Site:** Neerim South Recreation Reserve	**Existing:** Neerim South Recreation Reserve’s roof area has an opportunity to install an additional 19kW solar PV system. The site has an existing poor condition 2kW solar system. It is recommended to remove or decommission this system. The site connects to a shared 300kVA transformer with the main connection point located on the east side of the football ground. The Main Switchboard (MSB) is presently capable of 80 Amps. There are two separate meters, one for the football club, the second for the oval lighting. **Proposed:** A 25 kW/50 kWh battery storage system and a 19kW solar system has been designed for the site. **Justification:** To prioritise energy resilience a 50kWh battery has been designed which is large relative to preliminary modelling.	**Solar:** $20,262 **Battery:** $117,500 Total: $137,762 **Grant:** $117,500 **Co-contribution:** $20,262 **Additional cost to charge from solar in island mode:** $16,000

	Comment: This system has been designed to allow for back-up pavilion lighting circuits/critical power circuits excluding ground lighting in case of a power outage.	
East Gippsland Shire Council **Site:** Lucknow Recreation Reserve	**Existing:** Lucknow Recreation Reserve's roof area on the pavilion is already at capacity. There is an opportunity to install an additional 46kW solar PV system on the gymnasium roof based on the space available, as this building is connected to the pavilion and the MSB. The site has an existing 20kW solar PV and a 39kWh battery storage system. The site connects to a shared 300kVA transformer. The Main Switchboard (MSB) is presently capable of 400 Amps located at the front entrance to the site along with the site's metering. **Proposed:** A 30 kW/120 kWh battery storage system and a 28kW solar system has been designed for the site. **Justification:** A 30kW/120kWh battery has been selected to meet the grant funding minimum requirements, to fit the battery as closely to the modelling as technology will allow and offer energy resilience. **Comment:** This system has been designed to allow for back-up pavilion site only via MDB circuit at the main switchboard in case of a power outage.	**Solar:** $30,862 **Battery:** $207,900 Total: $238,762 **Grant:** $207,900 **Co-contribution:** $30,862 **Additional cost to charge from solar in island mode:** $16,000
LaTrobe City Council **Site:** Gippsland Regional Indoor Sports Stadium (GRISS)	**Existing:** GRISS's roof area has an opportunity to install a large commercial sized solar PV system. The Council has scheduled for a 400kW solar PV system to be installed in Q3,2024. The preliminary modelling has accounted for this. The site connects to a dedicated 400kVA kiosk transformer. The Main Switchboard (MSB) is presently capable of 800 Amps and is located outside on the east side of the facility along with the site's metering near the transformer. A 400kW solar system is expected to be installed in Q3, 2024. The site's electricity retail arrangements already include billing at spot market prices. **Proposed:** A 100 kW/300 kWh battery storage system only has been designed for the site. **Justification:** The grant funding cap limits the size of the battery recommended despite preliminary modelling suggesting a larger battery be installed at the site. **Comment:** This system has been designed to allow for back-up critical lighting circuits/critical power circuits including office and amenities excluding stadium lighting in case of a power outage.	**Solar:** $0 **Battery:** $409,900 Total: $409,900 **Grant:** $300,000 **Co-contribution:** $109,900 **Additional cost to charge from solar in island mode:** $25,000
South Gippsland Shire Council **Site:** Korumburra Indoor Recreation Centre (KIRC)	**Existing:** KIRC's roof area has an opportunity to install approximately 70kW solar PV system. The site has no existing solar PV or battery storage system. The site connects to a shared 200kVA transformer. The Main Switchboard (MSB) is presently capable of 160 Amps which is located at the front entrance of the facility along with the site's metering. There is a manual changeover switch to install a temporary generator in an outage. **Proposed:** A 30 kW/120 kWh battery storage system and a 26kW solar system has been designed for the site. **Justification:** A 30kW/120kWh battery has been selected to meet the grant funding minimum requirements and to fit the battery as closely to the modelling as technology will allow. **Comment:** This system has been designed to allow for back-up basketball court lighting/reception lighting/ power circuit in case of a power outage.	**Solar:** $25,440 **Battery:** $196,800 Total: $222.240 **Grant:** $196,800 **Co-contribution:** $25,400 **Additional cost to charge from solar in island mode:** $16,000

3.3 Financial Results

A summary of the results of financial modelling for each site is provided in Table Seven below.

Table Seven. Financial results by site

LGA	Financial Results	Comments
Wangaratta Wangaratta Sports & Aquatic Centre	**PPA Prices** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 19.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 11.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 5.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Additional cost: $47,947 more over 10 years **Option B: Host site ownership** Internal Rate of Return: -3.4% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: N/A Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. The major driver for this outcome is the large site consumption relative to the proposed battery size. The proposed battery is not sufficient to shield the site from increasing wholesale costs. This could be managed with additional storage as prices decrease, or an approach that avoids wholesale exposure.
Swan Hill Swan Hill Basketball Stadium	**PPA Prices** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 32.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 24.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 14.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $26,178 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -0.6% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 6.8% Payback Period (inclusive of electricity cost savings): 8 Years	The financial case for the installation of a solar and battery system at the site is positive for either option. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a marginally negative internal rate of return and a positive adjusted rate of return over 10 years.
Strathbogie Euroa Depot	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 33.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 24.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Additional cost: $8,845 more over 10 years **Option B: Host site ownership** Internal Rate of Return: -5.3% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: -12.0% Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. This battery is significantly oversized due to the focus on energy resilience. It is unlikely that a third party would invest in the system as currently modelled. Third party lease of the equipment is expected to return both a negative internal rate of return and a negative adjusted rate of return.

South Gippsland Korumburra Indoor Rec Centre	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 18.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Cost saving: $49,382 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 2.2% Payback Period (without electricity cost savings): 9 Years Adj Rate of Return*: 23.1% Payback Period (inclusive of electricity cost savings): 5 Years	The financial case for the installation of a solar and battery system at the site is positive for either option. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a positive internal rate of return, and a positive adjusted rate of return over 10 years.
Murrindindi Marysville Community Centre	**PPA Prices** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 7.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $21,460 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 0.1% Payback Period (without electricity cost savings): 10 Years Adj Rate of Return*: 15.3% Payback Period (inclusive of electricity cost savings): 5 Years	The financial case for the installation of a solar and battery system at the site is positive for either option. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a marginally positive internal rate of return, and a positive adjusted rate of return over 10 years.
Mount Alexander Wesley Hill Stadium	**PPA Prices** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 15.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 5.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $4,428 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 4.1% Payback Period (without electricity cost savings): 9 Years Adj Rate of Return*: 9.1% Payback Period (inclusive of electricity cost savings): 7 Years	The financial case for the installation of a solar and battery system at the site is positive for either option. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a positive internal rate of return, and a positive adjusted rate of return over 10 years.
Mildura Alfred Deakin Centre	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 24.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 9.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 5.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $141,630 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -4.7% Payback Period (without electricity cost savings): >10 Years	Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a negative internal rate of return, and a positive adjusted rate of return.

	Adj Rate of Return*: 3.4% Payback Period (inclusive of electricity cost savings): 7 Years	
Mansfield Bonnie Doon Rec Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 36.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 24.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Additional cost: $4005 more over 10 years **Option B: Host site ownership** Internal Rate of Return: -3.4% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: -7.3% Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. Third party ownership of the system would provide backup power to the site but would increase electricity costs. Third party lease of the equipment is expected to return a negative internal rate of return, and a negative adjusted rate of return.
La Trobe City Gippsland Regional Indoor Sports Stadium	**PPA Prices:** Not applicable **Option A: Third party ownership** Not applicable **Option B: Host site ownership** Adj Rate of Return*: 13.7% Payback Period (inclusive of electricity cost savings): 5 Years	This site is unique in that it currently has a retail arrangement whereby the site is billed according to wholesale prices. The site therefore has a clear commercialisation pathway for the battery. The baseline scenario includes wholesale market access and a 400 kW solar PV system. A scenario has been modelled that maintains the existing retail arrangements, adds access to FCAS markets through an appropriate third party, adds a fixed fee for the operation and maintenance of the battery, includes the 400kW solar PV system and a 300 kWh battery.
Hepburn Doug Lindsay Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 28.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Cost saving: $41,161 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -0.1% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 21.6% Payback Period (inclusive of electricity cost savings): 5 Years	Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a marginally negative internal rate of return, and a positive adjusted rate of return.
Gannawarra Sir John Gorton Library	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 15.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $17,928 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -3.6% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 10.6% Payback Period (inclusive of electricity cost savings): 7 Years	Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a negative internal rate of return, and positive adjusted rate of return.

East Gippsland Lucknow Recreation Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 27.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 20.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Additional cost: $4,335 more over 10 years **Option B: Host site ownership** Internal Rate of Return: -5.0% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: -8.6% Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. Third party ownership of the system would provide backup power to the site but would increse electricity costs. Third party lease of the equipment is expected to return a negative internal rate of return, and negative adjusted rate of return. The existing solar and battery system already creates significant financial benefit for the site, and additional storage has only a marginal financial impact.
Central Goldfields Maryborough Aquatic and Leisure Centre	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 22.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 15.50 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 9 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Additional cost: $12,817 more over 10 years **Option B: Host site ownership** Internal Rate of Return: -5.2% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: -17.5% Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. Third party ownership of the system would provide backup power to the site but would increse electricity costs. Third party lease of the equipment is expected to return a negative internal rate of return, and negative adjusted rate of return. The business case is challenging due to the large on site load relative to the proposed battery size (aligned with available grant funding). Poor financial performance is driven by spot exposure at later years in the model as spot prices increase.
Campaspe Echuca War Memorial Aquatic Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 27.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 17.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Additional cost: $64,993 more over 10 years **Option B: Host site ownership** Internal Rate of Return: 0.4% Payback Period (without electricity cost savings): 10 Years Adj Rate of Return*: -27.2% Payback Period (inclusive of electricity cost savings): >10 Years	The financial case for the installation of a solar and battery system at the site is negative for both options. Third party ownership of the system would provide backup power to the site but would increse electricity costs. Third party lease of the equipment is expected to return a negative internal rate of return, and negative adjusted rate of return. The business case is challenging due to the large on site load relative to the proposed battery size (aligned with available grant funding). Poor financial performance is driven by spot exposure at later years in the model as spot prices increase.
Bendigo Epsom Huntly Recreation Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 33.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 23.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $5,372 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -4.2% Payback Period (without electricity cost savings): >10 Years	Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return both a negative internal rate of return, and a negative adjusted rate of return.

	Adj Rate of Return*: -3.3% Payback Period: >10 Years	
Benalla Sir Edward Weary Dunlop Learning Centre	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 18.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $225,984 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 1.4% Payback Period (without electricity cost savings): 8 Years Adj Rate of Return*: 93.9% Payback Period (inclusive of electricity cost savings): 2 Years	The financial case for the installation of a solar and battery system at the site is positive for either option.
Baw Baw Neerim South Recreation Reserve	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 31.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 22.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $14,032 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -3.1% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 8.3% Payback Period (inclusive of electricity cost savings): 7 Years	Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a negative internal rate of return, and positive adjusted rate of return.
Ballarat Ballarat Badminton Stadium	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 28.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 20.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 9.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $41,618 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 3.6% Payback Period (without electricity cost savings): 9 Years Adj Rate of Return*: 28.9% Payback Period (inclusive of electricity cost savings): 4 Years	The financial case for the installation of a solar and battery system at the site is positive for either option. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a positive internal rate of return and a positive adjusted rate of return.
Ararat Pomonal Hall & Men's Shed	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 31.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 20.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 7.00 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Additional cost: $5,989 more increase over 10 years **Option B: Host site ownership** Internal Rate of Return: -4.2%	The financial case for the installation of a solar and battery system at the site is negative for both options. Third party ownership of the system would provide backup power to the site but would increase electricity costs. Third party lease of the equipment is expected to return a negative internal rate of return, and negative adjusted rate of return.

	Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: -27.1% Payback Period (inclusive of electricity cost savings): >10 Years	
Alpine Shire Bright Community Centre	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 33.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 24 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10 c/kWh No daily supply charge or other electricity retail or network associated charges **Option A: Third party ownership** Cost saving: $902 less over 10 years **Option B: Host site ownership** Internal Rate of Return: -0.6% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 0.9% Payback Period (inclusive of electricity cost savings): 10 Years	The financial case for the installation of a solar and battery system at the site is marginal for both options. This is due to the existing solar PV and battery system, which already generates significant financial benefit for the site.
Alpine Resorts (Falls Creek) Falls Creek Wastewater Treatment Plant	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 30.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 18 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A: Third party ownership** Cost saving: $66,383 less over 10 years **Option B: Host site ownership** Internal Rate of Return: 3.4% Payback Period (without electricity cost savings): 8 Years Adj Rate of Return*: 35.5% Payback Period (inclusive of electricity cost savings): 3 Years	The financial case for the installation of a solar and battery system at the site is positive for both options. Third party ownership of the system would provide the host site with positive cost savings. Third party lease of the equipment is expected to return a positive internal rate of return and a positive adjusted rate of return.

Financial discussion

The financial performance of each of the sites varies widely. Table Eight provides a ‘quick guide’ summary to sites that are projected to deliver positive cost savings and a positive rate of return, and sites where the financial case for a neighbourhood battery is negative.

Under Option A, 13 sites are projected to provide positive electricity cost savings for the host site over ten years. Projected cost savings for each site vary significantly, ranging from $902 to $225,984. The median cost saving across the 13 sites is $26,000.

Under Option B, five sites are projected to have a positive internal rate of return over ten years. These sites are projected to recover the capital costs of the battery system within 8-10 years. Thirteen sites are projected to have positive adjusted rate of return (including electricity cost savings) over ten years. The best performing of these sites are expected to recover the capital costs of the battery in 2-5 years.

Seven sites have a negative financial case for both Option A and Option B. The decision to invest in a neighbourhood battery is not purely a financial one. Non-financial benefits, including backup power, can be delivered at these (and all other) sites if there is an appetite to invest in these outcomes while grant funding is available. The financial case for these sites may improve if funding guidelines are changed in future 100NB program rounds.

Table Eight. Quick guide to site financial performance

Sites	Financial Results			
	Option A	Option B		
	Positive cost savings	Positive internal rate of return	Positive adjusted rate of return	Negative financial case for both options
Wangaratta Sports & Aquatic Centre	No	No	No	Yes
Swan Hill Basketball Stadium	Yes	No	Yes	No
Euroa Depot	No	No	No	Yes
Korumburra Indoor Recreation Centre	Yes	Yes	Yes	No
Marysville Community Centre	Yes	Yes	Yes	No
Wesley Hill Stadium	Yes	Yes	Yes	No
Alfred Deakin Centre	Yes	No	Yes	No
Bonnie Doon Recreation Reserve	No	No	No	Yes
Gippsland Regional Indoor Stadium	N/A	N/A	Yes	No
Doug Lindsay Reserve	Yes	No	Yes	No
Sir John Gorton Library	Yes	No	Yes	No
Lucknow Recreation Reserve	No	No	No	Yes
Maryborough Aquatic & Leisure Centre	No	No	No	Yes
Echuca War Memorial Aquatic Reserve	No	No	No	Yes
Epsom Huntly Recreation Reserve	Yes	No	No	No
Sir Edward Weary Dunlop Library	Yes	Yes	Yes	No
Neerim South Recreation Reserve	Yes	No	Yes	No
Ballarat Badminton Stadium	Yes	Yes	Yes	No
Pomonal Hall & Men’s Shed	No	No	No	Yes
Bright Community Centre	Yes	No	Yes	No
Falls Creek Wastewater Treatment Plant	Yes	Yes	Yes	No
Total no. sites	**13**	**5**	**13**	**7**

The major drivers of financial performance across the 21 sites are as follows:

1. **Capital cost:** Participating organisations have indicated that maximising energy resilience is the priority objective for battery systems at proposed sites. In some cases, an oversized battery has been proposed to meet this objective, beyond a financially optimal point. Other sites have technical complications that make the site a more expensive installation. These include:
    a. Battery location and proximity to electrical infrastructure.
    b. Condition of electrical infrastructure for connection of solar and/or battery.
    c. Site complexity based on circuits to be backed up from either the main switchboard, distribution boards or onsite mechanical generators.
    d. Solar installation may require additional height safety considerations including temporary guardrails and/or lifting equipment.

2. **Grant funding proportion:** Current network tariffs disincentivise charging a battery from the grid. A solar PV system is required as a part of the installation and to support long duration island-ability in the event of an extended grid outage. Solar PV isn't eligible for grant funding under the current funding guidelines for Round 1 of the 100NB program. Sites with larger loads must install larger solar PV systems to supply both the load and charge the battery. Sites with larger load commonly require a larger battery too. This can lead to larger cash co-contribution amounts under current grant guidelines, which are not recoverable over the ten year modelled lifetime. It is worth noting that larger sites are commonly relief centres and provide greater opportunities for energy resilience outcomes, as well as emissions reductions and cost savings.

3. **Current Electricity Retail Tariffs:** Many of the sites are on competitive electricity retail tariffs through the VECO PPA. These tariffs make a difficult baseline to compare against to establish financial benefits. It is easier to establish financial benefits for the host site if the site is on an electricity retail tariff with a market average price.

4. **On site load:** Existing on-site load allows for cost savings by avoiding electricity retail purchases. Supplying on-site load through a PPA improves financial performance relative to the sale of electricity to the National Electricity Market (NEM). Selling through a PPA behind the meter allows for the fixing of electricity sell prices at a commercial level, providing benefits to the battery owner and the host site. Sites without material on-site load must sell to the NEM, increasing risk and negatively impacting expected financial performance.

5. **Existing solar PV and battery:** Many of the sites included in this project have existing solar PV systems in place, and some have site batteries. These systems create significant financial benefit for the site already, but in most cases are not sufficient to deliver desired resilience benefits at the site. Commonly, additional battery storage provides only a marginal financial benefit. For this reason, sites with existing solar and battery systems have poorer financial performance, but have capacity to deliver other non-financial benefits to the community should councils have the appetite to invest in these outcomes.

3.4 Project Benefits

A qualitative assessment of the project benefits aligned to the objectives of the 100 NB program are provided in Table Nine.

Table Nine. Project benefits against 100NB program objectives.

Objective	Comment
Benefits from local renewable energy and energy storage are passed on to consumers, including lowering household energy bills	All proposed sites for neighbourhood battery installation are council-owned facilities providing services to community. Some sites are council managed, while others are tenanted sites with a Committee of Management comprised of community user groups. Councils and community groups who manage and use these sites to provide programs and services to members of the wider community will be the beneficiaries of cost savings quantified in Table Five. To enable the local community to engage with the battery by tracking its performance, the host site would need to seek an operator with energy sharing software.
Increased energy reliability	Increasing local storage capacity can contribute to greater network reliability by reducing dependence on high-voltage feeders and lowering peak demand. All proposed sites for neighbourhood batteries cab be used as emergency relief or coordination centres or are high impact energy resilience sites. Proposed battery systems have been designed to provide backup power to keep critical functions at these sites operational in the event of an extended grid outage. Expected backup duration per site is detailed in Table Five. Resilience benefits will be derived by council, emergency management agencies, and community members operating from/accessing these sites during emergency events.
Reduced costs of network upgrades	The ability of the project to deliver on this objective depends on the industry partner selected for ownership or operation and maintenance. All proposed battery systems have been designed to include a Mondo Ubi control device, recommended based on its capacity to deliver the following network support functions: • The deployment of dynamic operating envelopes • Demand increase: charging batteries to soak up excess solar • Demand decrease: discharging batteries during the evening peak • Voltage support to raise and lower network voltages when required With appropriate engagement from the local distribution network service provider, delivery of these functions could assist in reducing network upgrade costs. The neighbourhood batteries proposed in this project would also support the network by design, exporting significant renewable energy and reducing local network peak demand in the evening peak.
Communities feel they are personally contributing to Victoria's energy transition	Situating neighbourhood batteries at high-value community sites will provide a visual demonstration to community members that their community is participating in the energy transition. Stakeholder engagement throughout the implementation and operation of the proposed batteries will create opportunities for community members to build energy literacy and participate in knowledge sharing and learning about neighbourhood batteries and renewable energy technology. Stakeholder engagement plans are outlined in Section 4.2 The ability of the project to connect the proposed battery systems to local consumers will depend on the selection of an appropriate electricity retail

	partner. It is expected that launch events would be hosted at installed battery sites, offering local communities the chance to tour the site and learn how the battery system operates.
Scaled up delivery of operational models for neighbourhood scale batteries.	Implementation of some or all 21 battery systems designed through this project would represent a significant contribution to scaling-up delivery of operational models for neighbourhood batteries. The project has developed commercial options for deployment of behind-the-meter neighbourhood battery systems that provide on-site backup capability. Implementation of this business plan would provide an opportunity to test these commercial options in practice, supporting ongoing innovation and learning, and demonstrating the role that local governments can play in deployment of this technology. Delivery would allow councils to assess the positive impact of battery technology for replication at other council sites. Third party ownership and/or operation of proposed battery systems on council-owned community facilities provides a specific opportunity to develop and test operational models that balance commercial and community interests to achieve broader community benefit outcomes.
Environmental benefits	The battery systems designed through this project can support councils and communities in their progress towards local emissions reduction and renewable energy targets, and broader electrification goals. The proposed battery systems could export excess electricity generated and stored by the system to community in the early evening to replace high emissions intensity electricity consumption at this peak demand time, with near zero emissions electricity supplied from the solar and battery system.

The following benefits have been calculated for each site, aligned with the priority objectives identified by participating organisations, and are presented in Table Ten (below):

- **Community cost savings:** Estimated energy bill savings for the host site. All sites are managed by councils or a Committee of Management for community benefit, and cost savings will accrue to councils and community groups using sites to provide programs and services to the wider community.
- **Site backup:** System design for each site includes identification of critical backup circuits. An estimate of the amount of electricity consumption per day from the backed-up circuits is provided for each site. This estimate has been used to establish the expected backup duration in days considering the amount of battery storage and standard battery manufacturer recommended depth of discharge. The backup duration calculation assumes backup from the battery alone and does not include battery charging from solar during times of grid outage and site islanding. This functionality comes at an additional cost (as outlined in Table Five) for sites where extended backup duration is sought.
- **Renewable energy supply to the host site:** The amount of the site load expected to be supplied from the installed battery system in megawatt hours per annum, converted into a percentage of the whole site's annual load.
- **Renewable energy supply to the community:** The amount of electricity expected to be exported to the community from the battery system in megawatt hours per annum.
- **Battery orientation:** the percentage of the battery discharged to load and to the grid, demonstrating whether the battery will primarily supply clean energy for on-site consumption, or as exports to the local community.
- **Emissions reductions:** estimated emissions reductions in tonnes of CO2 equivalent based on energy flow and emissions modelling.

Table Ten. Quantification of project benefits

LGA Site	**Community Cost Savings** *Note: Some sites have negative cost savings (increase)*	**Site backup** Estimated backup duration from battery only	**Renewable energy supply to the host site**		**Renewable energy supply to the community (MWh per annum)**	**Battery orientation**		**Estimated Emissions Reductions (T CO2)**
			Site load from system (MWh per annum)	**% of site load supplied**		**Battery to site load (%)**	**Battery to grid (%)**	
Wangaratta Wangaratta Sports & Aquatic Centre	Year 1: $24,311 saving *10 yrs: $47,947 cost increase*	4 days 60kWh per day **Comment:** Back-up Distribution Board WWP	279.29	19%	0.00	100%	0%	84.35
Swan Hill Swan Hill Basketball Stadium	Year 1: $2,809 cost saving 10 yrs: $26,178 cost saving	3 days based on 50kWh per day battery only usage. **Comment:** Back-up the lights and power for the office, toilets and the court 1 sub-board at the Main Switchboard	31.31	86%	52.54	45%	55%	49.7
Strathbogie Euroa Council Depot	*Year 1: $448 cost increase* *10 yrs: $8,845 cost increase*	3 days based on 45kWh per day battery only usage. **Comment:** Back-up whole-of-site	11.45	86%	39.34	16%	84%	27.3
South Gippsland Korumburra Indoor Recreation Centre	Year 1: $4,015 cost saving 10 yrs: $49,382 cost saving	3 days based on 30kWh per day battery only usage. **Comment:** There is a manual changeover for Whole of site backup with a temporary generator. It is proposed to modify switchboard for basketball court lighting/reception lighting/ power circuit to be backed-up.	21.04	72%	37.78	28%	72%	18.8
Murrindindi	Year 1: $2,274 cost saving 10 yrs: $21,460 cost saving	3 days based on 30kWh per day battery only usage.	22.89	17%	18.27	23%	77%	14.1

Marysville Community Centre		**Comment:** Distribution Board DBLG2 community kitchen main circuits, toilets and change rooms.						
Mount Alexander Wesley Hill Stadium	Year 1: $702 cost saving 10 yrs: $4,428 cost saving	2 days based on 20kWh per day battery only usage. **Comment:** Back-up office, toilets and multi-purpose power and lighting circuits/ one air-conditioning unit onsite at Distribution Board 1	14.27	86%	26.80	53%	47%	25.0
Mildura The Alfred Deakin Centre	Year 1: $1,389 cost saving 10 yrs: $17,928 cost saving	3 days based on 80kWh per day battery only usage. **Comment:** Back-up Community Centre DB-4 and Visitors Information Centre DB-3 Distribution Board power and lighting.	392.85	27%	0.008	100%	0%	158.5
Mansfield Bonnie Doon Rec Reserve	*Year 1: $232 cost increase* *10 yrs: $4005 cost increase*	3 days based on 15kWh per day battery only usage. **Comment:** Back-up lighting circuits, power circuits & clubrooms Distribution Board.	14.78	60%	14.10	59%	41%	21.2
LaTrobe Gippsland Regional Indoor Sports Stadium	Not applicable	3 days based on 80kWh per day battery only usage **Comment:** Back-up critical lighting circuits/critical power circuits including office and amenities.	1. 273.86	2. 77%	227.33	93%	7%	-2.9
Hepburn Doug Lindsay Rec Reserve	Year 1: $3,352 cost saving 10 yrs: $41,161 cost saving	3 days based on 30kWh per day battery only usage. **Comment:** Back-up lighting circuits/critical power circuits pavilion at Distribution Board 1	25.43	54%	17.16	54%	46%	18.6
Gannawarra		3 days based on 25kWh per day battery only usage.	21.00	66%	22.08	46%	54%	14.3

Sir John Gorton Library		**Comment:** Back-up reception power and lighting, multipurpose power and lighting including office and one hot water circuit at Main Switchboard.						
East Gippsland Lucknow Recreation Reserve	*Year 1: $348 cost increase* *10 yrs: $4,335 cost increase*	3 days based on 30kWh per day battery only usage. **Comment:** Backup pavilion site only via MDB	2.02	72%	22.92	44%	56%	21.2
Central Goldfields Maryborough Aquatic and Leisure Centre	Year 1: $4,304 cost saving *10 yrs: $12,817 cost increase*	3 days based on 55kWh per day battery only usage. **Comment:** Back-up office, toilets and multi-purpose power and lighting circuits/ one air-conditioning unit	158.39	56%	2.91	97%	3%	65.6
Campaspe Echuca War Memorial Aquatic Reserve	*Year 1: $264 cost increase* *10 yrs: $64,993 cost increase*	3 days based on 80kWh per day battery only usage. **Comment:** Back-up office, toilets and multi-purpose power and lighting circuits/ one air-conditioning unit	244.18	64%	5.80	97%	3%	106.8
Bendigo Epsom Huntly Recreation Reserve	Year 1: $2,481 cost saving 10 yrs: $5,372 cost saving	3 days based on 80kWh per day battery only usage. **Comment:** Back-up lighting circuits/air conditioning/critical power and domestic refrigeration circuits.	72.31	56%	23.03	79%	21%	0.6
Benalla Sir Edward ‘Weary’ Dunlop Learning Centre (Benalla Library)	Year 1: $18,178 saving 10 yrs: $225,984 saving	3 days based on 15kWh per day battery only usage. **Comment:** Back-up lighting circuits, power circuits and one A/C unit	33.05	40%	41.24	50%	50%	-1.4

Baw Baw Neerim South Recreation Reserve	Year 1: $1,142 cost saving 10 yrs: $14,032 cost saving	2 days based on 50kWh per day battery only usage. **Comment:** Back-up pavilion lighting circuits/critical power circuits/ excluding ground lighting	13.48	83%	41.85	18%	82%	16.0
Ballarat Ballarat Badminton Stadium	Year 1: $3,394 cost saving 10 yrs: $41,618 cost saving	2 days based on 20kWh per day battery only usage. **Comment:** Back-up lighting circuits/critical power circuits including stadium lighting	21.22	77%	15.03	67%	33%	20.0
Ararat Pomonal Community Hall & Men's Shed	*Year 1: $254 cost increase* *10 yrs: $5,989 cost increase*	2 days based on 20kWh per day battery only usage. **Comment:** Back-up Hall lighting circuits/air conditioning/critical power circuits including kitchen excluding Men's Shed	55	6.99%	6.59	52%	48%	0.37
Alpine Shire Bright Community Centre	Year 1: $168 saving 10 yrs: $902 saving	2 days based on 20kWh per day battery only usage. **Comment:** Back-up lighting circuits, power circuits and one A/C unit.	3.71	42%	14.11	20%	80%	9.0
Alpine Resorts (Falls Creek) Falls Creek Wastewater Treatment Plant	Year 1: $5,406 saving 10 yrs: $66,383 saving	3 days based on 15kWh per day battery only usage. **Comment:** Existing generator for whole site operation / Separate office circuits to be powered by battery storage	30.15	39%	1.29	96%	4%	11.4

4. Implementation

4.1 Project Delivery

A high-level Project Delivery Schedule is outlined in Table Ten, highlighting key project delivery phases, activities, and indicative timelines.

The activities most likely to result in delays to the project delivery timeline are contract negotiations, planning approval processes, DNSP connection applications, electrical upgrades (if required), and the installation and commissioning process. These activities will require close planning and monitoring. Community and stakeholder engagement will be critical at all stages of the project to realise project benefits and mitigate project risks.

Table Eleven. Project delivery schedule

Project Phase	Key Activities
Grant application *(1 month)*	- Site confirmation - Selection of preferred ownership model - Co-contribution - Grant application

Planning and Engagement *(2-3 months)*	- Confirm project management and governance arrangements
	- Commence community engagement
	- Appoint legal and probity advisors
	- Procurement:
	    o Option A. Expression of interest for third party delivery partner
	    o Option B. Tender for battery operations and maintenance provider
	- Contracts:
	    o Lease agreements
	    o Operation and maintenance agreements
	- Secure planning approvals
	- Establish delivery schedule with contractor/s
	- Establish working group to determine site resilience requirements
	- Confirm procedures for overriding day-to-day commercial operation of the battery to deploy energy resilience mode

Installation and Commissioning *(8-9 months)*	- Ongoing community engagement
	- Engineering design
	- DNSP grid connection application
	- Electrical upgrades (*if required*)
	- Procurement:
	    o Battery supplier
	    o Electrical contractor
	- Installation
	- Pre-commissioning tests
	- Commissioning
	- Launch event

Operation *(ongoing)*	- Deployment of battery in markets by third party owner and/or operator, and implementation of energy resilience procedure - Contract management including PPA, lease, and operation and maintenance agreements - Evaluate procedures in place for deploying energy resilience mode

4.2 Stakeholder Engagement

A Stakeholder Engagement Plan has been developed for each participating organisation, outlining how project proponents may engage with the community and other stakeholders in the final design and delivery of a neighbourhood-scale battery project at selected sites.

Early and ongoing engagement with key stakeholders in the final design and delivery of the project – including site managers, site users, and emergency services – will be critical to the delivery of operating models capable of achieving desired community benefit outcomes.

Stakeholder engagement throughout the delivery of the proposed battery projects also presents a valuable opportunity for councils to work with site users and other stakeholders to optimise site use for energy efficiency, build energy literacy, and support emergency preparedness and response.

Engagement Objectives

The key objectives of each Stakeholder Engagement Plan are to:

- Raise awareness of and support for the proposed project, its purpose, objectives, and expected benefits.
- Explain how stakeholders and the wider community can engage with the project, including opportunities for input throughout the delivery of the project.
- Explain the potential impacts of the project and how these will be managed.
- Demonstrate proactive and meaningful engagement with stakeholders and the wider community to achieve desired community benefit outcomes and effectively manage project risks.

Key Stakeholders

Stakeholders differ from site to site. Table Twelve summarises stakeholders identified in common across the 21 project sites.

Table Twelve. Key stakeholders

Primary Stakeholders	Council decision makers Council site managers Community site managers and users Emergency services (CFA and SES)
Secondary Stakeholders	Nearby neighbours Nearby schools and businesses DNSPs Funders
Tertiary Stakeholders	Current energy retailer Community sustainability groups General public / wider community Local media

Primary stakeholders will be directly involved in the project and, depending on their level of participation, will have the opportunity to provide direction, advice, and feedback at each stage of project delivery. Secondary stakeholders will be consulted at critical stages throughout the project and updated on progress. Tertiary stakeholders will have an early opportunity to share their thoughts on the project and will be kept informed of progress.

Engagement Activities

Key engagement activities have been identified for each stakeholder group and project delivery phase. These activities include:

- Community information sessions
- Meetings with site managers, users and emergency services
- Establishment of a project reference group
- Regular communication via council's online engagement platforms, information sheets, council website, e-newsletters, social media, and media releases
- Council briefings
- Site notices
- Launch event and community tours

A link to the Stakeholder Engagement Plan for each site is provided in Appendix 3. These plans should be treated as living documents, updated at each stage of the project and in response to the outcomes of further engagement activities, stakeholder feedback, and monitoring and evaluation.

4.3 Risk Management

A high-level risk management framework has been developed for the delivery of proposed neighbourhood battery projects that identifies, classifies, and assesses risks and controls relevant to behind-the-meter neighbourhood battery and solar PV systems.

This framework has been developed with reference to the Australian Energy Council's *Battery Energy Storage System Guidance Report*, the Country Fire Authority's *Design Guidelines and Model Requirements for Renewable Energy Facilities*, and the Country Fire Authority's *Neighbourhood Battery Energy Storage Systems* guidance.

Risks associated with energy generation and storage projects arise from feasibility through to end of life. Risks are categorised into three process areas as follows:

1. **Investment Risk:** Risks associated with planning, procuring and installing neighborhood batteries.
2. **Operational Risk:** Risks associated with generating and selling energy and energy services from neighborhood battery systems, and from breakdowns in stakeholder engagement processes.
3. **Financial Risk:** Risks associated with monetizing the energy and energy services of neighborhood battery systems.

Risks are then group into subcategories based on the impact they have on the project.

Table Thirteen. Risk subcategories

Risk subcategories	Description
Technology	Failure of system to perform required functions due to failure or degradation.
Market	Loss of revenue due to external factors such as energy market prices, interest rates and inflation.
Credit	Loss of revenue due to debtor default.

Liquidity	Difficulty meeting liabilities when they fall due.
Valuation	Loss of project book value.
Model	Errors and/or poor assumptions during project feasibility stage.
Execution	Errors in project delivery, including breakdowns in stakeholder engagement, leading to system underperformance, capital expenditure overrun, and/or delayed lead times.
Vendor	Risks arising from reliance on vendors for support / maintenance / spare parts which may, for example, increase in price or be discontinued.
Contractual	Enforcement of contract terms
Regulatory	Failure to comply with existing regulations, and changes to regulations leading to non-compliance or increased compliance burden.
Health & Safety	Inherent risks associated with failure to provide a safe workplace. (Contingent health and safety risks arising from eg. natural disasters are treated separately)
Security	Failure to maintain appropriate technological and information systems and infrastructure. Failure to maintain internal and external cyber and technology controls. Failure to maintain an adequate watch on technological change and innovation and to optimise related decisions.
Environment	Failure to manage our impact on the environment. Failure to plan and adapt to a changing environment.
Weather / Natural Disaster	Bushfire / flood / earthquake / storm

The consequence-likelihood method is applied to assess levels of risk.

Table Fourteen. Risk assessment matrix

	CONSEQUENCE				
LIKELIHOOD	1 - Insignificant	2 – Minor	3 - Moderate	4 - Major	5 – Extreme
5 – Almost Certain	Medium	High	Very High	Very High	Very High
4 – Likely	Medium	Medium	High	Very High	Very High
3 – Possible	Low	Medium	Medium	High	Very High
2 – Unlikely	Low	Low	Medium	Medium	High
1 – Rare	Low	Low	Low	Medium	Medium

Treatments options are outlined in Table Fifteen below.

Table Fifteen. Risk treatment options

Risk Treatment Options	Description
Accept	Retaining the risk by informed decision

Avoid	Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk or removing the risk source
Reduce likelihood	Reducing the likelihood
Reduce consequence	Reducing the consequences
Share	Sharing the risk with another party or parties (including contracts and risk financing)

Links to a Draft Risk Register and Fire Risk Management Plan Template are provided in Appendix 3. These documents identify risks and recommend treatments and controls relevant to behind the metre neighbourhood battery projects, based on Indigo Power's experience, and with reference to relevant industry standards and guidelines.

The Draft Risk Register and Fire Risk Management Plan Template provide information relevant to all 21 projects in this business case. These documents are intended as guides only and should be reviewed and updated by project proponents in planning for and delivery of the proposed neighbourhood battery projects.

Addendum: Revised funding guidelines for 100NB Round 2

Since this business case was completed, the Victorian Government has released updated funding guidelines for Round 2 of the 100 Neighbourhood Batteries Program, with changes to the amount of funding available per battery, co-contribution requirements, and available funding streams.

This addendum provides a summary of these changes, and a high-level overview of the impact on the business case for each of the 21 sites investigated though this project.

100NB Program Round 2 Funding Guidelines

100NB Round 2 funding guidelines were released on 14th August 2024.

Changes to Round 1 funding guidelines in Round 2 (relevant to this business case) include:

- Introduction of a dedicated stream (Stream 3) for batteries that will provide back-up power at community facilities.
- Increase in the amount of project funding available per battery, from $300,000 to $400,000 per battery.
- Changes to the co-contribution requirement from 10% of the battery capex, to 5% of the total project budget (including any solar PV generation technology to be installed under Stream 3).

Eligibility requirements for the three funding streams in Round 2 are summarised in the table below. Neighbourhood batteries designed through the RGA-NBI project are well aligned with the eligibility requirements for funding under Stream 3.

Stream 1: Delivering network and community benefits	**Stream 2: Delivering community benefits**	**Stream 3: Delivering energy resilience**
Funding (of up to $400,000 per battery) will be provided for projects that: • put in place one or more neighbourhood batteries (including installation and commissioning) • prove quantified benefits for both the electricity network and local community • include at least a 30% cash co-contribution of the requested grant amount • each battery must be a chemical battery of a minimum size 20kW/40kWh and maximum 5MW/20MWh • will complete the project delivery by 31 August 2026.	Funding (of up to $400,000 per battery) will be provided for projects that: • put in place one or more neighbourhood batteries (including installation and commissioning) • prove quantified benefits for the local community • include at least a 10% cash co-contribution of the requested grant amount • each battery must be a chemical battery of a minimum size 20kW/40kWh and maximum 5MW/20MWh • will complete project delivery by 31 August 2026.	Funding (of up to $400,000 per back-up system) will be provided for projects that: • implement one or more energy back-up system/s that will be capable of continuing to supply power to one or more publicly accessible building/s during grid outages. Each energy back-up system **must** include a neighbourhood battery and may also include installation of any or all of the following: solar photovoltaics (PV), generator and management systems. • prove quantified benefits for the local community • include a cash co-contribution of at least 5% of the requested grant amount • each battery must be a chemical battery of a

		minimum size 20kW/40kWh and maximum 5MW/20MWh • will complete project delivery by 31 August 2026.

Implications for financial modelling

Financial models have been adjusted with updated assumptions aligned to Round 2 funding guidelines. Updated financial results for each site are presented in Table Sixteen below. Changes to funding guidelines do not impact the operational modelling of the site or the expected benefits and energy flows.

Round 2 funding guidelines will enable project participants to deliver neighbourhood batteries with strong financial, environmental, and resilience benefits. Financial results for nearly all 21 sites are now positive for both Option A and Option B. Only one larger site with a higher project cost (over $400,000) and co-contribution amount, and greater exposure to wholesale spot prices, continues to perform negatively.

Stream 3 funding guidelines allow for the inclusion of cost associated with the installation and commissioning of an energy management system to enable charging from solar in island mode. This can be included in the total requested funding amount, along with the costs of solar PV or generators required as part of the neighbourhood battery system design. Solar PV and energy management system costs have been included in the updated capital cost estimates for each site.

Requested grant amounts across the 21 sites range from $117,000 to $400,000, with an average of $248,000. The required co-contribution amount for each site (assuming applications under Stream 3) ranges from $6,000 to $353,000, with a median co-contribution amount of $12,000.

Table Sixteen. Updated financial results and cost estimates based on Round 2 funding guidelines

Site	Battery Sizing	New/ Additional Solar PV	Total Capital Cost	Updated Financial Results (based on 100NB Round 2 funding guidelines)		
			(inclusive of additional cost to charge from solar in island mode)	**Grant Request** (up to $400K per battery)	**Cash Contribution** (5% of total project cost)	**Updated Financial Results** Option A: Third Party Ownership Option B: Host Site Ownership
Wangaratta Sports & Aquatic Centre	100kW/300kWh	100kW	$ 753,250	$ 400,000	$ 353,250	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 20.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 12.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 5.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: -$198,049 over 10 years (cost increase) **Option B:** Internal Rate of Return: 3.1% Payback Period (without electricity cost savings): 8 Years Adj Rate of Return*: N/A Payback Period (inclusive of electricity cost savings): N/A
Swan Hill Basketball Stadium	60kW/170kWh	50kW	$ 327,578	$ 311,199	$ 16,379	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 24.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 14.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $64,123 over 10 years **Option B:** Internal Rate of Return: 16.5% Payback Period (without electricity cost savings): 5 Years Adj Rate of Return*: 57.0% Payback Period (inclusive of electricity cost savings): 2 years
Euroa Depot	40kW/170kWh	30kW	$ 280,820	$ 266,779	$ 14,041	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 24.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 14.00 c/kWh

						Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $5,408 over 10 years **Option B:** Internal Rate of Return: 4.8% Payback Period (without electricity cost savings): 9 Years Adj Rate of Return*: 10.8% Payback Period (inclusive of electricity cost savings): 6 years
Korumburra Indoor Recreation Centre	30kW/120kWh	26kW	$ 238,240	$ 226,328	$ 11,912	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $51,459 over 10 years **Option B:** Internal Rate of Return: 15.2% Payback Period (without electricity cost savings): 6 Years Adj Rate of Return*: 57.1% Payback Period (inclusive of electricity cost savings): 2 years
Marysville Community Centre	30kW/120kWh	18kW	$ 232,534	$ 220,907	$ 11,627	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 29.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 15.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $16,889 over 10 years **Option B:** Internal Rate of Return: 16.0% Payback Period (without electricity cost savings): 5 Years Adj Rate of Return*: 33.9% Payback Period (inclusive of electricity cost savings): 3 years
Wesley Hill Stadium	25kWh/50kWh	15kW	$ 139,490	$ 132,516	$ 6,975	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 22.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 12.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges.

						Option A: Cost saving: $9,390 over 10 years **Option B:** Internal Rate of Return: 15.8% Payback Period (without electricity cost savings): 6 Years Adj Rate of Return*: 32.1% Payback Period (inclusive of electricity cost savings): 3 years
Alfred Deakin Centre	100kW/300kWh	170kW	$ 687,600	$ 400,000	$ 287,600	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 23.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 10.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 4.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $213,241 over 10 years **Option B:** Internal Rate of Return: -2.7% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 12.1% Payback Period (inclusive of electricity cost savings): 5 years
Bonnie Doon Recreation Reserve	25 kW/50 kWh	8kW	$ 135,816	$ 129,025	$ 6,791	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $12,118 over 10 years **Option B:** Internal Rate of Return: 8% Payback Period (without electricity cost savings): 7 Years Adj Rate of Return*: 29.1% Payback Period (inclusive of electricity cost savings): 4 years
Gippsland Regional Indoor Sports Stadium	100kW/300kWh	None	$ 434,900	$ 400,000	$ 34,900	**PPA Prices:** Not applicable **Option A:** Not applicable **Option B:** Adj Rate of Return*: 73.1% Payback Period (inclusive of electricity cost savings): 2 Years
Doug Lindsay Reserve	30kW/120kWh	23kW	$ 252,752	$ 240,114	$ 12,638	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 20.00 c/kWh

						Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $48,071 over 10 years **Option B:** Internal Rate of Return: 11.1% Payback Period (without electricity cost savings): 6 Years Adj Rate of Return*: 49.7% Payback Period (inclusive of electricity cost savings): 3 years
Sir John Gorton Library	30kW/100kWh	16kW	$ 200,670	$ 190,637	$ 10,034	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 24.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $17,287 over 10 years **Option B:** Internal Rate of Return: 8.4% Payback Period (without electricity cost savings): 7 Years Adj Rate of Return*: 31.7% Payback Period (inclusive of electricity cost savings): 4 years
Lucknow Recreation Reserve	30Kw/120kWh	28kW	$ 254,762	$ 242,024	$ 12,738	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 24.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 6.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $11,093 over 10 years **Option B:** Internal Rate of Return: 4.2% Payback Period (without electricity cost savings): 8Years Adj Rate of Return*: 17.0% Payback Period (inclusive of electricity cost savings): 5 years
Maryborough Aquatic and Leisure Centre	50kW/200kWh	77kW	$ 357,304	$ 339,439	$ 17,865	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 22.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 12.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 4.00 c/kWh No daily supply charge or other electricity retail or network associated charges.

						Option A: Cost saving: $67,849 over 10 years **Option B:** Internal Rate of Return: -4.3% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 59.8% Payback Period (inclusive of electricity cost savings): 2 years
Echuca War Memorial Aquatic Reserve	100kW/300kWh	130kW	$ 604,800	$ 400,000	$ 204,800	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 13.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 4.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $51,557 over 10 years **Option B:** Internal Rate of Return: -4.8% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 0.4% Payback Period (inclusive of electricity cost savings): 10 years
Epsom Huntly Recreation Reserve	100kW/300kWh	None	$ 420,500	$ 399,475	$ 21,025	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 20.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $87,547 over 10 years **Option B:** Internal Rate of Return: 17.2% Payback Period (without electricity cost savings): 5 Years Adj Rate of Return*: 64.1% Payback Period (inclusive of electricity cost savings): 2 years
Sir Edward Weary Dunlop Learning Centre	60kW/170kWh	None	$ 250,800	$ 238,260	$ 12,540	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 17.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $232,132 over 10 years **Option B:** Internal Rate of Return: 14.6%

						Payback Period (without electricity cost savings): 5 Years Adj Rate of Return*: 173.7% Payback Period (inclusive of electricity cost savings): 2 years
Neerim South Recreation Reserve	25kWh/50kWh	19kW	$ 153,762	$ 146,074	$ 7,688	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $23,074 over 10 years **Option B:** Internal Rate of Return: 9.8% Payback Period (without electricity cost savings): 7 Years Adj Rate of Return*: 42.2% Payback Period (inclusive of electricity cost savings): 3 years
Ballarat Badminton Stadium	25kWh/50kWh	25kW	$ 144,478	$ 137,254	$ 7,224	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 16.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $48,601 over 10 years **Option B:** Internal Rate of Return: 24.6% Payback Period (without electricity cost savings): 4 Years Adj Rate of Return*: 84.9% Payback Period (inclusive of electricity cost savings): 2 years
Pomonal Hall & Men’s Shed	25kWh/50kWh	None	$ 122,900	$ 116,755	$ 6,145	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 25.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 15.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $892 over 10 years **Option B:** Internal Rate of Return: -2.1% Payback Period (without electricity cost savings): >10 Years Adj Rate of Return*: 0.7% Payback Period (inclusive of electricity cost savings): 10 years

Bright Community Centre	25kWh/50kWh	10kW	$ 135,494	$ 128,719	$ 6,775	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 26.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 18.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 8.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $4,079 over 10 years **Option B:** Internal Rate of Return: 4.5% Payback Period (without electricity cost savings): 9 Years Adj Rate of Return*: 13.4% Payback Period (inclusive of electricity cost savings): 6 years
Falls Creek Wastewater Treatment Plant	25kWh/50kWh	17kW	$ 160,284	$ 152,270	$ 8,014	**PPA Prices:** Peak consumption (7-10 am & 3-10 pm Mon-Sun, local time): 27.00 c/kWh Shoulder consumption (10pm-7am Mon-Sun, Local Time): 18.00 c/kWh Off peak consumption (10 am- 3pm Mon-Sun, Local Time): 10.00 c/kWh No daily supply charge or other electricity retail or network associated charges. **Option A:** Cost saving: $79,779 over 10 years **Option B:** Internal Rate of Return: 25% Payback Period (without electricity cost savings): 4 Years Adj Rate of Return*: 109.6% Payback Period (inclusive of electricity cost savings): 1 year

Appendix One: Modelling Assumptions

Energy Flow Assumptions

Assumption or Input	Detail
Platform	Gridcog operational modelling Excel financial modelling
Inflation	4.5%. Applied to PPA rates and all revenue and cost items.
Load	Site meter data for a twelve month period within the previous 24 months. Assume load profile remains unchanged across time.
System sizing	System design and sizing is based on detailed site assessment from Indigo Power’s qualified electrician and preliminary modelling in Gridcog.
Solar Generation	Solar system designed in the design platform Pylon. System details provided as input to Gridcog software. Generation profile based on system configuration and solar resource assessment and forecasting platform Solcast for the site’s coordinates.
LGCs (if generation is greater than 100 kW)	LGC certificate generation based on solar generation modelling. Inflation-adjusted LGC price assumed is $44 in 2025, decreasing to $38 in 2026, $32 in 2027 and $0 at the end of the Renewable Energy Target in 2031.
Network tariffs	Site network tariffs are based on existing site network tariffs. CPI applied to network tariffs. It is assumed that the tariff structure and inflation-adjusted rates do not change.
Wholesale price	Forward curve from Endgame Economics (Q3 2023 Central Case) are applied.
FCAS	CY2022 contingency FCAS prices were used. Prices are linearly derated 5% year-on-year from 1 Jan 2024 to replicate potential future declines in FCAS prices. FCAS revenue assumes a 50% share of revenues with a licenced and registered third party demand response service provider, responsible for deployment of the battery in applicable FCAS markets.
System responsiveness	Gridcog modelling assumes perfect foresight, with the system performance perfectly responding to all price signals. A derating factor is incorporated in post-processing and applied to wholesale energy exports and imports, mimicking the imperfect foresight operation which will be achieved in practice. The wholesale export performance has been de-rated accordingly.
Retail rates	Baseline analysis assumes electricity retail tariffs for the 2023/24 financial year supplied to Indigo Power by the host site. Where rates are available for the 2024/25 financial year baseline analysis has assumed these.
Solar and battery efficiency loss	While battery round-trip efficiency varies depending on operation and ambient temperature, we have modelled a round-trip efficiency of 80% which we anticipate is conservative. Modelled solar output is derated by 11% to mimic cabling, shading and inverter losses.
Battery depth of discharge	80% of nominal battery storage depth of discharge, consistent with manufacturer recommendations for LFP batteries.

Financial Assumptions

Assumption or Input	Detail
Energy flows	Energy flows are provided as an output from the operational modelling performed in Gridcog.
Energy flow accounting	We post-process the energy flow outputs from Gridcog to calculate how much of the site's load is supplied from the solar and battery system. We assume that solar preferentially supplies load before any other sink (grid or battery), from which all other terms follow.
Carbon emissions reduction estimation	We take the product-sum of the energy flows from Gridcog and a time-varying average emissions factor to estimate emissions associated with electricity use for the site. This is done for both the baseline (business as usual) and proposed scenarios, then the difference between the emissions of the two scenarios is taken and this is reported as an indicative emissions reduction associated with the project. The average emissions factor time series represents the assumed energy mix in the Endgame Economics forward curve. In this calculation we do not consider renewable energy certificates, transmission losses or distribution losses, nor embodied energy/carbon with the generation and storage system.
Grant amount	The maximum grant funding amount for the 100 NB grant program is assumed. All other funding (solar capex) is provided as an investment from a third party owner or the host site, depending on the commercial option.
Grant funding amortisation	Grant funding contributions have been amortised over the life of the battery according to accounting standard AASB120, rather than treated as year one revenue.
Behind the meter power purchase agreement price	The sale of electricity to the host site from the solar and battery system has been modelled based on the PPA rates presented above. These rates are fixed and increase annually in line with inflation.
OPEX Battery	A battery opex cost of $1000 p.a per 100 kWh battery installed is applied. Opex costs include monitoring and maintenance, control and aggregation fees, market access fees, and any third party overheads for battery deployment.
OPEX Solar	A solar opex cost of $500 p.a. per 50 kW installed is to calculate solar opex. Solar opex costs include system inspection, maintenance and cleaning when required.
Insurance	Insurance of $2500 per 1 million of asset insured has been applied. Paid for by a third party owner or the host site depending on the ownership of the asset.
Network connection and fees	In both options the third party operator assumes responsibility for the site meter. Network charges are absorbed by the third party operator and are not passed on to the host site.
Site lease costs	The cost for a third party to lease the necessary area to host the solar, battery and associated equipment has been set to zero. Under this analysis, consideration for the lease is represented by low cost PPA rates. Delivery is expected to include commercial rent, which may be offset by a commensurate increase in PPA prices. In any event, the net position of the host site will remain the same.

Lease period	A ten year period has been modelled, however, further options could take the total period of any lease to at least 15 years, the expected useable life of the battery system.
System lifespan and depreciation	Battery system depreciated over 15 years. Solar PV system depreciated over 25 years. Linear depreciation.

Appendix Two: Site Inspection Outcomes

Project Participant & Sites	Site Assessment	Final Site
LGA: Alpine Resorts **Inspected sites:** 1. Wastewater Treatment Plant 2. Council Administration Building	1. **Renewable Energy:** All sites had a small roof space but the largest was the Wastewater Treatment Plant meaning they could generate some solar power. 2. **Energy Supply:** Wastewater Treatment Plant site the transformer was adequate to host a neighbourhood battery with adequate space near the main switchboard. The Administration building was not able to host a battery in a suitable location near the building 3. **Energy Resilience:** The Wastewater Treatment Plant site has a need to operate in a power outage. Back-up circuits to the office can be accommodated	The Wastewater Treatment site was selected as it was able to host a neighbourhood battery and had suitable electrical infrastructure available.
LGA: Alpine Shire Council **Inspected sites:** 1. Bright Community Centre 2. Tawonga Memorial Hall	1. **Renewable Energy:** Both sites had adequate roof space but the largest was Bright Community Centre meaning they could generate significant solar. 2. **Energy Supply:** Tawonga Hall's transformer was not adequate to connect a neighbourhood battery and the switchboard too small. Bright Community Centre has more suitable electrical infrastructure available. 3. **Energy Resilience:** The Bright Community Centre can become an evacuation point with a kitchen and amenities available. The Hall was less appealing.	Bright Community Centre was selected due to its centralised location and available amenities to be used in an emergency. This site is preferred.
LGA: Rural City of Wangaratta **Inspected sites:** 1. Wangaratta Sports & Aquatic Centre 2. HP Barr Community Centre	1. **Renewable Energy:** Both sites had adequate roof space but the largest was Wangaratta Sports & Aquatic Centre meaning they could generate significant solar. This site also had adequate space to host a battery whereas the Community Centre was limited in this area. 2. **Energy Supply:** Wangaratta Sports & Aquatic Centre electrical infrastructure was good and able to connect a larger neighbourhood battery. The HP Barr Community hall had suitable electrical infrastructure to host a smaller battery. 3. **Energy Resilience:** The Wangaratta Sports & Aquatic Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	Wangaratta Sports & Aquatic Centre was selected due to it being able to host a larger capacity battery and space available in combination with a large solar PV system and suitable electrical infrastructure.

LGA: Benalla Rural City Council **Inspected sites:** 1. Sir Edward ‘Weary’ Dunlop Learning Centre (Benalla Library) 2. Benalla Visitor Information Centre	1. **Renewable Energy:** Benalla Library has a large solar PV system installed and the roof is at capacity which generates significant solar. The Visitor Centre has a smaller roof area available for a smaller solar system. 2. **Energy Supply:** Benalla Library has suitable electrical infrastructure available to has a reasonable sized neighbourhood battery with adequate space to host the battery. The Visitor Centre has limited space available for a battery. 3. **Energy Resilience:** The Library can become an evacuation point to be able to hold a good number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	Benalla Library was selected due to it being able to host a larger capacity battery and space available with the existing large solar PV system and its suitable electrical infrastructure.
LGA: Mansfield Shire Council **Inspected sites:** 1. Bonnie Doon Rec Reserve 2. Mansfield Community Centre 3. Jamieson Memorial Hall	1. **Renewable Energy:** All sites identified and inspected had limited roof capacity to install solar PV on. The Bonnie Doon Recreation Reserve has an existing system that can connect additional solar to generate significant solar. 2. **Energy Supply:** The Community Centre and the Memorial Hall has limited electrical infrastructure available and could only host a small battery. The Recreation Reserve has suitable electrical infrastructure to host a neighbourhood battery with space available to install this near the main switchboard. 3. **Energy Resilience:** The Recreation Reserve can be an evacuation point to hold a large number of people in an emergency. Backup of power at this site is more beneficial than the other two sites.	Bonnie Doon Rec Reserve was selected due to its centralised location and available amenities to be used in an emergency. This site is preferred as the electrical infrastructure is adequate to host a neighbourhood over the other two sites.
LGA: Murrindindi Shire Council **Inspected sites:** 1. Marysville Community Centre 2. MiRA	1. **Renewable Energy:** MiRA has a smaller roof area, with an existing solar system installed, it is near capacity to host an additional solar expansion. Marysville Community Centre has a large roof area, with existing solar meaning it could generate significant solar with additional PV panels. 2. **Energy Supply:** The Community Centre’s electrical infrastructure can host a good sized neighbourhood battery with space available while MiRA had issues with space available for a battery. The Community Centre’s electrical infrastructure could also accommodate a larger battery.. 3. **Energy Resilience:** The Community Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities and kitchen available. A neighbourhood battery can operate to keep some power available in an outage.	The Community Centre was selected due to it being able to host a larger capacity battery and space available in combination with a large solar PV system.
LGA: Strathbogie Shire Council **Inspected sites:**	1. **Renewable Energy:** Both sites had adequate roof space but the largest was Euroa Council Depot meaning they could generate significant solar.	The Euroa Depot is a preferred site over the Showgrounds due to it being used as an emergency control centre in

1. Euroa Council Depot 2. Euroa Showgrounds	2. **Energy Supply:** The Euroa Showgrounds had complex electrical infrastructure and in some cases in poor condition. The Euroa Depot site has adequate, good condition electrical infrastructure and a good connection point to host a neighbourhood battery. 3. **Energy Resilience:** The Euroa Depot is used in emergency events as a control centre and would need to operate in long power outages. This is where all emergency services work from at these times to assist the community where needed.	emergencies. The site is able to host a suitably sized neighbourhood battery for this purpose.
LGA: Campaspe Shire Council **Inspected sites:** 1. Echuca War Memorial Aquatic Centre 2. Echuca Basketball Stadium	1. **Renewable Energy:** Both sites had adequate roof space but the largest was Echuca War Memorial Aquatic Centre meaning they could generate significant solar. This site also had adequate space to host a battery. The Echuca Basketball Stadium has an existing solar and battery system in operation. 2. **Energy Supply** Echuca War Memorial Aquatic Centre electrical infrastructure was good and able to connect a larger neighbourhood battery. The Basketball Stadium has an adequate solar and battery system installed. 3. **Energy Resilience:** The Echuca War Memorial Aquatic Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	Echuca War Memorial Aquatic Centre was selected due to it being able to host a larger capacity battery and space available in combination with a large solar PV system and suitable electrical infrastructure.
LGA: Central Goldfields Shire Council **Inspected sites:** 1. Maryborough Aquatic and Leisure Centre 2. Central Goldfields Shire Council Office (Municipal Centre)	1. **Renewable Energy:** Both sites had adequate roof space but the largest was Maryborough Aquatic and Leisure Centre meaning they could generate significant solar. This site also had adequate space to host a battery whereas the Municipal Centre was limited in this area. 2. **Energy Supply:** Maryborough Aquatic and Leisure Centre has suitable electrical infrastructure available to host a reasonable sized neighbourhood battery with adequate space available.. The Municipal Centre has limited space available for a battery. 3. **Energy Resilience:** The Maryborough Aquatic and Leisure Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	Maryborough Aquatic and Leisure Centre is better suited to host a neighbourhood battery based on the site use, the electrical infrastructure, and space available for the battery to be installed.
LGA: City of Greater Bendigo **Inspected sites:**	1. **Renewable Energy:** Epsom Huntly has a large solar PV system installed and the roof is at capacity which generates significant solar. The Truscott Reserve site has a large roof area available for a solar system however the site is underutilised.	Epsom Huntly is better suited to host a neighbourhood battery based on the site use, the electrical infrastructure, and space available for the battery to be installed.

1. Epsom Huntly Recreation Reserve 2. Truscott Reserve, California Gully	2. **Energy Supply:** Epsom Huntly has a large transformer and main switchboard with room to install the neighbourhood battery in close proximity. Truscott Reserve has some limitations on how the facility is used day to day and therefore not making best use of the battery. 3. **Energy Resilience:** The Epsom Huntly site has good amenities including toilets and showers in the pavilion. This site is able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	
LGA: Mount Alexander Shire Council **Inspected sites:** 1. Wesley Hill Stadium 2. Taradale Public Hall	1. **Renewable Energy:** Taradale has limited roof space available and would also present a difficult installation. The Wesley Hill Stadium has a large roof area meaning it could generate significant solar. 2. **Energy Supply:** The Taradale Hall site has a small switchboard and could not host a large neighbourhood battery. The Stadium has space available to host a battery while the electrical infrastructure is adequately sized and in good condition. 3. **Energy Resilience:** The Wesley Hill Stadium can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	The Wesley Hill Stadium site was the largest site with available area to host a neighbourhood battery, and with amenities to provide energy resilience service.
LGA: Ararat Rural City Council **Inspected sites:** 1. Pomonal Community Hall & Men's Shed 2. Pomonal Old CFA Shed	1. **Renewable Energy:** The Pomonal CFA Shed has limited roof area and is not structurally suitable to host a solar system. The Pomonal Hall has some roof space available and currently has an existing system on the hall and the Men's Shed meaning it generates solar at site. 2. **Energy Supply:** The Pomonal CFA Shed site has a small switchboard and could not host a large neighbourhood battery. The Pomonal Hall has space available to host a battery while the electrical infrastructure is adequately sized and in good condition to connect a battery to it. The battery size is limited by the transformer capacity. 3. **Energy Resilience:** The Pomonal Hall is an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	The CFA shed was not suitable to host a neighbourhood battery. Pomonal Community Hall is a place of last resort in emergencies in the town.
LGA: City of Ballarat **Inspected sites:** 1. Ballarat Badminton Stadium	1. **Renewable Energy:** Both sites had adequate roof space but the largest was the Ballarat Badminton Stadium meaning it could generate significant solar. This site also had adequate space to host a battery which is similar for the Learmouth Football Club.	Ballarat Badminton Stadium has a higher amount of electricity use and there is good community access to the facility.

2. Learmouth Football Club	2. **Energy Supply:** The Learmouth site has a good condition switchboard however the battery capacity may be limited by the mains cabling. The Ballarat Stadium has space available to host a battery while the electrical infrastructure is adequately sized and in good condition to connect a battery to it. 3. **Energy Resilience:** The Ballarat Badminton Stadium can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	
LGA: Hepburn Shire Council **Inspected sites:** 1. Doug Lindsay Recreation Reserve (Preferred) 2. The Warehouse Clunes	1. **Renewable Energy:** The Warehouse has limited roof area with an existing small solar system. The Doug Lindsay Reserve has the largest roof area meaning it could generate significant solar. There is an existing solar system installed which could be expanded. This site also had adequate space to host a battery whereas The Warehouse does not and is a heritage zoned area.. 2. **Energy Supply:** The Doug Lindsay site has a good condition switchboard and the battery could be positioned close by. The Warehouse has a good electrical infrastructure however there are no options for a battery to be installed. 3. **Energy Resilience:** The Doug Lindsay Reserve can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	Doug Lindsay Recreation Reserve is the preferred site due to having a suitable area to host a battery and it is more accessible to the community as a place of last resort in an emergency.
LGA: Gannawarra Shire Council **Inspected sites:** 1. Sir John Gorton Library 2. Cohuna Hall	1. **Renewable Energy:** The Library site has an existing solar PV system installed and the roof is some additional area for additional system expansion. The Cohuna Hall also has space available to expand the existing solar system. 2. **Energy Supply:** The Library has suitable electrical infrastructure available to host a reasonable sized neighbourhood battery with adequate space to host the battery. The Hall has limited space available for a battery and potentially difficult connection. 3. **Energy Resilience:** The Library can become an evacuation point to be able to hold a good number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	The Sir John Gorton Library has good electricity usage day to day and is used by the community daily. The site has a reasonably sized solar system to recharge the neighbourhood battery.
LGA: Mildura Rural Council **Inspected sites:**	1. **Renewable Energy:** Both sites had adequate roof space with the largest at Mildura Sporting Precinct. Each site also had adequate space to host a neighbourhood battery.	The Alfred Deakin Centre has less overall electricity usage compared with the Mildura Sporting Precinct, but still very high, making both sites challenging to make good use of the neighbourhood battery. The neighbourhood battery

1. The Alfred Deakin Centre 2. Mildura Sporting Precinct	2. **Energy Supply:** Both sites have suitable electrical infrastructure available to host a reasonably sized neighbourhood battery, however the Sporting Precinct uses a high amount of power daily that the battery would not be well used for its intended purpose. 3. **Energy Resilience:** The Alfred Deakin Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	may be used to back-up applicable circuits at either site. Alfred Deakin Centre was prioritised..
LGA: Swan Hill Rural City Council **Inspected sites:** 1. Swan Hill Basketball Stadium 2. Swan Hill Aquatic and Recreation Centre	1. **Renewable Energy:** Both sites have a large roof area meaning each could generate significant solar however Swan Hill Aquatic and Rec Centre has a complex roof area and may be a difficult installation. The Basketball Stadium has an existing solar system and can be expanded easily. The Basketball Stadium has a suitable area to host a neighbourhood battery. 2. **Energy Supply:** Both sites have good condition switchboards available for connection of a neighbourhood battery. 3. **Energy Resilience:** The Swan Hill Basketball Stadium can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	The Swan Hill Basketball Stadium is a preferred option as the Aquatic Centre has high electricity usage and will not make best use of the battery operation. The Swan Hill Basketball Stadium can become an evacuation centre in emergencies.
LGA: Baw Baw Shire Council **Inspected sites:** 1. Neerim South Recreation Reserve 2. Buln Buln Recreation Reserve	1. **Renewable Energy:** Both sites have a reasonable sized roof area to host a solar PV system allowing for solar generation for each. 2. **Energy Supply:** Each site has an accessible main switchboard for the connection of a neighbourhood battery. Both sites also have good electrical infrastructure. 3. **Energy Resilience:** Both sites have good amenities including toilets and showers in the pavilions. Neerim South would be able to cater toward a large number of people in times of need with amenities available than Buln Buln. A neighbourhood battery can operate to keep some power available in an outage.	Neerim South Recreation Reserve is better suited to host a neighbourhood battery based on the site use, the electrical infrastructure, and space available for the battery to be installed.
LGA: East Gippsland Shire Council **Inspected sites:** 1. Lucknow Recreation Reserve 2. Bairnsdale City Oval	1. **Renewable Energy:** Lucknow has a reasonably sized solar PV system installed and the roof is at capacity which generates significant solar with an additional system to be installed at the gym roof. Bairnsdale City Oval also has a small solar system with an opportunity for additional solar PV. 2. **Energy Supply:** Lucknow has a large transformer and main switchboard with room to install the neighbourhood battery in close proximity to it. Bairnsdale Oval has some limitations on battery positioning due to use of the site and the ease of connection.	Lucknow Recreation Reserve is better suited to host a neighbourhood battery based on the site use, the electrical infrastructure, and space available for the battery to be installed.

	3. **Energy Resilience: Both sites** have good amenities including toilets and showers in the pavilion. This site is able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage for each.	
LGA: LaTrobe City Council **Inspected sites:** 1. Gippsland Regional Indoor Sports Stadium (GRISS) 2. Moe-Newborough Leisure Centre	1. **Renewable Energy:** Both sites have a large roof area meaning each could generate significant solar. The GRISS has an existing solar system and can be expanded easily while both sites also have a suitable area to host a neighbourhood battery with Moe Leisure Centre being more complex. Each has high electricity usage. 2. **Energy Supply:** Both sites have good condition switchboards available for connection of a neighbourhood battery with access to GRISS being in close proximity to the battery and an easier connection. 3. **Energy Resilience:** GRISS can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage to critical circuits.	GRISS is the preferred site due to the neighbourhood battery being close to the main switchboard and an easier connection.
LGA: South Gippsland Shire Council **Inspected sites:** 1. Korumburra Indoor Recreation Centre (KIRC) 2. South Gippsland SPLASH	1. **Renewable Energy:** Both sites have a large roof area meaning each could generate significant solar however SPLASH has a roof area that needs some repair and removal of solar heating tubes. Each site has a suitable area to host a neighbourhood battery. 2. **Energy Supply:** Both sites have good condition switchboards available for connection of a neighbourhood battery with adequate sized transformers nearby. 3. **Energy Resilience:** The Korumburra Indoor Recreation Centre can become an evacuation point to be able to hold a large number of people in times of need with amenities available. A neighbourhood battery can operate to keep some power available in an outage.	KIRC is the preferred site due to the condition of the site overall and that the battery may be better used in a long term power outage for resilience purposes.

Appendix Three: Site-Specific Documents and Links

The following site-specific documents and additional supporting materials can be found here: https://cvga1.sharepoint.com/:f:/s/RegionalAlliancesNBI/EnJOyP5c8UhLsNWvN1T4w8oBPAqwshV5UhWPyTx5uVgZLA

Please contact the Central Victorian Greenhouse Alliance for password access to files: admin@cvga.org.au

Participating Organisation	Document Codes
1. Alpine Resorts (Falls Creek)	1A. Site Inspection Report 1B. Preliminary Modelling 1C. System Design and Costing Report 1D. Site Business Case - Financial Modelling 1E. Stakeholder Engagement Plan
2. Alpine Shire Council	2A. Site Inspection Report 2B. Preliminary Modelling 2C. System Design and Costing Report 2D. Site Business Case - Financial Modelling 2E. Stakeholder Engagement Plan
3. Ararat Rural City Council	3A. Site Inspection Report 3B. Preliminary Modelling 3C. System Design and Costing Report 3D. Site Business Case - Financial Modelling 3E. Stakeholder Engagement Plan
4. City of Ballarat	4A. Site Inspection Report 4B. Preliminary Modelling 4C. System Design and Costing Report 4D. Site Business Case - Financial Modelling 4E. Stakeholder Engagement Plan
5. Baw Baw Shire Council	5A. Site Inspection Report 5B. Preliminary Modelling 5C. System Design and Costing Report 5D. Site Business Case - Financial Modelling 5E. Stakeholder Engagement Plan
6. Benalla Rural City Council	6A. Site Inspection Report 6B. Preliminary Modelling 6C. System Design and Costing Report 6D. Site Business Case - Financial Modelling 6E. Stakeholder Engagement Plan
7. City of Greater Bendigo	7A. Site Inspection Report 7B. Preliminary Modelling 7C. System Design and Costing Report 7D. Site Business Case - Financial Modelling 7E. Stakeholder Engagement Plan
8. Campaspe Shire Council	8A. Site Inspection Report 8B. Preliminary Modelling 8C. System Design and Costing Report 8D. Site Business Case - Financial Modelling 8E. Stakeholder Engagement Plan
9. Central Goldfields Shire Council	9A. Site Inspection Report 9B. Preliminary Modelling 9C. System Design and Costing Report 9D. Site Business Case - Financial Modelling 9E. Stakeholder Engagement Plan
10. East Gippsland Shire Council	10A. Site Inspection Report 10B. Preliminary Modelling 10C. System Design and Costing Report

	10D. Site Business Case - Financial Modelling 10E. Stakeholder Engagement Plan
11. Gannawarra Shire Council	11A. Site Inspection Report 11B. Preliminary Modelling 11C. System Design and Costing Report 11D. Site Business Case - Financial Modelling 11E. Stakeholder Engagement Plan
12. Hepburn Shire Council	12A. Site Inspection Report 12B. Preliminary Modelling 12C. System Design and Costing Report 12D. Site Business Case - Financial Modelling 12E. Stakeholder Engagement Plan
13. La Trobe City	13A. Site Inspection Report 13B. Preliminary Modelling 13C. System Design and Costing Report 13D. Site Business Case - Financial Modelling 13E. Stakeholder Engagement Plan
14. Mansfield Shire Council	14A. Site Inspection Report 14B. Preliminary Modelling 14C. System Design and Costing Report 14D. Site Business Case - Financial Modelling 14E. Stakeholder Engagement Plan
15. Mildura Rural City Council	15A. Site Inspection Report 15B. Preliminary Modelling 15C. System Design and Costing Report 15D. Site Business Case - Financial Modelling 15E. Stakeholder Engagement Plan
16. Mount Alexander Shire Council	16A. Site Inspection Report 16B. Preliminary Modelling 16C. System Design and Costing Report 16D. Site Business Case - Financial Modelling 16E. Stakeholder Engagement Plan
17. Murrindindi Shire Council	17A. Site Inspection Report 17B. Preliminary Modelling 17C. System Design and Costing Report 17D. Site Business Case - Financial Modelling 17E. Stakeholder Engagement Plan
18. South Gippsland Shire Council	18A. Site Inspection Report 18B. Preliminary Modelling 18C. System Design and Costing Report 18D. Site Business Case - Financial Modelling 18E. Stakeholder Engagement Plan
19. Strathbogie Shire Council	19A. Site Inspection Report 19B. Preliminary Modelling 19C. System Design and Costing Report 19D. Site Business Case - Financial Modelling 19E. Stakeholder Engagement Plan
20. Swan Hill Shire Council	20A. Site Inspection Report 20B. Preliminary Modelling 20C. System Design and Costing Report 20D. Site Business Case - Financial Modelling 20E. Stakeholder Engagement Plan
21. Wangaratta Rural City Council	21A. Site Inspection Report 21B. Preliminary Modelling 21C. System Design and Costing Report 21D. Site Business Case - Financial Modelling 21E. Stakeholder Engagement Plan
22. Additional Supporting Documents (held in common across sites)	22A. Draft Risk Register 22B. Fire Risk Management Plan Template

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