MyTown MICROGRID

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Techno-Economic Feasibility Analysis of Community Batteries in Heyfield, Victoria

2ND ANU 'Future of Neighbourhood Batteries' Conference 2023

29th November 2023

wattwatchers DIGITAL ENERGY

LATROBE VALLEY AUTHORITY

HEYFIELD COMMUNITY RESOURCE CENTRE

RMIT UNIVERSITY

public interest ADVOCACY CENTRE

AusNet services

UTS

Federation University

community power agency

Agenda

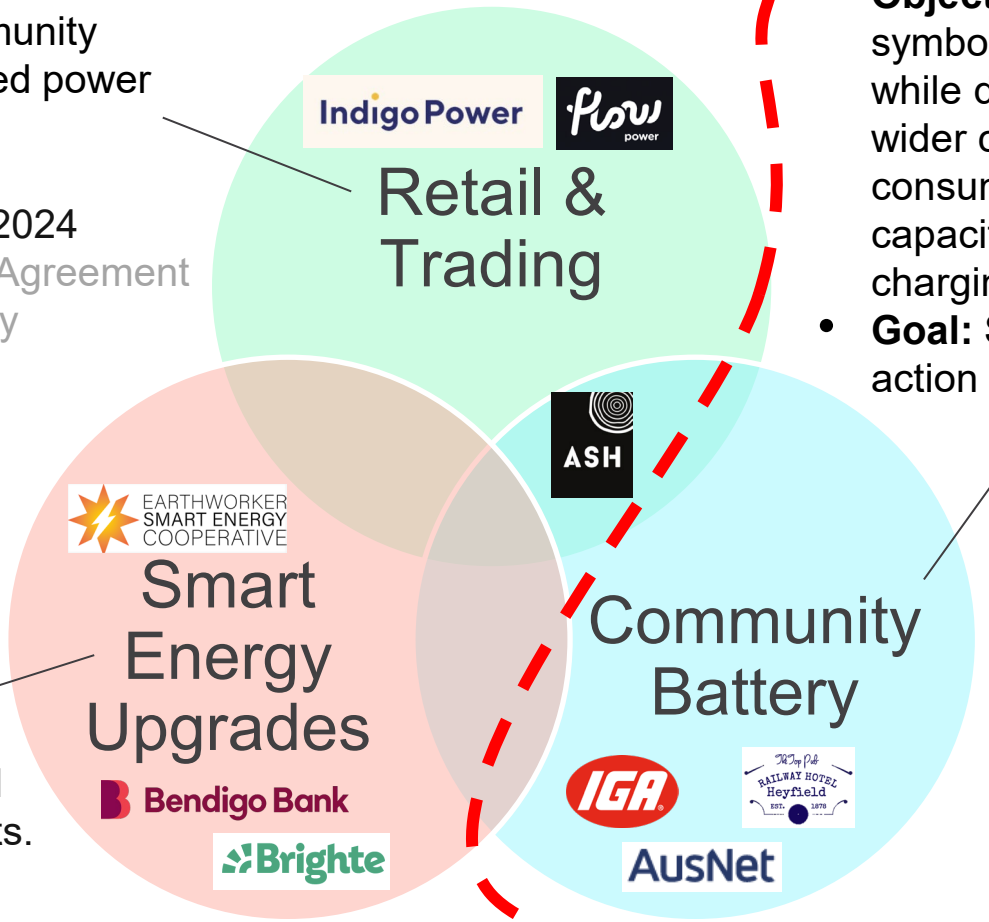
1. Context

2. Economic & technical viability results of large front-of-the-meter and behind-the-meter batteries

3. Community direction in progressing community battery & complementary options

Heyfield MyTown Energy Objectives & Goals

- **Objective:** To unlock community "sharing" of locally generated power through local retail offer.
- **Goals:**
  - Confirm retail partner in 2024
  - Broker Power Purchase Agreement to underpin mill bioenergy



- **Objective:** To provide a visible symbol of local action on renewables while delivering maximal value to wider community (local PV self-consumption, increased hosting capacity, resilience of key sites, EV charging option).
- **Goal:** Successful grant bid to drive action to subsidised implementation.

- **Objective:** Town-scale rollout of trustworthy one-stop shop model of financed solar & energy improvements.
- **Goal:** Release of supplier/ partner EOI by 30 Sep 2023.

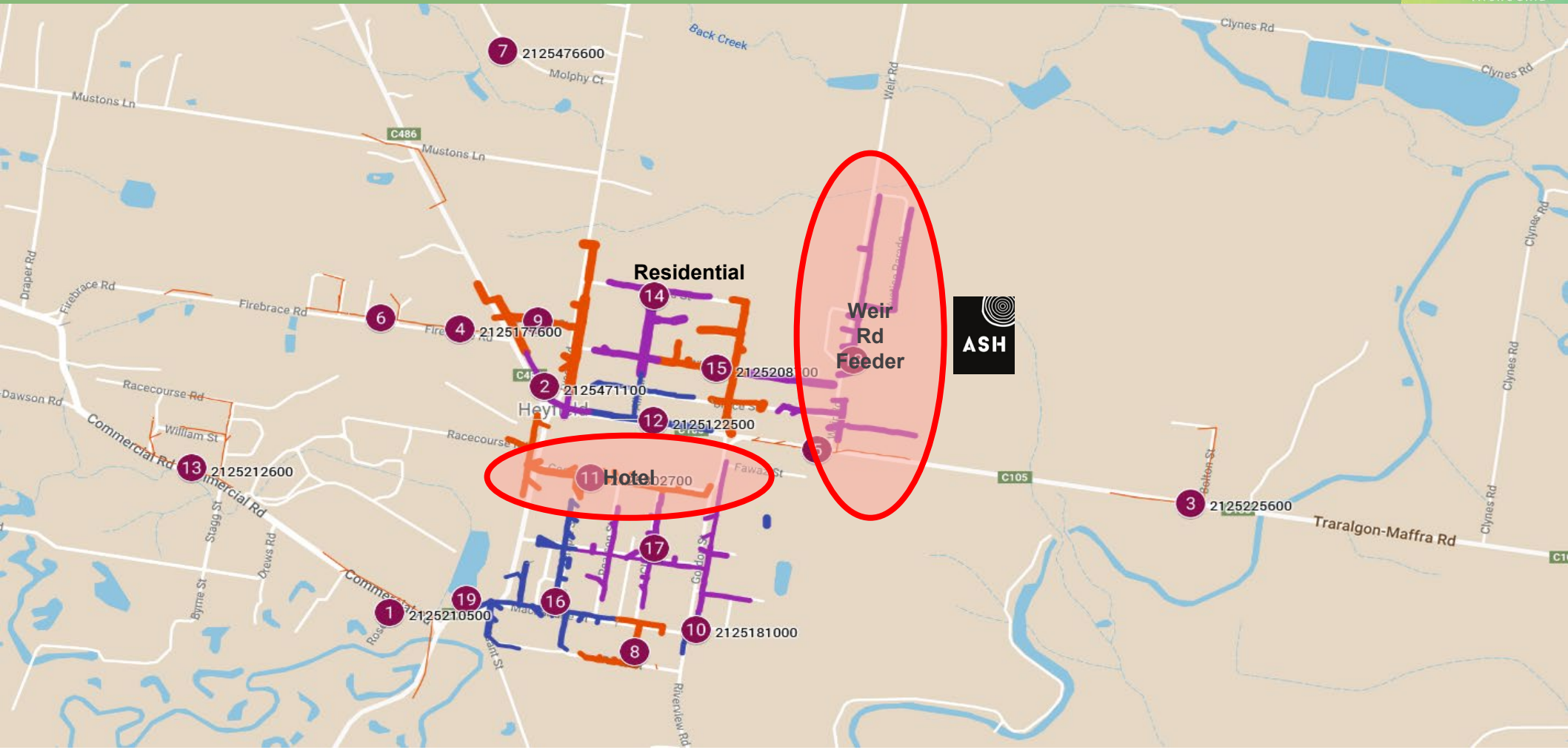
Governance

Goal: Obtain funding for coordinator to continue momentum post UTS handover.

Community battery feasibility – cases

	Battery size Economic model	**Battery size** Tech. model	**Business model**
Case 1: Front-of-meter (FTM) battery on residential feeder	100kW/ 200 kWh	100 kW	Community owned, retailer operated. Profit (or loss) to community.
Case 2: Fleet of behind-the-meter (BTM) batteries on residential feeder installed at solar PV-households on the same residential feeder.	180 kW/ 198 kWh (60 x 3 kW/ 3.3 kWh)	100 kW	Individually owned and operated. Profit (or loss) to household.
Case 3: Front-of-meter (FTM) battery on mixed commercial/ residential feeder	Didn't include this case	100 kW	Not relevant
Case 4: A BTM battery commercial premise (the pub) with large solar system	2.5kW/ 5 kWh to 50 kW/ 100 kWh	10 kW – 100 kW	Community owned, retailer operated. Profit shared 30% to pub and 70% to community.

Location Options (Now + Future)

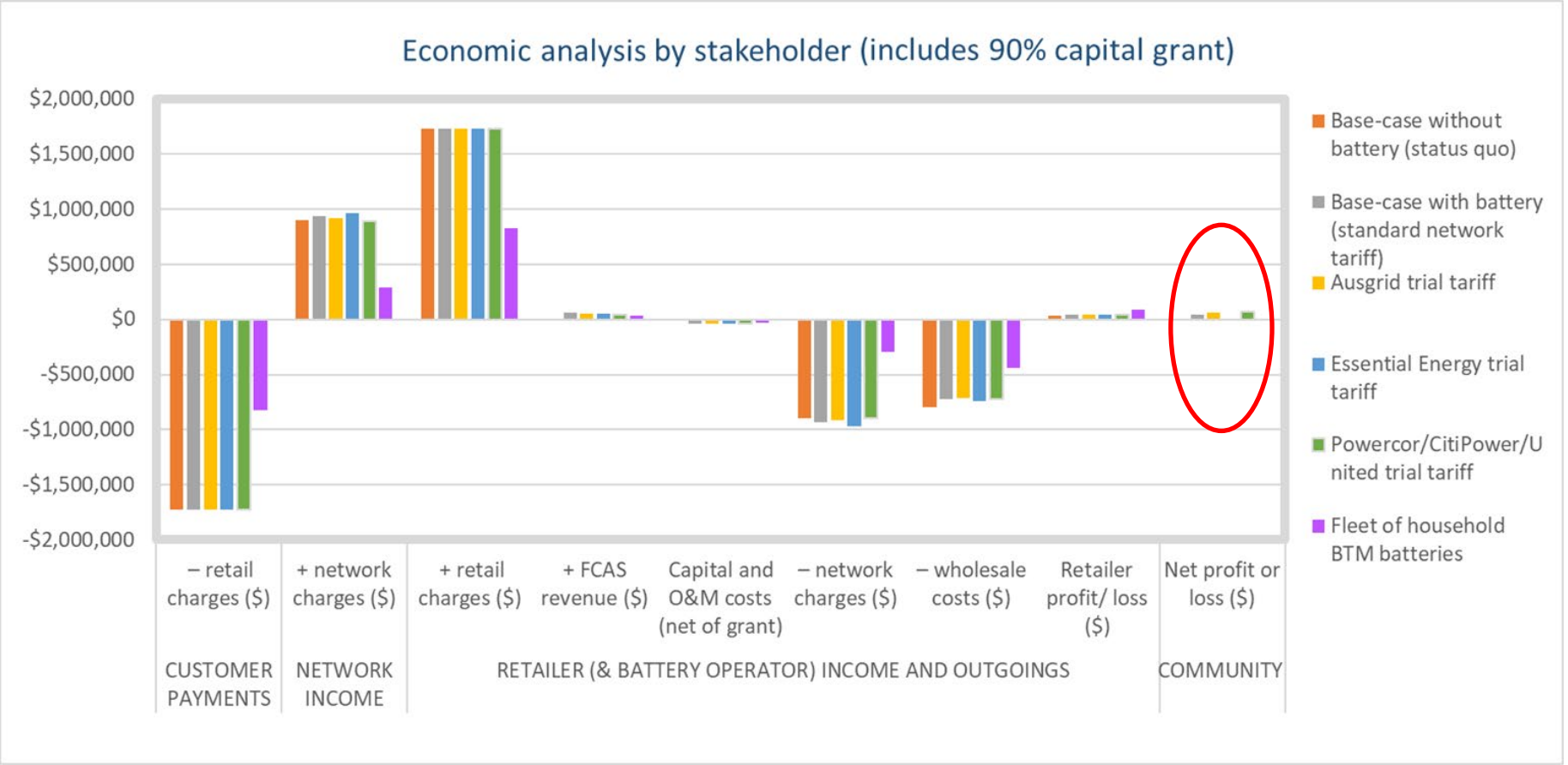


Economic viability results

Key assumptions for economic analysis

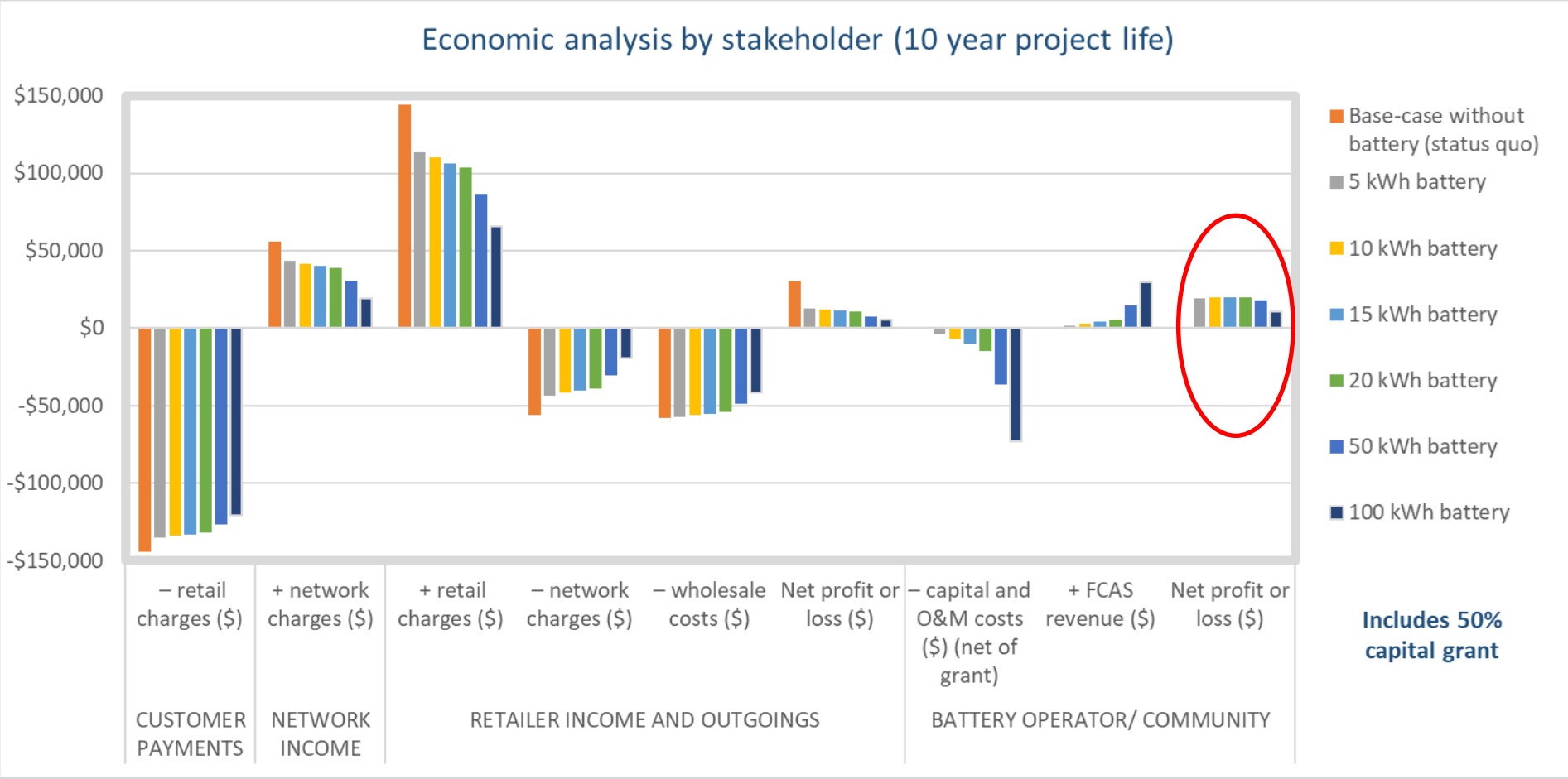
- **Residential and small commercial tariffs:** Victorian default offer; feed in tariff for solar 5c/kWh
- **Network tariffs:** for the FTM battery charging we tested 4 tariffs – the standard small commercial in the AusNet area (NAST12), plus the **trial battery tariffs** offered by Ausgrid, Essential Energy, Powercor/ Citipower.
- **Battery capital cost:**
  - FTM battery $306k, battery cells replacement end of year five $89k (BTM batteries don't need cell replacement as less cycles)
  - BTM battery: $1,500/ kWh ($4,950 per household), total cost of fleet $297k
- **Revenue sources:** FCAS and grid arbitrage
- **Project life:** 10 years
- **Development costs:** not included for BTM batteries.
- Retailer makes a surcharge of 1c/kWh on battery throughput in the FTM case.

Results – FTM battery with different tariffs & BTM residential



Comparison of FTM 100 kW/ 2 hour battery on residential feeder (101 customers; 31 with solar, 70 without) with BTM fleet of batteries with the same energy storage on same feeder (60 customers with solar)

BTM battery at the pub – Results



Technical feasibility analysis – overview of results

Case	Voltage characteristics	Hosting capacity	Islanded operation
Case 1: 100 kW FTM battery on residential feeder	Improved; best result from battery located at end of feeder	PV installations could double without a battery, or treble with a battery (from 89 kW to 310 kW)	Not commercially feasible
Case 2: Fleet of BTM batteries on residential feeder (100 kW in total)	Improved somewhat more than FTM	PV installations could increase somewhat more with BTM batteries (to 330 kW).	Not investigated
Case 3: 100 kW FTM battery on mixed residential/ commercial feeder	Improved; best result from battery located at end of feeder	PV installations could increase by 80% without a battery (from 202 kW to 360 kW), or by 170% with the battery (to 560 kW)	Not commercially feasible
Case 4: BTM battery at commercial premises, 10 kW – 100 kW	Assumed same as FTM case if 100 kW	Assumed same as FTM case if 100 kW	Feasible for additional cost of $4,985 - $7,514.

Next Steps: NBI Business Case Grant

Sept 2023-Aug 2024

Sept 2024-~Dec 2024

Dec 2024

Detailed feasibility & planning → Capital funding & installation → Operation!

$ Surplus → Not-for-profit MyTown entity

Detailed financial case & business model refinement to de-risk for implementation from Q3 2024

2024 DEECA capital funding earmarked for delivery

Read our reports

MyTown Microgrid | heyfield (heyfieldcommunity.org.au)

UTS website

www.uts.edu.au/isf/explore-research/projects/mytown-microgrid-heyfield-victoria/mytown-outputs