



RENEWABLES

CEP21

Developing Town-Scale Renewable Energy Projects

ENGINEERING | STRATEGY | ANALYTICS | CONSTRUCTION



ITP is a global leader in renewable energy engineering, consulting, project management and development.

ITPE Group

- Over 30 years of international experience and 2,000 projects.
- Head office in UK.
- Major regional offices in India, China and Australia.

ITP Australia

- Head office in Canberra, with offices in Sydney, Melbourne, Adelaide, Perth and Auckland.
- Active in Australia and the Pacific region for over 15 years.
- Involved in RE projects of all scales (1kW to 250+MW) including:
 - Design and commissioning of the 3.5MW Cubby Station Solar Farm and 15MW Carag Solar Farm
 - Developed the 5MW (AC) Lang's Crossing Solar Farm
 - Developed the 15MW (AC) Yoogali Solar Farm

Engineering, Development and Construction

- Since 1981, ITP has designed and specified solar PV and battery energy storage to optimise remote PV hybrid mini-grids all around the world.
- Respected specialists in low-voltage electrification at the village and town scale.
- Range of services covers the entire spectrum of the energy sector value chain, including:
 - Detailed project design
 - Electrical network modelling and provision of specialist engineering expertise
 - Installation review and commissioning
 - Ongoing asset management, operations and maintenance services
 - Quality assurance

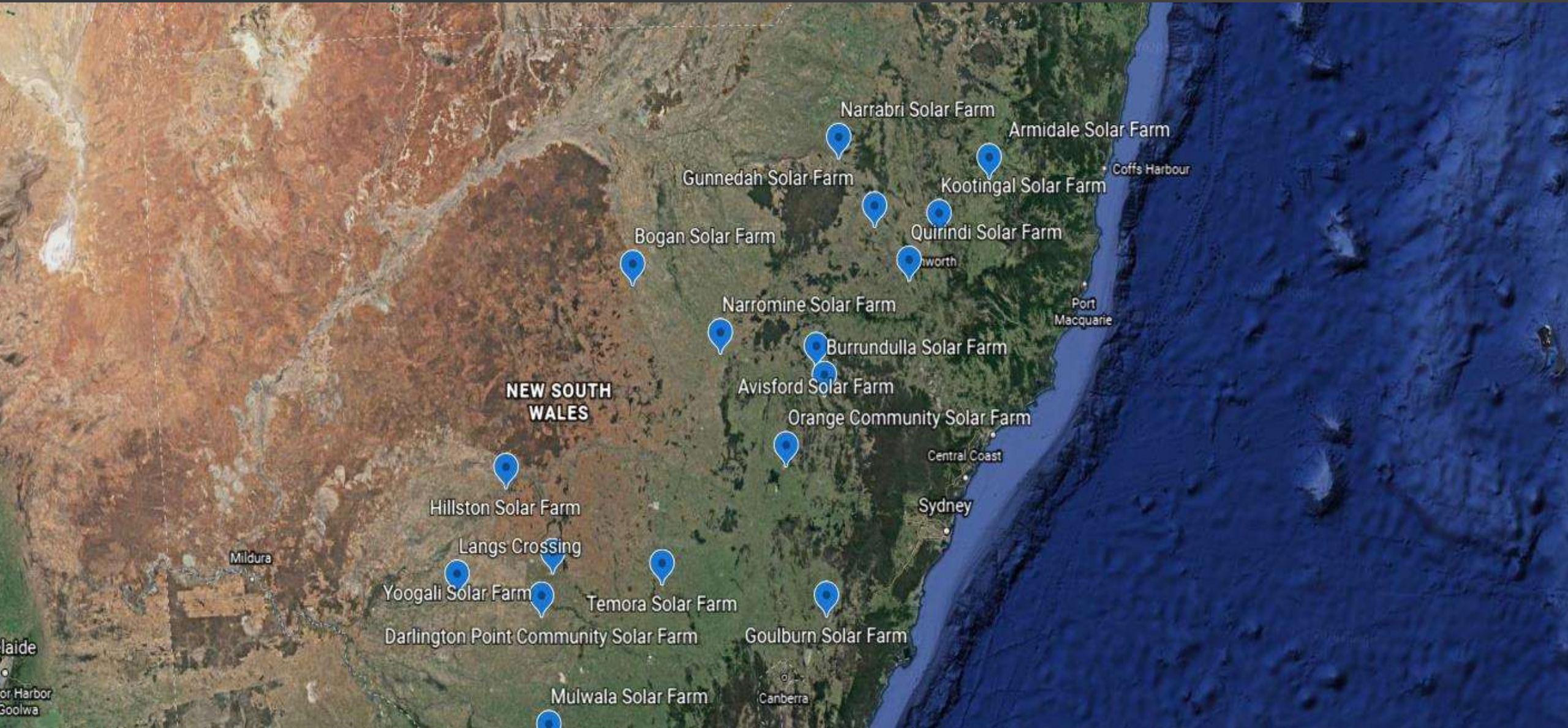
ITP develops town-scale renewable energy projects around regional Australia. Individual projects are in the range of 5MW to 20MW, and are connected to the local distribution network, rather than the long-distance transmission network.

The scale of each project is designed to match current and projected future demands for electricity (e.g. residential, commercial, industrial) within a given community. This means that the clean energy generated will be used locally. Increasingly ITP's projects also include battery energy storage systems to further support the local grid.

ITP Development has an impressive portfolio of projects in the development phase.

- **Pipeline:** 1,390MW of projects in the pipeline
- **Size:** projects ranging from 5MW – 600MW
- **Locations:** across regional NSW
- **Capacity:** non-curtailable assets when connecting 4.99MW projects
- **Speed:** short-timeframe from project inception to generation due to small-scale (18-months)
- **Integrated approach:** in-house development, network modelling and EPC expertise allowing the efficient delivery of projects

PROJECT LOCATIONS



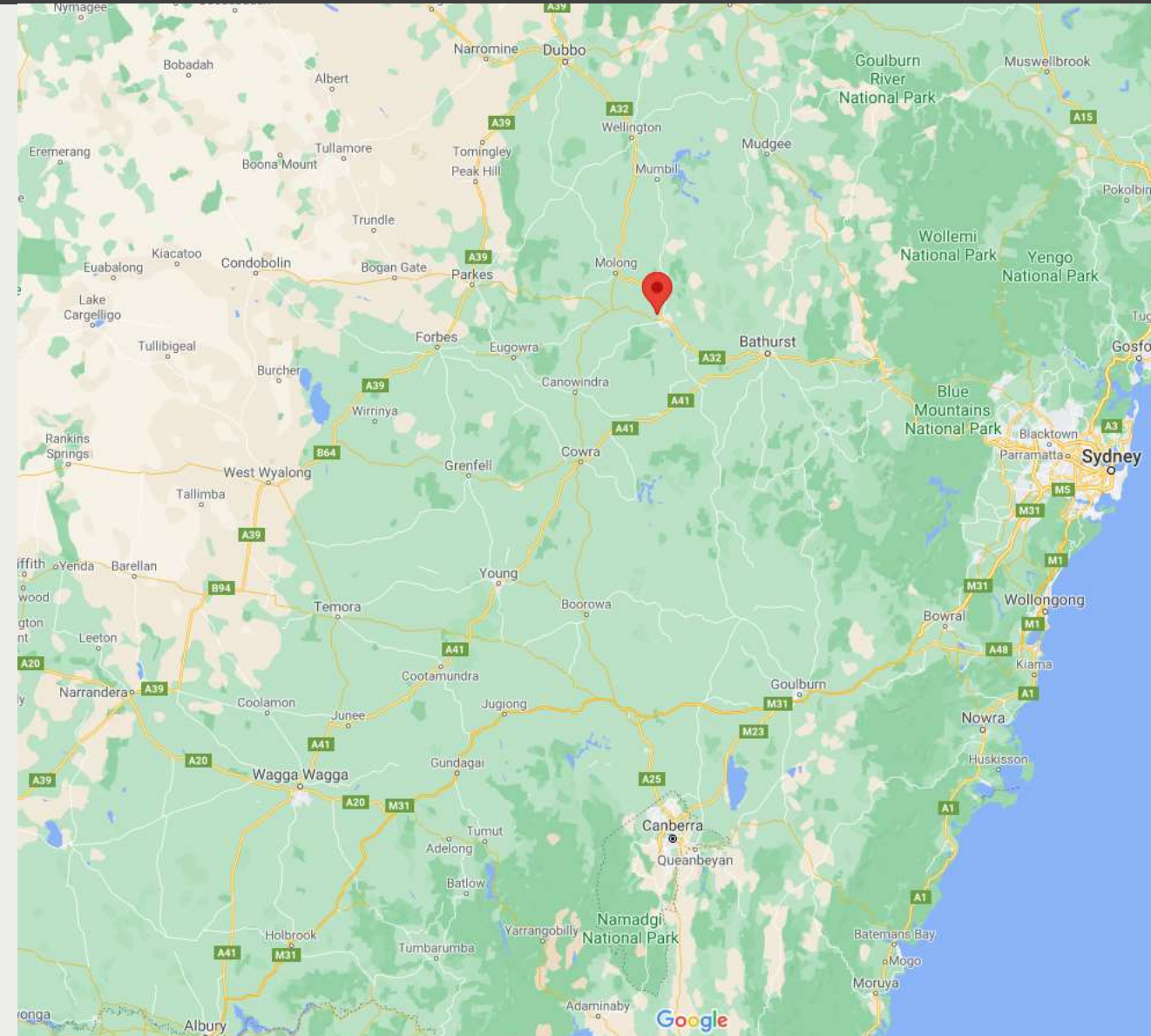


Case Studies

PROJECT OVERVIEW



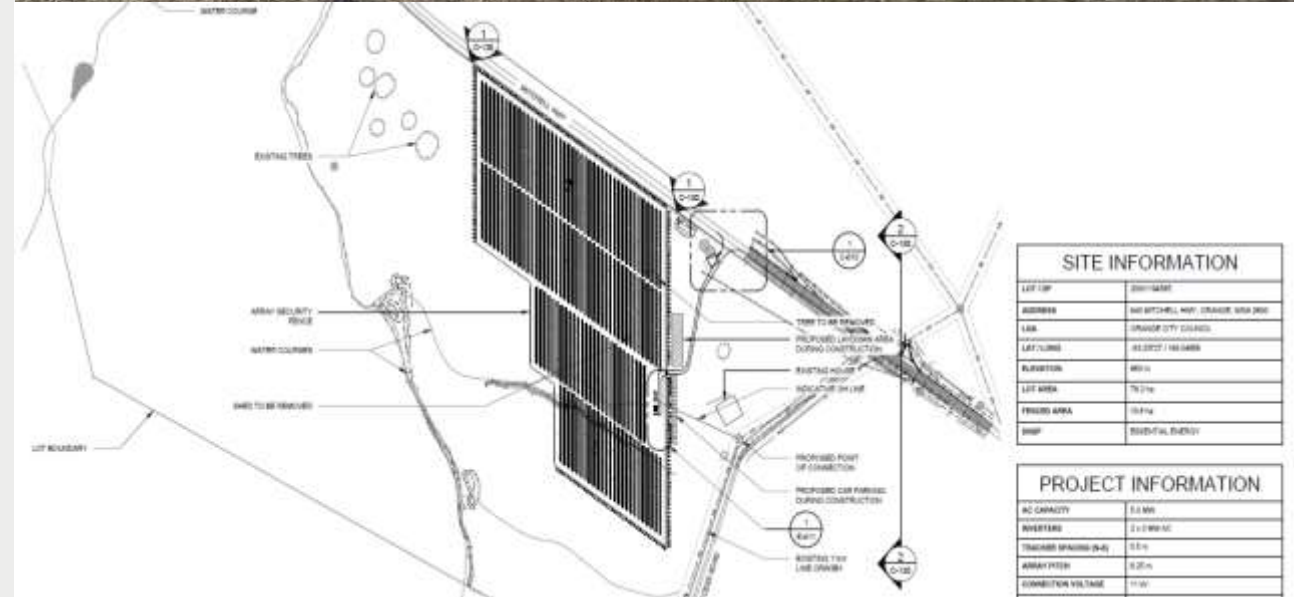
- Location: approximately 6km north-west of Orange, NSW
- Size: 5MW solar farm with 5MWh of battery storage
- Innovation:
 - Technical: allow for battery storage to manage the output from the solar component
 - Commercial: blend of community and private investment to make the project more viable
- Current phase of development:
 - Development complete
 - Construction to commence Q3 2021



PROJECT OVERVIEW – ORANGE COMMUNITY RENEWABLE ENERGY PARK



Site Name	Orange Community Renewable Energy Park
Current Land Use	Grazing
Land Access	280m gravel road off Mitchell Hwy
Location and Site	
Lot/DP	200/1194585
Lat/Long	-33.2443, 149.0526
Solar Farm Area (ha)	15
LGA	Orange
PV Capacity	
DC Capacity (MW)	6.5MW
AC Capacity (MW)	5MW
Specific Production (kWh/kWp/year)	2102
Annual Generation (MWh)	13,663
Battery Capacity	
Power (MW)	5MW
Energy (MWh)	>5MWh
Funding Partner	NSW Government
Funding Amount	\$3.5 million
Community Group	Energy Democracy



PROJECT PARTNERS



ITP Development

- The project developer securing the land, finance, grant funding as well as obtaining all necessary regulatory approvals for the project.
- Has approximately 25 town scale solar projects under development across the country.
- Company within the ITP Energised Group which has over 30 years of international experience and is headquartered in the UK. Group has a history in village and town-scale electrification in developing countries supporting international aid agencies and local communities access energy.

Energy Democracy

- Organisation which facilitates the establishment of community co-operatives in Australia and New Zealand.
- Objective is to build a sustainable renewable energy model, whereby the community benefits from their participation in reducing the impact of climate change.
- Launched the Energy Democracy Central West NSW Co-operative in April 2021 to raise up to \$4 million
- Membership to the Co-operative is now open to anyone in NSW with some parcels already sold.

Energy Democracy Central West NSW Co-operative

- Based in Orange and governed by a board including Central West NSW local identities.
- Limited opportunity for the community to invest in locally generated community energy.
- Octopus Investments Australia is underwriting the project to proceed to construction and will cover any capital gap in the event that the target equity from the community is not reached.

What is the technical innovation?

- The Regional Community Energy Fund (RCEF) provides grants to community energy projects that create innovative and/or dispatchable renewable energy and benefit the local community
- The project will include a 5MWh battery energy storage system (BESS) which will store excess energy generated by the solar farm to provide dispatchable power

What are the benefits of including battery storage?

- Dispatchable power
- Members of the co-operative will be able to purchase shares entitling them to parcels of solar panels and battery storage
- The electricity generated will be assigned to the participating member's household or business via a virtual net-metering program

What is the commercial innovation?

- The commercial innovation of the project is to use a blend of community investment through the local co-operative, and private investment.
- Town-scale projects well-suited to community investment as they are sized to suit local needs, and enable local communities to make a significant investment

What are the benefits of community energy projects?

- Local communities stand to gain from community renewable projects in terms of the benefits that they bring creating jobs and opportunities for local business to supply to the project and general uplift in regional economic activity in the locality near the project
- They allow the community to be involved in energy through investment that will assist reduce greenhouse gas emissions and reduce their electricity bills
- The project provides indirect economic benefits to the wider regional economy
- The project will be accessible to residents and small businesses that can't install solar panels and/or batteries on their own roof
- Community ownership represents the highest form of public participation in project – empowering residents through making them decision-makers as co-owners

PROJECT OVERVIEW – WAHROONGA SOLAR FARM



Site Name	Wahroonga Solar Farm
Current Land Use	Grazing
Land Access	280m gravel road off Mitchell Hwy
Location and Site	
Lot/DP	494/66672 and 2/569410
Lat/Long	-30.54896, 151.67366
Solar Farm Area (ha)	20
LGA	Armidale Regional Council,
Capacity	
DC Capacity (MW)	6.2MW
AC Capacity (MW)	5MW
Specific Production (kWh/kWp/year)	2096
Annual Generation (MWh)	12,995
Grid Connection	
Connection Voltage (kV)	11
TNI	NAR1
MLF	0.9395
DLF	1.0320
Total Loss Factor	0.9696
Substation Name	Galloway Street zone substation



Petersons Solar Farm

- **Location:** Near Armidale, NSW
- **Size:** 6MW DC/5 MW AC
- **Annual Generation:** 12,074MWh
- **Land Secured:** Yes
- **Targeted date for Offer to Connect:** 1/12/2020

Layout



Nyngan 1B

- **Location:** Near Nyngan, NSW
- **Size:** 6MW DC/5 MW AC
- **Annual Generation:** 12,772MWh
- **Land Secured:** Yes
- **Targeted date for Offer to Connect:** 1/2/2021

Layout



Mulwala 1D

- **Location:** Near Mulwala, NSW
- **Size:** 6MW DC/5 MW AC
- **Annual Generation:** 11,899MWh
- **Land Secured:** Yes
- **Targeted date for Offer to Connect:** 1/3/2021

Layout



MICROGRID PROJECTS



WEL Networks Microgrid

ITP Renewables was engaged by WEL Networks to develop a least cost plan for developing an embedded microgrid at the Ruakura development in Hamilton, NZ. The Ruakura development is a major new commercial, residential and light industrial development being undertaken by Tainui Group Holdings (TGH).

WEL Networks are providing an innovative microgrid solution to provide electricity to the development.



Local Microgrid Options for Cobargo and Quaama

ITP was commissioned by the NSW Department of Planning, Industry and Environment to help the Cobargo and Quaama communities better understand their options for developing a local microgrid. After the 2019-20 bushfires that devastated parts of the Bega Valley, the community is hoping to build an electricity microgrid that could either operate as part of the main grid or as a stand-alone power system when the main grid is down.



Yarrabah Microgrid Feasibility Study

The Yarrabah Microgrid Feasibility Study seeks to showcase the potential for Yarrabah, a coastal Aboriginal community located south-west of Cairns in Queensland, to be a self-reliant, sustainable microgrid that can be rolled out to other communities

TP is pleased to be a partner in the Yarrabah Microgrid Feasibility study being undertaken by a group led by Queensland-based Ener-G Management Group





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