Community Microgrid Feasibility Study FAQ's

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Community Microgrid Feasibility Study Frequently Asked Questions

Why is the project needed?

We want to investigate alternate technology solutions, incorporating solar energy and battery storage to improve network performance, reliability, and resilience for 'fringe of grid' communities. These communities, located at the extremity of the electricity network, can experience more frequent and longer duration outages due to the length of the powerlines, several environmental factors, as well as the tyranny of distance when responding to unplanned outages.

These communities, located at the fringe or extremity of the electricity network, can experience more frequent and longer duration outages because the community at the end of the line experience all the faults along the length of the powerline, and the tyranny of distance when responding to unplanned outages.

Many of our fringe of grid lines were designed in the 1960's and 1980's to serve the small communities of that time, and while they continue to serve these communities well, electricity needs have changed over time. We are increasingly reliant on electricity in every facet of our lives, and of course, in recent years, the take up of renewable energy has grown.

These factors all need to be considered by our network planners when designing the right solutions for each community's electricity needs.

Before we start making changes to how we operate the network, we want to make sure we have the right solutions. By understanding the community's electricity needs, how much, and when it is needed, we can design and test the most efficient network solution.

Because building electricity networks is expensive, and the assets are in place for a long time, we want to get it right and the Community Microgrid Feasibility Study will provide us with that opportunity.

What is involved in the feasibility study?

The Community Microgrid Feasibility Study will investigate opportunities to improve the reliability and quality of supply at the Clairview and Stanage Bay for both the three-phase and SWER networks.

The aim of the study is to determine how a microgrid could automate seamless switching between the grid and island mode, using smart grid controls and local distributed energy resources, when needed to ensure a continuous reliable energy supply. It will also explore the benefits of using the local energy resources for grid support services in times of need while grid connected.

Diesel generation is used in some areas to support our networks in our remote communities. This project will investigate how distributed renewable energy technologies, such as roof top solar and battery storage, can improve reliability of supply to these communities, offer an alternative to costly network augmentation, and improve environmental outcomes by limiting the use of diesel generation.

The project will involve several elements, delivered in stages.

Project Stages

Stage 1 – Network Desktop Study

We will conduct a series of technical studies to analyse the existing network and electricity supply to these two communities and research available information from established network microgrids. We will look at new technologies being used around the world and consider their suitability on our remote ends of the network.

Stage 2 – Council, Community and Customer Engagement

Our community engagement will involve a range of activities including sitting down with Councils and the community to explain the project, introducing some energy literacy education, and working together on some of the options for the project. We'll also provide project updates and publish the final feasibility study findings.

Stage 3 – Customer Energy Use Study

In this stage, we will get to know the Clairview and Stanage Bay communities and their energy needs in more depth. We will install new digital metering, conduct energy audits and conduct a land assessment to identify a list of potential sites suitable for establishing a microgrid close to the network.

Stage 4 – Microgrid Technical Analysis

This stage will involve a range of technical assessments focussing on how a microgrid would interact with the electricity network. We will look at the fundamentals for intelligent microgrid operations including control and communications, safety and protection, and ways to ensure stability in the system and obtain dynamic operational response.

Stage 5 – MIST Laboratory Prototype and Testing

This exciting stage involves creating microgrid prototypes in the Microgrid and Isolated Systems Test (MIST) facility and simulating how these systems would operate. The team will develop and run an extensive range of tests to see how the microgrids would operate and respond in a range of 'real life' scenarios.

Stage 6 – Community Microgrid Feasibility Study

This stage involves compiling the information that we have learned through the microgrid feasibility study and compiling a report outlining the findings. The report will explain feasible microgrid options, and include a deployment plan for decision makers.

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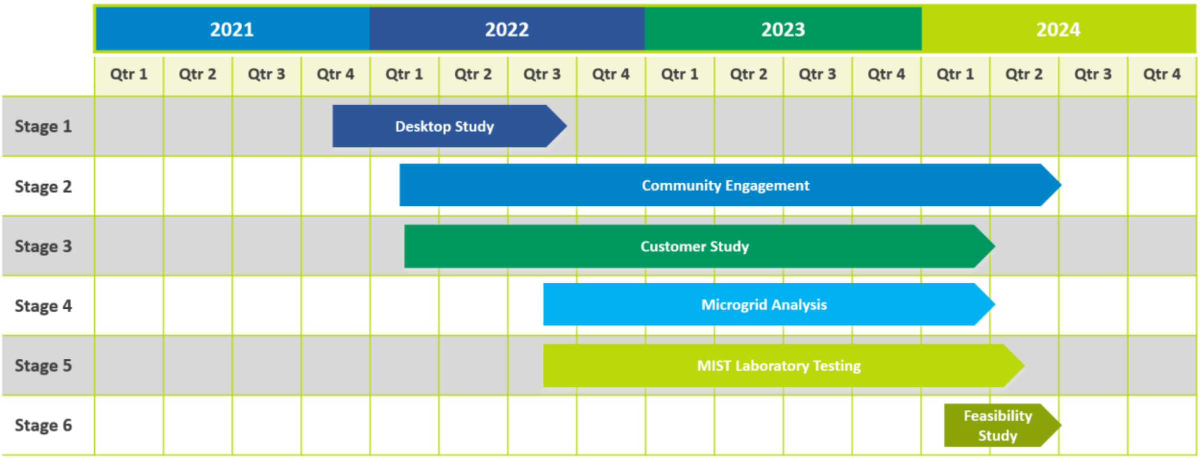
When is the project going to start and how long will it take?

The project commenced in late 2021 when we secured funding and established a small project team. The study will be delivered in stages as outlined in the Project Timeline and will be completed by mid-2024.

Project Timeline



What are the objectives of the study?

The objectives of the Community Microgrid Feasibility Study include:

- Determine the technical and financial feasibility of installing microgrids at the communities of Clairview and Stanage Bay and use the lessons learnt from the study for other fringe of grid locations.
- Understand customers' energy needs and their interest and willingness to be involved in a future microgrid solution.
- Develop business intelligence to include deployment of microgrids as an option for addressing network constraints such as reliability, power quality or capacity, where viable as an alternative to augmenting the network.

How will this feasibility study support the take up of renewables and the transition to net zero emissions?

This study will make a vital contribution towards the Queensland Government's 50% renewable energy target, and the state's journey to net zero emissions by advancing our knowledge on the integration of renewable energy into our energy systems. It will also support the evolution of 'renewable energy' microgrids to improve the performance of the network.

Queenslanders are putting solar on homes and businesses at record rates, with almost 40% of detached houses, and over 10% of businesses across Queensland, now with rooftop solar energy – that's well over a million rooftops. We expect Queenslander's to double the amount of solar connected to the electricity network by 2030. We support the transition to renewable sources of energy and this study is one of many initiatives we have underway to get the network ready for this expected increase.

Why have Clairview and Stanage Bay been selected for the feasibility study?

The small coastal communities of Clairview and Stanage Bay are 'fringe of grid' communities located at the end of one of Queensland's longest powerlines, measuring over 1,000 kilometres in length.

The communities have many similarities including location and size, and they are connected to the same feeder powerline. However, the design of infrastructure supplying the two townships is very different.

The network here is unique in that the township of Clairview is supplied by the three-phase network, and Stanage Bay by a Single Wire Earth Return (SWER) construction.

This different network design combination in a fringe of grid location, makes these communities ideal for our feasibility study, as it will highlight the similarities and differences in using microgrids integrated with the different network construction.

What is the MIST?

The Microgrid and Isolated Systems Test (MIST) facility is an energy laboratory, located in Cairns, where we can research new energy technologies before introducing them to the network. The MIST allows us to accelerate the integration of new technology into the electricity network.

The MIST boasts a super-computer for real time digital simulation, as well as a large array of connection options allowing complex testing of technology in simulated conditions.

This will allow us to identify the most feasible microgrid technology to power our remote communities, saving time and money, as well as giving us confidence that the network solutions we employ are fit for purpose for our fringe of grid communities.

Fringe of grid

What does 'fringe of grid' mean?

Fringe of grid is a term that refers to parts of the electricity network that are geographically remote, located at the end of the network, often away from generation sources and population centres.

These sections of the network are characterised by long powerlines, situated in rural and remote geographic areas, with very few customers per kilometre.

These powerlines may experience quality of supply and reliability performance issues, and transmission losses given their distance from the generation source.

Why is Ergon considering alternate network solutions for fringe of grid communities?

Energising communities across vast distances and in isolated locations across Queensland can be a challenge. Traditionally, the most reliable and cost-effective method of getting power to many of these regional and remote communities has been via Single Wire Earth Return (SWER) powerlines.

Our network has around 65,000 kilometres of SWER lines. It's one of the largest SWER networks in the world and supplies only 4% of our customers. The majority of the SWER network was installed in the 1970s and 1980s.

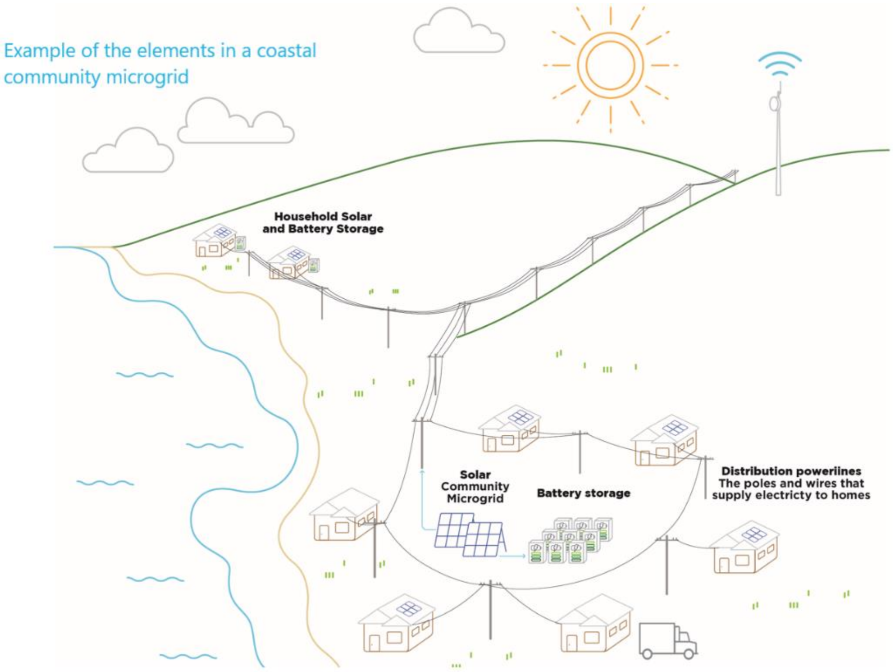
As these sections of the network age, we're looking for more modern, innovative solutions, like microgrids, to ensure our rural and remote customers continue to have access to safe, secure, affordable, reliable, and efficient supply solutions into the future.

Microgrids

What is a microgrid?

A microgrid is a small-scale electricity network powered by one or many distributed energy resources. They are increasingly intelligent energy systems designed to be able to be self-sufficient and to power the electricity needs of a discrete group of customers. They can be operated either connected or stand alone to the main electricity network.

While the technology in a microgrid can support the main electricity network, a key benefit of the system being explored for in this feasibility study, is that it would be able to be disconnected from the main grid and operate autonomously in 'island mode', supplied by the distributed energy sources, like solar and battery storage. This would allow any future microgrid to operate autonomously when supply from the main network is disrupted or unavailable, for instance, if there is a fault on the main network.



Are you building a microgrid in our community?

Not yet. This is just a feasibility study.

Because building electricity networks is expensive, and the assets are in place for a long time, before we commit to making any changes to the network, we want to get it right.

The Community Microgrid Feasibility Study will provide us with the information we need to make informed decisions about the future of the network in the area.

If Ergon eventually builds a microgrid, will our community be disconnected from the network?

While one of the key benefits of a microgrid is its ability to operate independent of the main electricity network, the study will focus on a system that remains connected to the network on a normal daily basis but has the flexibility to be separated from the state-wide network and operate in ‘island mode’ from time-to-time when needed.

Get in touch with us

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