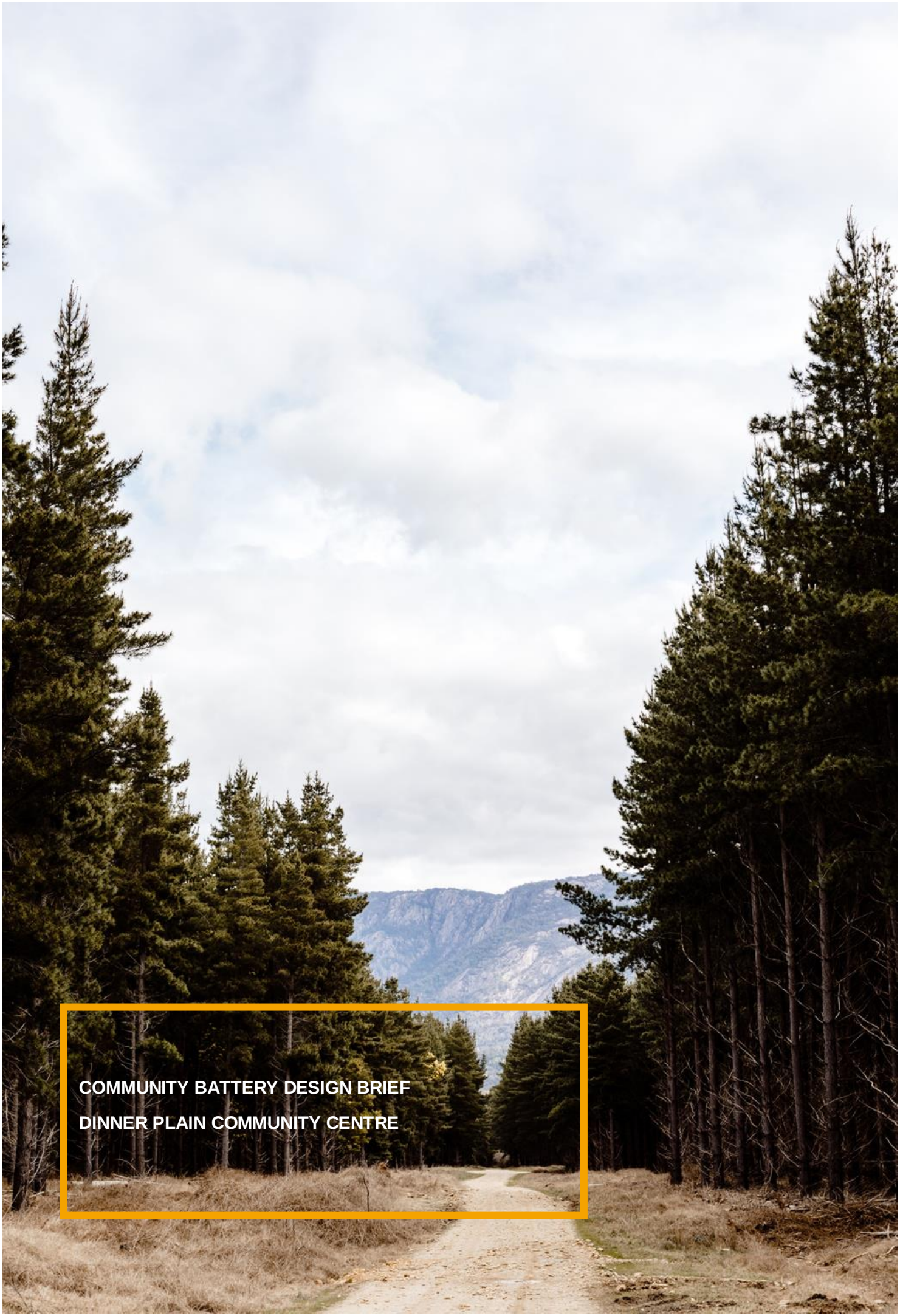

COMMUNITY BATTERY DESIGN BRIEF

DINNER PLAIN COMMUNITY CENTRE

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1. Site Overview

1.1. Solar PV capacity max

The building appears to have shading issues along with snow cover over winter. We would advise installing a ground mount system beside the Community Centre. It would also prevent snow build up from behind the panels, snow build up can be common with solar systems that are installed on roofs in alpine areas. This snow can cause issues with the panels overtime and affect there IP ratings. We would suggest 13kW ground mount solar system. Installing a ground mount solar system would make it easier to clean build-up of snow from the front of the panels and prevent any snow building up behind the panel.

1.2. Electrical infrastructure and limitations

The Hall connects to a 300kVa transformer. The switchboard is presently capable of 63 amps Three phase. Therefore, we expect to be limited to 5kW-15kW export capacity at any one time from any solar and battery system.

1.3. Preferred output as suggested by modelling

We would recommend installing 13kw of solar PV and 40kwh of battery storage to the Centre. We are suggesting such a large battery due to the excessive load from the site's heaters. During the winter months the site will be drawing excessive amounts due to heating requirements. During island able mode when the site loses power, we would only suggest backing up general lighting, some general power outlets and 2 heaters. While this would only allow you to heat two spaces it would prolong the battery life. The site has 6 heaters with a maximum current draw of around 20kW for the heating only. This could have the potential of draining the battery in around 2 hours. By only connecting 2 heaters to the backup circuits, you could prolong the battery life to at least 8 hours. If the sun is shinning and the solar can charge those batteries the battery life could be at least doubled again.

2. System Design

2.1. Recommended System

2.1.1. System Summary

For sites that have an energy resilience focus a flow battery is recommended.

Solar PV Size	13kW
Solar PV Brand	Tier One (Tindo, SunPower, Hyundai, Jinko)
Battery Size	40kWh
Battery Brand	Redflow
Inverter Size	10kW
Inverter Brand	Deye
Control Device	Mondo UBI
Electrical infrastructure	63-amp Three Phase supply
Grid Connectivity	Connected to a 300kva transformer

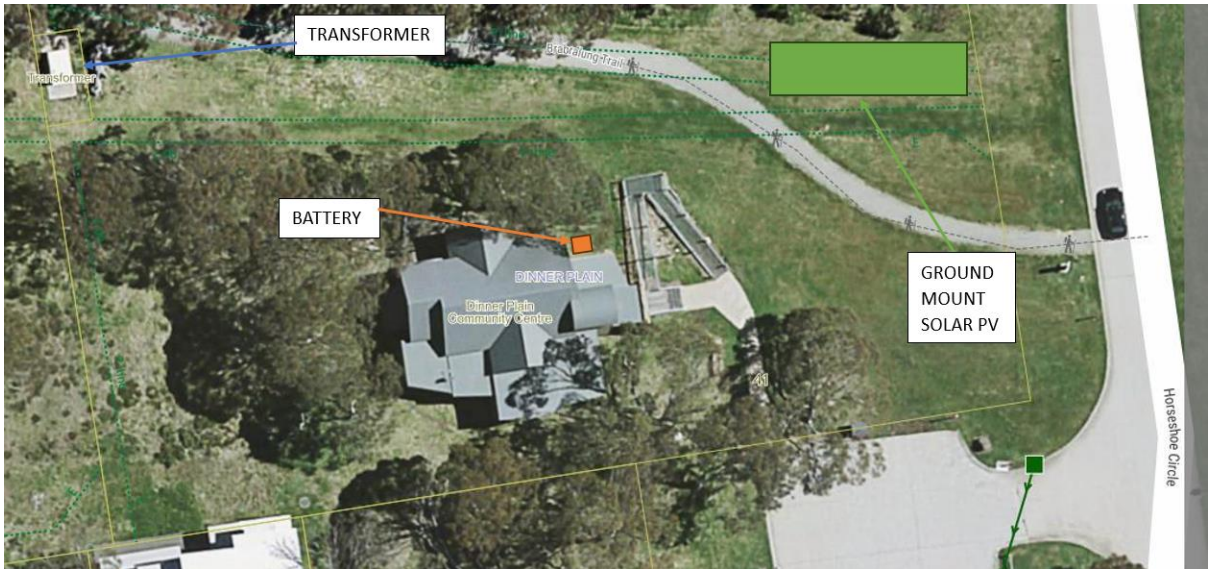
2.1.2. Site Battery System Details

Supply and Install 4 x Redflow ZBM3 10kWh battery stacks with Redflow heating system.
This system will be coupled with a 10kW Deye Hybrid Inverter.
Battery decibel rating is low at no more than 40dB.

2.2. Design Layout

2.2.1. Solar PV layout

2.2.2. Site layout



The dimensions of the proposed battery are:

- Height: 1.8m
- Width: 1.0m
- Length: 1.0m

Redflow batteries are a containerised unit and can be padlocked to ensure the safety of the site is maintained. No cages or bollards are required to protect the battery or to restrict access.

Battery placement is based on the applicable standard (AS5139). In summary, the standards state that a pre-assembled integrated battery energy storage system shall not be installed:

a) Within 600mm on any exit, window, door, an appliance, in access walkways or evacuation routes.
b) Within 900mm below any of the above.
c) Against a wall where there is a habitable room on the other side unless the wall is of a suitably non-combustible barrier, or there is a non-combustible barrier between the wall and the battery. A surface or barrier material is considered suitably non-combustible if the material is deemed to be not combustible when tested in accordance with AS1530.1. The following are considered non-combustible and do not need to be tested: brick or masonry block, concrete, compressed cement sheeting, ceramic or terracotta tiles.

2.2.3. Structural considerations

No observed structural issues.

3. Delivery

3.1. Delivery Plan

Delivery of a project like this should take around 8 months.

3.2. Indicative Delivery Costs

We estimate the cost of the above (solar ground mount PV, battery installation) to be around $110,000 ex GST.

The installation above will generate 143 STC's. These STC's will be kept and sold by the installer. The value of the STC's has been subtracted from the total cost of the solar installation and this cost reduction is reflected in the total estimated cost of the facility. If STCs are retired, rather than sold, the above total cost will increase by around **$5,360 ex GST.**

4. EV Charging Addition

The Alpine Shire Council has requested information to support the possible installation of an EV charging facility at the site.

4.1. Technical Considerations

This site is currently limited by its supply capacity and therefore a 25 kW EV charging facility. This EV charger would be able to be installed without the proposed energy system. The new technology in EV chargers means when the site requires more energy during winter for heating the charger can ramp up or down so that the charger isn't taking all of the electrical capacity of the building all of the time.

The EV charging facility would be supplied from the behind the meter solar and battery system. A sub meter could be installed after the primary site meter and before the EV charger to account for all energy consumed at the EV charger. This would offer Council the option of having the solar and battery system and the EV charger managed separately.

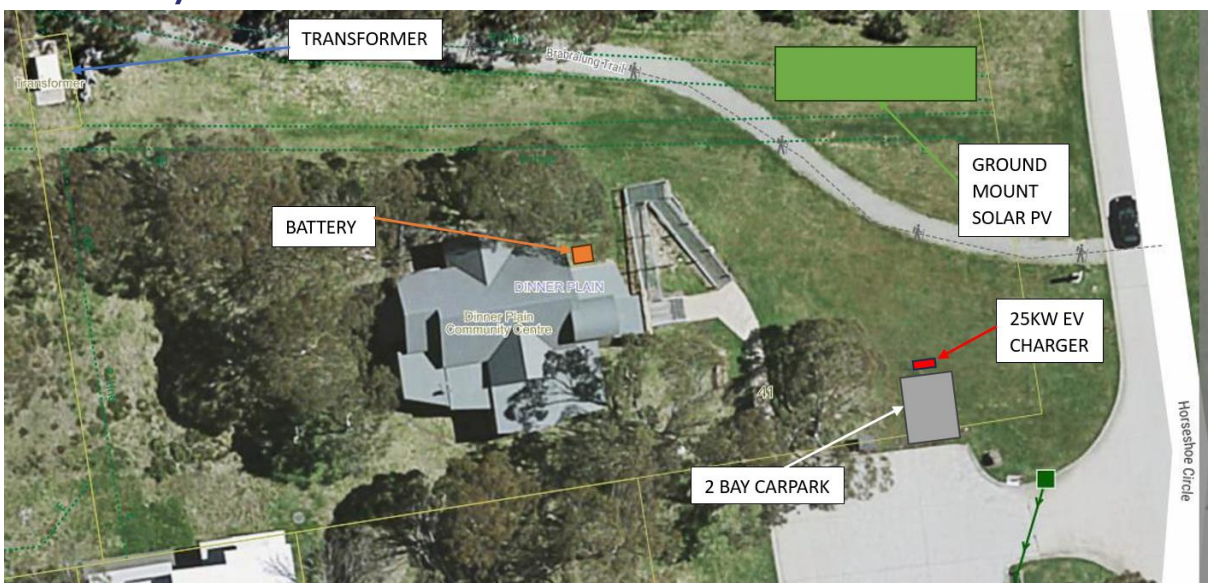
The EV charger could provide EV drivers with competitive charging rates given its access to onsite renewable energy.

4.2. Fee Estimate

Our fee estimate for the delivery of a 25 kW charger is $75,000 ex GST. This cost includes:

1. Design and electrical engineering
2. Project management of installation
3. Procurement of charger
4. Installation and commissioning
5. Supply and install metering
6. Civil and site works including traffic bollards, concrete foundations for the charger, line marking and concrete slab for car parking.
7. Travel

4.3. Site Layout



5. Appendix

5.1. Site photos

Detailed photos of site electrical infrastructure can be found at the below link.

https://drive.google.com/drive/folders/185NzMPNBbb_TCVw1Lu5jHhEbxZVshMOP?usp=drive_link

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