ATA Presentation on Community-Based Energy Initiatives

Brad Shone
Renewable Energy in Regional Australia
September 17th 2007
Bendigo, Victoria

INTRODUCTION

ATA has recently undertaken research into innovative initiatives taking place in Victorian rural and regional communities aimed at improving energy and water supplies. The primary purpose of this research is to promote successful community-driven and supported projects that have resulted in more efficient, reliable or affordable energy and water supplies.

This presentation will outline a diverse selection of initiatives which have been successful in securing energy supplies in rural and regional Victoria. It will highlight the factors instrumental in their success, identify structural and financial impediments faced, and explore the most effective way to remove regulatory and policy impediments to their development.

About ATA

The ATA is a not-for-profit community organisation that has been promoting renewable energy, energy efficiency and water conservation since 1980. ATA's mission is "to connect, grow and give voice to the community of people making sustainable technology and lifestyle choices in their home."

As a membership based organisation, ATA has developed to connect a network of people making sustainable technology and lifestyle choices in their own homes. With a strong focus on practical solutions, and the sharing of information on sustainable living solutions, ATA aims to increase the uptake of sustainable behaviours.

RESEARCH BACKGROUND

ATA has recently undertaken research into community-based initiatives designed to secure energy and water supplies for rural and regional communities in Victoria. The purpose of the research was to produce a document to be used to promote successful community-driven and supported water and energy projects to a variety of community, media and government stakeholders, to highlight the benefits and feasibility of such initiatives, as well as to inform future policy discussions.

The research stems from a successful tender we filed with the Consumer Utilities Advocacy Centre (CUAC), who had previously identified a lack of information about such projects as being an impediment to future projects proceeding in other communities. ATA would like to take this opportunity to acknowledge and thank CUAC for vision and interest in this important topic, and for their generous support in enabling us to undertake this research.

The ten projects examined in the research, and their locations, are as follows:

- Hepburn Community Wind Park, Daylesford/Hepburn
- Project Aquarius, Ballarat
- Maldon Farm Water Supply, Maldon
- Earth Utility Solar Services Pilot, Ararat
- Alpine Shire Natural Gas Access, Myrtleford, Bright, Beechworth
- Ararat Hospital Water Tank and Treatment Farm, Ararat
- Warrnambool Geothermal Water Use, Warrnambool
- Biogas Power Generation, Tatura
- Hopetoun Sustainability Audit, Hopetoun
- Community Action Group Strategies, various locations across Victoria.

This paper will focus on the four projects with a direct relevance to renewable energy: Hepburn Community Wind Park, Tatura Biogas Power Generation, Warrnambool Geothermal Water and Earth Utilities Energy Utility Services.

The research report is currently in its draft stage, with publication expected sometime in October. This presentation will provide an outline of some of the projects, and a focus on the learnings identified through the research, with a specific and appropriate focus on the energy-related projects.

HEPBURN COMMUNITY WIND PARK

The small central Victorian communities of Daylesford and Hepburn have had a long history of embracing sustainability and an appreciation of the natural environment. It was here that Victoria's first community owned wind facility was proposed in 2005, and is now rapidly approaching construction.

The plan is to build a 4MW wind powered generating facility (2 x 2MW wind turbines) in the Hepburn area which will be majority owned by the local community. The project, which began in early 2005, was conceived by the Hepburn Renewable Energy Association, a community-based group, independent of council and large developers. It has been co-implemented by Future Energy which has focussed more on the actual development of the wind park project and the many technical, regulatory and operational aspects which needed to be resolved. Future Energy has also assisted with the development of the HREA website and attended all meetings of the association.

Barriers

Of the barriers confronted by the project proponents, the most significant ones were predominantly planning related, including the lack of regard for project size in the planning requirements; and the onerous permits and assessments required. Further, there was considerable difficulty encountered in negotiating both a grid-connection agreement with the local distribution business and a retailer contract for the sale of electricity, which I understand is ongoing.

Another difficulty encountered surrounds the situation with property rates legislation for wind developments, which favours large projects. The Department of Sustainability and Environment, in a bid to create greater certainty around property rates for wind farm proponents, developed a formula for calculating property rates for wind developments which could be adopted by proponents (formerly this was done entirely by negotiation with the local council.) However the formula, set at $40,000 plus $900 per megawatt of installed capacity, heavily favours larger wind farms. For example, the rates work out to be about $1,300/MW for a 100MW farm, compared with over $20,000 / MW for a 2MW farm.

Despite all of these barriers, there exists no special assistance for community-owned distributed generation. The proponents had to absorb the considerable financial risk involved in undertaking the necessary assessments, including a process permit, a fauna assessment, a flora assessment, an acoustics assessment, a shadow assessment, a heritage assessment, a geotechnical initial assessment and a visual amenity assessment, as well as the public risk associated with taking on a potentially controversial development. (in a smallish community?)

Positives

The project did, however, benefit from $1million of Victorian state government funding, via the Renewable Energy Support Fund, however such support is far from guaranteed for future projects. The proposal also benefited from high levels of community support, with nearly 10% of residents members of the HREA, and this number increasing weekly.

Further, the ownership structure of the proposed farm is based on a cooperative model with minimum 50% community ownership, effectively meaning 1 member = 1 vote (as opposed to 1 share = 1 vote). This ensures decisions regarding the wind park remain with community.

The project has also benefited from an excellent wind resource and high levels of local knowledge regarding wind facilities, with one of the founding members of the HREA an employee of the wind turbine manufacturer Vestas and another with knowledge of community-owned wind facilities from his background in his native Denmark.

Additionally, there was a desire to keep the project of a scale that was relevant to the community, with the size of the project designed to produce a quantity of electricity that is roughly equivalent with

the community's consumption. This decision quite possibly assisted in generating such a high level of public acceptance of the project.

WARRNAMBOOL GEOTHERMAL WATER USE

Geothermal water resources have been used in Portland since 1983, providing both water for town water supply and heat for the community. The heat from the geothermal water has been used to provide either heat or domestic hot water (or both) to 13 sites in the town, including the hospital, police station, municipal offices, swimming pool, library and a local hotel.

The groundwater was disconnected from the water supply system in the mid-1990s due to ongoing water quality concerns, however has continued to provide heat up until the present day, providing very significant savings for the Portland community for over 20 years. (Whilst it is due to be closed in the very near future due to poor plant and equipment condition, the council is investigating options for the drilling and commissioning of a new bore.)

A new project in the region which is proposing the utilisation of geothermal water resources is the *Warrnambool Waters Resort*. This will involve the water at a temperature of 44°C being pumped from the 770m geothermal bore, operating 24-hours per day, 7-days per week. A small proportion of the water will be used to heat the swimming pool and spas, with the majority of it used, via a heat exchange system, to preheat the domestic hot water of the facility. In cold weather the heat from the bore will also pre-heat the water in the resort heating system.

Pre-heating with the geothermal hot water will reduce the consumption of natural gas by 5,600 gigajoules (GJ) per year, the equivalent of 1,500 MWh. On this basis, Sustainability Victoria has offered to provide approximately 20% of the capital cost (capped at $235,000) as a grant from the Renewable Energy Support Fund.

Barriers

The Warrnambool Waters Resort has experienced significant hold-ups due to delays in the issuing of the Water Extraction Permit by Southern Rural Water (the responsible issuing authority). In addition, there is, at present, heavy interstate demand for drilling equipment, further delaying the start of the project.

In addition, neither Renewable Energy Certificates nor NSW Greenhouse Gas Abatement Certificates are available to be generated by the project, removing a potential income source for the project which could have gone some way to offsetting the capital costs.

Benefits

Victoria has relatively good geothermal resources, with very large hot water aquifers in the south-west of the State, in Gippsland, and along the Murray basin, where water temperatures are typically in the 30ºC to 60ºC range. Legislation passed in 2005 specifies that any geothermal energy or water sources in Victoria that are greater than 1 km underground, or greater than 70ºC, fall under mineral exploration statutes. 31 geothermal exploration blocks were gazetted in 2006 alone, and to date some 13 exploration licences have been let to six companies, showing considerable interest in the utilisation of these resources.

The use of geothermal groundwater for heating and domestic hot water displaces fossil fuels at point of use, and as such has significant positive environmental outcomes, such as reducing carbon dioxide emissions. Further, it is a proven technology, with geothermal bores in the region being in operation since 1983, and geothermal energy is highly reliable with relatively low maintenance.

The utilisation of local and available renewable energy resources means that more money stays in the town rather than being spent externally on energy provisions, building the self-reliance of the local community. It is also possible that the availability of a clean green energy source can attract new industry to the region.

BIOGAS POWER GENERATION

There are more than 140 facilities around the state for treating human and commercial waste. Typically these take place in aerobic ponds utilising oxygen for the treatment process, however, in some instances, anaerobic treatment is used via High Rate Anaerobic Lagoons (HRAL), which is a more efficient process, however produces methane as a by-product.

Goulburn Valley Water (GVW) has implemented HRAL at three of their treatment sites – Tatura in 1999, Mooroopna in 2001 and Shepparton in 2003 – and has entered into an arrangement with Diamond Energy to utilise the methane by-product from one of their Tatura facility in the State's north, with the plan to introduce a similar system in Shepparton in 2008. The biogas electricity generation plant installed by Diamond Energy is capable of producing over 1 megawatt of electricity when operating at peak capacity, or enough to power about 1000 homes.

This partnership arrangement between Diamond Energy and GVW has given rise to a range of innovative agreements between the parties, including a Biogas Purchase and Supply Agreement, covering the responsibilities and obligations of the parties, and an Access and Lease Agreement, under which Diamond Energy leases the necessary land where its biogas generation plant, power line and poles are located.

One of the keys features of the project is the ability of the generation plant to feed electricity into the grid at times of peak demand. This is done by the implementation of flexible covers on the lagoon providing the pressure to allow the use of the gas on demand. By providing electricity at times of peak demand the facility is able to relieve constraints on the local network, where supply is struggling to keep up with demand, and also enable the generator to sell the electricity at times when the wholesale price of electricity is at its highest.

With over 140 similar facilities treating human and commercial waste around the state, the potential to replicate this technology and arrangement to other locations is large. However it must be noted that this project benefited from a significant amount of state government support, the region had a significant quantities of additional feedstock material available due to the large number of food processing facilities in the region.

Barriers

Barriers to this project closely resemble the impediments faced by the Hepburn Community Wind Park. Specifically, Diamond Energy has faced difficulty negotiating grid connection for the connection to the local distribution network. Whilst these problems remain, there is a significant amount of work being done on this on both the federal and state level, with electricity network services providers being increasingly required to consider non-network solutions to peak demand network constraints, including embedded generation of this type.

Another difficulty faced by the project was negotiating the sale of electricity to an electricity retailer at a price that captures the full value of that electricity. With the wholesale prices of electricity reaching their highest levels in the middle of the day, when demand is at its highest, electricity fed into the grid at these times is inherently more valuable. However, without precedence, and given the facility is a relatively small generator, it is difficult for the project proponents to negotiate a sale agreement which fully captures this value, reducing the financial return on the investment.

One proposed solution to this difficulty would be for the generator to become a retailer themselves, to then be able to sell electricity directly to retail customers and thus extract the full value of their investment. However licensing as a retailer in the Victorian electricity market is in itself an expensive exercise, and thus may not be a realistic option – it is currently being explored by Diamond Energy.

Positives

The project received $800,000, or approximately 20% of the estimated capital cost, from Sustainability Victoria's Renewable Energy Support Fund, with this support providing a positive demonstration of the State government's support for localised renewable generation as a valuable addition to the overall grid network.

As previously mentioned, the food processing facilities in the Goulburn Valley provide an excellent source of organic material to boost the human waste feedstock for the project, and thus enhance the

projects viability. Regardless, there still exists significant potential for other sewage treatment facilities across the state to implement similar technology on a scale which is appropriate to each respective community.

As with the Hepburn Wind Energy Park, this project being a pioneer in the field will certainly pave the way for future projects to come on board without having to confront some of the barriers faced by Diamond Energy and GVW. This will be further enhanced by the consideration being given to embedded generation by electricity industry retailers, and by the impending introduction of a price for carbon which is set to make such projects more financially viable.

ENERGY SERVICES UTILITY

The final case study to be considered in this paper is the that of an energy services utility which is set up to provide renewable energy services, such as solar hot water and solar photovoltaics, to homes on a lease arrangement, avoiding the need for the typically large capital investment required by the homeowner. The project examined in the research was the establishment of a company, *Earth Utilities*, to provide these energy services as well as rainwater tanks, to residents of the Ararat region, with the assistance of the Ararat Rural City Council

The provision of these services by a third party assist by eliminating capital outlays via a service fee model, and can potentially be extended to the outsourcing of ongoing maintenance responsibilities. This is a familiar practice used in business and the public sector. In the Earth Utilities (EU) case, the utility sources sustainable utilities in bulk, establishes an efficient installation and ongoing maintenance regime, installs the chosen equipment at no upfront cost to the recipient, and provides ongoing maintenance and support, for a quarterly service fee.

Again, this project received $400,000 in support from Sustainability Victoria, under the agreement that the money would be used to measure customer uptake in a real-life trial, and to monitor actual energy and water savings in comparison to theoretical models. Ararat Rural City Council agreed to participate in the pilot and all the grant funds will be allocated to council and community installations, including:

- Ararat Hills Estate Luxury Lifestyle Village – gas-boosted SHW and rainwater tanks
- YMCA Building – SHW, commercial pool heating via solar or heat pumps
- Arts Centre and Museum – solar hot water
- Other Council Buildings/Sports Ovals – solar hot water
- Schools – solar hot water and rain water tanks
- Plus various residential installations (joint SV and EU funding)

Due to the economics of renewable energy options at present, the focus is very much on providing solar hot water systems, as solar photovoltaic electricity is not a financial proposition in the current environment. It is anticipated that the costs will be in the order of $300 per year in service fees for a 300 litre solar hot water installation. As savings on energy bills will be a few hundred dollars greater than this, the homeowner benefits from a financial gain from the installation, as well as the knowledge that their hot water is coming, at least in part, from a renewable energy source.

It must be remembered that, as Earth Utilities is a for-profit company, the savings to households may not be as great as they potentially could be if they had access to the capital up-front to purchase the equipment themselves, or as they may be if the scheme was run on a not-for-profit basis, whether by a community organisation or a local council.

A similar project interstate is the proposal by a community group called *Local Power* in south east Queensland. The group proposes to establish a buying group of 50 homes in the region interested in installing solar photovoltaics on their roofs. This group will then use their buying power to negotiate a favourable purchase and installation agreement for the equipment, passing the cost savings on to members of the group.

Barriers

One of the key barriers to establishing an energy services utility project like EU is the initial capital costs required to purchase the renewable energy equipment. As such, this would limit the scope of this model for many community groups. However, possibilities still exist for larger councils who may

have access to greater capital for establishment costs. Alternatively, the model taken by Local Power of creating a buying group could be readily implemented by local communities, albeit still requiring a significant financial investment by members in the initial infrastructure.

Additionally, at present such projects are fairly limited to solar hot water, as the economics of solar photovoltaics just don't stack up. However this may change in the near future, in the advent of the introduction of a feed-in tariff for solar electricity and other renewable energy sources which have the potential to improve the financial return on investment.

Positives

Of the many benefits of such these projects, the key one would have to be the increased market uptake of sustainable utilities within households and small businesses who might not otherwise be able to afford them. Projects such as the one proposed by Earth Utilities enable low income households to be able to access solar hot water which may have otherwise have been out of reach. And the Local Power arrangement may bring the cost of solar photovoltaics down to a level which makes it financially possible to a wider number of households.

Some of the additional benefits form the EU project is the fact that customers will make savings on their utility costs while also reducing their carbon emissions; customers will avoid the difficulties of selecting the most appropriate equipment, procuring it, organising permits and installation, and securing ongoing support in the event of a breakdown; the service can be extended to include public service and community buildings and commercial premises; and employment will be created within local communities for tradesmen.

Again, as mentioned previously, EU was successful in their application to Sustainability Victoria for pilot project funding, and a grant of $400,000 was agreed to establish and run this pilot in western Victoria.

SUMMARY

In summary, it should be noted that many of the projects outlined above are transferable to different locations around the state and the country, depending on available resource.

Future projects will benefit from the work of these pioneering 'trail-blazer' projects in reducing barriers and paving the way for regulatory change to assist similar proposals in the future. For example, the recurrent issue of difficulty in negotiating grid-connection for renewable energy generators, and small to medium embedded generators more broadly, is being addressed on both a state and federal level, through an increasing requirement on network service providers to look at non-network solutions to network constraints.

It must be acknowledged that these projects have all benefited from significant levels of government support, primarily through Sustainability Victoria's renewable Energy Support Fund. However a future environment of reduced regulatory and market impediments, a price for carbon dioxide emission and the potential for mandated feed-in tariffs for the export of electricity to the grid from small-scale embedded renewable generators will potentially all combine to make projects like those outlined above commonplace across the state, and indeed across the country, in the coming years.

ATA's report *Community-Based Water & Energy Initiatives in Regional & Rural Victoria* will be available on our website sometime later in October.