

## STANDING COMMITTEE ON THE ENVIRONMENT AND ENERGY

### Inquiry into modernising Australia's electricity grid

#### Organisational Submission

**Organisation –** Totally Renewable Yackandandah (TRY)

**Summary –** Incorporated in April 2014 Totally Renewable Yackandandah is a small community group who are working toward the goal of bringing the township of Yackandandah (NE Victoria) to being reliant on 100% renewable electricity by 2022.

#### **Introduction**

The following is a submission from the community group Totally Renewable Yackandandah (TRY). The purpose of the submission is to firstly, inform the Committee of the Yackandandah based mini grid project we are implementing in partnership with the energy distribution company AusNet Services, and secondly, to suggest possible improvements to the current regulation of Australia's electricity grid that would facilitate projects of this type, and in so doing contribute to the modernisation of the energy market. It is hoped that this submission will assist the committee's understanding of points one and particularly two of the terms of reference. In particular, TRY would like to impress on the Committee the possibility of community energy projects to both strengthen the functioning of the grid and to smooth communities' acceptance of those changes necessary for the modernisation of the grid. We also wish to underline the potential investment that can be unlocked within communities. We have found that people in our local community are willing to invest in renewable energy projects managed for and by their local community.

The submission proceeds in the following manner. Firstly, it gives an introduction to the town of Yackandandah and the work of TRY. It goes on to outline the partnership between TRY and AusNet services. Secondly, it outlines the partnership's five step plan for what we hope will be Australia's first commercially operating community mini grid. It then outlines the proposed governance structure of the Mini Grid. Finally, it outlines the possible outcomes of the Yackandandah based community mini grid as they relate to this inquiry, and possible changes to the current regulation of Australia's grid that would facilitate the project.

#### **1. Yackandandah, TRY and AusNet Services**

Totally Renewable Yackandandah (TRY) is an incorporated association and community renewable energy advocacy group working within the North East Victorian community of Yackandandah. TRY is working with Yackandandah based residents and businesses to generate (or purchase) and store sufficient electricity from renewable sources to meet 100% of the town's electricity needs by the year 2022. The group was formed in March 2014 following a Community Energy Forum hosted by the Indigo Shire Council. The township of

Yackandandah itself sits within the Indigo Shire Council. Whilst the township has a population of 950, it is located within a rural hinterland, and the wider district of Yackandandah extends to a population of 4,488 residents.<sup>1</sup>

The Yackandandah community has a history of applying itself to ambitious community managed projects with success. In 1997 it held the first annual Yackandandah Folk Festival, a volunteer managed music event that is now in its 20<sup>th</sup> consecutive year. In 2002 the community established the Yackandandah Community Development Corporation, commonly known as YCDCo, to replace the closing fuel station. The YCDCo is community owned and operated, distributing 50% of profits back into the community through a community grant program. The town maintains a community garden, toy library, community centre, radio station (Indigo FM), a local newspaper (Yackity Yack), several active service clubs, successful sporting clubs, and a strong CFA branch. Yackandandah is recognised as a country town with a vibrant community spirit and has been exhibited on Australia's national broadcaster, the ABC, twice in 2016. First on the popular Back Roads television program and again on the 'Back to Yack' event, which hosted national radio programs broadcast on Radio National.

The community of Yackandandah is strongly supportive of TRY's renewable energy target (RET) and believes that it is achievable.<sup>2</sup> The target is supported both for its ability to promote community spirit and pride, as well as a desire to achieve self-sufficiency and independence.<sup>3</sup> There has been a clear desire within the community for a coherent timeline and strategy to meet the target, one that outlines necessary steps and the role to be played by residents. Within the community there is a preference for this strategy to be inclusive and community driven, providing clear and specific individual actions as well as supporting action at the community level.<sup>4</sup> For Yackandandah residents, the community owned and operated fuel station, YCDCo, exists as a commonly shared example of good community action to meet an agreed need.<sup>5</sup> The Yackandandah Community Mini Grid (the Mini Grid) is now being implemented as a means of addressing the town's aspirations and specifications.

In mid 2016 TRY began discussions with the Melbourne based office of the multi-nationally owned business AusNet Services. AusNet Services is Victoria's largest energy delivery service and the company owns and operates the electricity transmission network (or grid) in Melbourne's north east and across all of eastern Victoria, including Yackandandah.<sup>6</sup> Ongoing discussions between the two organisations has led to a partnership dedicated to the development of Australia's first commercially operating community mini grid in Yackandandah. AusNet Services has prepared its own submission to this inquiry.

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<sup>1</sup> Indigo Know and Grow (2015), <http://business.indigoshire.vic.gov.au/resources/reports/>, accessed 17 March, 2017.

<sup>2</sup> Ginnivan and Stayner (2015), [http://totallyrenewableyack.org.au/wp-content/uploads/2015/12/CSU\\_TRY-Report\\_PrintVersion.pdf](http://totallyrenewableyack.org.au/wp-content/uploads/2015/12/CSU_TRY-Report_PrintVersion.pdf), accessed 17 March, 2017.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> AusNet Services About Us, <http://www.ausnetservices.com.au/About+Us.html>, accessed 17<sup>th</sup> March, 2017.

## 2. The Yackandandah Community Mini Grid

### 2.1 A Five Stage Development

TRY and AusNet Services have partnered in order to create what they believe will be Australia's first commercially operating community mini grid. A mini grid is an energy system in which a group of households are equipped with an individual energy generation (solar panels) and storage capability (battery). As a mini grid this group can function as a unified energy unit able to generate, store and share electricity across the community. The community mini grid proposed by AusNet Services and TRY proceeds as a five-stage installation.

**Stage 1.** The first stage represents Yackandandah's current electricity profile. It is a town where 30% of the population already have solar panels.

**Stage 2.** The second stage requires a town wide installation of solar panels. A piece of proprietary micro-processing technology called an Ubi will be added to both new and existing solar arrays. The Ubi is able to monitor individual household electricity use to allow users to better engage with their electricity use. The Ubi is also necessary for the installation of batteries. The installation of solar panels and Ubis means that participating households will then be battery ready. This stage will also allow people to monitor energy use, giving them detailed information to help make informed energy efficiency measures.

**Stage 3.** The third stage requires a town wide deployment of batteries. Batteries will be installed based on the electricity use profiles of individual households. Data collected by the Ubi processor will allow each household to determine the optimal time to install a battery system, and the optimal system to be installed. Each household will then be able to generate and store solar energy, feeding any excess back into the grid.

**Stage 4.** The fourth stage requires the creation of an electricity trading or sharing system that will allow members of the Community Mini Grid to share or trade electricity with one another (Figure 2). This will allow the mini grid to function as a unified energy unit able to generate, store and distribute renewable electricity across the community. Crucial to this stage in the mini grid is the development of a community energy retailer. An energy retailer is required for households to be able to trade electricity with one another and to import electricity to the mini grid.

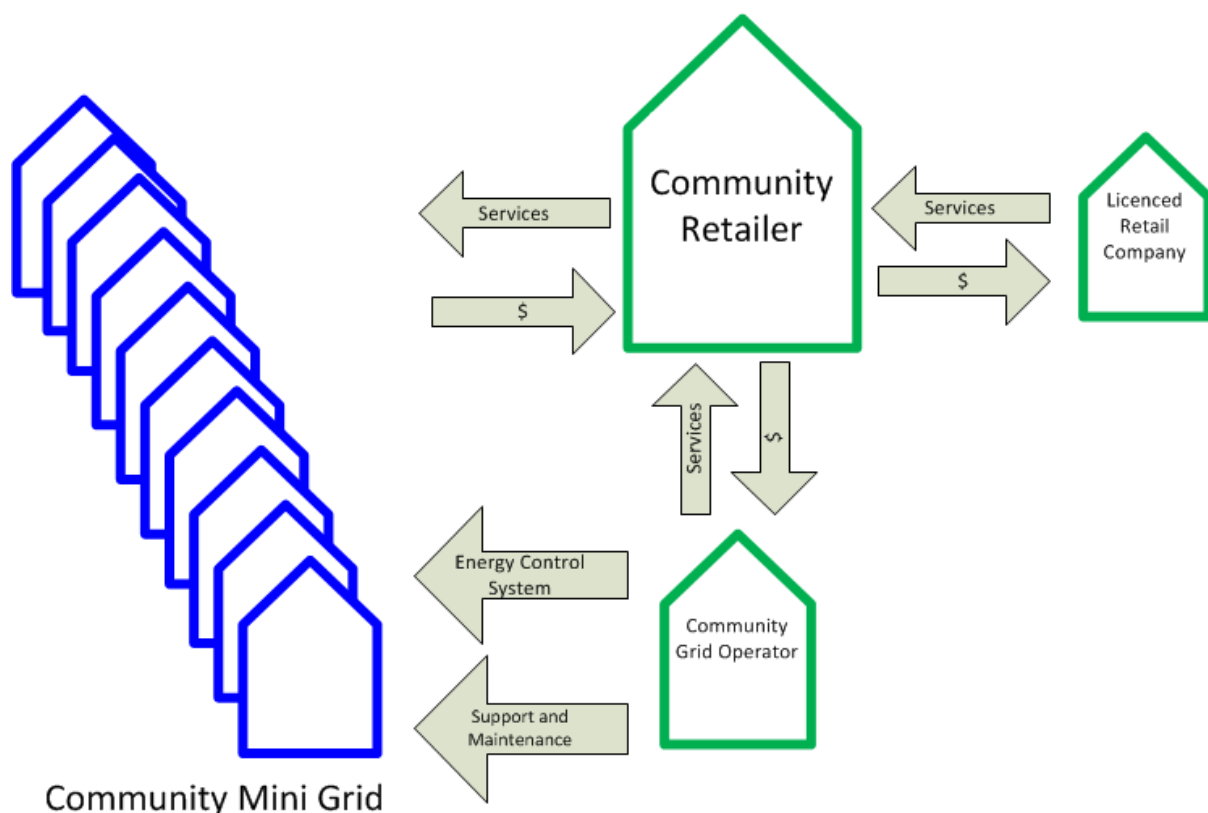
**Stage 5.** The fifth stage comprises of the installation of a solar and battery plant proximal to the town. A fully functioning community mini grid is expected to be able to provide 90% of Yackandandah's energy needs. The remaining 10% of the town's RET can be met through the installation of the solar and battery plant which will feed top up electricity into the mini grid.

### 2.2 Governance of the Mini Grid

The effectiveness of the Mini Grid depends on the ability of participants to share electricity with one another. If members of the mini grid are able to agree on a system for sharing or trading electricity then the town will derive the maximum benefit from the Mini Grid. With a successful system in place, the mini grid will be able to become a cooperative energy generating and storage system. Under current regulations, all trading of electricity, even between households on a mini grid, must be facilitated by an energy retailer. For the Yackandandah based mini grid project a community based electricity retailer is proposed. The community retailer envisaged for Yackandandah would be supported by an established

retailer able to perform ‘back end’ functions, such as energy hedging, meeting regulatory requirements and so on. The community energy retailer would provide a localised mini grid service to facilitate electricity sharing and trading across the mini grid.

The responsibility for the installation and maintenance of the mini grid infrastructure would be assumed by AusNet Services. AusNet Services would charge a fixed fee for the installation and service of the mini grid infrastructure, and the community retailer would facilitate transactions within the mini grid (see figure 3.). In this scenario the community itself would produce and sell their own electricity with AusNet Services and the community energy retailer charging for services that facilitate the optimal functioning of the mini grid. The Yackandandah community mini grid would be the first commercially operating mini grid in Australia and the full details of how this cooperative energy system will be governed, so that energy is shared equitably, is a yet to be developed.



**Figure 1.** Proposed community mini grid governance arrangement (from a presentation by AusNet’s Mark Judd at mini grid Workshop #3, Dec 13, 2016).

### 2.3 The Roll out of the Community Mini Grid

TRY and AusNet services are currently implementing stage two of the Yackandandah Mini Grid. The role of TRY in the Mini Grid has been to promote the mini grid project within the community. TRY hosted two mini grid information nights to which over 300 people attended. AusNet services have now received approximately 150 expressions of interest for the stage two solar bulk buy and Ubi installation. At the same time, AusNet has funded the provision of 50 cost free ‘Ubi’s to existing solar households across the Yackandandah

community. These units will support householders to make informed decisions about energy efficiency measures and the eventual installation of battery storage, based on real time data.

TRY has also facilitated the installation of a stage three mini grid – including battery installation – in one small estate within the town. Of the 25 houses within the estate, 16 are now in discussions with AusNet Services about the purchase of solar and battery systems for their households. It is important to note that both these Mini Grid offerings are commercial offerings, requiring households to make significant purchases, of up to \$12 000, in order to participate in the Mini Grid. TRY believes that community groups like ours can play a significant role in facilitating the modernisation of Australia's electricity grid. In describing the case of Yackandandah, TRY hopes to make the Committee aware of the high rates of adoption of new electricity technologies and the large amount of local investment present in the Mini Grid project. TRY asks the committee to consider the role played by community groups, and how the Federal Government might assist such groups.

### 3. The Benefits of the Mini Grid and Possible Improvements

#### 3.1 Advantages of the Mini Grid

The community mini grid has a number of advantages. These include:

**Building on the Solar Advantage** The mini grid is able to expand upon Yackandandah's already strong solar presence.

**A Renewable Energy Storage System** The addition of battery storage to a solar array provides the obvious advantage of being able to use stored solar electricity at times when solar panels are not generating electricity (overcast weather and overnight). This increases the town's use of renewable energy and decreases the cost of purchasing electricity during those times. It also reduces the reliance and pressure on the existing network which in Victoria typically uses brown-coal generated electricity. It therefore offers both economic and environmental outcomes.

**Ubis Promote Energy Efficiency** The Ubi technology has the advantage of being able to optimise electricity consumption, improving energy efficiency within each individual house. It also offers households real-time engagement with their energy use, allowing them to experiment with energy saving/optimisation measures. Whilst aiming to reduce total energy use in homes it also seeks to increase total solar electricity generation by restoring some unrealised solar electricity capacity by alerting households when solar panels have switched off, are malfunctioning, or require cleaning.

**The Mini Grid Benefits the Local Economy** The Mini Grid shifts the production and retail of Yackandandah's energy supply from remote locations to the town itself. This is expected to deliver economic benefits to the town of Yackandandah. The installation and maintenance of the mini grid is expected to employ local technicians and the establishment of a community

energy retailer is likely to employ at least one, and possibly more, full time staff.

**The Mini Grid is Reliable**

The Mini Grid is capable of operating separately from the larger electricity network. If electricity delivery through the wider grid is disrupted the houses in the Mini Grid will be able to continue operating as a stand-alone unit. The proposed Yackandandah Mini Grid will remain connected to the wider AusNet Services network, however. By staying connected to the network the Mini Grid will be able to draw electricity from the network during times when it is not generating enough electricity to service each home. When the mini grid is generating more than it is using it will be able to sell this electricity back to the grid. Thus the mini grid is seen to be a positive contributor to the ongoing success of the broader grid, avoiding the danger of stranded assets and threats to households/dwellings that cannot afford to make a switch to energy generation and storage.

**Yackandandah Becomes a Source of Electricity to the Grid**

Internal modeling suggests that the Mini Grid, by itself, will be capable of generating up to 90% of Yackandandah's electricity needs. With the addition of a solar and battery installation proximal to the town it is likely that the town of Yackandandah will become a source of electricity to the grid, thereby improving its reliability and efficiency.

3.2 Impediments and Possible Improvements

As outlined, full functioning of the Mini Grid is dependent upon the development of an energy retail model able to facilitate transactions between members of the mini grid. Both TRY and AusNet Services seek to support a 'community' energy retailer model able to retain economic benefits in the local community. The following suggestions are made in the belief that they would contribute to the Mini Grid itself or the community energy retailer, and thereby the modernisation of Australia's grid.

- Development of the Community Power House model across Australia. A community power house, provides hubs of expertise across Australia to provide high quality, technical, financial, governance and community development advice to community energy groups. This provides the dual function of both helping groups reduce wasted time, and ensuring efforts are directed toward effective and nation building strategies. To offer an effective and successful comparison, Landcare Australia offers a model as to how effective communities can be when expertise resources are made available.
- Revision of tariff structures which limit the ability for electricity to be traded locally. This feature of the energy market effectively reduces the enormous potential of mini-grids which are currently locked in to the full kWh tariff cost of energy provision. This could include a provision for local network charges so that those on the mini grid pay for the upkeep and maintenance of that very localised section of the grid that they need. Local network charges would reduce the risk of households choosing to go 'off grid' as the benefits of staying on grid would measure up well against lower costs. TRY acknowledges that the social equity built into the current tariff structure of the grid needs

to be maintained. It reiterates however, the benefits of mini-grids: in reducing the future need to expand the grid; in stabilising the spikes in energy demand; in facilitating the creation of a local area smart grid; and reducing the need to expand energy generation from fossil fuel sources. This balance between local network charges and a 'user pays' system, and the equity built into the contemporary grid is suggested as a useful target for the inquiry.

- In a related matter, some the grid would benefit if some households were to go off grid. There is the potential for a review of SWER lines, considering their possible replacement with serviced stand alone systems (solar, batteries, generators). Especially in rural areas with long SWER lines, this could contribute large cost savings.
- Currently grid regulations significantly limit the size of rooftop solar generation. This needs to be reviewed with the advent of dwelling/business level smart energy control systems. These devices can regulate and even shut down the export of electricity to the grid. This control capacity means that where demand is high generation can be exported assuming local transformers have the capacity.
- An appropriate transition to renewable energy systems also depends on a level playing field amongst generators. Currently fossil fuel electricity generation operates without proper accounting of the externalities associated with this type of electricity generation. A mechanism that truly accounted for the cost of fossil fuel electricity generation would radically change the cost competitiveness of renewable energy generation and storage systems.
- As critical conduits with local communities, Local Government would also provide a strong investment platform to lead the transformation of the electricity network. Well funded programs at a local government level would also allow Federal investment with confidence, given the strong, accountable and transparent governance structures in local government.
- The Mini Grid depends upon a careful balance between electricity generation, storage and use. In the maintenance of a mini grid system each variable is as important as the others. The efficiency of appliances has a large impact on the use of electricity and the regulation of appliance efficiency could also be considered as a key factor in modernising Australia's grid.

## Conclusion

This submission has described the installation of a Community Mini Grid in the town of Yackandandah. In doing so it has sought to create a space for community energy projects in the modernisation of Australia's grid. As this submission has attempted to show, community energy projects are able to:

1. Facilitate the implementation and acceptance of new technologies, in this case mini grid technology;
2. Redistribute energy economies to benefit rural and regional communities;
3. Unlock local investment in local projects; and
3. Assist in the transition to renewable energy technologies, whilst ensuring the efficiency and reliability of Australia's grid.

It asks that the inquiry consider community energy, and mini grid, projects and how best to support them.