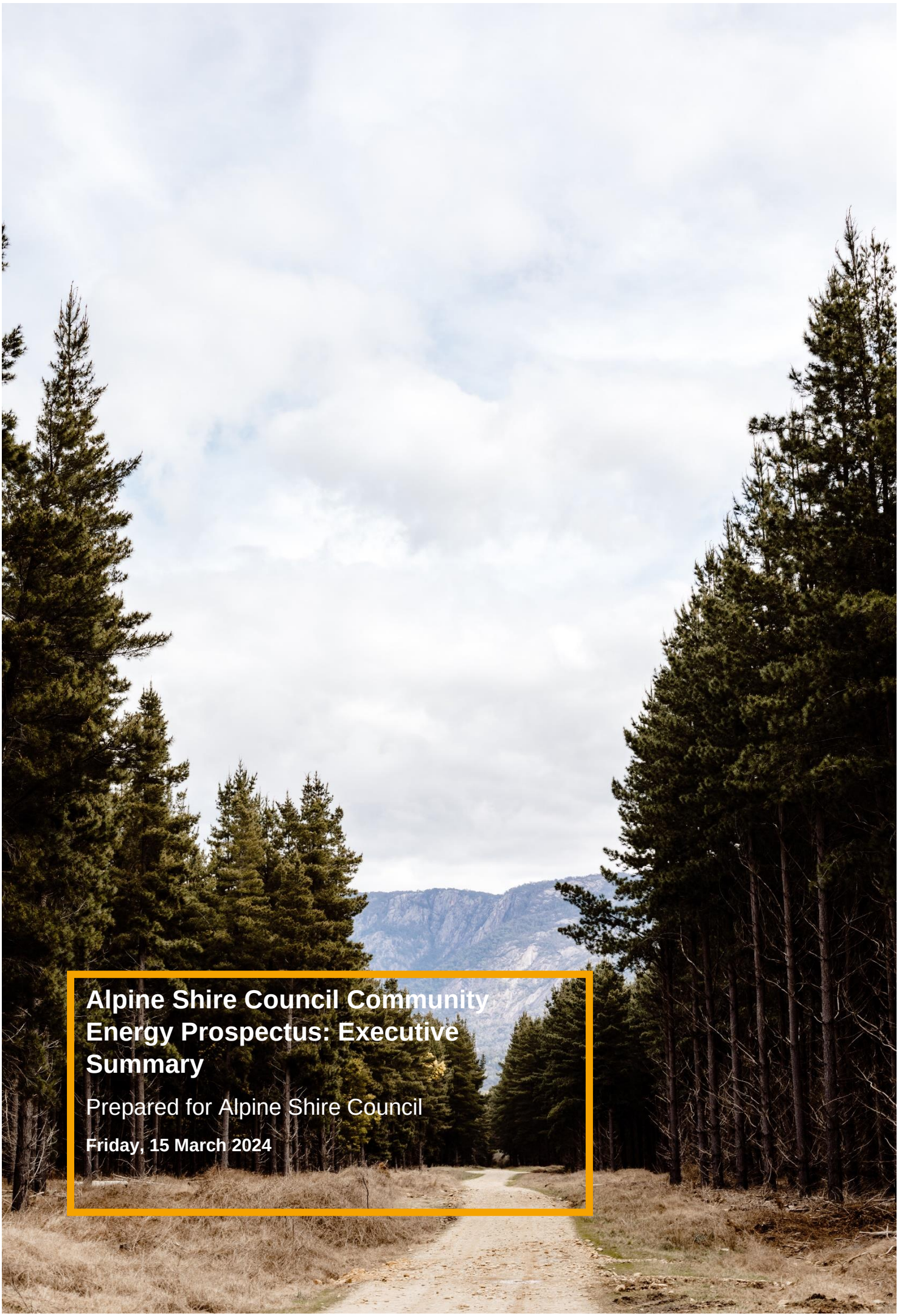

Alpine Shire Council Community Energy Prospectus: Executive Summary

Prepared for Alpine Shire Council

Friday, 15 March 2024

Disclaimer

Any advice provided by Indigo Power throughout this project is not legal advice, financial advice, or taxation advice.

1. Introduction

1.1 Background

Indigo Power has been engaged by the Alpine Shire Council to prepare a prospectus to promote opportunities for investment in community energy and/or public Electric Vehicle (EV) charging infrastructure on land where Council has standing to act as a community energy proponent. This was defined as all Council owned, managed, tenanted or maintained sites, henceforth referred to as Council sites.

This work coincides with the announcement of significant government funding for the delivery of community battery facilities. These are the $200 million Community Batteries for Household Solar Federal Government initiative[1] and the Victorian Government's $10 million 100 Neighbourhood Batteries Initiative Round One[2].

1.2 Project Objectives

The project sought to design solar, battery and EV charging systems in line with two models:

1. Community Power Plants (CPP): These are oversized solar and battery systems capable of supplying site load and exporting excess power to the local community. As both the solar generation and battery storage systems are oversized relative to site load, the host site has access to energy generation and storage that can be used to withstand long duration power outages.
2. Energy Nodes: These are small sites that have structural or electrical limits to the size of the solar and battery system. Energy nodes are smaller solar and battery systems capable of providing back up power to smaller sites.

EV charging infrastructure has been designed and costed at suitable sites, prioritised with the support of Council staff (see section 2.3).

Solar and battery systems have been designed to deliver the following benefits:

1. **Household benefits:** CPPs would deliver locally generated renewable energy to local communities each day. Solar and battery facilities would share electricity with local Indigo Power customers under circumstances where Indigo Power owned, or was engaged to operate, the facilities. Facilities would be able to stabilise electricity price increases, but not provide significant customer cost savings.

2. **Energy Resilience:** Energy Node and CPP systems provide backup power to sites during a power outage. All sites provide an important community service during bushfire or similar emergency events. Only those sites that have solar and battery

[1] https://arena.gov.au/funding/community-batteries-round-1/
[2] https://www.energy.vic.gov.au/grants/neighbourhood-batteries/100-neighbourhood-batteries.

facilities will have continuous power supply during power outages. Surrounding households would lose power.

3. **Environmental:** All battery sites have been designed to charge almost exclusively from on-site solar PV. All sites would be almost entirely supplied by the on-site solar and battery system.

4. **Cost Savings:** Both energy node and CPP facilities target a reduction in the host site's electricity costs by at least 20%. However, this is not always possible.

5. **Network Benefits:** The energy node and CPP facilities would export at peak demand times to the electricity grid, assisting with possible low voltage issues on the network.

6. **Innovation:** There are very few community battery facilities currently in operation in Australia. Delivery of CPPs would establish the business case for the delivery of community batteries at council sites in regional Victoria.

2. Project Approach

2.1 Site Prioritisation

Indigo Power conducted a desktop review of all Council owned, managed, tenanted or maintained sites, selecting 22 sites for site inspection by Indigo Power's electrician. A short list of ten sites was selected, with input from Council staff, for a full analysis. Sites were selected on the following criteria:

1. Roof space for additional solar panels and structural integrity of the roof to bear more panels.
2. Ground space and whether there was room for a battery system.
3. Quality of existing electrical infrastructure and whether this infrastructure could host additional generation and storage technologies.
4. Site connection to the electricity grid and whether excess electricity generated on site could be exported from the site.
5. Community use of the site and whether the site provided an important community service or function.
6. Suitability of the site for a public electric vehicle charging station.

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 available grant funding.

An autosizing modelling approach was used to determine the amount of solar panels (kW) and battery storage (kWh) that 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 rerun with different hardware costs to determine what is financially feasible today, and what may be financially feasible with a reduction in capital costs. Several grant schemes for battery projects are currently underway, and for financial feasibility grant funding is equivalent to a reduction of hardware costs. A recommended set of hardware is obtained for each pair of solar prices ($/kW) and battery prices ($/kWh).

Preliminary modelling reports provide the detail of the analysis carried out and recommend a system configuration.

2.3 Design Briefs

Solar, battery and electric vehicle (EV) charging facilities were designed and costed based on the preliminary modelling outputs. Technical design briefs were created for each of the ten sites to provide detail on:

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

EV Charging Assessment

Sites were assessed for public EV charging suitability and prioritised with the assistance of Council staff. Public EV charging designs were prepared for the best five public EV charging sites.

2.4 Proposals

Financial modelling was carried out for the proposed system at each of the five CPP sites. The proposal provided financial information and cost savings for the host site under two commercial models. The first model is ownership of the energy generation and storage system by a third party, notionally Indigo Power, who leases the site from the site owner. The second model is ownership of the energy generation and storage facility by the site owner and the operation of the CPP facility by a third party, notionally Indigo Power, under an equipment licence agreement with either a fixed annual fee or for a share of the operational net surplus. Under both arrangements the host site purchases electricity from the solar and battery facility at a reduced rate.

3. Project Sites

The ten sites selected for final analysis are described in Table One below. There are five CPP sites and five energy node sites. As detailed in the table, there are several ownership,

management and lease combinations for the sites, and all sites have multiple stakeholders. This adds complexity and is a risk that will need to be managed should any installations proceed.

3.1 Project Sites

Table One. Summary of Alpine Shire Sites assessed under this project.

Site	Ownership, management and lease	Who pays electricity bill?	Existing generation and storage infrastructure	Site suitability
Bright Childcare (CPP)	Department of Education own the land and the building. Council lease from Depart. of Education (DoE) and sub-lease to Alpine Children's Services	Alpine Children's Services	10 kW solar.	Roof space for a large solar PV system. Space for a large battery. Suitable electrical infrastructure. Site could export 100 kW. Not an optimal site for a public EV charger.
Bright Pioneer Park (CPP)	Crown Land, pavilion was a tenant improvement by Council. Management by Council Committee of Management (CoM).	Council (VECO PPA)	15 kW solar. 15 kWh battery.	Roof space for a large solar PV system. Space for a large battery. Suitable electrical infrastructure. Site could export 100 kW. Not an optimal site for a public EV charger.
Mount Beauty Sports Stadium (CPP)	Council own land and building. Council owned and managed (but pool is leased to private entity).	Council (private entity pays pool)	23 kW solar. 30 kWh battery.	Roof space for a large solar PV system. Space for a large battery. Suitable electrical infrastructure. Site could export 50 kW. Site could host a public EV charger.
Myrtleford Showgrounds (CPP)	Crown land and buildings except Myrtleford stadium which Council has assumed responsibility of through stadium renewal works. DEECA appointed CoM, except Myrtleford stadium which is Council appointed CoM	CoMs (not Council)	35 kW solar and 22 kWh battery.	Roof space for a large solar PV system. Space for a large battery. Electrical infrastructure upgrade would be required. Site could export 150 kW with upgrade. Site could host a public EV charger.
Myrtleford McNamara Rec Reserve (CPP)	Crown land. Council owns Ablett pavilion building. Council CoM manages the land. Ablett Pavilion has a CoM in place.	Ablett Pavilion CoM (not Council)	None.	Roof space for 40 kW of rooftop solar on tilt frames. Large electrical switchboard capacity due to football oval lights. Not an optimal site for a public EV charger.

Dederang Rec Reserve (Energy Node)	Crown land and buildings. DEECA appointed CoM in place.	CoMs (not Council)	10 kW solar and 13.8 kWh battery.	Some roof space and battery space. Limited export capacity at 5 kW. Site could host a public EV charger.
Dinner Plain School Community Centre (Energy Node)	Council owned. Leased to DoE, Council has a licence from DoE to manage the building Apr-Sept.	Council (VECO PPA)	None.	Use of roof space limited by snow cleaning requirements. Large 300 kVA transformer but small switchboard limits to 5-15 kW export without switchboard upgrade. Site could host a public EV charger.
Harrietville Community Hall (Energy Node)	Crown land and buildings. DEECA appointed CoM in place.	CoM (not Council)	10 kW solar PV, 16 kWh battery and a generator.	No roof space for additional panels. Export limited to 5-15 kW export without switchboard upgrade. Site could host a public EV charger.
Mudgegonga Community Hall (Energy Node)	Crown land and buildings. DEECA appointed CoM in place.	CoM (not Council)	5 kW solar.	Some roof space and battery space. Limited export capacity at 5-10 kW. Site could host a public EV charger.
Running Creek Community Hall (Energy Node)	Crown land and buildings. DEECA appointed CoM in place.	CoM (not Council)	12 kVa generator.	Some roof space and battery space. Limited export capacity at 5-15 kW. Not an optimal site for a public EV charger.

3.1 Site Analysis

Larger CPP systems have been designed for those sites that have large existing roof space and a strong connection to the electricity grid. These sites include:

1. Bright Childcare
2. Bright Pioneer Park
3. Myrtleford McNamara Reserve
4. Myrtleford Showgrounds
5. Mount Beauty Stadium and Pool

Detailed site proposals were developed for CPP sites which include analysis for both third party and host site ownership.

Under third party ownership arrangements space at the site would be leased to host the solar and battery systems and clean energy would be sold to the site occupier through a behind the meter power purchase agreement. Analysis on host site cost savings was presented for this option.

Under host site (Council) ownership of the solar and battery facility, a third party would be engaged to operate the facility. The operator would pay either a fixed fee (lower risk and lower reward) to the host site or a variable fee (higher risk and higher reward). The fixed fee payment would be an annual amount sufficient for Council to recover the inflation adjusted (3%) cost of its investment over the twenty years. The variable fee is 50% of the operational net surplus. Analysis for this model includes the project internal rate of return, which considers only those cash flows generated by the performance of the solar and battery facility. A second metric, the adjusted rate of return, considers both cash flows generated by the performance of the solar and battery facility and host site cost savings. Those sites with negative rates of return will not recover the cost of their investment over a ten year time horizon.

A summary of financial results for the CPP and Energy Node sites is presented in Table Two below.

Table Two. Site Proposal Details

Site	System Specifications	Capital Cost	Energy Rate and Energy Savings (excludes EV charger)	Licence Agreement IRR, ARR & payback (excludes EV charger)
Bright Childcare	Existing: 10 kW solar. Additional 60 kW solar on tilt frames. Addition of 50 kW/200 kWh flow battery.	Solar Capital Costs: $72,000 Battery Capital Costs: $298,800 Total: $370,800	Block One (first 200 kWh per day): 19 c/kWh Block Two (above 200 kWh per day): 40 c/kWh Saving of $7,174 per annum or 34% saving.	IRR: 7% Payback period: 5 yrs. ARR: 19.8%
Bright Pioneer Park	Existing: 15 kW solar and 15 kWh battery. Additional 35 kW solar on tilt frames. Addition of 50 kW/200 kWh flow battery.	Solar Capital Costs: $74,400 Battery Capital Costs: $274,200 Total: $348,600	Block One (first 200 kWh per day): 20 c/kWh Block Two (above 200 kWh per day): 40 c/kWh Additional cost of $417 per annum or 10%.	IRR: - 2% Payback period: >10 yrs. ARR: - 4.5%
Mount Beauty Sports Stadium	Existing: 23 kW solar, 30 kWh battery and generator. Additional 35 kW solar on tilt frames. Addition of 50 kW/200 kWh flow battery. Addition of 25 kW EV charger	Solar Capital Costs: $62,000 Battery Capital Costs: $275,400 Total: $337,400 Potential structural engineering costs allow an additional $40,000 EV charger costs $50,000	Block One (first 200 kWh per day): 16 c/kWh Block Two (above 200 kWh per day): 40 c/kWh Saving of $457 per annum or 11% saving.	IRR: 1% Payback period: >10 yrs. ARR: 0.5%

Myrtleford Showgrounds	Existing: 35 kW solar and 22 kWh battery. Additional 160 kW solar on tilt frames. Addition of 150 kW/600 kWh flow battery. Addition of 50 kW EV charger.	Solar Capital Costs: $259,200 Battery Capital Costs: $834,000 Total: $1,093,200 EV charger costs: $75,000	Block One (first 600 kWh per day): 20 c/kWh Block Two (above 600 kWh per day): 40 c/kWh Saving of $1,529 per annum or 36% saving.	IRR: -3% Payback period: >10 Yrs ARR: -2%
Myrtleford McNamara Rec Reserve	Existing: none. Addition of 40 kW solar on tilt frames. Addition of 50 kW/200 kWh flow battery.	Solar Capital Costs: $66,000 Battery Capital Costs: $298,800 Total: $364,800	Block One (first 200 kWh per day): 20 c/kWh Block Two (above 200 kWh per day): 40 c/kWh Saving of $4,489 per annum or 27% saving.	IRR: 2% Payback period: 10 yrs ARR: 11.7%
Dederang Rec Reserve/Memorial Hall	Existing: none. Addition of 10 kW solar on tilt frames. Addition of 20 kWh flow battery. Addition of EV charger not possible due to transformer limitations.	Total capital costs: $58,000	Between $1,627 and $2,376 in cost savings per annum.	None
Dinner Plain School Community Centre	Existing: none. Addition of 13 kW solar on tilt frames. Addition of 40 kWh flow battery.	Total solar and battery capital costs: $110,000 Total EV charger cost: $75,000	No meter data for the site. Savings likely material given assumed site load.	None.

	Addition of 25 kW charger			
Harrietville Community Hall	Existing: 10 kW solar PV, 16 kWh battery and a generator. Addition of 25 kW EV charger	25 kW EV Charger: $55,000	No additional energy savings.	None.
Mudgegonga Community Hall	Existing: 5 kW solar. Addition of 10 kW solar. Addition of 20 kWh battery storage. Addition of 7 kW EV charger	Solar and battery capital cost: $58,000 EV charger cost: $40,000	Between $723 and $1,299 in cost savings.	None.
Running Creek Community Hall	Existing: 12 kVA generator. Addition of 12 kW solar. Addition of 20 kWh of battery storage.	Solar and battery capital cost: $60,000	Between $1,726 and $2,450 in cost savings.	None.

3.3 Discussion

There is currently significant Federal and Victorian Government funding available for the delivery of community batteries. In the short term, government funding is required to subsidise the delivery of CPPs and projects are not financially viable without this support. In the mid-term, network tariffs and wholesale electricity prices are expected to change to be very low during the day and to be very high during the evening. This improves both the financial performance of the CPPs and the expected host site costs savings.

The five CPP's presented here are strong candidates for this funding and all could host a CPP facility. From a technical perspective, the best CPP site is the Myrtleford Showgrounds, which can host a very large solar and battery system. From a financial perspective, the strongest CPP sites are those that don't have an existing solar system, or have only a small solar system. The Myrtleford McNamara Reserve and the Bright Child Care have the strongest financial cases. Note: The Bright Childcare Centre is an unlikely candidate for a CPP as the site owner, Victorian Department of Education, is unlikely to agree to host the CPP facility.

It is assumed that government grant funding will pay for the total of the battery capex costs but not the solar capex costs. This cost would be covered by the solar and battery owner, whether the host site or a third party. If the host site chooses to cover this cost and own the solar and battery facility, Indigo Power, or a similar third party, would licence the use of the battery and maintain it. Modelling shows the host site would cover the cost of its investment under a licence arrangement over ten years at the McNamara Reserve, Bright Child Care and Mount Beauty Stadium. The life of the batteries proposed as a part of this project is between 15 and 20 years.

EV chargers have been designed and costed at the Mudgegonga Community Hall, Harrietville Community Hall, Dinner Plain School Community Centre, Myrtleford Showgrounds, and the Mount Beauty Sports Stadium. EV chargers have been designed to include sub-metering so they can be managed by either the host site or a third party.

CPP and energy node sites provide day to day benefits in the form of energy cost reductions, and energy resilience benefits through the supply of backup power to important emergency response sites. CPPs have the additional benefit of supplying significant amounts of locally generated renewable energy to local communities.

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