Regional and Remote Communities Reliability Fund Microgrid

MyTown Microgrid

Heyfield Microgrid and Local Energy Options Feasibility – Final Report

June 2023

wattwatchers DIGITAL ENERGY

LATROBE VALLEY AUTHORITY

HEYFIELD COMMUNITY RESOURCE CENTRE

Federation University

UTS

public interest ADVOCACY CENTRE

community power agency

AusNet services

Research Team

- Institute for Sustainable Futures, University of Technology Sydney (UTS)
- Federation University Australia
- RMIT University
- Public Interest Advisory Centre (PIAC)

Key support

Wattwatchers Digital Energy
Heyfield Community Resource Centre
Community Power Agency
Latrobe Valley Authority
AusNet Services

About the Project

MyTown Microgrid is an innovative, multi-year, multi-stakeholder project that aims to undertake a detailed data-led microgrid feasibility for the town of Heyfield (Victoria), built on a platform of deep community engagement and capacity building.

The project received funding under the Australian Government's Regional and Remote Communities Reliability Fund Microgrids stage 1 funding round. It also received funding from the Latrobe Valley Authority as part of the Gippsland Smart Specialisation Strategy.

Citation

Dwyer, S., Rutovitz, J., Langham, E., Mey, F., Smith, H., Mohseni, S., Shah, R., Wright, S., Assaf, J., McCoy, T. Hogarth, M., Kallies, A., Memory, C. (2023) Heyfield Microgrid and Local Energy Options Summary Feasibility. Prepared for the Regional and Remote Communities Reliability Fund

Executive Summary

The MyTown Microgrid project (developed an innovative data-led approach to local energy solutions, starting with the feasibility of a microgrid for the town of Heyfield in Victoria. Built on a platform of deep community engagement and capacity building, the project sought to create the knowledge and tools to make it faster, easier, and cheaper for other regional communities to understand the proposition for microgrids for their towns.

This report is a summary of the entire project that draws on the various outputs published over its three-year duration.

Key points

- An island-able microgrid for the town of Heyfield was found to be only marginally cost-effective under only one of the multiple scenarios and boundary options investigated.
- Despite the other potential benefits that the microgrid could offer, the Community and Project Team concluded the economic case was not enough to warrant navigating the substantial financial risks and regulatory complexity that were identified as part of the feasibility study.
- However, four underlying components of the assessed microgrid did emerge as highly promising with less risk for delivering cost-effective and resilient local renewable energy in Heyfield. In consultation with the community, the Project Team undertook further analysis of these local energy options to quantify the costs and benefits and determine the business models.
- A community engagement platform was developed as a keystone feature of the research design, demonstrating how capacity and knowledge could be built in a community through a stratified approach that can engage a broad age demographic of community members.
- The main barrier for microgrid uptake in regional areas was identified as the lack of cost effectiveness where the community is relatively well served by a main grid, with no major network augmentation planned for the local vicinity.
- Other major barriers encountered included the complexity of the current regulatory framework, the technical expertise required to assess the various energy options, obtaining data from electricity network businesses, a lack of transparency and certainty over the business models, and maintaining community interest and engagement over an extended period.
- Future policy and programs can look to address these barriers, but communities and proponents of local energy solutions will need continuing support to bridge the gap between feasibility and implementation.

Main Outcomes

- Four local energy solutions were identified as most promising for the Heyfield community to focus on for the future. These were:
  - A town-scale smart energy upgrade and electrification program: to help local households with rising electricity prices through improved energy efficiency, fuel switching, and shifting consumption to 'soak up' excess daytime solar.
  - Community-scale batteries: that can increase the amount of new solar that can be connected in the community, help reduce carbon emissions by increasing the amount of renewables in their evening consumption, and improve resilience by allowing continuous power to critical sites.
  - A community retailer partnership: to help facilitate the sharing of local energy between homes and businesses.
  - A closer working relationship with the local timber business: as it investigates wood waste bioenergy for night-time energy when solar output ramps down.
- An Implementation Plan was developed with detailed next steps beyond the end of the current project's funding period (from 1 July 2023). This was created through a collaborative process involving the Community and the Project Team. The Plan covers the prioritised local energy solutions, the funding sources being targeted, potential partnerships being sought, and clear organisational responsibilities.
- Community representatives have now established *MyTown Energy Heyfield* as an ongoing community energy group and are seeking funding to continue the co-ordination role established as part of the grant project. With over a dozen community members having been involved in the project over the three years, they will now focus on taking the four prioritised local energy options towards implementation.
- MyTown Energy[1], an online tool, was designed and developed as a web-based application to support community decision making for local energy solutions. It also serves as an interactive knowledge sharing platform for the MyTown project and as a key legacy output of the project. MyTown Energy will be hosted online for 30 months beyond the end of the project (to 31 December 2025), with additional funding sought to expand and enhance the tool.
- A series of short films[2] that describe the MyTown project's background, aims, approach, and outcomes. These compliment more than 20 detailed project reports that were published under the grant agreement of the Regional and Remote Community Reliability Fund – Microgrids. The films and reports have all been made available online via the websites of the Heyfield Community Resource Centre[3] and UTS Institute for Sustainable Futures[4].
- Approximately 100 energy monitoring devices were installed in 70 homes, 15 businesses, and 2 schools. This surpassed the project's original target and was delivered on time and on budget. The subscription to data services for the devices and the project's community data dashboard solution was extended for 12 months beyond the end of the grant agreement (until at least 30 June 2024). This ensures that the project participants continue to benefit from greater visibility over their energy use and generation. Local electricians were used to install the devices, enabling the training and employment of 2 apprentice electricians as a result.

[1] https://mytownenergy.net/
[2] https://www.youtube.com/@mytownmicrogridheyfield1323/videos
[3] https://www.heyfieldcommunity.org.au/mytown-microgrid
[4] https://www.uts.edu.au/isf/explore-research/projects/mytown-microgrid-heyfield-victoria

Contents

LIST OF FIGURES AND TABLES

LIST OF ABBREVIATIONS

Abbreviation	Description
ASH	Australian Sustainable Hardwoods
API	Application programming interface
CLO	Community Liaison Officers
CPA	Community Power Agency
CRG	Community Reference Group
DNSP	Distribution Network Service Provider
HCRC	Heyfield Community Resource Centre
LCOE	Levelised cost of energy
LV	Low voltage
LVA	Latrobe Valley Authority
MW	Megawatt (a measure of power or load)
MWh	Megawatt hours (a measure of energy)
PV	Photovoltaic (Solar)
RMIT	Royal Melbourne Institute of Technology
UTS ISF	University of Technology Sydney Institute for Sustainable Futures

Background

Project concept and objectives

The Heyfield MyTown Microgrid project undertook a detailed data-led microgrid and energy solutions feasibility for the town of Heyfield (Victoria), built on a platform of deep community engagement and capacity building.

Over the three-year duration, 2020-2023, the project developed the knowledge and tools to make it faster, easier, and cheaper for other regional communities to understand microgrid and other energy solution propositions for their community.

This project took a novel approach to a community-based microgrid feasibility process by:

- Using multi-data source platforms to calculate demand, flexibility, and supply.
- Undertaking deep community and stakeholder engagement.
- Co-designing community-centric business models with enshrined benefits and consumer protections.
- Wrapping technical, market, economic and regulatory analysis into fit-for-purpose decision support tools.

From the community's perspective, the deployment of microgrid and other local energy solutions sought to improve community agency over:

- Energy use and generation, including maximising the utilisation of local renewable energy.
- Energy bills.
- Quality and reliability of electricity supply.

The community also wanted to maximise complementary social and economic development outcomes to improve the position of Heyfield and the surrounding region in a low carbon, climate resilient future.

Project origination

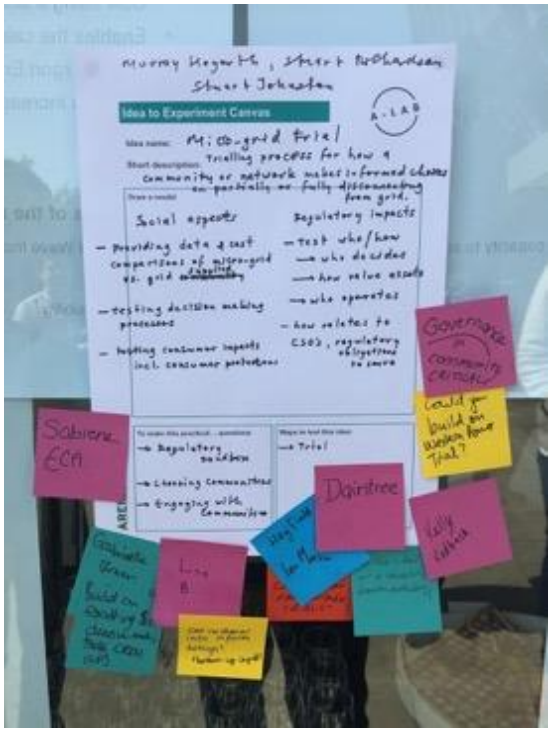


*Figure **1** 'Idea to Experiment Canvas' for a Community Microgrid trial (ARENA A-Lab, 2017)*

How the project came about

The original concept for MyTown Microgrid was conceived at an innovation event series called A-Lab, run by the Australian Renewable Energy Agency (ARENA), in 2017.

The basic premise of the concept was for "trialling a process for how a community or network (business) makes informed choices on partially or fully disconnecting from the grid".

The project concept required a model community to trial the process. Following various iterations of a project proposal led by the UTS Institute for Sustainable Futures, with the support of Wattwatchers, a partnership was eventually formed with the Heyfield Community Resource Centre.

From then on, the MyTown project used the town of Heyfield as the model community to test its feasibility process.

The model community – why Heyfield?

Heyfield was known to members of the UTS team through its numerous award-winning activities in sustainability over the last 10 years. It was also renowned for its high penetration of rooftop solar through its community-led initiatives, and had a mix of residential, commercial, and industrial energy users. This included a local timber manufacturing business (Heyfield's major employer and energy consumer) that was keenly interested in sustainability and was investigating the potential use of bioenergy at the local plant. With reported distribution network reliability issues, the town also appeared to be on the fringes of the electricity distribution network.

The combination of these factors helped identify Heyfield as a highly suitable candidate as the model community to test the feasibility process.

The collaboration between the Heyfield Community Resource Centre and the academic and industry partners helped the project idea to be further refined. This included presenting it to the Smart Grids Innovation Group, a group convened by the Victorian Government's Latrobe Valley Authority (LVA) as part of its Smart Specialisation Strategy.

Project funding – Federal and State support

The Regional and Remote Communities Reliability – Microgrids Fund (RRCRF) was announced by the Australian Government in 2019. Up to $50.4 million was to be awarded in two stages to fund projects running over 5 years between 2019 and 2024. The MyTown project received $1,790,000 in funding from stage 1 of the Fund. An additional $100,000 grant was provided by Victoria's LVA through the Smart Grids Innovation Group.

The Federal funding was provided to support feasibility studies looking at microgrid technologies to replace, upgrade or supplement existing electricity supply arrangements in off-grid and fringe-of grid communities located in regional and remote areas. Ultimately it would go on to fund feasibility studies for over 110 communities across Australia.

Other intended outcomes of the Fund were:

- Improved regional business, community services and emergency resilience through innovative microgrid solutions.
- Scaled-up and improved microgrid systems in regional and remote communities.
- Increased human capital (skills/knowledge) in the design and deployment of microgrids.
- Demonstrated commerciality and/or reliability and security benefits of deploying and upgrading microgrids.
- Reduced barriers to microgrid uptake in remote and regional communities.
- Increased dissemination of technology and/or project knowledge regarding the deployment and upgrading of microgrids.

Project approach

A conceptual view of our project's approach to developing a replicable process for a community-led and data-driven microgrid feasibility is shown below:

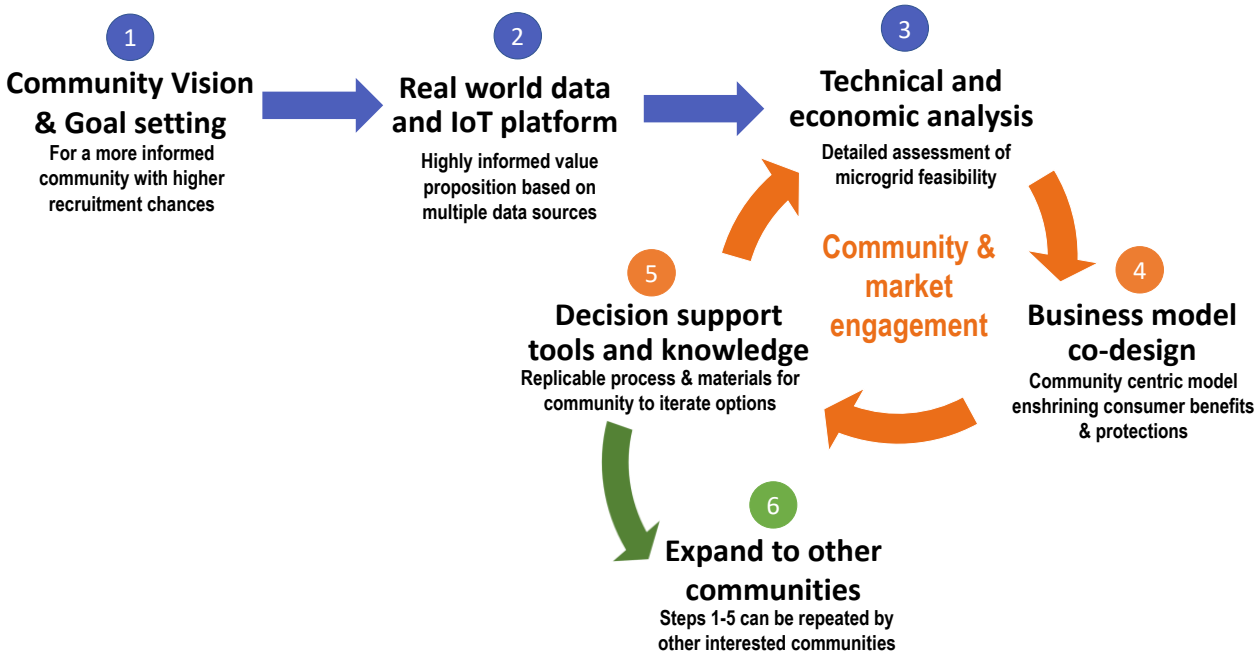


Figure 2 Conceptual view of the project approach for MyTown Microgrid

The MyTown project was delivered via six Work Packages across three phases, with each phase being undertaken sequentially over the course of a year from 1 July to 30 June. The Work Packages were led by different team members but were highly dependent on each other, with a Project Management team responsible for their effective integration.

Phase 1 was the initial project establishment and research phase, where the implementation of the community and stakeholder engagement plan begun. It also was where the data and analytical frameworks were designed, where community visioning and goal setting took place, where the first of the energy monitoring and control devices were deployed, and where initial energy options for a Heyfield microgrid were scoped (*duration: 1 July 2020 – 30 June 2021).*

Phase 2 represented the main technical and economic microgrid assessment phase, and where capacity in the community continued to be built through the engagement process. This phase also saw the continued deployment of the energy monitoring and control devices for data collection and was where the priority business models were co-designed. A beta version of the Decision Support Tool (now named 'MyTown Energy') was also developed in this phase to help other regional communities understand the options for a microgrid, or other local energy solutions, for their own communities *(duration: 1 July 2021 – 30 June 2022).*

Phase 3 was the concluding phase in which the final business case was established, the Decision Support Tool work was finalised, the knowledge sharing materials were developed, and the project was evaluated for its ability to achieve its objectives. A public closing event to celebrate the outcome of the project with the community marked the culmination of the MyTown Microgrid Feasibility Project (*duration: 1 July 2022 – 30 June 2023)*.

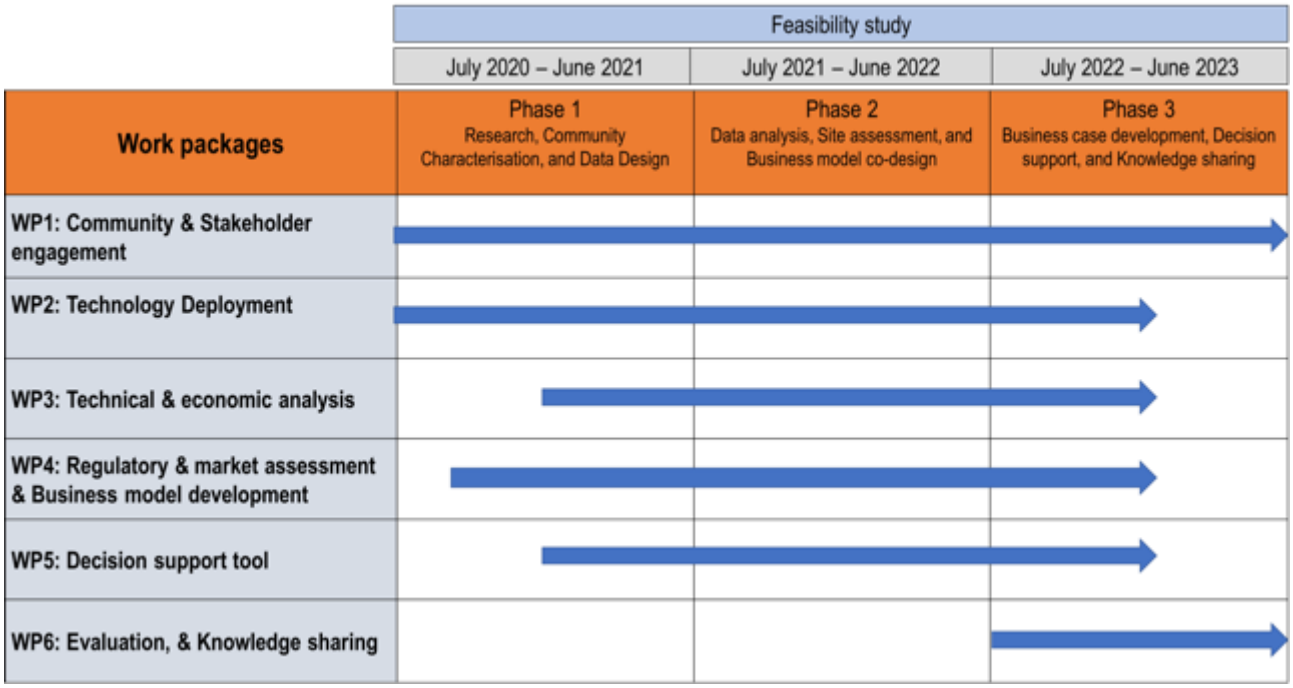


Figure 3 Delivery schedule for the six Work Packages across the project's three phases

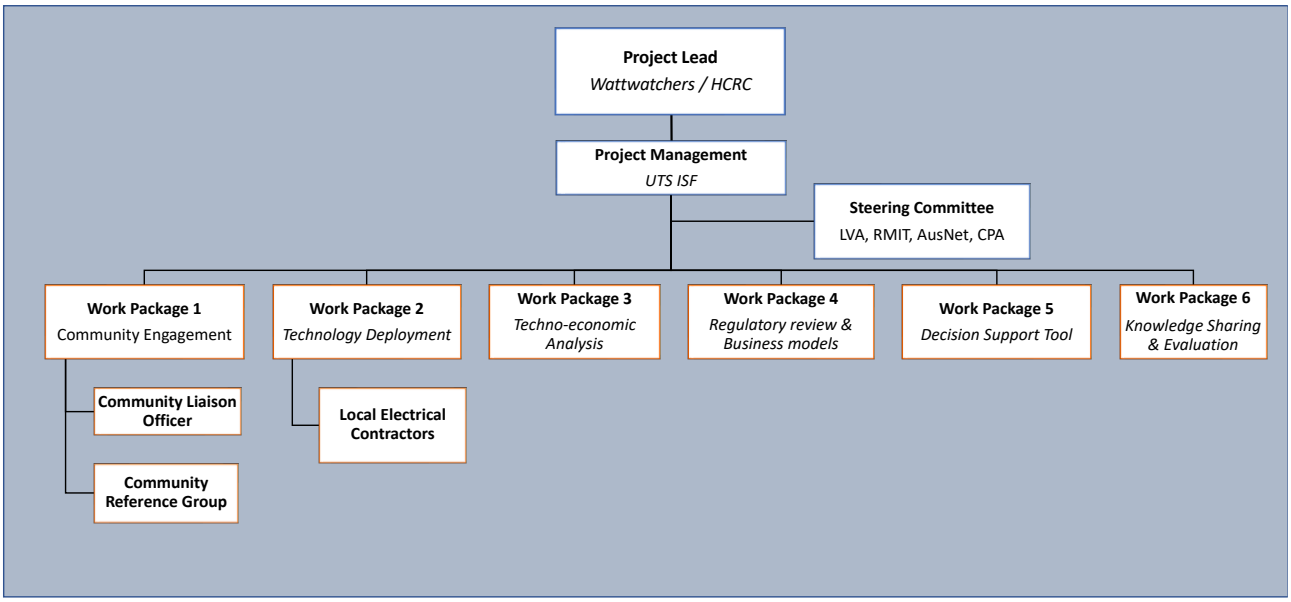


Figure 4 Project structure for the delivery of MyTown Microgrid

Table 1 Project Team members roles and activities.

Team members	Role	Activities
Wattwatchers Digital Energy: Award-winning Australian energy scale-up, specialising in devices and data to monitor and control electricity at circuit level in real-time through the cloud.	Project Lead Technology & Data (Lead)	Digital energy monitoring and control technologies and platforms, data gathering, cloud communications, Internet of Things (IoT) integrations.
Heyfield Community Resource Centre: Award-winning community group representing the Heyfield community and established in 1988.	Community Representative	Community engagement, community schemes.
UTS Institute for Sustainable Futures: Award-winning transdisciplinary research institute working to address our most pressing sustainability challenges. Part of top-ranked young university UTS, known for practical innovation and research that benefits industry and society.	Project Management (Technical) Community Engagement (Lead) Business Model (Lead) Technical analysis (Lead) Microgrid feasibility (Lead)	Project management, technical energy research, social research, business models, community engagement, and microgrid assessment.
Public Interest Advocacy Centre: Independent, non-profit legal centre based in NSW and established in 1982. Deep understanding of the decentralised energy and microgrid regulatory landscape and energy market reforms influencing consumer outcomes.	Regulatory and Policy (lead)	Regulatory and market.
Federation University Australia A public, dual-sector university based in Ballarat with the Gippsland campus based out of Churchill. Expertise in smart grid and microgrid modelling.	Technical analysis (modelling)	Modelling of the LV network, data collection for the electrical network, sizing of components, and energy flow studies.
RMIT University: Global university of technology and design and Australia's largest tertiary institution based in Victoria.	Regulatory and legal (Advisory Panel)	Regulatory and market.
AusNet Services: Owner and operator of Victoria's largest network of electricity and gas infrastructure.	Local DNSP Knowledge sharing Technical advice	Technical and regulatory advice (networks). Assessing value of integrating project with AusNet Services distributed energy management systems.
Latrobe Valley Authority: The Latrobe Valley Authority was established to coordinate Victorian Government action in the Latrobe Valley as it transitions to a diversified economy.	Local and regional context Stakeholder engagement	Community collaboration. Regional innovation.
Community Power Agency: The Community Power Agency is a not-for-profit organisation with expertise that enables and advocates for community energy. It supports communities across Australia to engage in and benefit from the transition to renewable energy.	Community engagement	Community and stakeholder engagement.

Community Engagement

Approach

A microgrid is a technical option that can have far reaching implications for all members in a community. At the core of the MyTown project was a novel community engagement approach for empowering the local community to understand whether a microgrid or other form of local energy solution was suitable. It also aimed to develop the knowledge and tools to make it faster, easier, and cheaper for other regional communities to understand local energy propositions for their towns.

The MyTown approach was built on a foundation comprising a Community Engagement Plan (CEP) that detailed who to involve (via stakeholder mapping) and how (via a local engagement and communication strategy). The primary lesson from these activities was to ensure engagement with the community was initiated as early as possible. A pre-feasibility study (as was undertaken by the Project Team in 2019 prior to the MyTown project) provided an important head start to gauging and building community interest.

Figure 5 The MyTown Microgrid launch event (February 2021).

MyTown's original concept, project name, and title was strongly connected to the grant award, which led to the focus on microgrids as the primary local energy solution to investigate for Heyfield. An important lesson from this is for future funding programs and projects to consider the influence this can have on community aspirations, as microgrids are only one type of potential local energy solution that can be considered.

Local representation and two-way communication with Heyfield residents and businesses were vital for successful project implementation. The recruitment of Community Liaison Officers (CLOs) and the establishment of a Community Reference Group (CRG) as representative of the local community proved highly effective. Clear processes and procedures, a regular schedule of meetings, and regular communication were found to be critical to get the most from CRG member involvement.

One of the first community engagement activities held was a Community Vision workshop. This was designed to help Heyfield community members to envisage their own driving motivations and guide the primary direction of the project. This sought to create a shared understanding of how the town would like energy to be generated, supplied, and consumed, now and into the future. Further effective communication and engagement methods included one-to-one interactions where concerns or questions could be addressed directly, as well as one-to-many interactions such as workshops and webinars.

On-street engagement was used as another method for capturing ideas and feedback from the broader community. As an example, it provided useful insights into perceived barriers that could make potential participants reluctant to apply for technology installations.

Figure 6 Working groups in progress at the Vision Workshop (February 2021).

The basis for MyTown's community engagement was its communication strategy with the associated processes and tools established early in the project. A mailing list in a basic CRM was developed, a regular newsletter scheduled, dedicated pages on community and project partner websites were hosted, and Facebook and Instagram profiles were created. Contact and an ongoing working relationship with local media was also established for publicising updates. Communications collateral for internal and external presentations was generated, including flyers, slide presentations, and short videos. Presentations at a variety of public events, from international conferences to local community meetings, helped share knowledge and build interest in the project beyond Heyfield.

What is a microgrid?

Typically, microgrids are implemented in remote or fringe-of-grid areas as a more reliable and less costly alternative to a connection with the main grid. Microgrids are increasingly being implemented around the world, driven by the falling cost of renewables, concerns around energy resilience and reliability, a desire to reduce carbon emissions, and for avoiding rising fossil fuel prices.

There are many different definitions of a microgrid, from the very complex to much more simplistic versions. Initially the US Department of Energy definition was used:

> “A (microgrid is) a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island mode”[5]

However, for the purposes of communication with the community, a much simpler version was adopted:

> “A microgrid can be defined as a group of homes and businesses that use, generate, and share electricity. It may be able to function both as part of the grid, and autonomously.”

The most basic features are:

- Defined boundary
- Islandable with a grid connection
- Interconnected loads
- Interconnected distributed energy resources
- Controllable

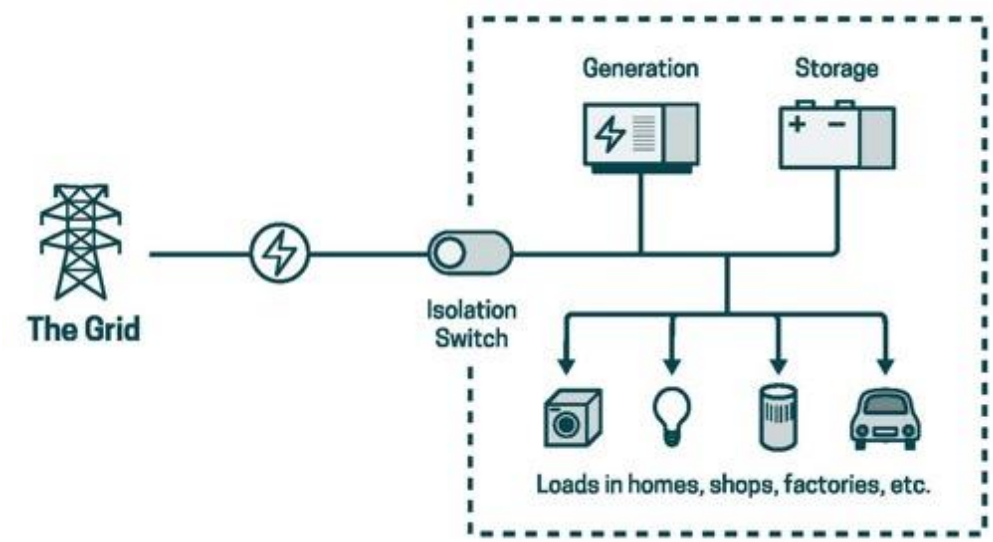


Figure 7 Technical components of a microgrid design

A microgrid is not suitable for every situation, and greater technical and regulatory complexity can make it challenging, requiring significant effort, time, and resources to realise any of the potential benefits. This was the starting point for the project team in its research and engagement with the community.

[5] https://www.energy.gov/sites/prod/files/2016/06/f32/The%20US%20Department%20of%20Energy's%20Microgrid%20Initiative.pdf

Community Reference Group meetings

Figure 8 Community Reference Group (CRG) members at their regular meeting
(Left-right: Darcy Jones, Jessica Cox, Mike Kube, Julie Bryer, Paul Brookes, Pete Collings, Rosemary Dunworth. Some CRG members attended remotely.)

The aim of establishing a group like the CRG was to enable community input into the feasibility assessment at each step in the process. The Heyfield CRG became a well-established group of between 11 and 13 local community members (including CLOs and local project members), who convened monthly at meetings also attended by members of the extended project team.

The meetings were coordinated and prepared by the CLOs, who developed the agenda in collaboration with the CRG and the project team. Minutes were taken by the CLOs and were circulated after each meeting to all attendees.

Community Liaison Officers (CLOs)

The locally-based CLOs proved to be highly effective for many aspects of the MyTown project, especially for activities relating to technology deployment and community engagement.

These local team members were a critical interface between the project team and the wider community. They should be considered an invaluable resource for energy projects in regional and rural areas.

Key lessons were that ensuring a local presence supports the two-way flow of information between the community and the project team, and that recruiting as early as possible was vital to ensure their involvement from the start of the project, and to make sure that any additional resources needed for such a role are not underestimated.

Figure 9 Community Liaison Officer Emma Birchall and local installer Brenton Stuart.

Engaging local schools

The project team established an ongoing relationship with local schools, both at primary and secondary level. Two primary schools (Heyfield Primary School and St. Michael's Catholic Primary School) both had Wattwatchers energy monitors installed on their switchboards. They were also provided a subscription to Solar Schools, a curriculum-integrated STEM education package using data collected by the Wattwatchers monitors. This provided a unique opportunity to educate local students on the potential of localised renewable energy solutions, inspire new ideas, and integrate their creativity into the MyTown project.

Training in the Solar Schools program was undertaken to familiarise teaching staff with the education package and demonstrate how it can be used in the classroom, to promote both further numeracy and sustainable behaviours. Wattwatchers has donated a smart TV for the state primary school to display the Solar Schools information dashboard and energy data collected by the Wattwatchers devices.

The CLOs also worked with Year 8 students from the local high school through their Collabor8 program, part of the Broadening Horizons Program at Maffra Secondary College. In the Collabor8 program, industry representatives are asked to present to students, giving an overview of their industry and the opportunities and challenges it faces. Problems are presented to the students, who are given the opportunity to ask questions of the industry representatives. Industry representatives were given the opportunity to mentor the students throughout the process as shown below:

Figure 10 Collabor8 program process used at Maffra Secondary College

Figure 11 Photos of the various engagement activities with the local schools and students

(Left-right clockwise: Hydroelectric prototype designed by students and based on those installed at Glenmaggie Weir which was considered in the feasibility, CLO Emma Birchall presenting to students with industry partners, screenshot from the Solar Schools Training with the CLOs and Principal Velleda Bradford from the Heyfield State Primary School, CLO Emma Birchall with Year 8 Students.)

Community communications

Communication is an essential part for engaging a community on project activities while also promoting its progress and findings to a broader audience at local, national, and international levels. Below describes the various methods the MyTown project employed for communication with its community and beyond.

Newsletter

A monthly newsletter was prepared by a CLO informing Heyfield about the latest project developments, local and regional energy events, and relevant community energy initiatives.

A unique feature of the newsletter was a series of interviews with CRG members, giving voice to the local perspective and insights on the latest project activities. It was distributed via Mailchimp to a contact list of more than 200 people. In addition, regular updates were also posted in the HCRC's Newsletter, sent regularly to 300 people as a hard copy and to 50 people via email.

Website

The project's main online presence was through a microsite hosted by the HCRC and integrated within its existing website. The CLO maintained the microsite though posting project updates and links to other useful resources[6].

In addition, password protected subpages were provided to give CRG members exclusive access to internal resources, such as meeting minutes and draft versions of project reports for review.

Community dashboards

Community Dashboards were developed as an information management and communication tool linked to data generated by the MyTown project. Their aims were to:

- Provide a summary of the anonymised data being collected by the Wattwatchers energy monitors installed in residential and commercial properties in and around Heyfield.
- Increase awareness, energy literacy, and engagement with the feasibility study process throughout the community and amongst visitors to the town.

Dashboards were installed at the Post Office, the HCRC, and one of the schools.

[6] MyTown website https://www.heyfieldcommunity.org.au/mytown-microgrid

Figure 12 Screenshot of the MyTown Microgrid microsite on the HCRC website

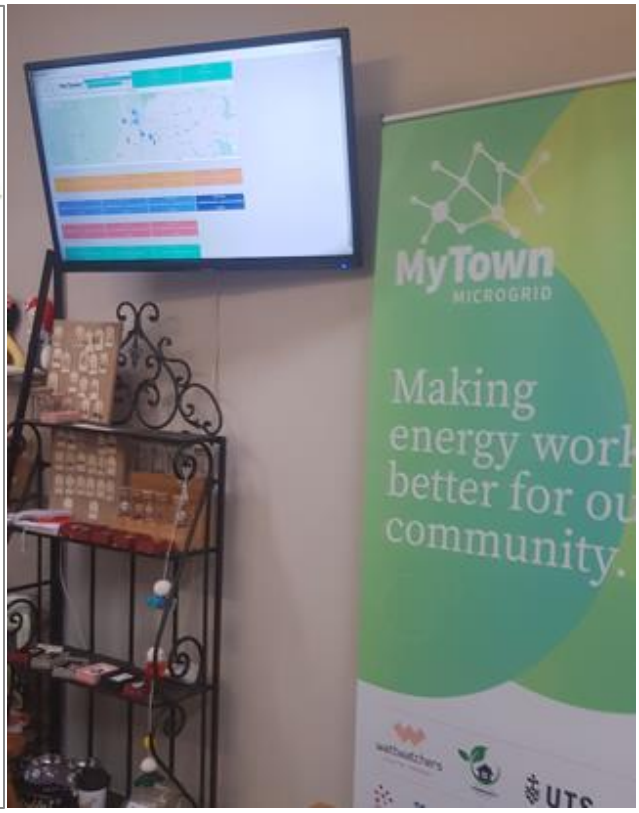


Figure 13 Community Dashboard as displayed on a screen in the Community Centre

Conferences, workshops, and professional networks

An important aspect of the knowledge sharing approach was presenting the project at various conferences, workshops, and professional networks events. This enabled the wider communication of the MyTown project's concept, aims, activities, and findings beyond just Heyfield, and included events held at a local, national, and international level.

Table 2 Events at which the MyTown Microgrid project was presented

Local events	National events	International events
Rotary Club Meetings; Community Climate Action Groups; Wellington Renewable Energy Network; Gippsland Climate Change Network; LVA Smart Grids Innovation Group.	Energy Efficiency Expo 2020; 2nd Virtual Power Plants 2021, Microgrid, Large Scale Solar and Energy Storage Innovations Forum 2021; All Energy 2022	Asia Week 2021; US Microgrid Knowledge 2021.

This approach served to generate interest in the project to maximise its impact, sharing knowledge on local energy solutions, and supporting the exchange of new ideas while inspiring other communities and projects. It also helped to build capacity in the CLOs and CRG members through providing them the opportunity to present on the project.

This aspect of knowledge sharing also led to the development of a portfolio of presentation materials over the course of the project and was subsequently made available on the MyTown microsite for others to view.

COVID-19

The COVID-19 pandemic and associated social restrictions brought unprecedented challenges for local communities and individuals, with a reduced ability to stay connected being one impact. While the MyTown Microgrid project supported the overall purpose of empowering community members in the decision-making process, and the co-creation of locally adequate energy solutions, we also provided an opportunity for the local community to connect, discuss and exchange ideas during a difficult time for many.

Table 3 Summary of Community Engagement Activities

Activities	Purpose and Details	Outcome/ Impact
Community Liaison Officers (CLOs)	The role of the CLOs was to build trusted relationships with all parts of the community while working closely with the Project Team. The recruitment of CLOs from the Heyfield area enabled the use of their local networks and knowledge while also building capacity and experience in community members.	Two people were hired for the first four months of the project inception phase, while one continued in the role for the remainder of the project. Their involvement proved especially important in the successful delivery of the technology deployment and community engagement work streams.
Community Engagement Plan (CEP)	A key document that mapped the main stakeholders, described the different engagement and participation methods, and outlined the process for recruiting and involving community members and other local stakeholders in the project.	The CEP was used as a 'live' document that was continually updated over the course of the project. The template can be used for other community-led local energy solution projects for ensuring regular and effective engagement.
Logo and visual identity	A logo and visual identity for the MyTown project that was created to be easily recognisable and support trust building, while helping to increase the impact of the project and its knowledge sharing.	Project collateral and communications materials were able to be produced quickly, efficiently, and were of a consistently high quality. This also proved to be a valuable community engagement tool with a logo design competition for local students and children.
Community Reference Group (CRG)	Provided a platform for community input over the course of the feasibility study while offering advice and recommendations at each step in the process. It was established in early 2021, constituting between 10-13 people recruited from within the community and from a variety of backgrounds.	The members became highly experienced and knowledgeable in issues relating to microgrids and other local energy solutions for communities. They have since formed the MyTown Energy Heyfield community group to further the different priority options identified as part of the feasibility process.
One-on-one meetings	These were used to increase awareness of the project, targeting specific community individuals and groups to encourage participation and support. The meetings were designed to inform, answer queries, invite attendance to different events, and recruit for project participation.	The CLOs conducted many one-to-one meetings over the course of the project. In a small community, in-person engagement and word-of-mouth was found to be the most effective method of engagement. This was because it was able to maintain a personalised approach and address concerns or questions immediately. It was found to be essential for educating individuals and key stakeholders on the project.
Launch event	An initial townhall meeting for introducing the project and its aims, scope, and timelines. It was held on 24 February 2021 and was attended by community members from Heyfield and the surrounding areas, as well as the project team.	The launch was well received and attended by more than 50 people. Local media provided additional coverage of the project. The introduction of the project team was an important first step in building community trust.
Community Vision Workshop	A key event to determine a shared vision for the way energy should be used and generated in Heyfield, now and into the future. The 1.5-day workshop was held back-to-back with the launch event. It offered a forum where attendees could learn more about what might be involved should a microgrid be implemented, from the capability of the energy monitoring devices to what distributed energy resource technologies might be deployed.	It marked an important step to bring together members of the project team with members of the community, allowing an open discussion. The CRG gained greater confidence in the project methodology and benefited through engaging on the technical options with the technical team. The technical team were able to address any perceived concerns relating to the costs or benefits of the different technologies.

Activities	Purpose and Details	Outcome/ Impact
Community survey (Ecologic platform)	The app-based platform Ecologic was used to gather information on the trial participants' homes or business premises to characterise how energy was used and generated. The information was captured using a smart phone to fill in a survey, complimenting the data collected by the energy monitoring devices.	The survey was completed by almost 100 community members providing insights into their electricity use and demand. Although its use in the technical analysis was more limited than expected, it was highly valued at a household/business level, for community engagement, and for capacity building.
Media reach-out	This enabled promotion of the project within and beyond the borders of Heyfield to help maximise the impact and its unique approach to a microgrid and local energy solutions feasibility.	The project was covered by multiple media outlets at local, national, and international levels. This led to invitations to speak at events, contribute to publications, and submit the project to a global award for sustainability.
Webinars	Presented by different project team members, these 45-minute webinars were aimed at people from Heyfield and other communities interested in local energy solutions. They were designed as an accessible way to help attendees to understand various aspects of the MyTown project.	Six webinars were held with a combined attendance of approximately 100 people. This supported knowledge sharing and capacity building, generated interest in the project, and helped shape ongoing project deliverables based on feedback from webinar participants.
Final Town Hall event	A public wrap-up event recapped on the project's aims and process and celebrated the main outcomes. The event was tailored to appeal to a wide demographic from the community with live music, food, refreshments, and activities for children.	Attended by around 50 people from Heyfield on 2 June 2023, attendees heard from the project team and other community members who had been involved in MyTown. The focus was on next steps, and on what both individuals and the project had achieved and learned over the three years.

Data and technology deployment

A key aspect of the MyTown project was that it took a data-driven approach to decision-making regarding the feasibility of potential local energy solutions for the town of Heyfield. The data that was able to be collected played a crucial role in helping to characterise energy use in the town, and for assessing solutions for cleaner, more reliable, and more affordable energy. The following sections summarise each of the key steps in the data and technology deployment work package.

77

Sites installed
62 Residential
12 Commercial
2 Schools
1 Farm

100

Devices installed (and energy audits completed)

3

Community Dashboards installed
1 Community Centre
1 Post Office
1 School

Figure 14 MyTown technology deployment in numbers

Monitoring devices

Data was collected using Wattwatchers' Auditor energy monitoring devices. The Auditor 6M is a compact energy monitoring solution installed in the customer's electrical switchboard. It can monitor up to 6 circuits with revenue-grade Class 1 metering accuracy (+/- 1%) and cellular (4G/3G) communications. This provided access to near-real-time energy data through Wattwatchers' cloud platform and application programming interface (API). Australia-wide, Wattwatchers' Auditor range has seen over 50,000 units deployed across residential, commercial, industrial, and utility use cases.

Figure 15 Wattwatchers Auditor and current transformer product range

Site selection

A Data Sampling Design Plan was developed that defined the number, type and characteristics of the sites that were being targeted for deployment of the data monitoring devices. While the final number and mix of sites that had devices installed varied based on those initially targeted, which is to be expected in a real-world and geographically-focused deployment, the plan served as a useful guide in the initial stages of the project and for later benchmarking.

The site selection criteria list was defined as follows:

- A distribution of sites around the Heyfield township and the local electricity network segments.
- Different types of sites (homes, schools, community facilities, small businesses, and industry).
- Sites with and without solar, and with and without battery systems.
- Key energy consumers in the region, such as large businesses.

Participant recruitment

The recruitment of participants for large, complex, innovative energy research projects takes time and often proves more challenging than expected. The targeted number of participants for recruitment into the MyTown project was exceeded, which can be attributed to:

- Early planning: This took place from the start of the project and recruitment was initiated as soon as was feasibly possible (within the first six months of the three-year project).
- Engaged community: Heyfield already had a strong track record for high participation in community-based sustainability initiatives prior to the MyTown project being initiated.
- Experienced project team: From being involved in – and researching - other similarly innovative and complex energy projects implemented across Australia (Alexander et al 2020[7]).

Residential participants were recruited from all the target areas in Heyfield, Coongulla, Cowwarr, Denison, Glenmaggie, Seaton, Tinamba West and Winnindoo. This selection of areas for inclusion was based on the largest potential microgrid boundary options for the project. This resulted in a wide range of sites, from typical single-building domestic dwellings in the Heyfield town itself, to larger rural properties with multiple buildings and outbuildings in the surrounding areas.

The commercial site participants included a mixture of the small and medium businesses in Heyfield, such as cafes, a supermarket, hospitality, retail stores, a hotel, and an industrial site.

Two schools in Heyfield were also recruited for the project. Heyfield State Primary School – with around 195 students with an existing 27kW solar system installed; and St Michael's Primary School – with around 80 students with no solar system installed.

The school sites were supported by Solar Schools[4], a Wattwatchers business partner that provided an additional education and support package to the schools. This formed part of the community education and engagement of the MyTown project.

Installation

The process involved installation of Wattwatchers 6M Auditors on the customer side of participants' electrical switchboards to monitor the key circuits, including grid imports and exports, solar generation, and other major equipment such as electric hot water and air-conditioning systems. These devices were capable of revenue-grade metering accuracy and used integrated 4G/3G communications to provide access to near real-time energy data. They were installed by a fully-qualified, locally-based electrician, with the majority installed in the first two years.

In several instances, properties had solar generation systems installed on a second building at the property, such as a garage or shed. This required a second Wattwatchers device to be installed to directly monitor the solar generation to make this data available to the research team and the participant.

[7] Alexander, A., Dwyer, S., Briggs, C., Reidy, C. (2020). DER Customer Insights: Values and Motivations. Prepared for ARENA by ISF-UTS. Available here

Figure 16 Local electrician installing a Wattwatchers device on a switchboard in Heyfield.

Additional data gathering

Data collected by the Wattwatchers devices was supplemented by energy audits from Ecologic[8], an app-based solution that gives tailored advice for reducing energy use, energy bills and carbon emissions. Through a questionnaire that a user can complete themselves with minimal knowledge of energy auditing, data was collected on the residential and business premises, including the number of occupants, property use, heating, cooling, hot water, building and insulation, and appliance usage.

Data collection was undertaken either by the project participant or by project team members (either the CLO or another HCRC staff member). All project team members received training and had some experience of entering homes to undertake energy audits.

Energy bills and smart meter data was also used to supplement the data gathered by the energy monitoring devices and energy audits.

Engagement with the data

Project participants were able to engage with the data collected by the energy monitoring devices using Wattwatchers' MyEnergy smartphone app. The app provided users with insights on their energy use and generation in an easy-to-understand, graphical format. For the broader community, digital display screens located in highly-visible public places (termed "Community Dashboards") were used for presenting the aggregated data for the town on energy consumption and generation. The local schools also had dedicated screens which presented a summary of their energy data, while serving to educate and inform students and teachers as part of the Solar Schools Program.

[8] https://www.getecologic.com/

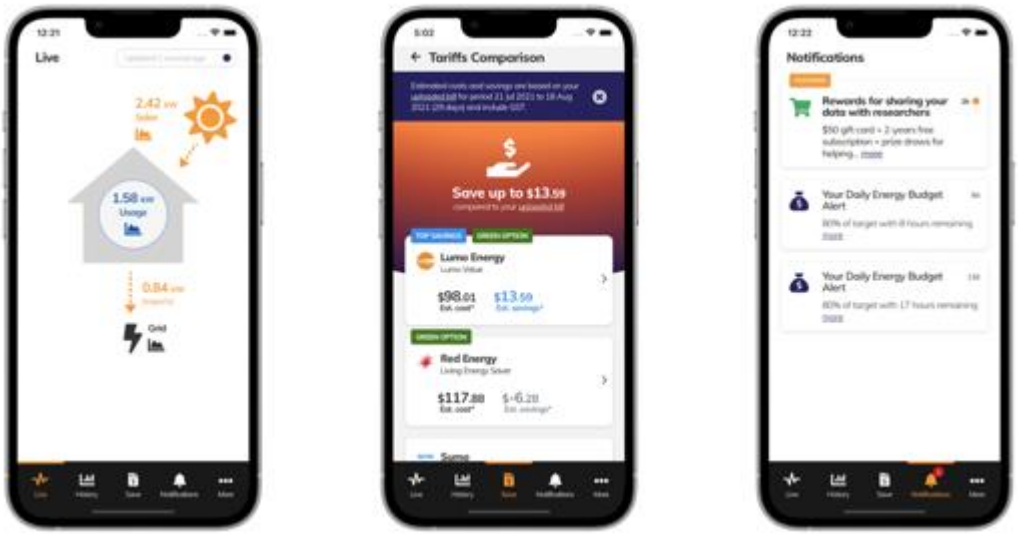


Figure 17 Wattwatchers MyEnergy smart phone app

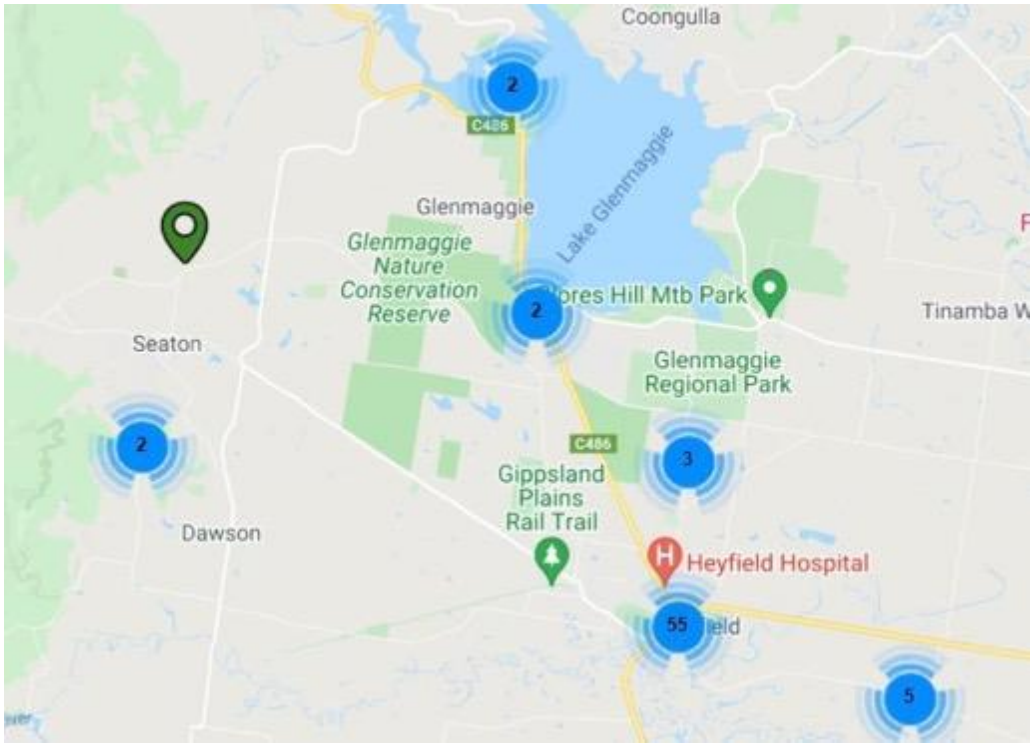


Figure 18 Summary Map of Wattwatchers Device Anonymised Installation Locations
(Google Maps via MyTown Microgrid Project Dashboard. Not all devices are shown due to visible map area).

Data collection and processing

Data from the Wattwatchers devices was made available to the research team using the Wattwatchers applications and API for visualising, processing, and analysing data in external tools. It was combined and compared with other data obtained during the project, such as information from AusNet Services on the local electricity network, energy bills, smart meter data, and the Ecologic energy audits.

This multi-source data approach allowed for a combination of both top-down and bottom-up analysis of a cross-section of sites within the different boundary options that were assessed for the potential microgrid and community energy solution options.

General lessons

Some general lessons from the participant recruitment and technology deployment work streams were:

- Seek a committed technology partner (not just a technology supplier) who shares the same vision: With a role in the inception of the concept for MyTown Microgrid, Wattwatchers had a highly-integrated project role as the technology vendor, as overall project lead, and as manager of the Technology Deployment Work Package. Combined with a highly-experienced team and a shared philosophy around open technology platforms, they were a key factor behind the project meeting its technology deployment targets.
- Free devices and easy registration: all the monitoring devices were able to be provided for free due to the grant, and obtaining the device only required a simple registration process. While the provision of a free device doesn't guarantee acceptance from customers, it gave the project a huge advantage when it came to customer recruitment for this project.
- Do not underestimate the effort required to engage a community and recruit participants: Significant resources are required to support effective community engagement and participant recruitment. The groundwork required to educate, engage, and recruit in a new community could easily consume 9-12 months or more depending on their foundational understanding of energy and sustainability issues. Additional time from the CLOs needs to be allocated during critical periods of the project when engagement with the community is intensive, such as participant recruitment.
- Plan for a minimum of 12 months of data plus a margin for error: Where data for characterising the energy profile of a town is required, a full 12 months of energy data at the very least is required to account for seasonal variation. Data quality issues or unforeseen delays to installations can mean that a potentially longer timeframe is needed, with additional time and checks factored in for quality assurance.
- Community Liaison Officers and CRG members can be good beta-testers: Both were used to help test recruitment procedures and the technology platforms. The processes were smoothed and several bugs in the platform were able to be identified and rectified because of their feedback.
- Utilise CLOs and CRG member networks: Social media profiles and membership of other community groups are established channels that can help promote and educate on the work being undertaken in the project.
- Define your community participant recruitment process early: Even for a relatively simple technology installation program, there are many inherent complexities of mapping the recruitment process. Especially one that provides a smooth experience for the community member while ensuring ethics and data requirements are met. Any late changes to this process can result in having to make repeat visits to obtain the necessary approval from participants.
- Ensure there is a plan for people with different levels of computer literacy: The recruitment process was initially designed around the assumption that participants would have access to the internet and a smartphone, but this was not always the case. A parallel process was developed with additional one-on-one assistance and step-by-step registration guides for those who wished to participate but did not have access to the internet or who felt less comfortable with technology.

Impacts from COVID-19 on technology deployment

The project endured several interruptions that required device installations to be delayed or rescheduled due to lockdowns, restrictions, and other impacts from COVID-19. This particularly impacted the project during the August to September 2021 Victorian lockdown period which prevented most installations from occurring due to restrictions on access to residential properties and deferred non-essential works for commercial properties. This also resulted in a substantial backlog of other work for the local electrician, who was required to attend to high priority works in the September to December 2021 period that further limited the rate of deployment of new devices.

The overall impact of the restrictions meant that a reduced number of installations were completed due to the lost time before 31 December 2021. As a result of these impacts, installations continued through to early 2022. This was within the original project budget plan but meant that 12 months of data was not available from some devices.

Business models

Over the last decade, Australian communities have demonstrated that community ownership models for energy assets can both work and be scalable. However, some concepts like microgrids and community batteries are relatively new to Australia while also being inherently complex.

In previous examples where community ownership models have worked, the network provider and/or third-party partners has been crucial in helping that community with implementation and in creating a viable business model.

Whether for a community microgrid or any other type of local energy solution, multiple business models are possible. For any community, the most appropriate business model for them will need to consider its goals, available resources, geography, electricity network topography, regulations, available funding, and the market players and their current market offers.

The MyTown project sought to trial a new co-design process to identify and co-design viable business model options for a local energy solution in Heyfield. A description of the process can be found in the Business Model Design Report[9].

The MyTown project used the following definition for a business model:

> Business model (defn.) "*The way an organisation creates value, and how it gets paid – or rewarded through other means – for doing so. It comprises three key elements: value creation, value delivery and value capture*".

Co-design workshops and process

The Project Team led five business model workshops based around each of the different local energy solution options. The purpose of these was to identify and co-design viable business model options for local energy solutions in Heyfield.

They featured pre-prepared slides and sought attendee feedback and preferences on key design choices of the different business models, local energy solutions, relevant business models options, possible pathways, and any risks. These were attended by CRG members and other selected stakeholders.

The workshops were typically sessions of between two and three hours, with the first held on Monday evenings at the regular meeting time of the CRG. A final workshop was held over the course of a Friday evening and Saturday. The discussions were facilitated by the CLO, who captured the feedback, insights, and any questions for the project team.

The workshops were broadly structure as follows:

Figure 19: Structure of business model co-design workshops

[9] https://www.uts.edu.au/isf/explore-research/projects/mytown-microgrid-heyfield-victoria/mytown-outputs

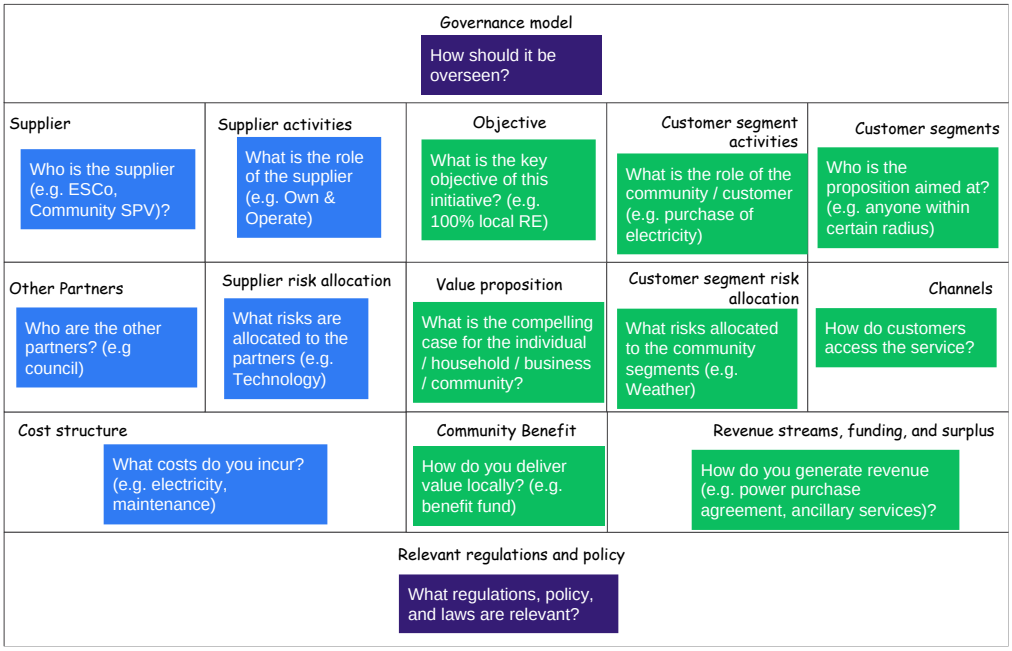


Figure 20 Business Model Co-Design Workshop Canvas

(Adapted from the Business Model canvas by Strategyzer.com[10] and used for characterising each diffeent business model explored in the workshops)

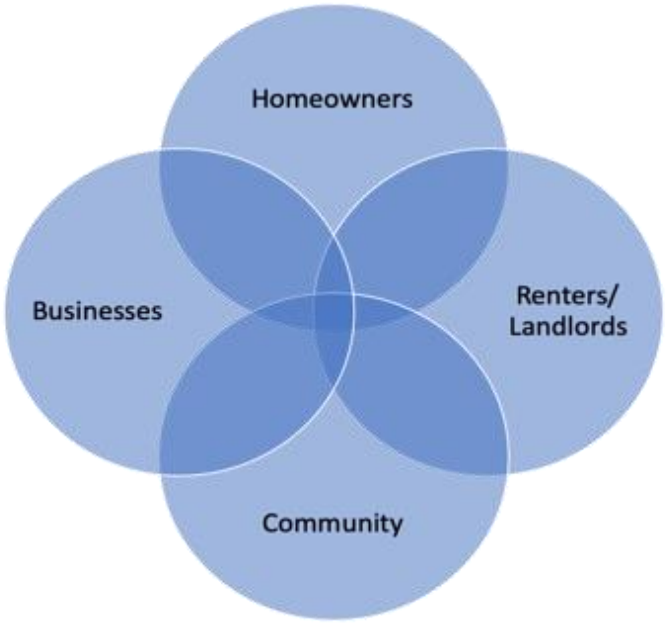


Figure 21 What is the customer proposition for each community stakeholder group?

(This diagram was used for mapping the customer proposition for each business model explored in the workshops).

[10] Osterwalder, A.; Pigneur, Y. Business Model Generation; Modderman Drukwerk: Amsterdam, The Netherlands, 2009; pp1-44.

Microgrid feasibility

A key objective of the MyTown project and the key requirement of the grant funding was to undertake a microgrid feasibility for Heyfield[11]. The following section details the results as well as the process that was undertaken. A summary of the findings is contained in the table below:

Is a town-scale microgrid feasible for Heyfield?	
Technical perspective	**Yes – a microgrid is technically possible.** However, a key determinant of whether a microgrid could be feasible for a community is the existence of 'network pain'. This occurs if there are major network problems that are costing the local DNSP significant amounts (either now or soon), and that are resulting in a poor service for customers. In such a case, the DNSP is more likely to be receptive to the implementation of a microgrid. This increases the likelihood for financial support and an easier path to regulatory compliance. This is not the case for Heyfield. The local zone substation (Maffra) is operating near capacity in summer, but AusNet Services is not proposing any capacity upgrades or expecting substantial load growth in the region. A recent expansion at the Australian Sustainable Hardwoods (ASH) timber mill in Heyfield led to an investment in voltage regulation on its incoming feeder, reducing the occurrence of persistent outages and reliability issues.
Regulatory perspective	**While no clear conclusion was able to be made, highly complex negotiations would be required for a Heyfield microgrid**. Even if these were successful, any application may still be turned down by the relevant energy regulatory body. None of the standard exemptions apply, and there is no clear route to comply with required consumer protections.
Economic perspective	**Under one scenario that involved bioenergy, a microgrid was found to be economically feasible with certain caveats**. To know with certainty a microgrid with bioenergy is economic would need more detailed analysis. However, there are very high risks whether economic or not, as the generator would need to be run in an entirely integrated manner. This would mean operating according to the needs of the entire system, including shutting down and using solar PV when there is excess PV generation. This was determined as a high-risk venture for both the business involved and the community.
Desirability perspective	**While technically possible, the economic case does not appear strong enough while the regulatory risks are high**. As a result, the desirability of this option for the community was seen as low.
Overall	**No - a town scale, island-able microgrid was considered not to be feasible for Heyfield.** However, other components of the assessed microgrid were discovered to be promising for delivering on the community's aspirations, and these were deemed to be worthy of further exploration as part of the MyTown project.

Process

The feasibility approach consisted of three main elements: a technical feasibility, a regulatory feasibility, and an economic feasibility. The technical feasibility used specialised software to simulate loads and generation at times when equipment is likely to be stressed. It aimed to determine whether the microgrid could keep operational conditions within reasonable limits, and how much power the microgrid could export, and to ascertain the costs of the microgrid equipment. The regulatory feasibility looked at the rules and regulations concerning microgrids to find out whether a town microgrid would be legally possible, and what it would involve. The economic feasibility calculated the cost to establish and operate the microgrid, including how much generation and storage would be needed, and whether different stakeholders would be better or worse off. The desirability was then assessed and confirmed with the support of the CRG as representatives of the community.

[11] The full feasibility report can be downloaded at https://www.uts.edu.au/isf/explore-research/projects/mytown-microgrid-heyfield-victoria/mytown-outputs

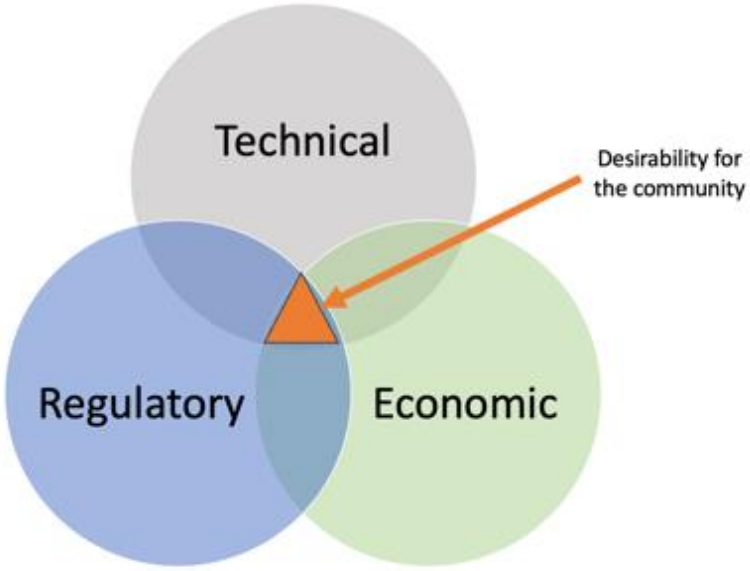


Figure 22 Trifecta for community microgrid feasibility

Regulatory feasibility

The regulations as they relate to microgrids are not clear cut, so there it is not a simple answer as to whether a town microgrid is feasible from a regulatory point of view. The establishment and operation of a town-scale microgrid was determined to be enormously complicated and fraught with risks.

A distribution license and a generation license (or exemptions) would be needed. However, the automatic exemptions for embedded networks do not apply as the town network would cross property boundaries and would contain a large number of local customers. A distribution license is required unless the network was operated by an entity with a license, such as AusNet Services. An electricity retail license or an exemption would also be needed (although it is likely that a retailer would be needed anyway).

Apart from licensing, the microgrid arrangements would need to ensure that consumer protection laws were maintained. This means consumers must keep the option to leave the microgrid retail system, and any project must ensure that consumers will not be paying more for their electricity under the new arrangements. It was difficult to see how this could be achieved.

Technical feasibility

The technical feasibility was undertaken through a combination of assessing the potential microgrid boundaries and modelling using hybrid power system modelling software (HOMER) to understand the electrical load and generation within the microgrid. The figure below shows the different boundaries which were considered taking into account connection points with the main grid. The detailed assessment was undertaken for Boundary 3, as this was deemed most likely to be economic.

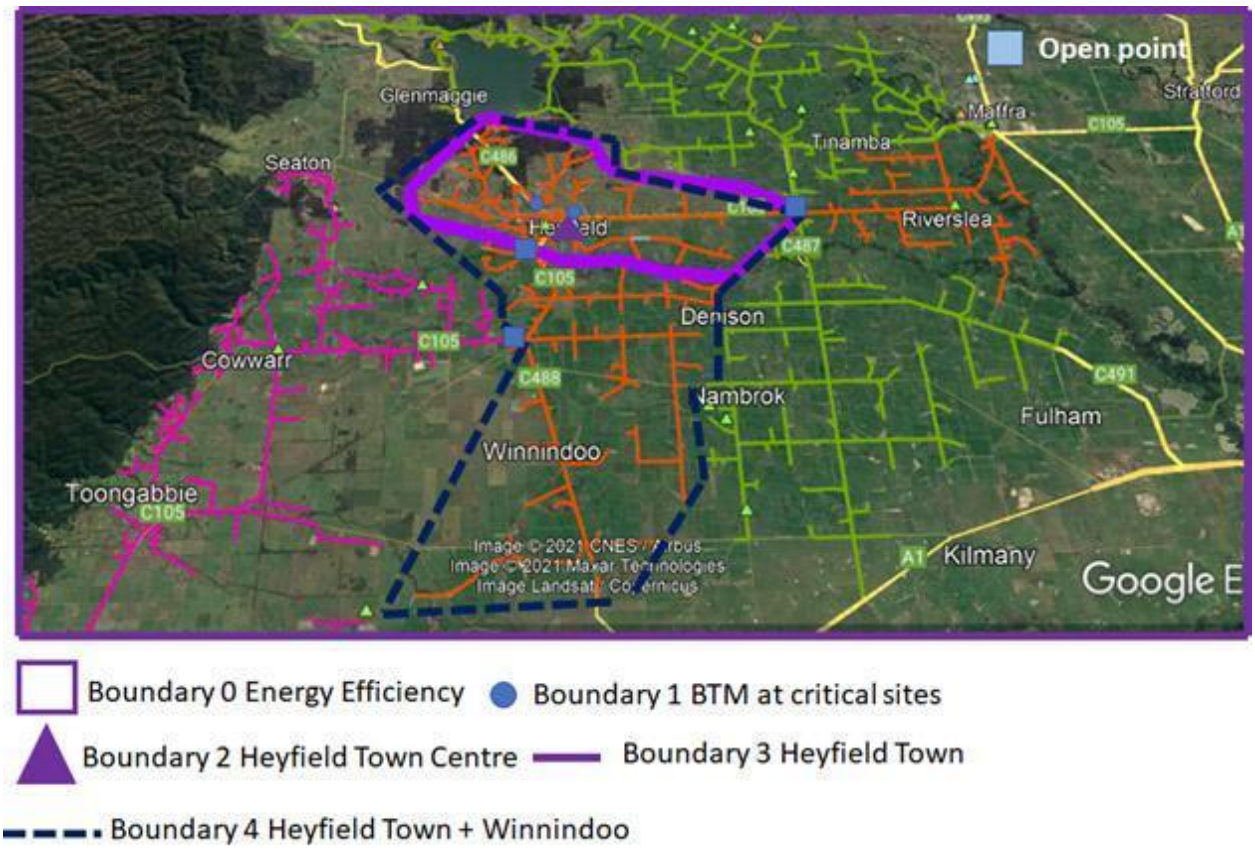


Figure 23 Boundary options for a Heyfield microgrid

(Boundary Option 3 was ultimately selected for the more detailed feasibility assessment)

The HOMER software enabled an assessment of the amount of generation the microgrid could support, the limits on export and import, the additional control infrastructure needed (and costs) with different amounts of local renewable generation, and the impacts of the microgrid on the reliability of the system.

While these are initial findings only, the results indicated:

- The medium voltage network in Heyfield could support a microgrid with a load well above the current peak, and host sufficient PV and other local generation to reach more than 80% of local generation.
- There is an export limit of about 1.7 MW because of constraints on the supply feeder from Maffra.
- The CAPEX of microgrid components (excluding those directly associated with the new generation) is between $0.5m – $0.8m in most cases.
- There is better reliability overall with the microgrid option compared to the grid-only option.

Economic viability

The economic viability of the microgrid was also assessed using HOMER. The optimisation process finds the system configuration that gives the lowest total discounted system cost, using the candidate technologies and staying within any specified constraints. As well as finding the optimal amount of generation and storage in each scenario, sensitivity analyses were undertaken to test changes in the key inputs, such as the cost of the bioenergy fuel. The figure below summarises the inputs, outputs, and processes.

The timber manufacturer within the town means there may be an option to have a large bioenergy plant. This would change the other generation and storage options needed to allow the microgrid to island (operate independently from the grid if needed) very significantly. Therefore, the project looked at two scenarios, one without the bioenergy plant (and the timber manufacturer) and one with them.

The optimisation software assumes that any resource within the microgrid is operated in an integrated manner. This would mean, for example, that the timber manufacturer load would use solar at times when

that is most economic for the entire system (for example, when it would otherwise be curtailed), and that the bioenergy plant would be operated when there is a lack of output from the solar PV.

As part of the modelling, a limit was set on the amount that could be imported from the grid at any moment, and limits of 1 MW, 1.5 MW and 2 MW were tested for each scenario (when the model was run without import limits, little additional generation was installed, as it proved cheaper to import energy from the grid).

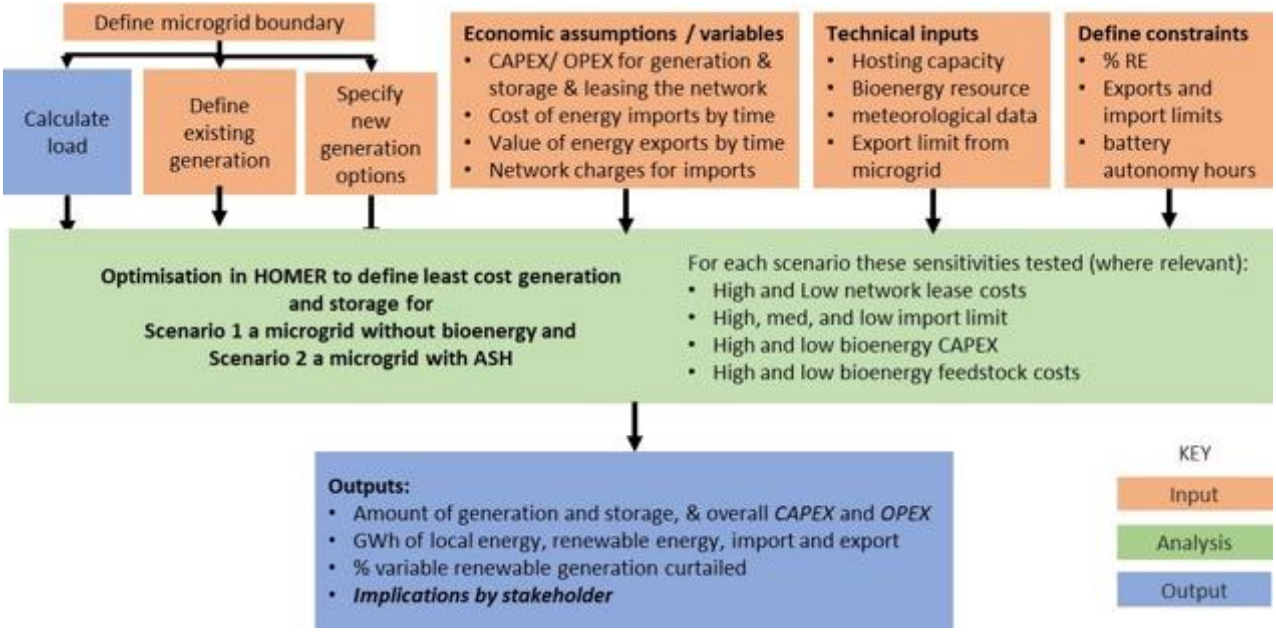


Figure 24 Modelling the economic feasibility.

The results from the economic analysis found that all scenarios were expensive with only one scenario likely to reduce energy bills for both solar and non-solar PV owning households. A summary of these findings and the assessed boundary of the town-scale microgrid are shown in the figure below.

	Total Cost	Change in average residential bill ($/year)	
	$m	no solar	with solar
SCENARIOS WITHOUT BIOENERGY			
Scenario 1	$48.9 m	+$891	+$712
Scenario 2	$20.2 m	+$114	+$234
SCENARIOS WITH BIOENERGY			
Scenario 3	$25.6 m	-$134	+$81
Scenario 4	$21.0 m	-$212	+$34
Scenario 5	**$14.9 m**	-$346	-$49

Figure 25 Summary of economic feasibility results.

For the scenarios without bioenergy, initial CAPEX varies from $20m to $48m if the scenario with high imports is disregarded. With bioenergy, the initial CAPEX varies from $21m to $27m.

In terms of the estimated impact on resident bills, all the scenarios without bioenergy result in increases of between 8% and 100%. Residents with solar PV are worse off because they currently get feed in tariffs for solar exported to the grid, which will not be available if they become part of a microgrid, so bills are likely to increase even in cases where the microgrid energy costs are close to the baseline. The scenarios with

bioenergy result in bills going down for residents who do not have solar installed, by between 10% and 25%. Residents with solar are worse off by between 5% and 11%.

The results found that while a microgrid was technically feasible, all the options were costly with only one of the scenarios able to reduce energy bills for both solar and non-solar households in Heyfield.

Other local energy solutions options

From the microgrid feasibility assessment, several other local energy options emerged as potentially more feasible for the Heyfield community while remaining well-aligned with their aspirations. Some of the options deemed worthy of further investigation are shown in the below table. A more detailed feasibility of the technical and economic potential of these options is contained in separate reports on community-scale batteries, load flexibility, and on-site options.

Table 4 Local energy options compared to some community aspirations.

	Energy bills	Reliability & resilience	Community involvement	Environmental benefit	Future-proofing
Town microgrid	✗	✓	✓	✓	?
On-site options	✓	✓	✓	✓	?
Load flexibility & control	✓	✓	✓	✓	✓
Community battery	?	✓	✓	✓	✓
Community renewable generator	✗	✗	✓	✓	✗
Community retailer	?	✗	?	?	✗
Stand-alone power at critical sites	✗	✓	?	✗	✗

MyTown Energy app – the Decision Support Tool

Overview

A Decision Support Tool (DST), now known as the MyTown Energy app, was a key deliverable of the MyTown project. It was designed as both a way to help communities make more informed choices about the way energy can be used and generated in their towns, but also serves as a repository of the knowledge garnered over the course of the MyTown project.

Its aim is to help communities in their sustainable energy projects by directing them to information that most suits them and their community's location, priorities, knowledge, skills, and ambitions. It aims to help them do the initial filtering of projects and guide them along the next steps. It has been developed by sustainable energy experts working in close partnership with the community, and with visual design experts.

Making the right community-led decisions for supplying clean, affordable, reliable electricity is complex and can be fraught with difficulties. One of the key obstacles to community implementation is understanding the energy market, having sufficient grasp of the technical alternatives, and matching projects to aspirations and capacities within the community.

There are many different options available and choosing the right option (or combination of options) for a community can challenge even the most experienced of experts.

The MyTown Energy app aims to be broadly useful for people new to community energy, as well as for those who are experienced in the area. It will help build knowledge, capacity, and a team to cover all the different aspects that can confront a community energy project. The secondary audience for this tool is those who look to help communities with their energy projects, including consultants, councils, researchers, installers, and electricity network companies. It was designed to help communities and other stakeholders navigate the inherent complexity by providing simple and easy to understand guides to help lead communities through the different options.

While the content is not being updated following the 30 June 2023, funding is being sought to actively share the tool with communities, and to ensure the content remains up-to-date and useful.

Specification of the Decision Support Tool

The DST was initially scoped as a project output that could support the journey of a community through the microgrid feasibility process.

While focussing on the technical aspects of microgrid decision making was one approach, a key learning from the project evaluation was that communities need to start by assessing priorities and options. Starting with a preferred solution (such as a microgrid) can be an obstacle to finding the most appropriate energy option.

The MyTown Energy app was therefore developed as a tool for users who have a microgrid in mind, and for those who are wishing to assess their options for local energy solutions more broadly. Adjacent to learning about microgrid options, the tool facilitates a growing awareness of energy use, energy resources, generation and storage technologies, and the social changes associated with an energy transition. Some of these decision stages are supported by the DST itself, and others by facilitation or guidance materials.

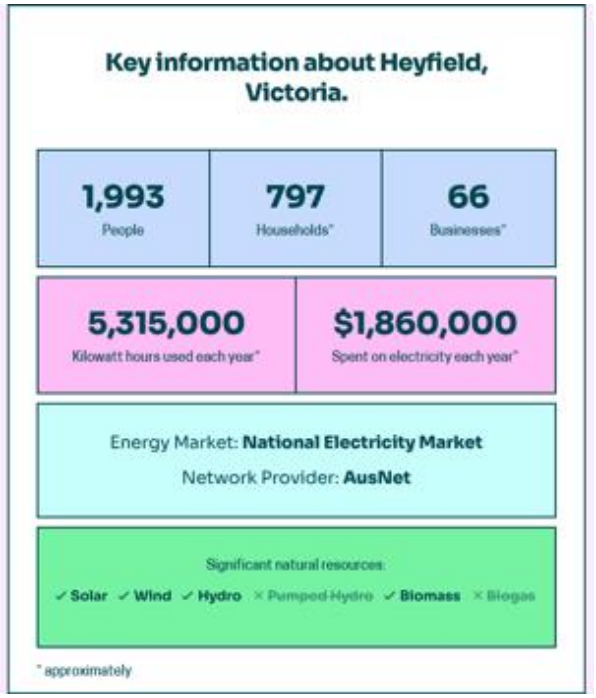
Design principles

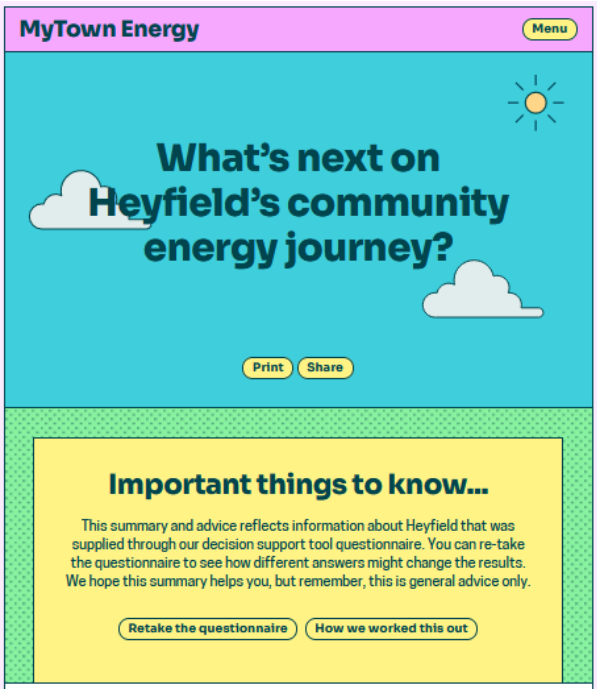
In designing the foundations of the MyTown Energy app, the following design principles were applied. It should:

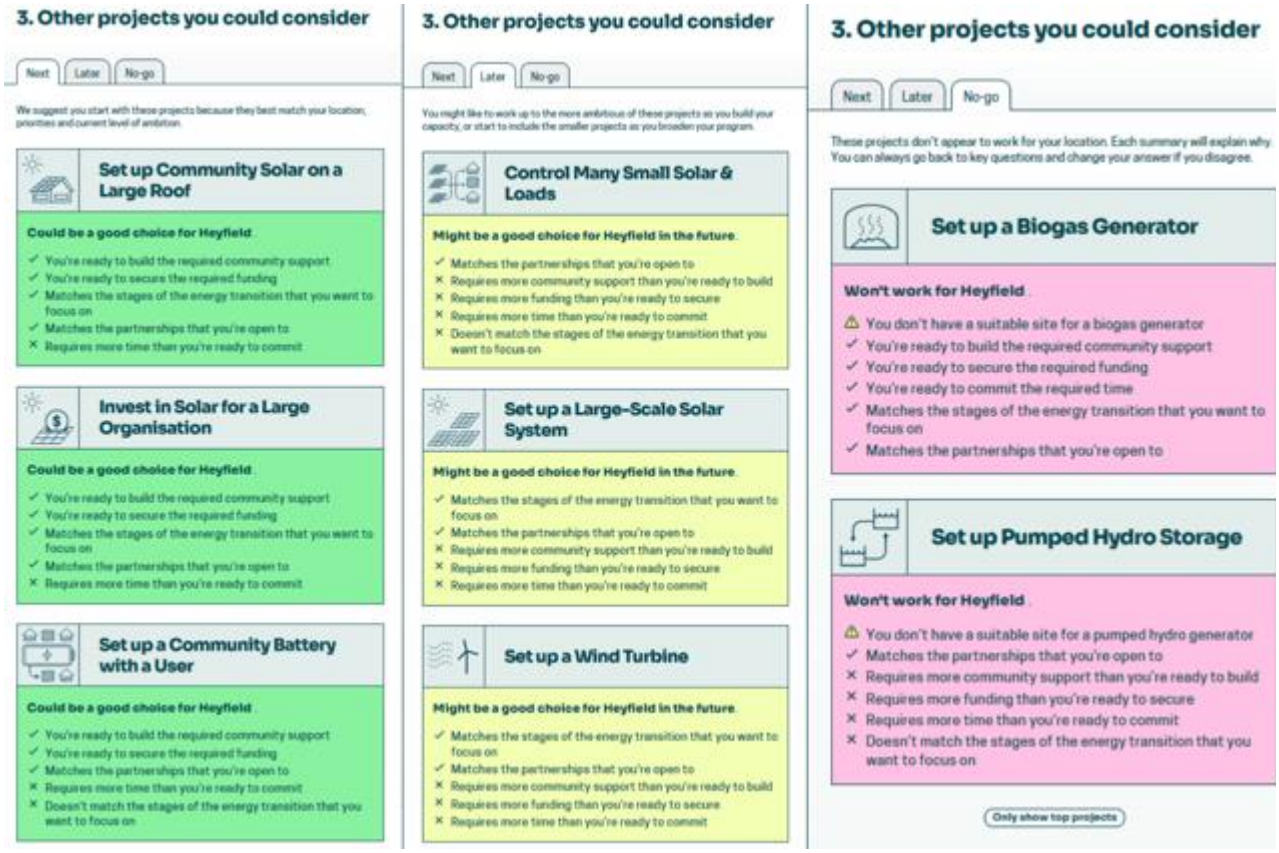
1. Support communities in understanding whether a microgrid could add value and might be viable in their area, with the least time investment and data requirement possible.
2. Allow flexibility for communities to use 'best available' data that could be high level or granular.

3. Be freely available, or readily accessible at low cost if the value proposition requires data sources to be updated or paired with community microgrid facilitation services, and which supports the replication of the feasibility process.
4. Dovetail with other community co-design resources.
5. Seek to limit unfunded maintenance of data or code to prevent becoming obsolete.
6. Quantify where the key costs and value streams lie, to start to inform communities about which stakeholders those costs and benefits will accrue to.

The MyTown Energy app can be accessed at www.mytownenergy.net and selected screenshots are shown below:






3. Other projects you could consider
Next
Later
No-go
We suggest you start with these projects because they best match your location, priorities and current level of ambition.
Set up Community Solar on a Large Roof
Could be a good choice for Heyfield.
✓ You're ready to build the required community support
✓ You're ready to secure the required funding
✓ Matches the stages of the energy transition that you want to focus on
✓ Matches the partnerships that you're open to
× Requires more time than you're ready to commit
Invest in Solar for a Large Organisation
Could be a good choice for Heyfield.
✓ You're ready to build the required community support
✓ You're ready to secure the required funding
✓ Matches the stages of the energy transition that you want to focus on
✓ Matches the partnerships that you're open to
× Requires more time than you're ready to commit
Set up a Community Battery with a User
Could be a good choice for Heyfield.
✓ You're ready to build the required community support
✓ You're ready to secure the required funding
✓ Matches the partnerships that you're open to
× Requires more time than you're ready to commit
× Doesn't match the stages of the energy transition that you want to focus on
3. Other projects you could consider
Next
Later
No-go
You might like to work up to the more ambitious of these projects as you build your capacity, or start to include the smaller projects as you broaden your program.
Control Many Small Solar & Loads
Might be a good choice for Heyfield in the future.
✓ Matches the partnerships that you're open to
× Requires more community support than you're ready to build
× Requires more funding than you're ready to secure
× Requires more time than you're ready to commit
× Doesn't match the stages of the energy transition that you want to focus on
Set up a Large-Scale Solar System
Might be a good choice for Heyfield in the future.
✓ Matches the stages of the energy transition that you want to focus on
✓ Matches the partnerships that you're open to
× Requires more community support than you're ready to build
× Requires more funding than you're ready to secure
× Requires more time than you're ready to commit
Set up a Wind Turbine
Might be a good choice for Heyfield in the future.
✓ Matches the stages of the energy transition that you want to focus on
✓ Matches the partnerships that you're open to
× Requires more community support than you're ready to build
× Requires more funding than you're ready to secure
× Requires more time than you're ready to commit
3. Other projects you could consider
Next
Later
No-go
These projects don't appear to work for your location. Each summary will explain why. You can always go back to key questions and change your answer if you disagree.
Set up a Biogas Generator
Won't work for Heyfield.
⚠ You don't have a suitable site for a biogas generator
✓ You're ready to build the required community support
✓ You're ready to secure the required funding
✓ You're ready to commit the required time
✓ Matches the stages of the energy transition that you want to focus on
✓ Matches the partnerships that you're open to
Set up Pumped Hydro Storage
Won't work for Heyfield.
⚠ You don't have a suitable site for a pumped hydro generator
✓ Matches the partnerships that you're open to
× Requires more community support than you're ready to build
× Requires more funding than you're ready to secure
× Requires more time than you're ready to commit
× Doesn't match the stages of the energy transition that you want to focus on
Only show top projects

Implementation plan and next steps for Heyfield

The ultimate high-level vision for the different project components being pursued by the Heyfield community, and how the pieces interact and complement each other, can be found in *MyTown Energy Heyfield: Project Outcomes & Partner Prospectus*. This implementation plan lays out the specific work streams into a series of prioritised tasks and clarifies responsibilities and timeframes for delivery. The two documents should be read and interpreted together.

Work streams & goals

The delivery of MyTown Energy Heyfield activities – the ongoing local community initiative, as distinct from the MyTown Energy app discussed above - covers three content-based work streams (in addition to Governance), summarised in the image below.

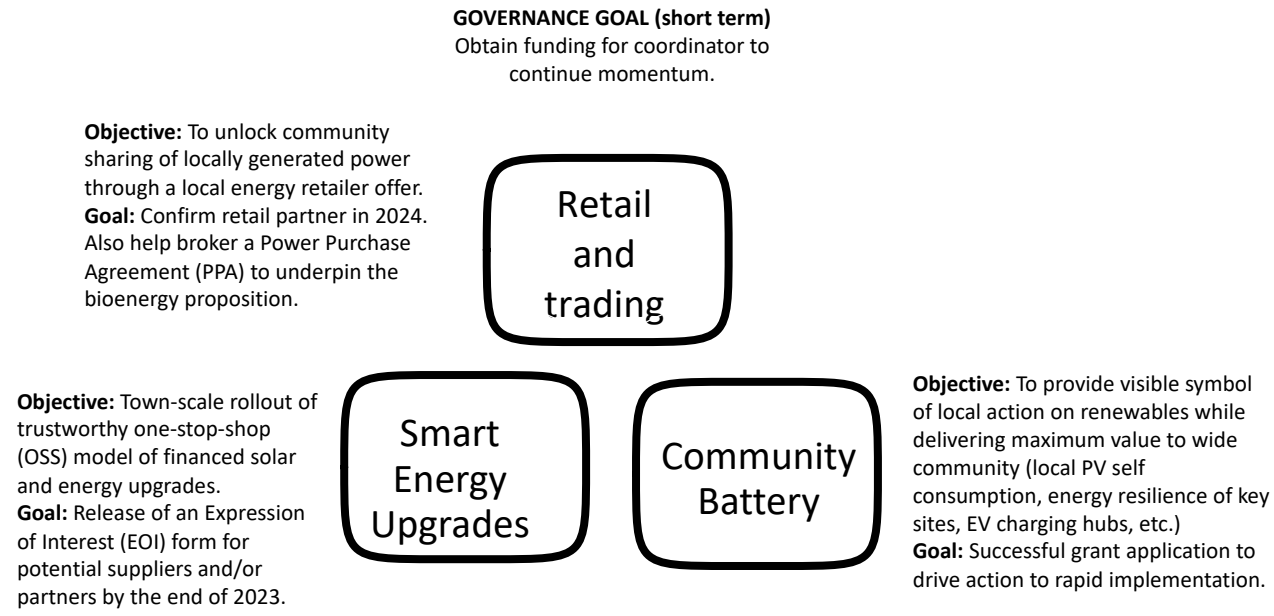


Figure 26 Overview of work streams and objectives for MyTown Energy

Each of the work streams is supported by the business model report, which outlines the rationale for the business model design choices that the group has made in arriving at the preferred approach to delivering these opportunities.

Work Stream 1: Smart Energy Upgrades

The delivery of on-site 'smart energy upgrade' options is guided by the following factors:

- HCRC's existing sustainability referral activities for local solar and heat pump installations can be built upon as the foundation for a coordinating role.
- HCRC holding a high level of trust and strong local relationships which need to be both preserved and leveraged.
- A lack of parties in the market, especially in the local area, who can deliver the necessary range of skills and services to allow a primarily partnership-based approach to be taken.

Work Stream 2: Community Battery

This activity is associated with the Neighbourhood Battery Initiative (NBI) 'Business case' grant application submitted in April 2023. A 12-month workplan was developed, with funding for a community coordinator, plus technical, legal, and engineering support works. The key elements of this workplan include business and

financial model refinement, legal and regulatory advice, engineering system design, network impact studies and community engagement.

The grant work plan will resolve the key implementation questions regarding whether batteries are better located on behind-the-meter on key community resilience sites, or in front-of-meter on streets where issues of high solar penetration are most prominent, and how partnerships and financial flows and risks would be managed.

If the NBI Grant is unsuccessful, the group needs to decide whether to reorient towards ARENA funding: either ARENA Community Batteries funding[12], which is more focused on immediate implementation, or RAMPP funding[13], which requires a more challenging 50% co-investment.

Work Stream 3: Retail & Trading

While channels of communication have been opened with potential energy retailer partners and other potential candidates have been identified, at this stage there is no clear candidate that meets all of Heyfield's main criteria, namely to:

- Allow the community to view and track community progress as a collective entity (such as the Indigo Community Hub Model).
- Provide a pricing scheme that rewards local generation with a good demand match (of the individual or the community hub).
- Allow for a diverse mix of Heyfield household and local business customers to join the retail plan.
- Provide some financial value back to the community through referrals or some other mechanism.
- Be reasonably competitive on price.
- Potentially support:
  - Community battery management/operation.
  - A bioenergy facility through a Power Purchase Agreement (PPA).
  - High-value alignment with Heyfield's vision (clean, community-centred, equitable).

As there is some reputational risk associated with either promoting a retailer who is not competitive, or changing retailers, the community retail or trading partner will be reviewed in early 2024 when the deployment plans for a town upgrade scheme are clearer. While all the criteria above are still unlikely to be met in full at that time, the goal would be to seek strong alignment with the partner's strategic direction.

A schematic of the group functioning and governance structure is shown below.

[12] https://arena.gov.au/funding/community-batteries-round-1/
[13] https://arena.gov.au/funding/regional-australia-microgrid-pilots-ramp/

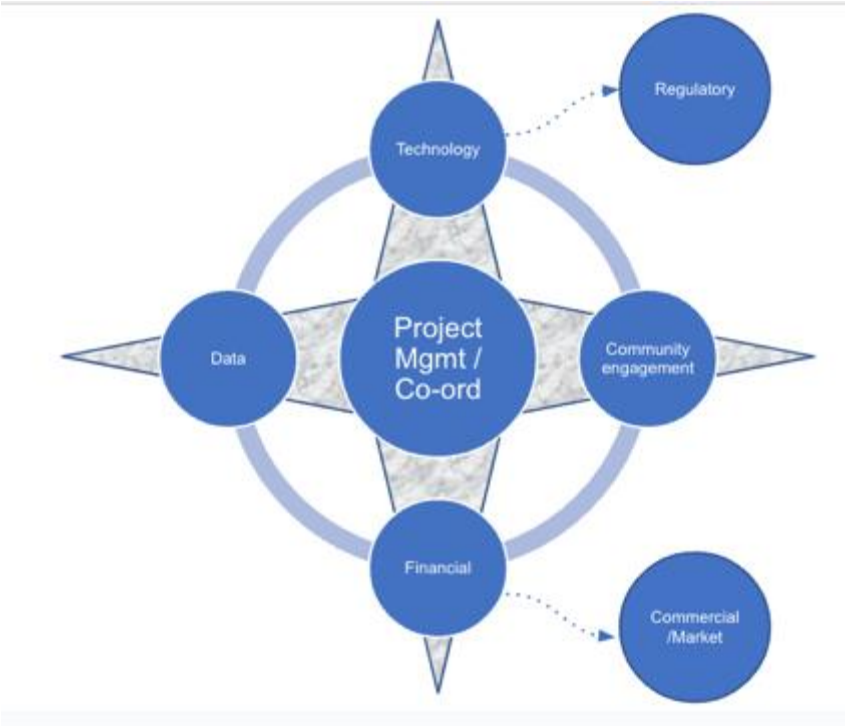


Figure 27 Community Reference Group – proposed future group functioning and governance structure.

Next steps

Heyfield's *MyTown Energy* community group will continue to pursue the options outlined in the Implementation Plan, while waiting on the final decisions from the neighbourhood battery grant applications. This includes a funding application for a project coordinator to be hired from Heyfield to manage future grants and initiatives relating the project's outcomes. The Project Team will be available to support the Heyfield Community in these applications where needed.

The MyTown Energy App will be further developed by the team at the UTS Institute for Sustainable Futures. This will be for the benefit of other communities around Australia, with additional external funding being sought for continued enhancement and ongoing support of the Decision Support Tool.

The Project Team and the UTS-sponsored doctoral candidate Mr Farzan Tahir will look to publish findings from the MyTown Microgrid project in scientific journals and at academic conferences, to further knowledge of the emerging area of community microgrids in the international academic community.

The Project Team will also continue to share knowledge arising from the project at industry conferences and community events to communicate the findings from the MyTown Microgrid project.

Further information

Heyfield Community Resource Centre
info@mytownmicrogrid.com.au
https://www.heyfieldcommunity.org.au/mytown-microgrid

Wattwatchers Digital Energy
https://wattwatchers.com.au/

UTS Institute for Sustainable Futures
info@uts.edu.au
https://www.uts.edu.au/isf/explore-research/projects/mytown-microgrid-heyfield-victoria