NARRABRI COMMUNITY BATTERY TRIAL PROJECT

Project Update as of 27th October 2025

ABSTRACT
To help community members better understand many aspects of the Narrabri Community Battery.

Geni.Energy

Contents

Purpose

This document seeks to provide details about the Narrabri Community Battery project as at the 27/10/2025. It is based on the approved technology and project as per this date to provide the sought after information. **Should the site change, various aspects of the project may be subject to change as well.**

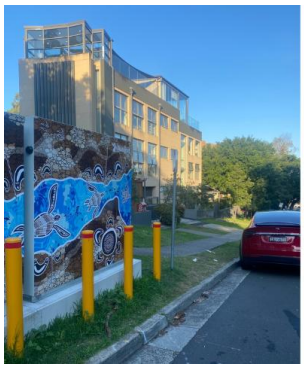
The Funding

The Narrabri Community Battery is a 500 kWh Lithium Iron Phosphate (LiFePO4) - referred to as LFP energy storage system funded by the Federal department of Climate Change, Energy, the Environment and Water through the Community Batteries for Household Solar Program in 2023.

Geni.Energy is one of only two not-for-profit organisations in the nation to be awarded federal funding in 2023 to deliver a community battery. Out of the 400 batteries funded, only 2 went to non-profit organisations, which highlights why there is national interest in what we are doing. We are trying to prove a model where community batteries deliver genuine community benefit and can be owned by community organisations (instead of energy retailers or network providers, which the rest are).

The funding was for $500,000 and currently two thirds of the funding has been spent on procuring the battery components, undertaking the planning and approvals processes, community engagement and project management. The remaining funding is for installation and commissioning of the battery. The current agreement has been recently extended to 31st March 2026.

Below are other examples of some of the community batteries already installed:



Bondi

Close to children's playground and residential apartments

In front of Flinders Civic Hall

Yakandanda

Up against the sports hall

Narrabri Community Battery System Overview

The system consists of two 250 kWh EVO Power (CATL EnerOne) battery enclosures using LFP chemistry, a 100 kW inverter, and a main switchboard. The units are currently planned to be installed on concrete culverts raised 900 mm above the ground, to prevent flooding issues and to protect from any possible vehicle collisions.

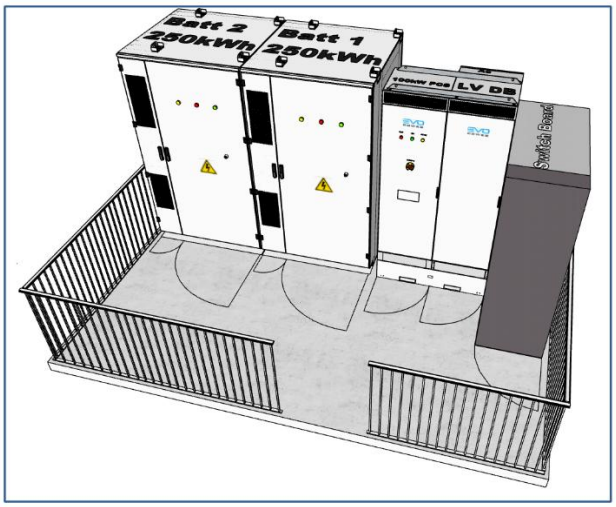


Figure 1 Consists of 2 battery cabinets, switchboard and inverter

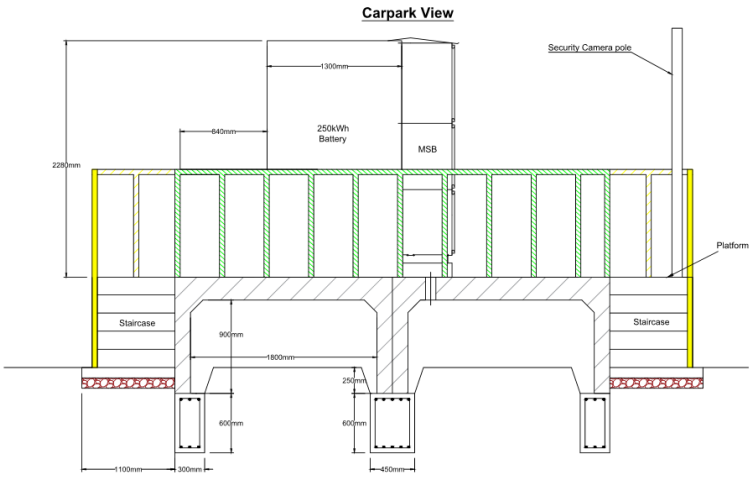


Figure 2 Current plan - Erected on culverts for flood mitigation

To meet Australian standards for safe working for those undertaking maintenance, a walkway is provided with access by two sets of steps.

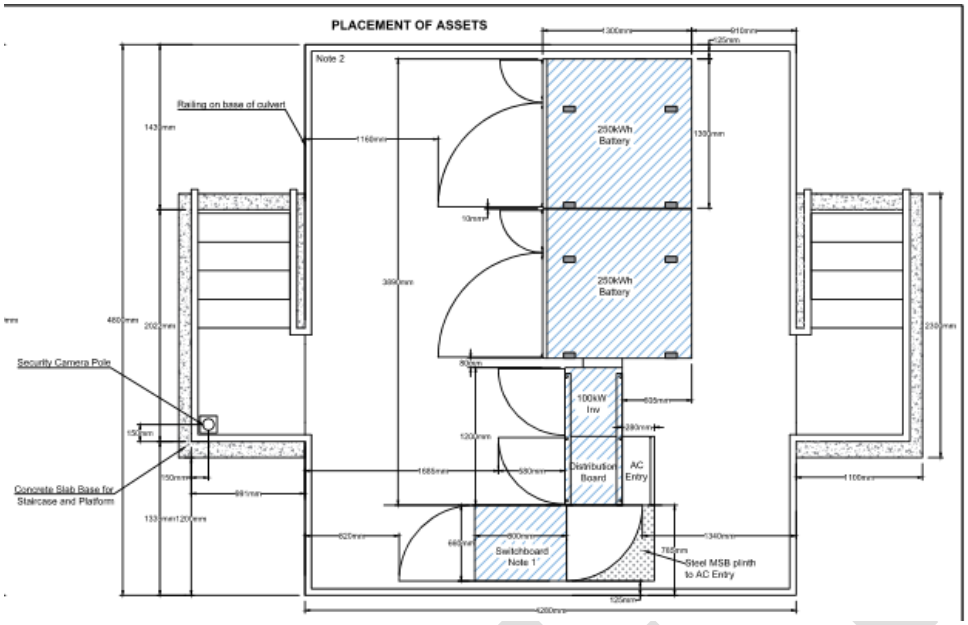


Figure 3 Current Plan - Placement of the Battery system on the Culverts

These culverts place the Battery system 900 mm off the ground, providing flood mitigation as well as extra safety from potential vehicle impacts.

Applicable Codes, Standards, and Guidelines

The battery and inverter have been built to the following standards:

COMPLIANCE	
Inverter related standards	AS/NZS 4777.2, VDE-AR N4105, IEC/EN 62477.1, IEC 62109-1/-2, IEC/EN 61000.6.2, IEC/EN 61000.6.4, IEC 60068.2.64
Battery related standards	UN 38.3, UL 1973, UL 9540A, IEC 62619, IEC 61000.6.2/.4

Figure 4 Doc 07 NEO Series Datasheet V9.3 Feb 2024

The batteries are manufactured by CATL which is the world's largest and most reputable lithium-ion battery manufacturer for both EV and stationary batteries.

UL 9540A is the *"Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems."* It is the global benchmark safety test for large batteries, like community batteries, home batteries, EV chargers, and commercial energy storage.

UL 9540A is to batteries what a crash test is to cars.

In a nut shell, the BESS is tested at different levels of containment for fire propagation. If the fire is contained at a certain level then there is no need to obtain the next level of Certification.

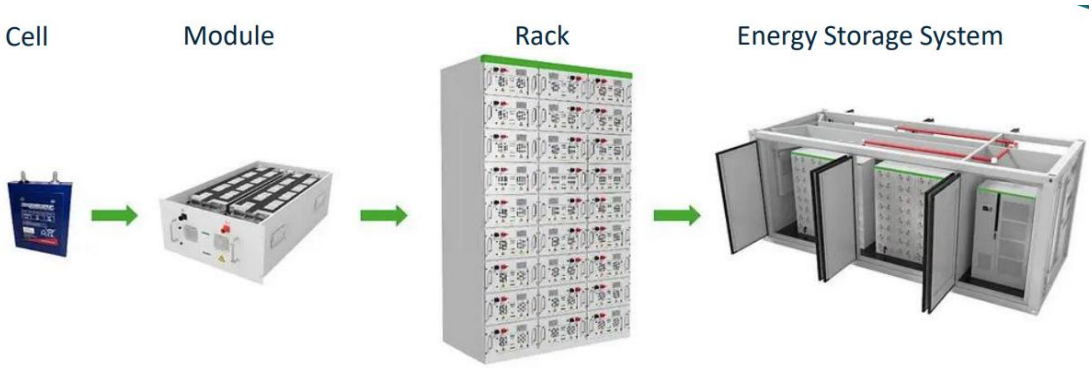


Figure 5 Modularity of BESS

- For these batteries thermal runaway was forced at the individual cell level but **no fire could be induced in the cell**.
- Further testing proved that thermal runaway was contained to the module level. This is certified by CSA group.
- Further testing at the Unit or Rack level and was again certified by the CSA group.

Meaning; the battery system has been tested for thermal runaway and self-propagation to a highly rigorous standard and has been shown to fully contain any runaway events at the module level. Furthermore if for some reason the issue is not contained at the module level it has also been shown to contain the issue on the Unit level.

CATL also designs the various packaging levels to incorporate the best-in-class mitigation measures and monitoring & control methodologies as set out by the USA National Fire Protection Agency in NFPA 855, including incorporating BOTH mitigation strategies under the NFPA 68 and NFPA 69 subsets, which other manufacturers only select one or the other.

This project meets and exceeds the following policies:

- Draft FRNSW Fire Safety Guidance (March 2023)
- NSW Hazardous Industry Planning Advisory Paper No. 6 – Hazard Analysis
- Victorian CFA's Community and Neighborhood Battery Energy Storage Systems Guidance Version 1.2 January 2025

CATL is the world's largest and most reputable lithium-ion battery manufacturer - for both EV and stationary batteries. Our Australian battery supplier, EVO Power, has installed over 150 MWh of batteries so far with **zero** recorded fire incidents. It uses CATL batteries which last year produced 670GWh of batteries in one year. This is approximately the equivalent of 1.3M Narrabri community batteries produced in one year.

Risk Mitigation Inherent in Battery Design

According to EVO Power's Emergency Response Guide (provided to LEMC on request), the EVO Power® Product Series utilises Lithium Iron Phosphate (LFP) chemistry, which is widely recognised as the safest lithium-ion battery chemistry currently available on the market. LFP has excellent thermal and chemical stability. Additionally, each battery cell and module is designed to be incombustible with features such as:

- internal hermetically sealed (completely airtight) individual cells or modules
- Deflagration doors for gas pressure relief
- **The Battery Management System** which prevents overcharging and over-discharging
- **A Heat Detector and A Smoke Detector that triggers an Aerosol Fire Suppressant System**, all of which are powered by backup power in case of blackout
- **Dedicated Air Conditioner** to prevent overheating
- DC relay isolation triggered automatically during thermal events
- Fire-resistant, IP66-rated cabinets with liquid cooling system

The Battery racks have passed the requirements of UL9540A (Standard for test method for evaluating thermal runaway fire propagation in Battery Energy Storage Systems) without the need for redundancies.

Even so, as a redundancy, each rack incorporates a Heat Detector, Smoke Detector and Fire suppressant canister as shown below.

The Detectors and Aerosol Suppressant are monitored and triggered by a Fire Control Panel that is located in the Inverter Skid Control Box. The Fire Control Panel is powered by UPS in the event of a shutdown of power, keeping the detectors and aerosol suppressant active for an extended period.

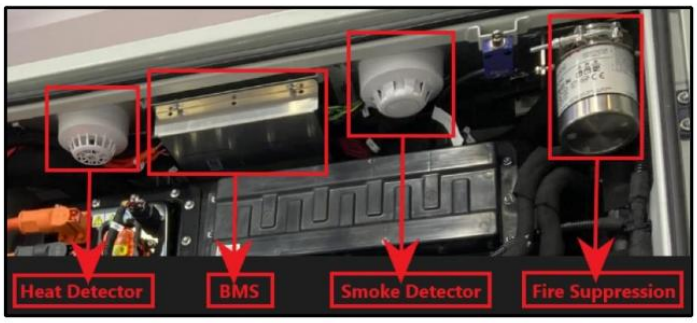


Figure 6 From Evo's Emergency Response Guide, image of the protections

Furthermore, the following technology safety measures are in place by EVO:

1. There is a digital set of eyes on the Battery system for it's lifetime.
2. There is a remote alert if there are any issues with the battery.

3. There is an annual maintenance program that addresses any issues and ensures general working function.
4. There is a Fire Control system that can issue a warning to the local fire department.
5. If there is any abnormal behaviour that could precede a thermal runaway event the BESS is shut off and EVO is notified.

Risk Mitigation Inherent in Site Design

As per the NSW Fire and Rescue Guidance, the current battery placement plan includes;

- greater than 3 meters from occupied structures (as per the NSW Fire and Rescue Policy for Community Batteries attached)
- more than 1 meter setback from roadways
- a 900mm high culvert for protection from vehicle collision
- Hydrant access within 60m (as per NSW Fire and Rescue Policy)
- Isolation signage and emergency contact details provided
- Emergency Response Guide shared with fire authorities, Consequence Management Guide developed by NSW Fire and Rescue
- Is not in a bush fire zone and has low risk of heating due to surrounding fires due to its carpark location on bitumen surface

Ways An Extreme Event Occurs

There are three ways an extreme event is triggered in a battery:

1. mechanical impact
2. prolonged elevated temperature such as a surrounding fire
3. internal manufacturing fault

Each of these is protected through the following:

1. The battery is 900mm off the ground on concrete culverts, reducing the severity of any impact.

2. The risk from bushfires is regarded the highest risk of the battery by industry. It is important that the site is located in a low bushfire risk location. There is some risk of fires started in surrounding buildings but no greater level of risk than any other business.

3. This is protected through the application of a range of standards that the batteries must meet.

Due to these measures it is extremely unlikely that an extreme event will be caused.

Chemical Composition of the Community Battery

The battery cells/modules contain the following materials, which under normal circumstances are sealed within the battery cells. A lot of these chemicals are **inside household items** like **phones, laptops, power tools, solar batteries, vacuum cleaners, paint, cosmetics, and even non-stick cookware**. The table below lists these from highest % of the weight to lowest:

Chemical	Other Common Uses
Graphite	Pencils ("lead" in pencils), lubricants (like lock lubricants), batteries (AA/AAA), brake linings (cars), some paints.
Lithium Iron Phosphate ($LiFePO_4$)	Mostly in **lithium-ion batteries** — in household solar systems, home storage batteries, electric tools, and some newer cordless vacuum cleaners and lawn mowers.
Hexafluoropropylene-vinylidene fluoride Copolymer (HFP-VDF)	Non-stick coatings (like some frying pans – **Teflon**-like surfaces), waterproof clothing coatings, wire insulation in electronics.
Lithium	Batteries (phones, laptops, hearing aids, cordless power tools), some medications (for bipolar disorder), greases, and air-conditioner desiccants (moisture absorbers).
Hexafluorophosphate	Electrolyte in lithium-ion batteries; limited direct household use, but **inside** every phone, laptop, cordless drill, and powerbank.
Acetylene Black	Conductive agent in batteries; also used in specialty paints, plastics, and some printer inks.
Diethyl Carbonate	Solvent in some specialty paints, coatings, adhesives; mainly hidden inside batteries.
Ethyl Methyl Carbonate	Battery electrolyte solvent (in most lithium-ion batteries); rarely found outside battery products.
Propylene Carbonate	Found in cosmetics (as a solvent or stabilizer), skin creams, hair dyes, adhesives, paints, and batteries.
Ethylene Carbonate	Battery electrolyte; also used in lubricants, plastic manufacturing, and some personal care products (as a solvent/stabilizer).

In the case of thermal runaway, copious and sudden release of gases can occur and the immediate area should be evacuated due to respiratory and explosion hazards.

Thermal runaway is when a battery gets too hot and starts a chain reaction it can't stop. The heat causes it to release even more heat, which makes it hotter and hotter until it catches fire or explodes. It is recommended that water is only used to cool the surrounds and that the fire burns itself out.

The gases released in a community battery fire would be the equivalent of a house fire. However with a house fire there are no ways to control the heat or gas, with a battery fire, the heat and gas is directed upwards. The heat from a house fire is estimated by Vicotria CFA to be about 10 times worse than that from a battery.

Likelihood of Fire Incidence

The Narrabri Community Battery uses LFP chemistry and has been tested to UL 9540A, showing no fire ignition or propagation even under forced thermal runaway scenarios.

As outlined in the documentation the Narrabri battery has the following safety features:

- Continuous remote monitoring
- Annual onsite maintenance
- Gas and smoke detection with automated suppressant deployment
- Deflagration venting
- Mounted 900 mm off ground
- Non-bushfire-prone, urban carpark setting

Electric Power Research Institute (EPRI) has been recording fire incidents in Battery Energy Storage Systems (BESS) since 2011. It recorded 88 BESS fire or thermal runaway incidents globally. Represented as normalized failure rates this is:

- 5.78 failures/year per 530 MWh
- Which equates to 0.01589% of MWh experiencing a failure annually.

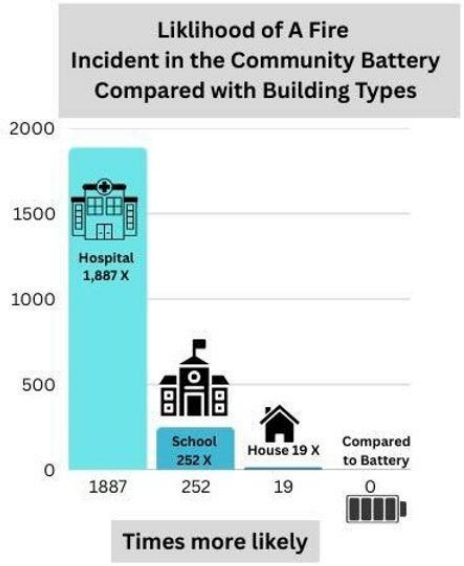
This project is 0.5MWh therefore its likelihood of a fire incident is **0.007945% per year**.

And this extremely small failure rate recorded across the world is not due to a lack of batteries installed. As of early 2025, the global installed capacity of grid-scale Battery Energy Storage Systems (BESS) is approximately **348 GWh** (or 348,000 MWh), according to Rho Motion's Battery Energy Stationary Storage Monthly Database.

When comparing the number of fire incidents in BESS compared with other types of infrastructure, this is the comparison:

Infrastructure Type	Fire Incidents per Asset per Year	Relative to Community Battery
Hospital	3.00E-01 (0.30)	**1,887× more likely**
School	4.00E-02 (0.04)	**252× more likely**
Residential House	3.00E-03 (0.003)	**19× more likely**
Community Battery (BESS)	**1.59E-04 (0.000159)**	**Baseline**

Presented as a chart:



Current Status

On 19th October Narrabri Shire Council moved a motion that essentially ended all site options with Council, despite the project having all of its approvals. Council refused to allow the General Manager to complete the license agreement (the rental agreement) with Geni.Energy so that the project could be completed.

More than 15 other sites were assessed across Narrabri and Gunnedah Shire with connection inquiries with Essential Energy completed for three other sites.

We are now at the beginning again of the feasibility and site assessment stages.

Fire Brigade Access

These site specific details will be assessed when a new site is being considered.

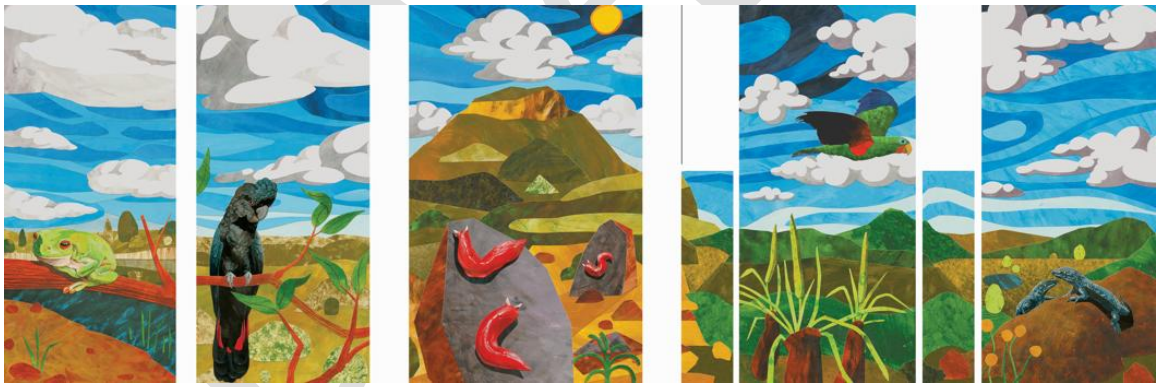
Community Benefit

Geni.Energy is a non-profit organisation whose profits are directed to its mission which is to create more local benefits from renewable energy. As such the profits from the battery project will be directed into renewable energy projects for community organisations. This is envisioned to be things like a solar system for a childcare center or a battery for a sports ground, creating immediate and ongoing savings for that organization.

Geni.Energy has established a community advisory group that were to provide advice for this program. It is difficult to model the likely profits from the battery as they are totally reliant on the electricity market which can be highly volatile.

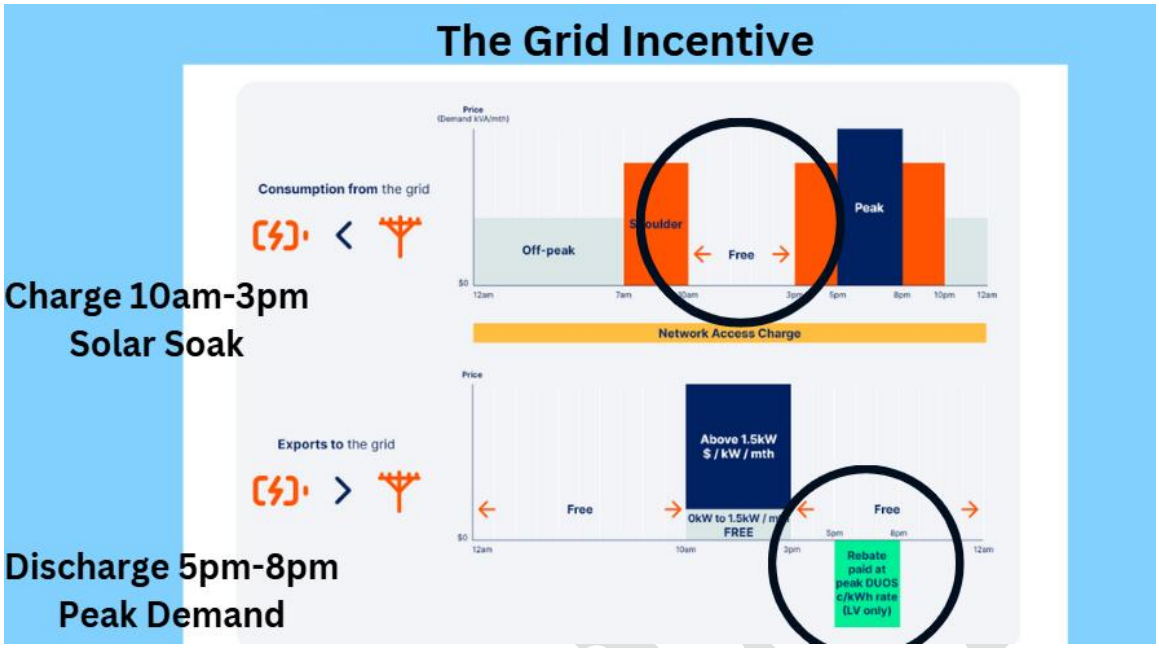
The Artwork

The beautiful artwork for the battery has been designed and completed by Coonabarabran artist Zac Craig, and will be printed on vinyl which will be installed on the battery once it is in-situ. It features critically endangered species from the local environment including the Kaputar pink slug, swift parrot, black cockatoo and others.

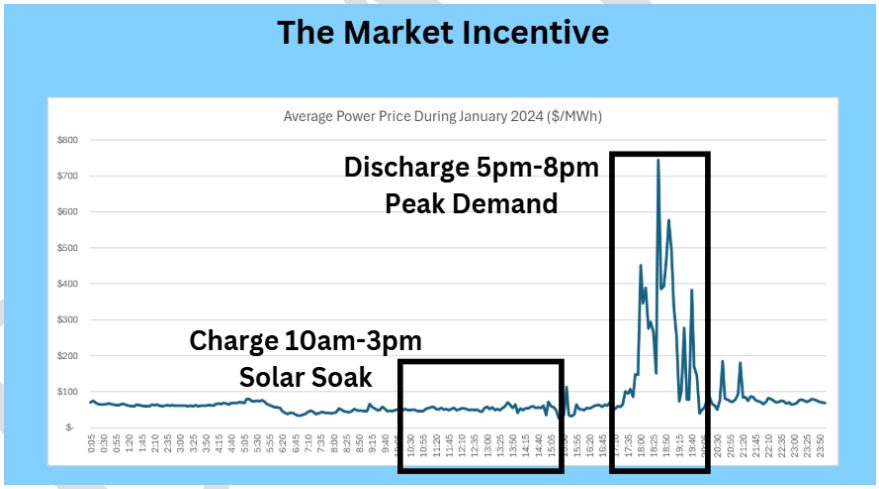


How It Works

The community battery is given a connection agreement by Essential Energy at a transformer that has spare capacity. The battery interacts directly with the grid. It's behavior is directed by the special community battery tariff created by Essential Energy which incentives it to soak up the excess solar generated during the day and provide it back in the peak evening period.



The second way that the battery responds is to price signals – the market encourages the same behavior:



A range of community batteries installed across the Essential Energy network (regional and rural NSW) ultimately provides grid benefits. As more solar is added on homes we are seeing more solar power in the grid in the middle of the day – even too much. This has multiple impacts across the grid, one of which is that in some cases, some solar systems are "ramped down" and reduced in the amount of electricity they export. One of the purposes of community batteries is to allow this electricity to go to the grid by giving it a place to be stored. Ultimately this means more solar is allowed across the network. Without these and other types of batteries, home will be more and more limited in the solar they can have and how much electricity they can export.