

# Community Based Water and Energy Initiatives in Rural and Regional Victoria

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for  
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### Consumer Utilities Advocacy Centre

CUAC works to ensure the interests of Victorian consumers, especially low-income, disadvantaged, rural and regional and indigenous consumers, are effectively represented in the policy and regulatory debate on electricity, gas and water.

CUAC's Reference Group consists of two streams, which initiate research proposals for grant monies.

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*The opinions contained in this report do not necessarily represent those of the Consumer Utilities Advocacy Centre or the above organisations.*

### About ATA

The ATA (Alternative Technology Association) is Australia's leading not-for-profit organisation, promoting sustainable technology and practice. The ATA provides services to members who are actively walking the talk in their own homes by using good building design, conserving water and using renewable energy. ATA advocates in government and industry arenas for easy access to these technologies as well as continual improvement of the technology, information and products needed to change the way we live.

[www.ata.org.au](http://www.ata.org.au)

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### LIST OF ACRONYMS

The following acronyms and abbreviations are used in this report. Note that reference to a government department or other government entity refers to the Victorian government unless stated otherwise.

AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ATA	Alternative Technology Association
BREAZE	Ballarat Renewable Energy and Zero Emissions Inc
CAG	Community Action Group
CHW	Central Highlands Water
CVAG	Central Victorian Greenhouse Alliance
CUAC	Consumer Utilities Advocacy Centre
DHS	Department of Human Services
DIIRD	Department of Industry, Innovation, and Regional Development
DPI	Department of Primary Industry
DSE	Department of Sustainability and Environment
DVC	Department of Victorian Communities
EPA	Environment Protection Authority
ESC	Essential Services Commission
ESD	Environmentally Sustainable Design
EWOV	Energy and Water Ombudsman of Victoria
FE	Future Energy
GL	Gigalitre
GJ	Gigajoule
GMW	Goulburn Murray Water
GVW	Goulburn Valley Water
GMMW	Grampians Wimmera Mallee Water
HRAL	High Rate Anaerobic Lagoon
HREA	Hepburn Renewable Energy Association
kW	Kilowatt
MASG	Mount Alexander Sustainability Group
MCE	Ministerial Council on Energy
MW	Megawatt
MWh	Megawatt hour
ML	Megalitre
NEMMCO	National Electricity Market Management Company
NGEP	Natural Gas Extension Program
NSC:UB	National Centre for Sustainability, University of Ballarat
OVAG	Ovens Valley Action Group
PV	Photovoltaic Cell – generator of electricity from sunlight
SEAV	Sustainable Energy Authority of Victoria (predecessor to SV)
SV	Sustainability Victoria
VCAT	Victorian Civil and Administrative Tribunal

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### 1. EXECUTIVE SUMMARY

It has become increasingly evident that real innovation is taking place in Victorian rural and regional communities to improve energy and water supplies. The drivers for these projects are various; some address issues of access, reliability or affordability while others are focused on reducing greenhouse gas emissions, reduced availability of water due to climate change or other environmental concerns.

Broad awareness of these initiatives outside participating communities is quite limited however, and there is little understanding amongst decision-makers of them, or the best way to remove regulatory and policy impediments to their development and replication elsewhere.

Regional and rural communities have responded quickly to the drought conditions of recent years, with many innovative projects under way to capture rainwater or stormwater, or the re-use of treated wastewater. In most cases, the water is being used as a cheaper alternative to treated (town) water for the watering of community facilities such as sports grounds and parks as well as reducing the non-essential use of scarce treated supplies.

These initiatives and other more ambitious water schemes are being well supported by state and federal government grants and rebates. Some water authorities are pursuing water efficiency initiatives of their own, however many others are not as well informed, resourced or supportive of community action to improve water efficiency as they could be.

Initiatives to reduce household and community energy use and greenhouse emissions are becoming more common around the state, and in several areas large scale well-funded community-based projects (e.g. Castlemaine 500) are under way. Unlike water restrictions, which have impacted virtually all households across the state, most individuals have not been impacted by electricity supply constraints and mid-2007 wholesale price increases have not flowed through to domestic consumers. As a result, energy efficiency initiatives are being supported more as a means of reducing greenhouse impact than an attempt to mitigate cost increases or improve supplies.

There is considerable scope for more government resources and funding (local, state and federal) to be applied to household energy and water audits and retrofit programs. Such initiatives stimulate behavioural change and provide a low-cost way to replace inefficient shower heads, taps, light bulbs and water heaters, as well as addressing energy waste from poor insulation and draughts.

While both state and federal governments have established dedicated resources and numerous funding programmes in the areas of energy and water efficiency, significantly larger sums are still being spent in other areas which are clearly seen as higher priorities. Furthermore, as a general observation, governments remain unwilling to make unpopular decisions such as setting more aggressive energy and water use standards for new buildings despite the obvious benefits that would result over time.

Local councils play a key role in rural areas as the 'first point of contact' for community groups, and many councils (Ararat's efforts stand out) are doing a good job in providing support and resources. Access to state government assistance continues to be confusing and challenging for rural communities. Councils' role in helping community groups gain access to the right government body that can provide support and funding for projects is particularly useful. Going forward, all councils need to understand the important role they



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can play in bringing community initiatives to life, and to make sure they allocate sufficient resources to community sustainability projects.

The importance of generating energy from renewable resources such as wind and solar has been widely publicised by government and has captured the imagination of several communities. Exciting projects are under way to implement community-owned small-scale embedded generation facilities from wind and solar, such as the Hepburn Community Wind Park. Such projects face many hurdles before they become a reality, not least trying to ensure that they will provide a commercial return to community and commercial investors. Furthermore, aspects of the current regulatory framework for electricity supply are not helpful to such projects – in particular the cost of connection to the distribution grid and the ability to maximise returns from the sale of the power.

Since 2004 some 30 towns have gained access to natural gas under the state's Natural Gas Extension Program, and have benefited significantly in terms of increased economic activity and reduced energy costs. Some towns of significance such as Myrtleford were excluded from the original list on the basis of cost benefit and are experiencing economic decline as a result. It may be that the cost of supplying gas is not economically viable, but no resources or funding have been made available to investigate alternatives despite continuing community and council lobbying on the issue.

It is interesting to observe that businesses in the water supply chain, including manufacturers of fixtures and fittings, have reacted quite quickly to water efficiency demands with new and innovative products and are visibly supportive of community water efficiency initiatives. In contrast, the vastly larger business community, which supplies power and devices that use power, is not well represented in supporting energy efficiency initiatives either through more efficient products or support of community projects.

This report documents the experience of communities pursuing initiatives to secure improved or alternative energy and water supplies. The case studies detailed in this report will 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 informing future policy discussions.

By researching and documenting a number of indicative real initiatives that communities have implemented, the valuable insights and recommendations resulting from the case studies are now accessible to all.

## 2. SUMMARY OF PROJECT BRIEF

The Consumer Utilities Advocacy Centre (CUAC) is an independent consumer advocacy organisation established to ensure the interests of Victorian consumers are effectively represented in the policy and regulatory debate on electricity, gas and water.

CUAC's Reference Group, a consultative body representing 17 consumer and community agencies, provides an opportunity for members to share their knowledge and experience to inform and develop research and actions that will assist Victorian utilities consumers. The Reference Group is divided into two Partnership Groups, with the Market Issues Group (MIG) addressing broader market and competition issues, focusing particularly on water and the needs of rural and regional customers.

A priority of the work plan agreed by MIG members was assisting rural and regional consumers improve energy infrastructure. It was agreed that a positive contribution could be made to the debate by producing a high-quality document to promote community-based initiatives that secure better energy and water supplies for their communities.

CUAC Market Issues Group members defined the scope of this project as to identify, document and publish case studies of community-based initiatives in rural and regional Victoria which have been or are likely to be successful in securing more efficient, reliable or affordable alternative energy and water supplies for their communities. The resulting document would help address the information gap that currently exists about the significant value of these initiatives.

The expectation was that some ten community-based initiatives would be identified and then documented based on information provided by the key community members involved as well as other relevant information sources.

The primary deliverables of the research were specified as:

- Delivery of a high-quality report discussing each initiative and including a summary outlining common issues and themes, including regulatory impediments;
- Presentation of the key findings and common themes to CUAC stakeholders, particularly Market Issues Group members;
- Assistance with the development of an agenda and identification of speakers for a half-day forum designed to add value to the report's findings by discussing ways to facilitate community initiatives e.g. how to reduce impediments identified in the research. The target audience for the forum would primarily be representatives from local, state and federal government and relevant regulatory agencies.

The research work was put out to tender by CUAC and the CUAC Board selected the Alternative Technology Association (ATA) to undertake the project on their behalf.

The research has not attempted to provide a detailed assessment or feasibility study of these projects, but rather to describe projects so as to highlight important aspects of their development and ongoing operation (e.g. financing, dealing with regulatory bodies or securing community support).

### 3. KEY FINDINGS

This study is intended to inform policy-makers about the broad range of valuable initiatives currently taking place in regional and rural Victoria and to assist them in identifying regulatory and bureaucratic impediments to greater uptake. The key findings are:

- Widespread water shortages and restrictions in 2006/7 have provided strong motivation for communities and some water authorities to implement initiatives aimed at using less water and establishing rainwater capture and wastewater reuse schemes both domestically and for community use;
- Most of the basic educational and appliance retrofit schemes involve little or no cost, face few regulatory challenges, and hence are open to widespread adoption. In addition, where community facilities are enhanced and 'drought proofed', clearly the whole community benefits;
- The installation of water tanks and related plumbing is costly even after rebates which may disadvantage certain groups within the community. However the service fee model being piloted in Ararat may be a feasible alternative;
- In most parts of Victoria, electricity supplies are adequate, supply levels have not been noticeably affected by recent weather or economic conditions and, despite recent price increases, prices remain relatively low by world standards and affordable to the majority of consumers. Therefore, community groups focused on energy efficiency or energy generation projects are tapping in to broad concerns for the environment as a basis for motivating their communities;
- As recent wholesale power cost increases flow through to domestic users, the direct benefits of energy efficiency initiatives will be more demonstrable and are likely to give greater traction to energy efficiency projects;
- Rebates and subsidies to support domestic energy retrofits that will reduce energy consumption are uncommon, yet might be of more assistance to lower income groups than rebates for solar hot water systems or PV panels which they may not be able to afford;
- The many large public companies involved in generating, transmitting, distributing and retailing electricity, and in manufacturing and selling appliances to consume it, do not feature heavily as supporters of community groups pursuing energy efficiency initiatives;
- Councils and local water authorities play a key role in supporting the activities of community groups, yet not all appear to recognise the importance of this role and the need to establish appropriate support structures, resources and budgets;
- The localised small scale generation of renewable energy by community-owned facilities is being pioneered in Hepburn, and other groups are already pursuing similar plans. The commercial viability of such projects is crucial when communities are personally investing millions of dollars, however the current regulatory structure of the electricity market in Victoria makes it difficult for these projects to earn a reasonable return.

In building on the findings from this research it is recommended that the following areas receive the primary focus:

1. Councils and local water authorities are 'first-points-of-contact' for rural and regional community groups, hence they need to ensure they have adequate structures, resources and budgets in place to provide information and support;



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2. State government has several different departments with offices and staff in regional and rural areas as well as Greenhouse Partnership organisations, all of whom are becoming involved in sustainability projects. Better communication and clarity of purpose would help community groups access support and funding more easily;
3. The Natural Gas Expansion Program is bringing significant economic and environmental benefits to the 34 recipient towns chosen in 2004. Given the importance of pursuing reductions in carbon emissions, it may be time for the government to review its capacity to extend the NGEF to a further group of towns who missed out. If NGEF cannot be extended, support for a thorough examination of lower cost and cleaner energy options should be made available to these towns;
4. Free energy audits are effective in demonstrating to users where efficiency gains and cost savings can be made. More financial and resource support for these as well as simple water and energy efficiency retrofit schemes would be very valuable;
5. Despite the widely-stated objective of increasing the amount of renewable energy generation in the state, the current regulatory framework continues to present obstacles. The state and federal bodies currently reviewing these frameworks should allocate a higher priority to considering how to quickly create a more supportive regulatory environment for small renewable embedded generators.
6. The major businesses involved in power supply and electrical appliances are not very visible in their support of energy efficiency schemes. Significant additional support and funding could be released if such businesses were motivated to get more involved in efficiency retrofit and renewable generation programs.

### 4. KEY THEMES AND COMMON ISSUES

Widespread innovation is taking place in Victorian rural and regional communities to secure and improve energy and water supplies. A broad range of drivers exists for these innovative projects, ranging from issues of access, reliability or affordability, to a focus on reducing greenhouse gas emissions, or increasing availability of water due to climate change.

The projects examined in this report fall within four broad categories, with many of the themes and issues faced by these projects of a similar nature. These categories are:

- Water initiatives
- Energy efficiency/offset initiatives
- Renewable energy generation initiatives
- Community action group initiatives

#### **Water**

Many people living in regional and rural Victoria have grown up in circumstances where rainwater stored in tanks was the sole source of household supply. For them, water was always a precious resource that needed to be used carefully, so it has been relatively easy for community action groups in rural areas across the state to motivate residents on the installation of water tanks and other efficiency measures. The key objectives of most groups focussing on securing water supplies are:

- Reduction in individual water consumption which also leads to reduced water bills
- Changes in behaviour to further reduce consumption such as shorter showers
- Sustainability of individual and community facilities such as gardens, parks and sports ovals by using alternative water sources
- Safeguarding catchment supplies in the event that low rainfall conditions continue.

#### **Energy Efficiency/Offset**

There are many examples of programs being run by local authorities and community groups to educate households and businesses on the benefits of reducing their carbon impacts through energy efficiency. Free energy audits, public information sessions and similar activities are widespread. Larger scale community schemes such as Castlemaine 500 and the Hopetoun Sustainability Audit have been able to access state and local resources in setting targets for energy savings and reduced greenhouse emissions for large community areas.

As with water, community action groups are developing strategies to mobilise support for simple projects aimed at education, behavioural change, and a reduction in energy use through retrofits. Access to subsidies and rebates, however, appears more difficult than with water projects. The more complex initiatives inevitably require greater degrees of local authority, state, and/or private enterprise funding and support.

#### **Renewable Energy Generation**

While much good work is being done by community action groups to drive energy reduction initiatives, for some groups the ambitious goal of establishing and owning local renewable energy generation is a key objective. Various rebate-supported schemes to install PV solar panels on domestic, commercial, community and business buildings are now well established. Community-initiated projects are under way for PV installations on council and community buildings which are funded in various ways, and these are certainly contributing

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to a reduction in grid-supplied energy use by these facilities, as well as motivating others in the community who can afford the investment to do the same.

On a larger scale, one case study in this report describes a 4MW community initiated and funded wind farm project in the Central Highlands, while another describes a 1MW commercial biogas project near Shepparton. In addition, other community groups are developing plans for renewable generation projects. What is evident is that, in an environment increasingly aware of climate change and Victoria's reliance on polluting brown coal electricity generation, communities are becoming increasingly interested and active in securing their own energy supplies. They are looking towards renewable energy to fulfil this need.

### **Community Action Groups**

Almost every town in rural and regional Victoria is seeing the emergence of a community group focused on environmental and sustainability objectives. The massive shift in public awareness and concern that has happened in the last 18 months is enabling motivated individuals to gain traction for their ideas at a rapid rate.

Highly motivated community action groups focused on relevant local water and energy issues are widespread and growing rapidly in number and in community support. Not surprisingly, they are able to make the most progress in pursuing simple initiatives where most of the necessary support can be sourced locally. Predominantly, these groups are focusing on energy and water issues from a climate change perspective, disseminating information on the impacts of climate change, promoting alternative energy options for individuals and groups and initiating community-scale projects regarding energy and water.

It is possible to identify and summarise some common themes and issues that emerge amongst projects dealing with water, energy efficiency and offsets, renewable energy generation and community action group organisation and support.

## ***Financial Issues***

### **Grants and Funding**

Possibly the largest barrier confronting any large infrastructure project is the procurement of funds to finance the initiative. For most renewable energy technologies, the high demand for capital investment required to set them up as well as ongoing operational costs make it difficult to earn a viable commercial return on investment.

Although they are simple and easy to install, the current power generation capacity of PVs in terms of conversion efficiency is below that of wind and biogas/biomass and their capital costs are relatively high. This research has not identified any planned large scale community PV installation projecting a reasonable investment return. Such large projects that do exist (e.g. Victoria Market in Melbourne) have been heavily subsidised as 'showcase' projects and are typically not commercially viable.

Large scale wind power provides relatively attractive commercial returns compared with other renewable energy options. In the case of the Hepburn Wind Farm, up to half of the \$9 million needed for capital expenditure will be provided via bank finance at commercial rates, financed by the return on the electricity generated.

However it must also be acknowledged the Hepburn Wind project received \$975,000 in funding from the Victorian State Government through Sustainability Victoria's *Renewable Energy Support Fund* – approximately 10% of the estimated start-up cost of \$9 million. Equally, the Tatura biogas generation plant received \$800,000, also from the Renewable

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Energy Support Fund, equalling roughly 20% of estimated capital cost. Such financial assistance was crucial in the successful implementation of both of these projects and it is unlikely that either would have succeeded without it.

In terms of water projects, government support is very well established. The federal government Community Water Grants scheme is now in its third round since 2004 and has made over 400 grants up to \$50,000 for water projects in Victoria. The state government's Smart Water Fund, now in its fourth round of funding, has also issued numerous grants for water improvement projects, although most of the focus has been in metropolitan Melbourne and major regional centres.

### Generating Income

Projects such as the Hepburn Community Wind Park and the Tatura Biogas Generator are able to sell electricity, via a retailer, to electricity customers, and thus recoup costs incurred in developing the project. However the viability of small generators would be maximised if the generator were able to sell its power directly to local community users and take advantage of spot market prices. At present, this requires the generating entity to register as a licensed electricity retailer in Victoria. However, the costs and requirements of becoming a licensed retailer for such a small business and specialised electricity supply generally make this option prohibitive.

In the absence of a class or classification of electricity retail licenses which allow for such an occurrence, small-scale generators are forced to negotiate purchasing agreements with other market players who erode the potential margin without adding any significant value to the process. Negotiating a Power Purchasing Agreement (PPA) has been identified as being a major barrier by both the Hepburn and Tatura renewable energy projects.

In addition, given community-scale renewable energy is located close to the point of consumption ('embedded generation'), by their very nature they use very little of the broad electricity distribution infrastructure and none of the transmission network. Regulations specify that generators receive some compensation for this<sup>1</sup>. However, there is no evidence that this is being adequately captured in the negotiation of the PPAs. Such projects are at a significant disadvantage in determining whether such compensation is adequately included in a retailer's pricing offer due to the lack of available information on network costs, the methodology used to determine compensation and ultimately the monopoly power of distribution companies.

Unless embedded renewable energy generators (wind, solar, biogas etc.) are able to recoup their investments and earn a commercial return on the sale of their energy, the spread of renewable generation sites across the state is likely to be severely constrained.

### Financial Risk

Considerable financial risk also lies with the proponents of community initiatives. For example, Hepburn Community Wind's project partner Future Energy bore a considerable amount of the financial risk of the project in the early days. Future Energy funded the costs of carrying out the various studies and consultancy activities, as well as legal and other fees in preparing draft documents,. Had Future Energy not been willing to underwrite the project in this way, the community would have had to organise significant additional funding from other sources.

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<sup>1</sup> See: *ESC Guideline 15* – Sections 4 & 5

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These risks were also real in the Warrnambool geothermal project, where fear of project delays and cost blowouts threatened to add significant costs to the project. As with other renewable energy projects, geothermal projects need to ensure a sales contract exists for the purchase of the geothermal water or heat derived from it. The risk that such contracts may not provide the expected return, or worse, may not be concluded at all, are very real. This must be recognised by those undertaking such ventures, and addressed by policy-makers hoping to promote these initiatives.

In the case of the Project Aquarius water saving initiative, a degree of financial risk was taken on by the householders whereby customers were required to pay up-front for the full cost of the measures, receiving the rebate at a later date on application. Customer dissatisfaction with this system was high, presenting a disincentive to participation for some. In any future program efforts should be made to eliminate this disincentive as it acts to exclude households on low or fixed incomes.

### **Alternative Implementation for Better Results**

The energy services provider model demonstrated in Ararat offers an innovative mechanism for providing sustainability technologies to homeowners who are unable to afford the upfront costs of installing them outright. The key to its success is the appeal of the service-fee concept to householders and small businesses in lieu of the upfront costs. If the trial project in Ararat meets its objectives, additional entities would be expected to adopt a similar practice.

The model examined in the report is being implemented by a for-profit entity and as such the savings to households may not be as great as they could be if households had access to the capital up-front to purchase the equipment themselves, or if the scheme was run on a not-for-profit basis, whether by a community organisation or a local council. The real key to low-cost and affordable implementation of this model with true value to the community is the adoption by not-for-profit organisations or entities with community-benefit at their core, to ensure that as much of the savings from the adoption of these technologies as possible are passed on to the consumer.

## ***Access to Information***

Access to, and dissemination of, information is essential for many of the community-based initiatives discussed in this report. For community action groups, often the first need is information and basic educational materials to stimulate interest and discussion within their community. As the groups grow and begin to establish their local priorities for action, they begin to need external support in the form of access to basic resources such as internet, email, web design, printing and keynote speakers for meetings.

Access to information is essential for start-up community groups, as revealed by those examined in this report. The most frequently mentioned organisations providing direct support to newly-established community action groups are:

- other community action groups, particularly in the early stages
- local councils
- local water authorities (variable)
- representatives of the five Greenhouse Alliance Partnerships overseen and funded by Greenhouse Victoria (DSE)
- Business Victoria Regional Development Officers (DIIRD)

Once projects reach a certain size and complexity, they inevitably require interaction with larger centralised institutions. Local councils often act as facilitators in this regard for

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community groups. The most mentioned central resource is Sustainability Victoria, while Parks Victoria and the Regional Development Victoria teams were also recognised.

When groups progress to implementing specific projects, additional assistance with funding, technical direction, regulatory issues, project management and a host of other external inputs depending on the project, is usually essential. In the case of the Hepburn wind project, the project partner Future Energy filled this role, bringing the technical and regulatory expertise essential for the successful implementation of the project.

### ***Regulation and Policy***

The simple projects examined in the report presented few impediments as a result of policies or regulations. Some projects such as tank installations may require council planning permission, and more complex and unusual water projects become more challenging when a community group, local water authority and/or council need to interact with state entities. Equally, there were few if any regulatory or policy obstacles to the energy efficiency initiatives examined, with state and federal government actively supporting such initiatives via rebates. As with water projects, the Greenhouse Alliance partnerships and local councils are a valuable resource for community groups.

### **Energy Market Structures**

For larger renewable energy projects, significant regulatory and market structure issues presented formidable barriers to their adoption. The structure of the National Electricity Market is based on traditional energy supply models that rely on power generated in relatively few, large remote locations and transmitted (with significant losses) over large distances to rural areas.

The separation and privatisation of generation, transmission, distribution and power retailing which has occurred in Victoria has resulted in pricing structures which enable the providers of these different services to recover costs and earn margins by charges levied on downstream entities. That is, electricity retailers who sell power to end users pay not only for the power they buy and re-sell, but also for a share of market overheads including the cost of the distribution and transmission networks. This cost is, in turn, passed on to the retail customers. This disaggregation of the energy supply chain can make capturing all the benefits of distributed, renewable energy difficult.

Generation plants which connect to the electricity grid via the Distribution Network rather than the Transmission Network are termed Embedded Generators (EG). Such forms of generation use significantly less network infrastructure as they are connected close to the point of consumption, rather than remotely. However, the current regulatory structure provides little opportunity for EG projects to capture this benefit, and the associated savings from reduced transmission losses. While work is underway to address these issues at the state and national level, there is a significant risk that reform will not significantly change the landscape for EG, due to vested interests lobbying to perpetuate the status quo.

### **Planning Laws and Requirements**

One further area of concern, which may still prove to be a significant issue, is the impact of municipal rates on the viability of an EG project. The Victorian Electricity Industry Act 2000 (Section 94) states that electricity generation facilities should pay rates to municipal authorities and that the normal process would be for the level of rates to be negotiated and agreed between the parties.

In December 2004, the Local Government (Rating Arrangements under the Electricity Industry Act 2000) Review Panel recommended the adoption of a formula with a fixed



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annual charge of \$40,000 plus a variable rate of \$900 annually per megawatt of installed capacity. Such a formula 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.

Whilst local governments and project proponents have the option of using this formula for calculating rates owing on wind developments, the mere inequity of the formula and the uncertainty created by it is an additional and significant barrier to further EG projects.

Despite the benefits that locally owned distributed generation can bring to a community, there is no coherent and comprehensive framework to promoting community-owned distributed energy, or facilitating it when a community decides to pursue it. Funding and grants are available to applicants, but this approach only captures individual projects and does not address systemic issues where they occur. Proponents have to absorb the considerable costs 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. These onerous planning requirements present an additional barrier for community-owned wind projects.

In the Maldon Farm Water Supply project, Alliance Resources Ltd was required to obtain an Extraction Licence from Goulburn Murray Water (GMW) to allow them to pump water out of its bores and shafts. GMW has an obligation under the Water Act to ensure that extraction of water by one party does not impact either the sustainability of the total water source or the ability of other licensed users to extract water. This necessitated various pumping tests being carried out, which were complicated by the number of unlicensed bores in operation in the area. In the end, a period of over a year elapsed between the application and the granting of the licence.

Whilst in this case the project was delayed by the complications of the case study, it should always be remembered that similar environmental requirements often exist for large scale infrastructure and environmental projects, and these need to be considered by proponents, both from a cost and time perspective. These unexpected delays and expenses can be mitigated by the engagement of organisations or bodies with experience in the field. Indeed, the biogas project at Tatura benefited from Diamond Energy's experience and the Hepburn wind project from the assistance of Future Energy.

## ***Individual and Community Engagement***

One key ingredient which is present in any successful community-based initiative is the presence of a motivated and visionary individual or group of individuals able to inspire those around them. Community engagement is essential to the success of projects, with the extraordinary work undertaken by the Hepburn Renewable Energy Association (HREA) in allaying the fears of local residents a case in point.

HREA offered tours to neighbouring wind energy projects in order to break down some of the misconceptions around wind farms that existed. Also, the ownership of the wind park is by a cooperative structure whereby one member has one vote (rather than one vote per share) and guarantees that 50% of shareholdings remain in the local community. This ensures community control and ownership of the project and further guarantees community engagement in the process. Equally, the Maldon Farm Water Supply project will be owned effectively by a cooperative.



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However, even significant efforts at community engagement won't ensure absence of community opposition. A major hurdle negotiated by the Hepburn project proponents was a Victorian Civil and Administrative Tribunal (VCAT) challenge to the project's planning approval, submitted by 18 local residents.

The grounds for objection tabled to VCAT were wide ranging and credibly presented, and included issues such as failures in the conduct of the community consultation by council, incorrect interpretation of various planning instruments and guidelines; environmental and amenity impacts of various kinds including to flora, fauna, water catchments and noise and visual impacts on residents and visitors. The local council successfully defeated the challenge in VCAT, enabling the project partners to continue work on the project, as well as the task of bringing all members of the community on-side.

### **Project champions**

One of the key risks of the reliance on community 'champions' is when the project grows to a significant degree. Many groups struggle at this point because most of the work is still being done by the highly motivated core group, using their own funds to cover costs, and working evenings and weekends with their own home facilities. This can soon become unsustainable unless other members, and/or external support resources can step in to help.

In the Wastewater Reuse in Rural Towns projects a substantial amount of time elapsed from the initial community discussions about the projects to the actual implementation and completion – in each case several years. Unfortunately, community groups, however strongly motivated and well meaning, struggle to execute processes in a timely manner simply by virtue of the normal everyday demands on the lives of the core group. Furthermore they are almost inevitably un-funded in the early stages; hence even the simplest of tasks such as writing and printing a newsletter has to be funded by those involved.

## **Government and Business Partnerships**

### **Business Partners**

Another key ingredient of the successful projects was strong partnerships between community groups, government and/or business. For example, in the absence of favourable regulatory structures, the ability for small embedded generation projects to optimise their commercial returns is heavily dependent on the behaviour of the distributors and retailers with whom they are obliged to deal.

Embedded generation projects are virtually at the mercy of the distributors in terms of grid connection charges, may not be able to negotiate optimal purchase terms from a retailer, and cannot enhance commercial return by selling their own power (as discussed under the *Regulation and Policy* section). As such, relationships with both network and retail businesses are essential for larger-scale initiatives.

The support of community action groups by private enterprise is inconsistent and generally occurs as a result of specific relationships that exist or develop between group members and commercial enterprises. Not surprisingly, businesses operating within a community tend to be supportive of small scale local initiatives, whereas larger projects have to work harder to secure external funding from large corporate entities who may have tightly structured and targeted philanthropy schemes.

### **Relationships with Government**

Once projects reach a certain size and complexity, they inevitably require interaction with more centralised agencies. Local councils often act as facilitators in this regard for



## **Community-Based Water and Energy Initiatives**

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community groups. The most mentioned central resource is Sustainability Victoria, while Parks Victoria and the Regional Development Victoria teams were also recognised.

Indeed, government bodies have actively promoted and funded a number of projects outlined in this report. Additionally, some very large projects are being championed by collaborations between federal and state governments and the power industry. The most recent example is the Solar Cities project – a \$40 million initiative to establish solar generation and a whole range of energy saving projects across 13 municipalities in Central Victoria. Such initiatives help support the activities of community groups both directly and indirectly.



### 5. CASE STUDIES

#### *Hepburn Community Wind Park*

##### **SUMMARY**

Since the discovery of mineral springs in the area, the Hepburn and Daylesford region has long enjoyed a reputation for embracing sustainability and celebrating the natural environment. Many of the local residents are well travelled, well educated and environmentally aware, hence it is no surprise that the growing awareness of climate change issues led in 2005 to a local newspaper advert inviting interested community members to form a group focused on exploring where and how to make a positive contribution to sustainability.

This small advert led to the formation of the Hepburn Renewable Energy Association (HREA) which, a couple of years later, is in the advanced stages of developing a small wind energy park with the potential to generate enough electricity to power the entire Hepburn/Daylesford community.

##### ***Community Champions***

Amongst the founding core group of HREA were two local residents with particular skills and knowledge about power generation via wind energy – Per Bernard, originally from Denmark, initiator of the newspaper advert and now HREA Chairman, and Brett Dutton, senior manager with Vestas and currently HREA Secretary.

HREA did not set out to simply build a wind park, rather, the wind park project emerged as the most appropriate starting point for action following many robust discussions about sustainability and the contribution that communities could make.

Committee Member Brett Dutton comments that “the debates about which initiatives to pursue were extremely valuable in advancing the community’s knowledge about sustainability, so that the wind park project was founded on a base of knowledge and broad support”.

The Hepburn Community Wind Park will be the first such venture in Australia. However, the concept is common and well developed in other countries – particularly Denmark where Per Bernard had personal experience of the organisation and workings of similar community-owned ventures.

##### ***Project Partners***

HREA, with a membership of over 400 residents from the Hepburn/Daylesford area, was a key player in the early stages of the project development. However, the project has benefited greatly from the support of project partner, Future Energy Pty Ltd (FE). FE was established by Managing Director David Shapero to profitably develop and manage small scale renewable energy generation facilities. The company has been working with HREA on the project for over two years.

In broad terms, HREA was responsible in the community for establishing awareness, building support, and maintaining regular communication. FE focused on the actual development of the wind park project and the many technical, regulatory and operational aspects that would need to be resolved.



## **Community-Based Water and Energy Initiatives**

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The project received a further boost in November 2006 when the then Minister for the Environment, John Thwaites, announced that Sustainability Victoria would contribute \$975,000 from the Renewable Energy Support Fund towards the estimated start-up cost of \$9 million.

After years of collaboration, hard work and passion from Per Barnard, Brett Dutton and a number of other community members, the objective of building a 4MW wind powered generating facility (2 x 2MW wind turbines) in the Hepburn area is close to being realised. HREA has handed the development and operation phases of the wind project over to the community-based Hepburn Community Wind Park Co-operative Ltd (Hepburn Wind). Hepburn Wind will own and operate the wind farm on behalf of its members and shareholders.

Hepburn Wind launched their share offer in July 2008. If oversubscribed, residents of the Daylesford/Hepburn communities will be given priority in the share offer, with the aim of ensuring Hepburn Wind is majority owned by the local community. The wind farm will generate enough electricity to power over 2,000 homes, with the income from power sales into the grid providing a commercial return on investment to the owners.

### ***The Future***

The major areas of activity over the next year for the Hepburn Wind/Future Energy partnership are:

- Finalising fundraising from the local community, commercial lenders and the wider public through a public share offer. SV will also require regular reporting and oversight of progress to enable the release of the promised grant funding.
- A range of agreements and contracts will need to be developed, negotiated, agreed and signed, including an Engineer/Procure/Construct (EPC) agreement for the infrastructure which will include imported turbines and other components; a project management contract with appropriately qualified consultants; a grid connection agreement with Powercor; and a purchase agreement for the power produced. Many of these agreements are being developed already and preliminary discussions have taken place.

Current worldwide demand for wind turbines means that the waiting period is over twelve months, so it is likely to be 2010 before the facility commences generating power. All the same, the project will certainly still be the first community-owned wind energy facility in the country and is an excellent example of what can be achieved by a passionate community with drive, determination, and a little help along the way.

### **KEY SUCCESS FACTORS**

The HREA/FE collaboration correctly identified wind energy as the most commercially viable source of renewable electricity under the current Australian energy industry structure and regulatory regime.

The Goldfields area, along with some alpine areas and the Victorian coastline, is blessed with wind energy sufficient to effectively develop power, and self-evidently appropriate wind energy is an essential pre-requisite for any wind energy facility.

The combination of the local Hepburn/Daylesford community, key HREA officers and Future Energy was a key factor in the pioneering progress that has been made. In particular:

- Per Bernard had practical experience of community wind farms from his Danish upbringing, while Brett Dutton works in the wind energy industry with Vestas and has a deep understanding of the many unique issues involved. Along with other motivated



## **Community-Based Water and Energy Initiatives**

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community members who formed the HREA committee, they have very effectively maintained positive community momentum and support;

- Future Energy has spent several years and considerable money to develop their knowledge, connections, and business model and was looking for a suitable start-up opportunity. The symbiotic combination of business motivation and community momentum was and is extremely significant in this initiative;
- The Hepburn/Daylesford community is already well disposed to alternative technologies and new approaches to environmental issues, hence was always likely to be receptive to such a project.

The importance of bringing together a suitably skilled core group in a receptive community cannot be underestimated, however the group also worked effectively and creatively in gathering local support for the project.

Additional key factors and strategies resulting in the success of the project include:

### ***Community Awareness and Communication***

Regular meetings and information sessions have been maintained, along with street information stalls, newsletters, website and local media coverage. Bus tours to Challicum Hills Wind Farm were organised to let local residents experience wind turbines up close – this strategy allayed many fears. The HREA currently boasts over 400 members which is more than 20% of local households.

### ***International Wind Energy Experience***

General sustainability information was disseminated throughout the community to help stimulate interest and pride in pioneering such an initiative in Australia.

### ***State Government Support***

The decision to provide a grant of almost \$1m by the government followed an assessment of the plan by Sustainability Victoria, who have remained very supportive of the project in every possible way.

### ***Relevance to Community***

The size and scope of the project in terms of power output was deliberately chosen to roughly match the size of the local community (2000 households), thereby creating a feeling of ownership and relevance. Furthermore, wind turbines by their very prominence represent a strong symbol of a community taking positive action to look after its own energy needs. The proximity of the turbines to the local community, again a deliberate choice, serves as a constant reinforcement to community pride.

### ***Return on Investment***

Underlying the genuine motivation of the community to support a sustainability project, the business model shows that a return on investment of 7% to 9% appears feasible – enough to represent an attractive investment option for local residents and an acceptable one for commercial lenders. For this reason, raising several million dollars to establish the wind park is unlikely to be a major hurdle.

***Intellectual Property Ownership*** – a minor point, but the created IP in documents and processes will be available to HREA, thereby becoming a community asset that can be commercially exploited elsewhere.



## **Community-Based Water and Energy Initiatives**

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### ***Council Support***

The presence of large turbines on hilltops and coastlines is not universally accepted or approved by the community and rural councils have little prior experience when asked to make planning decisions for such facilities. As such, planning approval was always going to be an early test for such a pioneering project.

However, following the excellent work done by Per Bernard and his colleagues within the HREA in gaining popular public support, as outlined above, and despite a small number of objections being received, the council determined at its meeting on 20<sup>th</sup> February 2007 to grant a planning permit subject to some reasonable conditions.

Following planning approval, a small group of local objectors appealed the decision at VCAT. On 2<sup>nd</sup> August 2007 VCAT approved the project to proceed. This positive VCAT ruling which overturned local objections is a significant milestone that will encourage other community groups in the region to move quickly to pursue similar initiatives.

### **REPLICABILITY AND COMMUNITY VALUE**

The Hepburn/Daylesford Community Wind Park project has the potential to be a template for the establishment of viable distributed renewable energy generation in Australia. By taking careful note of the key success factors described above, other communities should be able to quickly judge their capability to follow the HREA example.

In time, other companies like Future Energy will no doubt evolve, allowing community groups to have the benefit of choice and competition in their selection of project and business partners to take care of the start-up, construction, technological and operational aspects of wind energy. Without such a commercial partner, communities will face additional challenges as they will need to directly employ and manage the necessary skilled resources.

Other distributed energy projects based on solar power, biomass or geothermal energy are feasible if financial viability can be achieved, and in many cases a community ownership model along HREA lines is capable of being developed.

### ***Project Aquarius***

#### **SUMMARY**

Despite recent rains, water reserves in the Central Highlands Water region covering Ballarat were only 13% full in spring of 2008. In various areas of Australia large scale subsidised projects have been initiated to encourage householders to reduce their water use and energy consumption by installing lower flow taps and showerheads.

Project Aquarius was conceived and planned by Central Highlands Water (CHW) to try to achieve the same objective cost-effectively in Ballarat with a much smaller base of households, which are therefore less efficient to service. Knowledge of retrofit projects in larger cities – notably Sydney – led CHW to investigate the feasibility of modifying a large-scale program to fit a more modest sized environment such as Ballarat. Similar projects are now under way in regional towns but this project in the Ballarat area was one of the first in regional Australia.



The project commenced in February 2007 with the aim of retrofitting 5,000 households in the Ballarat area over the next two years with water efficient shower heads, tap flow controllers and cistern weights as well as fixing leaks. The net cost to the householder after DSE rebate is \$30, and total installations recently topped 1800 – almost 40% of the target reached in the first six months.

In May 2007 Ballarat's Belinda Kent (pictured above) became the 1000th resident to receive a water system re-fit courtesy of Central Highland's Water's Project Aquarius scheme. CHW CEO John Barnes commented "We certainly want to encourage more people to take it up. They'll save water and, particularly on their water heating bill they'll save money year after year after year," he said.

#### ***Minimum costs to households***

As the plan evolved, it became clear that a rebate would be an important component in engaging the community and enabling the participation of all socio-economic groups in significant numbers. DSE agreed to CHW's proposal to provide a \$50 rebate per household for a package of water saving initiatives installed by CHW, up to a maximum of \$250,000 (5,000 households).

It quickly became apparent that CHW did not have the resources or facilities to manage the whole project themselves, hence the decision was taken to engage Fieldforce Services Ltd as the implementation sub-contractor. Fieldforce Services specialises in providing water, energy and conservation services and has carried out the majority of household water re-fit projects in Australia on behalf of various utilities.

For an outlay of \$80 payable when the work is done, a householder receives a water re-fit carried out by a professional plumber which comprises the fitting of a 3-star showerhead (choice of three styles), flow controllers on internal taps, toilet flush control for single flush toilets and the fixing of up to three leaks from taps or toilet cisterns.



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CHW periodically submits documentation to DSE for a bulk payment of rebates due, and when the credit is received, \$50 is credited to individual household water accounts where the retrofits have been carried out.

Industry data available to CHW indicated that the net result of a water refit should be a reduction in consumption on average of 18,000 litres per annum per household, and a saving in energy bills as a result of the reduced amount of hot water used of around \$75 annually.

Through 2007, Ballarat residents have reduced their water consumption by around 13%, and CHW Marketing Manager Phil Anstis believes Project Aquarius has been a key factor. "The monthly water saving actions are deceptively simple but also deceptively effective as they save a lot of water," he said.

Through Project Aquarius, CHW has created a model to enable communities to enjoy efficiency gains and cost savings from lower water and power consumption for a very low outlay.

### **KEY SUCCESS FACTORS**

While water refit schemes are in operation in major municipalities, projects in communities with smaller population bases are rare. While the initiative was motivated by the water efficiency targets set for the region by DSE, the project's success to date has resulted from key decisions and outcomes initiated by CHW management, including:

- Reaching agreement with DSE that their existing household rebate scheme would apply to retrofits initiated under Project Aquarius was significant in making the retrofits more affordable to the community;
- Recognition that the project could not be effectively managed internally, and hence the decision to outsource the customer response, component procurement, scheduling and installation components to Fieldforce Services (FS);
- Successful negotiation with FS to undertake the work in a smaller and logistically more difficult area at an acceptable price;
- The experimentation with various media strategies to stretch marketing budgets as cost-effectively as possible;
- Ultimately, the delivery of substantial water use and energy reductions in retrofitted households will be the real measure of success.

### **REPLICABILITY AND COMMUNITY VALUE**

The community value inherent in Project Aquarius is that it provides low cost access to water and energy efficiencies and cost savings to the whole community.

CHW has created a model that should be easy for other water authorities to replicate, however they will need to make sure that the installation logistics of a smaller program can still be made to work cost-effectively. Demand Manager Brendan Clarke is confident that the scheme can be extended to Maryborough within a few months.

It is also feasible to consider a similar scheme being managed by a community action group, however DSE would need some assurances that the organisation and governance of the project was robust prior to committing to provide rebates, and a suitable contract would need to be negotiated with an installation contractor.

### ***Maldon Farm Water Supply***

#### **SUMMARY**

The town of Maldon in the Victorian Goldfields has a resident population of around 1500 – a far cry from the 1850s when over 40,000 miners toiled in the nearby creeks and gullies in the hope of making their fortune. The town was formally declared a municipality in 1858, and enjoyed reasonable prosperity from gold mining for the next 40 years until most of the seams became too difficult and costly to mine. Maldon has for decades drawn its town water supply via a pipeline from Castlemaine.

At some point during previous periods of drought, the need arose for local farmers with dry dams to be able to access the town water supply to support livestock and general farm use, hence a large stand pipe was installed on the south side of town to enable the filling of water tankers.



Alliance Resources Ltd holds the licence to mine for gold in the area, and in 2005/6 began expanding its operations. The many old mine workings in the area were all flooded from various groundwater sources, hence before any new mining could start, Alliance needed to pump out the water and will continue to pump 24/7 to keep the shafts open. The water quality is adequate for livestock and crops but is not potable. Steve Johnson, Alliance CEO, commented that “the amount of water we were

extracting was a real problem during cold weather when it was harder to evaporate. Without the pipeline idea, we would have had to invest in additional water storage and removal systems, so this will be a win win for us all”.

The concept of using mine water for livestock and farm use instead of town water originated with local farmer Barry McKnight – reportedly following a chat in the local pub. “My son is in the mining game and the idea dawned on us over a beer when he came to visit at Christmas” said McKnight. He then motivated his neighbours to form the Nuggety Water Users Group (NWUG) and initiated discussions with Alliance and the local Mount Alexander Shire Council. “The council were very supportive, and agreed to handle the project management in cooperation with the mine, as well as facilitate liaison with the other government bodies who had to be involved”.

With the support of the local council, various grants and donations, and a fund raising effort by the NWUG (local farmers), a pipeline is being built to carry the mine water to the local prison, community facilities and some 25 farms in the immediate area. This will remove the need to use treated water and will enable the eventual closure of the stand pipe.

The total cost of the project will be around \$150,000, of which \$100,000 has been provided by GMW from State Community Grant drought relief funding to cover the cost of the main pipe and pressure tank. The balance of the work will be funded by grants from the Maldon Community Bank Branch of Bendigo Bank (\$10,000), and other local sources including the



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farmers and the local community. Once constructed, the NWUG will own the pipeline and be responsible for ongoing maintenance.

Once the pipeline is fully operational, it is the intention to shut down the existing town water stand pipe, thereby saving considerable volumes of town water annually.

### **KEY SUCCESS FACTORS**

While this specific project relies on an unusual confluence of geographical and situational factors for its success, it is indicative of the kind of valuable community initiative that lateral thinking and an awareness of local needs and conditions can create.

The local farmers were smart enough to recognise that the excess water creating problems in the mines could substantially reduce if not eliminate their reliance on town water in times of drought. The key success factors thereafter have been:

- Negotiating access to large volumes of water of a quality suitable for livestock and other non-potable uses;
- Formation of the NWUG as an active and committed action group;
- Bringing the local council into the picture early to facilitate their discussions with Alliance, and the various government departments and authorities who needed to be involved;
- Persuading the council to take on the project management of the plan at no cost to the local community;
- Negotiating crown land access for the pipeline with DSE at no cost;
- Gaining the support of Alliance including a commitment to pay for the engineering review of the plan (a sensible safeguard on Alliance's part to make sure the job is done properly and their mining operations are not put at risk);
- Securing funding for the project from a variety of public and private sources.

Mark Boyd-Graham, Chairman of the local Bendigo Community Bank, commented that "once word of this idea became public, there was no hesitation on our part to support the project, and other local businesses and individuals readily became involved. It really is a no brainer for this community".

### **REPLICABILITY AND COMMUNITY VALUE**

The wider lesson from this case study is that opportunities to use a coincidence of needs and circumstances exist everywhere if someone is smart enough to see and exploit them. For this to happen, the importance of driving awareness amongst communities of the real value of water and energy resources cannot be overstated.

Rural and regional communities in Australia have always been conscious of the need to minimise their use of water, hence it is no surprise that water projects are numerous and ingenious throughout the state's rural areas, as this case study has shown.



### ***Shipwreck Coast Geothermal Energy and Water***

#### **SUMMARY**

In many parts of the world, geothermal energy has been used as a low cost and virtually infinite source of heat and/or energy for decades, and the technologies for pumping and piping hot water to where it is needed, or for generating electricity from direct geothermal steam are well evolved. As with wind farms, models for community ownership and use of such resources exist overseas but not yet in Australia.

Geothermal water resources have been used in Portland since 1983, to provide both water for town water supply and heat for the community. The Henty Park bore near Portland was drilled in 1982 for the purpose of extracting geothermal heated water from the Dilwyn aquifer, 1.3km below Portland. Initially the bore water served the dual purpose as a source of water for Portland and for the supply of geothermal energy for the heating of civic buildings.

During the 1996/97 financial year, Wannon Water disconnected the bore from the water supply system due to ongoing water quality concerns. Since then the bore has been used solely to supply hot water to the Council for the heating of various civic buildings including council buildings, Portland hospital, police station, swimming pool and the Richmond Henty motel.

Having passed through the council's heating system, the bore water is then cooled by Wannon Water prior to being discharged into the Portland canal. This cooling process is energy intensive, consuming approximately 800 megawatt hours of power per annum.

Wannon Water had concerns regarding the sustainability of this system given the high water and electrical consumption. In addition, the bore is due to be closed in the very near future due to poor plant and equipment condition; however the council is investigating options for the drilling and commissioning of a new bore.

#### **Spa Resort Development**

A new project in the region which is utilising the geothermal water resources is the *Mantra Deep Blue Resort*, involving an innovative method for using geothermal hot water for heating and everyday use which is replicable in other communities.

The motivation to develop the Mantra Deep Blue resort with geothermal energy as a supplement to conventional heating came initially from local developer Graeme Schultz, the sole director of development company Bambro Investments. "I was well aware of the existence of the aquifer," he said, "and it seemed like good commercial and environmental sense to try and use it".

Separately in 2005, Syncline Energy was established by Phillip Galloway, an engineer and mining executive, and Professor Jim Cull, Professor of Regional/Exploration Geophysics at Monash University, with the business plan to be Australia's largest developer and owner of direct geothermal energy projects. "There are several areas in Victoria which offer good potential for using the energy in geothermal water, and being able to start with a high-profile project in Warnambool is ideal," he commented.

The project involves water being pumped from a 770m geothermal bore at a temperature of 44°C, operating 24-hours per day, seven days per week. A small proportion of the water is used to heat the swimming pool and spas, with the majority of it used, via a heat exchange



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system, to preheat the facility's domestic hot water. In cold weather the heat from the bore also pre-heats the water in the resort's hydronic heating system.

Pre-heating with the geothermal hot water reduces the consumption of natural gas by 5,600 gigajoules (GJ) per year, the equivalent of 1,500 megawatt hours. On this basis, Sustainability Victoria provided approximately 20% of the capital cost (\$235,000) as a grant from the Renewable Energy Support Fund.

The geothermal water is directly used for a variety of purposes including toilet flushing and garden watering when mixed with filtered grey water after spa use.

Apart from the cost savings the resort will enjoy by purchasing geothermal water at lower cost than normal water and energy, there are opportunities for the provision of surplus bore water to other local organisations including:

- Warrnambool City Council is interested in purchasing 400 GJ equivalent of heat each year from the bore to heat the buildings and facilities at its proposed development of a yacht club on the foreshore, a distance of approximately 1km from the Mantra Deep Blue Resort.
- Wannon Water is very interested in purchasing any of the bore's water production that will not be used at the resort. This water will be given preliminary treatment at the resort before being pumped to Wannon Water's facilities for final treatment and use as domestic drinking water in Warrnambool
- Big4 Ocean Beach Holiday Village, located only a few hundred metres from the Mantra Deep Blue Resort, is also interested in purchasing hot water from the bore to heat its sixty-two units and cabins (currently heated by reverse cycle air-conditioners), the swimming pool and other guest facilities.

Given the widespread interest in the heat and water from this site, and the excellent geothermal resource in the region, it is possible that additional organisations may choose to access this resource. Opportunity exists for community groups, local councils and other organisations to re-investigate the possibility of tapping into this supply for wider community benefit, and for other communities in Victoria to investigate their own geothermal resources. (See Appendix 5 – Geothermal Energy Summary)

### KEY SUCCESS FACTORS

The obvious key factor in the success of this project is the presence of an excellent geothermal energy resource, closely followed by a history of geothermal energy use in the region providing an example for the development of future projects.

Assuming a geothermal water source with the right characteristics is available, the critical factors that helped to deliver a successful outcome and form a template for other similar projects are:

- The support and cooperation of Warrnambool Council regarding stormwater impacts and other issues
- The granting of a Water Extraction Licence by Southern Rural Water (no planning permit was required) albeit after a very long period of investigation which delayed the project
- The establishment of a robust and binding commercial arrangement between the end user and the technology provider which set out clearly each party's obligations and expectations



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- The involvement of an expert geothermal provider experienced in project managing and driving all aspects of the project

As Graeme Schultz commented, “the council and local community were a bit apprehensive at first but were always supportive of the core idea. Certainly the long drawn-out process of obtaining our Extraction Licence was frustrating, but in the end it has all come together well”.

### **REPLICABILITY AND COMMUNITY VALUE**

Victoria has geothermal resources in several areas of the state. However, notwithstanding SV’s support of this project, there is little evidence of community groups being encouraged to consider similar projects as a source of renewable energy for water and space heating.

An opportunity exists for suitably located communities, in cooperation with experts, to pursue development and ownership models for geothermal bores for heating and supplementary water. Community structures along the lines proposed for the wind energy farm in Hepburn would seem to be equally applicable to geothermal extraction projects. In geothermal areas with no access to natural gas, such a development could offer significant benefits to local residents in terms of energy cost savings, reduced emissions from conventional energy for heating and the generation of funds for other projects.

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.

### ***Biogas Power Generation***

#### **SUMMARY**

The treatment of human and commercial waste water takes place in over 140 facilities around Victoria managed by the various water authorities. Most treatment plants rely on aerobic treatment in open ponds; however some authorities have introduced the more efficient High Rate Anaerobic Lagoon (HRAL) system to meet their special needs.

A by-product of HRAL waste treatment is the production of significant quantities of flammable methane gas. Methane is a potent greenhouse gas – with a global warming potential 20 to 30 times more potent than carbon dioxide – and is also the main component of natural gas.

At the Goulburn Valley Water (GVW) HRAL treatment plant in Tatura, Diamond Energy has invested in a plant to capture this gas and exploit its energy value. They have installed a biogas generation plant capable of producing around 1 megawatt (MW) of electricity from the methane collected from GVW's Tatura HRAL ponds – sufficient to power around 1,000 homes.



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 which store the gas and provide the pressure to allow the use of the gas at any time. 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. Indeed, GVW already has plans for a second biogas generator to be constructed in 2008 at the Sheparton HRAL treatment plant, which will begin operation in 2009.

A request for funding was lodged with Sustainability Victoria (then the SEAV) which was received favourably and eventually led to a grant of \$800,000 being allocated (20% of estimated capital cost) from the government's Renewable Energy Support Fund in March 2005. Announcing the grant at the time, Ministers Thwaites and Theophanous commented that "Diamond Energy and Goulburn Valley Water are embarking on a technology application never before seen in Victoria". The energy to be produced from the three plants was expected to be sufficient to power 2,600 homes while cutting greenhouse pollution by 20,000 tonnes annually.

In mid-2005 GVW decided on a low risk partnership option whereby it would merely sell rights to its methane output to Diamond Energy who would then be responsible for the construction and ongoing operation of the biogas generation plant and the sale of the electricity produced.

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This necessitated the negotiation of innovative agreements between the parties including:

- Biogas Purchase and Supply Agreement covering the responsibilities and obligations of the parties and the essentials of the commercial relationship as regards gas supply and use; and
- Access and lease agreement under which Diamond Energy leases the necessary land where its biogas generation plant and power line poles are situated with appropriate access rights.

The completed plant (pictured below) was commissioned in January 2007 and has been contributing electricity into the local grid on a regular basis since then. The HRALs are away to the left a few hundred metres from the plant, while the conventional aerobic treatment lagoons are on either side.



The financial model on which the project was based anticipated a modest income stream to GVW from the sale of biogas to Diamond Energy and the leasing of the land for the plant. From Diamond Energy's perspective, the viability of the project depends on its ability to earn a return on its investment of several million dollars (not including the \$800,000 grant from SV), and other available income sources such as the sale of RECs and greenhouse abatement credits.

### KEY SUCCESS FACTORS

That a complex and ground-breaking project of this type has succeeded to the point of sustainable energy generation from biogas is a tribute to the determination and spirit of cooperation that has obviously evolved between GVW and Diamond Energy over the last three years. The other key success factors of the project are:

- The willingness of a naturally risk-averse organisation such as GVW to invest in HRAL technology and to then seek a commercial and environmental benefit from the methane output



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- The expertise of Diamond Energy and its preparedness to take on financial risks to demonstrate the feasibility of the process
- The support of the project to the extent of some 20% of capital cost by SV is a positive demonstration of the government's support for localised renewable generation as a valuable addition to the overall grid network which can be activated when local demand is highest
- The addition of flexible covers to the HRAL lagoons to enable the storage of biogas. Generation can then be scheduled during peak load and peak spot price periods, which assists in stabilising the local supply grid during such peak periods, and (subject to changes in market pricing arrangements) improves the financial viability of the plant.

### REPLICABILITY AND COMMUNITY VALUE

Unlike most of the case studies in this report, this project has not been initiated by the community, and other than via interaction with the local council, the community has not been involved or consulted.

The initiative was taken by GVW to move to HRAL waste treatment because of its specific issues with organic waste, and to seek a revenue stream from the methane biogas produced. The partnership that has evolved with Diamond Energy has delivered a technically successful outcome which however is not yet achieving acceptable financial returns. As MD Tony Sennitt comments, "any significant new project of this type faces challenges. With mutual goodwill between the parties, the start up difficulties have been effectively overcome. However small distributed generators such as ourselves still struggle to gain support and recognition for our efforts in pioneering renewable energy generation".

An operational template has been created in Tatura which can in theory be replicated where HRAL waste treatment lagoons or other sources of methane exist or can be created, such as plant waste. Furthermore, it would seem feasible to extend the benefits more broadly than simply electricity generation. The heat produced during the combustion process could in theory be captured for use via a hydronic heating arrangement, while the CO<sub>2</sub> might be captured to stimulate the growth of algae or other plant material which could ultimately be used as livestock food.

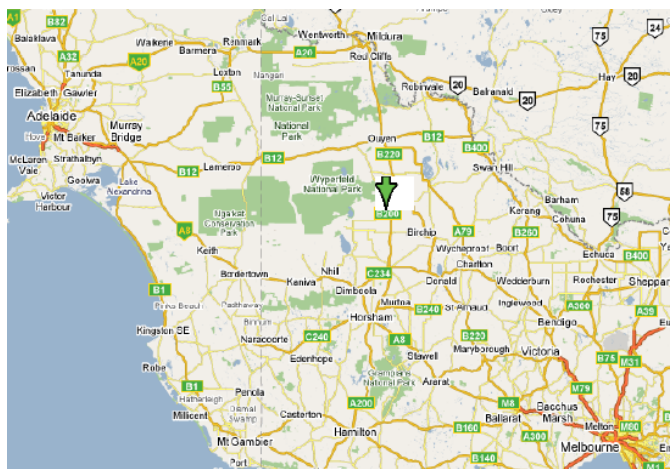
Various community involvement models become possible if the gas source and/or the generation plant can be owned, or the gas feedstock supplied by the local community, as could be the case in rural areas if waste agricultural composting were the source. As with other generation initiatives in this report, the local community would need access to appropriate technology and operational expertise as well as financial backing.

The project described later in this report to assess the capability of the Hopetoun community to generate local power will review biogas generation as a possible solution.

### ***Hopetoun Sustainability Audit***

#### **SUMMARY**

The 670 residents of Hopetoun in the southern Mallee are used to the energy and water challenges caused by their relative isolation 400km from Melbourne. The town has a history of self-sufficiency, relying on a diesel generator for its power supply until the 1970s when it was connected to the electricity grid. Back in 1958 the Hopetoun Community Hotel Co-operative Society Ltd took over the ownership and operation of a local pub which the existing owners intended to close down.



The town has no access to natural gas, and the commuter railway link was discontinued decades ago, leaving the town reliant on coaches for public transport to other parts of the state. Maintaining adequate water supplies for the widespread farming activity has also been a major challenge for this dry region, and today Grampians Wimmera Mallee Water supplies the area from a number of storage lakes and dams fed by the Glenelg and Wimmera rivers, as well as underground sources.

In the last few years, Sustainability Victoria (SV) has established Sustainable Energy Information Partnerships with organisations across the state to provide quality energy efficiency and renewable energy information to rural and regional residents, community groups and businesses.

In 2005, Hopetoun was chosen as one of nine Information Point sites by SV. It was designated to provide practical information on saving energy at home and in the workplace, including how to cut electricity and gas bills, creating a more comfortable living and working environment, and helping to cut greenhouse pollution. This selection was based on Hopetoun's history of effective community cooperative effort and established track record as an active and motivated community.

Not satisfied with this achievement, the community has embraced the need to further examine renewable energy options for the town. In early 2006, the National Centre for Sustainability at Ballarat University (NCS) submitted a proposal to SV on behalf of the Hopetoun region to explore Hopetoun's current and projected power demand and investigate potential local renewable energy alternatives. This includes collecting solar access and wind speed data, assessing biomass potential and developing a model of community management for other communities to apply.

The successful grant of \$100,000 will enable NCS to review the energy needs of Hopetoun, assessing the renewable energy resource options available and the capacity of the town to generate renewable energy, and developing a template for other similar communities to apply.

University of Ballarat project manager Craig Hurley said "The people of Hopetoun have been keen for some time to find out if it's feasible for their community to help Victoria's carbon

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emissions by becoming a renewable energy generator, but weren't sure how to proceed. This project will research what capacity Hopetoun has for the generation of clean renewable energy. We expect to find out what it would cost and how the community might finance such a project."

The project is a highly collaborative community initiative which will depend significantly on the support and involvement of the Yarriambiack Shire Council, the Hopetoun Progress Association and the Coorong Development Cooperative for its success.

"The university approached us with the idea of mounting this exciting and innovative project in relation to exploring alternative and sustainable energy," explains Ross Cook of the Coorong Development Cooperative. "We expect the project to focus particularly on the feasibility of wind, solar and bio-mass (organic waste) power," she added.

The research will be driven by a local steering committee formed from dedicated community volunteers including a councillor, the local newspaper editor, members of the Progress Association, local high school principal and students, a local farmer and representatives from the DPI Regional Office.

If the results suggest that the community could generate a worthwhile amount of power cost effectively by a renewable means, a detailed feasibility study will be undertaken subject to further funding being available. This will take into account the total benefits that might accrue from a particular option such as job creation, even if in strictly financial terms there may be a cheaper alternative.

Subsequent phases may involve assisting the local community to engage with the necessary government and private entities who will need to be involved to fund and implement the power generation project.

### KEY SUCCESS FACTORS

Whilst this project is just commencing, one of the key success factors in getting the sustainability audit off the ground would have to be the community itself. Over the years it has demonstrated its willingness and ability to act together to solve problems and manage issues affecting the town. It can be expected that if a viable renewable power source can be identified, the town community will again rally together to implement the project as effectively as possible.



Additionally, Sustainability Victoria saw the benefit in investigating the potential for a remote rural community to establish an alternative source of power generation, particularly if this produces other benefits such as creating jobs. The grant of \$100,000 will assist the Hopetoun community by enabling the NCS to conduct Phase One of a thorough study which will be crucial to the overall success of the project.

### REPLICABILITY AND COMMUNITY VALUE

Many towns across Australia are relatively isolated and heavily dependent on a few major economic drivers and on unreliable (or non-expandable) energy and water supplies for their survival. The project which has commenced in Hopetoun, whilst in its very early stage,



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provides a valuable template for other communities to use when exploring renewable energy options.

In addition, the Hopetoun community's willingness to band together and intervene when faced with the loss of community assets in the past demonstrates the power of a strong local community when confronting the challenges which are common to many small rural Victorian towns.



### ***Energy Services Provider Model – Ararat Trial***

#### **SUMMARY**

The adoption of energy and water efficiency measures by domestic households, public organisations and small businesses is an objective supported by all governments and political parties. However despite various rebate schemes, the affordability of such measures continues to be an obstacle for a significant number of households and small businesses.

However, an opportunity exists to replicate a model in use in the USA whereby a third party provides an energy service for a fee, and the consumer gains some of the benefits of that service without the upfront costs. Such a model could easily be adopted by a community group, council or a business.

Start-up company Earth Utility Pty Ltd aims to make sustainable utilities affordable and simple to adopt. By financing the initial capital outlays for solar hot water and rain water tanks consumers are able to obtain these technologies and their related services for an ongoing service fee, avoiding the large up-front costs.

In addition to organising the installation of the chosen units, the company provides ongoing maintenance for the term of the contract. It is expected that the ongoing service fee will be offset by the energy or water saving, and as such the consumer, although not saving as much as if they were able to afford the unit outright, should in most cases be financially better off than without the service. However, this situation could be greatly improved if the model were to be adopted by a not-for-profit entity such as a local council or community group.

Earth Utility has received a grant from Sustainability Victoria to pilot its business model and has received support from Ararat Council to implement trial sites in the local area.

“Ararat Rural City Council is thrilled to participate in this new innovative program, which introduces solar hot water systems as the ideal option to reduce your energy bills by up to 30% and protect the environment. We encourage all our residents to participate,” said Mayor, Cr Ian Wilson.

Installations commenced in July 2007 and full monitoring and reporting will be complete by April 2009. The council’s support for the model stems from the belief that it will enable both the council and the community to reduce energy and water costs and emissions in a way that promises to be simple to adopt and more affordable for average households.

The main service which the pilot will focus on is the installation of gas, electric or LPG boosted solar hot water systems which are capable of delivering significant energy cost savings as well as reducing the average household carbon footprint by up to 30%. The pilot project in Ararat commenced in July 2007, with local installers being trained and the first installations occurring at the Ararat Hills Estate.

Although in this instance the service is being provided by a for-profit company, there is no reason why a council or community group with the ability to raise some capital for the initial outlays would not be able to implement a similar system.

#### **KEY SUCCESS FACTORS**

The elimination of capital outlays via a service fee model and the outsourcing of ongoing maintenance responsibilities is a familiar option used by businesses and the public sector.



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This application of the same thinking to the provision of sustainable utilities and services is unique in Australia and has received strong support from both Sustainability Victoria and the Ararat Rural Council.

The grant from SV provides the opportunity to test the customer appeal and benefits delivered by this approach in a real-life pilot. All of the grant funds will be used to procure and install equipment on Ararat Council and/or community buildings which will remain in place regardless of the outcome of the pilot.

If the business model proves attractive to consumers and financially viable, it could be replicated by community groups or councils in order to provide low-cost and economical renewable energy to low income consumers who would otherwise not be able to access the benefits due to the large up-front costs.

### **REPLICABILITY AND COMMUNITY VALUE**

This case study describes a business venture and, if successful, may stimulate the provision of similar services to other communities across Australia with the benefits described above.

From a 'total cost of ownership' perspective, it is probably still preferable for households to purchase energy efficient utilities outright and retain the energy savings within the household budget. However, where this is not possible, the service provider alternative does enable low income households to gain access to more efficient appliances. Again, the most beneficial model for the householder would be one where the provider is a not-for-profit entity and as such the majority of the savings are able to be passed on to the consumer.

Community action groups such as BREAZE in Ballarat have gone a long way to simplify the problems faced by householders in selecting, purchasing and having sustainable utilities installed. It is feasible that by arranging funding support, a community group too could duplicate this concept, provided they are able to secure financing for the up-front costs and service this loan through the service fee.

### **Alpine Shire Natural Gas Access**

#### **SUMMARY**

Natural gas became available in Victoria in 1979, and through the '70s and '80s a reticulation network was installed across Melbourne and in other major cities. Recognising both the economic and environmental benefits arising from a low cost and relatively clean fuel, the State Government launched the Natural Gas Extension Program (NGEP) in 2003 with a budget of \$70m.



The economic benefits of natural gas in terms of energy 'value for money' as an alternative to electricity have been widely documented. The secondary benefit of natural gas – its significantly reduced environmental impact as an energy source compared to coal-fired electricity – has become much more important in recent years as concerns over carbon emissions have entered mainstream awareness.

After a detailed evaluation of submissions from councils and bids from potential operators, 34 towns were named to receive natural gas, and three bidders were approved to build and manage

the new networks. Currently work is in progress or completed in 29 of the 34 towns. The Alpine and Indigo Shire Councils and their local communities battled hard for the inclusion of towns such as Myrtleford, Bright, and Beechworth, and believed that a commitment to include them was given by the government. In the end, however, these towns were not included in the current NGEP process.

#### **Lack of Reticulated Natural Gas**

The decision to exclude Myrtleford and neighbouring towns from the NGEP has and will continue to cause significant economic disruption to these communities via a vicious circle of commercial decline, for example:

- Existing businesses do not have access to cheaper energy from gas, hence become less competitive to the point of closure or relocation away from the area
- New businesses are concerned and cautious about investing in an area where there is no access to cheaper energy. This reduces the possibility of offsetting the societal changes which have caused, for example, the closure of the Myrtleford tobacco industry and consequential job losses.

The net result is that from a business and employment perspective these towns are in decline because established businesses may not continue, and new replacement businesses are less likely to be attracted.

#### **Alternatives to Natural Gas Reticulation**

The communities of Myrtleford, Bright and the wider Ovens Valley weren't satisfied with the result of the NGEP review and set about examining alternatives to natural gas reticulation. Work was done in 2005/6 by Alpine Shire to evaluate other options including the reticulation of Liquefied Petroleum Gas (LPG), and the bulk storage and reticulation of liquid and compressed natural gas (LNG, CNG). The best option appeared to be storage of CNG on a town-by-town basis with localised reticulation, however even this was beyond the capacity of the local councils to fund.



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Attempts to secure funding from the gas distributors and State Government were again unsuccessful on economic grounds and the project lapsed. Since then, the council and community have been unable to access further support and/or resources from state or commercial entities for the investigation of other energy supply alternatives. Despite these failures, Council Economic Development Officer Kim Muhlen continues to seek alternative solutions. “Access to alternative energy sources would make a significant difference to the economic wellbeing of this community” she said, “and obviously if a solution is based on renewable energy that would be even better”.

The various community action groups – in particular the Ovens Valley Awareness (OVAG) and landcare groups – are keen to establish community campaigns to reduce their carbon emissions, but have little scope for significant improvements beyond energy efficiency awareness and conversion activities such as the installation of compact fluoro lights, electric boosted solar hot water and the purchase of GreenPower. OVAG Chairman Cheryl Sanderson still believes that a commitment was made by the government to include Myrtleford in the NGEF scheme. “In the end it wasn’t to be”, she said, “but we’ll keep on exploring every avenue to gain an alternative energy source for the area”.

The limitations caused by the lack of reticulated gas leaves electricity, wood and expensive bottled gas as the alternatives for heating and hot water, limiting the ability to attract businesses to the region. Despite rebate schemes, many renewable energy alternatives remain unaffordable for most people.

Whilst the implementation of a localised embedded gas network (CNG, LPG or LNG) was a preferred model for this community, the financial burden of such a project proved too great. This is, then, perhaps an opportunity for the local council or a larger community group to establish an energy services utility, such as the Ararat model outlined above.

### **KEY SUCCESS FACTORS**

Up to this point, there are no successes in this case study to analyse. The benefits to the local community if natural gas can be provided are well understood and would dramatically impact local business investment, job creation, and overall prosperity. The councils involved and the local community groups will continue to pressure their local members at every opportunity for access to natural gas, and may one day succeed.

The community, in particular the Ovens Valley Awareness Group (OVAG) is working to develop community initiatives to address water and energy efficiency and stimulate green power purchasing, but the area will not be able to make major gains in stimulating economic activity without external support to investigate alternatives.

Again, the opportunity exists for this community, north of the Divide and blessed with sunlight, to examine renewable energy options and perhaps investigate the implementation of an energy services utility to provide an affordable energy alternative for the region.

### **REPLICABILITY AND COMMUNITY VALUE**

The other significant part of the state without access to natural gas is the north-west, with major country towns such as Swan Hill, Ouyen and Warracknabeal not covered.

Unfortunately, when the proximity of towns such as Myrtleford to existing gas lines (<50km) is compared to the relative isolation of these north-western towns, their connection to gas supplies would seem even less likely. This again argues for more government support to investigate alternative energy supplies (projects such as the Hopetoun Energy Audit) specific to these hot, dry and isolated areas.

### ***Wastewater Reuse in Rural Towns***

#### **SUMMARY**

The research for this report has identified a number of similar water projects in different parts of the state which are indicative of the ability of motivated community groups to achieve significant local benefits through their drive and enthusiasm. Three similar water recycling and reuse projects were identified and are described below. These projects are similar in that they all result in a reduction in the use of treated water through the use of recycled waste water. This yields cost savings and establishes more attractive and functional year-round community and visitor facilities in these towns.

#### **Ouyen Reclaimed Water Project**

Ouyen is one of the largest towns in the Mallee situated some 450km north west of Melbourne and 103km south of Mildura. The town developed around a railway stop established in 1906, and today, with a population of around 2,000, is a transport and service centre for the vast agricultural industry that the Mallee supports.

In 1996 the amalgamation of municipalities resulted in Ouyen losing its own council and falling under the new Mildura Rural City Council (MRCC). In response, the townspeople formed a community organisation called Ouyen Inc, which has become very much the voice of the town in its dealings with the MRCC and with state government. Ouyen Inc exists to provide vision, direction, and leadership to help the town to grow and prosper, and is a successful model that has been copied in other remote areas. It is structured like a council with a chairman and board, and various committee members head up specific project groups.

Ouyen is supplied water via a 30km pipeline from the Murray River. However, while farmers are charged at \$620 per megalitre (ML), the town's domestic and community facilities pay \$1000 per ML, and as such the sports oval alone pays \$14,000 annually in water fees.

In 2001, the state government and Grampians Wimmera Mallee Water (GMMW) funded the installation of sewers to replace the town's reliance on septic tanks and established a new pondage-based waste water treatment plant just outside the town. A Community Opportunity Workshop (COW) held in 2004 identified the possibility of reusing the treated wastewater. The idea gained traction over time as drought conditions continued in the area and the cost of watering community facilities increased.

The project that is now going ahead to use treated wastewater (Class C water) will reduce the use of normal treated water by 20-30ML annually, and more importantly will reduce the cost of watering the community facilities by two-thirds, as it will only be charged at \$330 per ML.

The project is a collaboration between Ouyen Inc and a broad coalition of community groups, including Mildura Rural City Council, Ouyen Lawn Tennis Club, Ouyen Golf Club, Mallee Track Health and Community Services and Ouyen primary and secondary schools to



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name a few. However mobilising broad community support still had its problems as Ouyen Inc Secretary Graeme McKechnie describes. “Initially people couldn’t see the value of the cost and effort required because they regarded the drought situation as only temporary. Some people also tried to take advantage of the scheme for their own needs, so a lot of local networking and arm twisting was needed to create a united support base.”

Over recent months, GMWW and Ouyen Inc have been working to develop the detailed plans for the project including considering options for pressurised versus unpressurised systems and refining the list of sites to be supplied by the treated water system. Council has indicated that once this project is completed it will consider funding additional water infrastructure to make stormwater available for use on community facilities as well.

### Simpson Park, Streatham

The three small towns of Streatham, Mininera and Westmere are situated in central Victoria just south of Ararat, and have a total population of around 500 people. Despite this small number the community is very active with 28 clubs and societies and a well supported community action group. On an annual basis this group meets with Ararat Rural City Council to prepare a community action plan for the coming year and seek funding for projects they wish to pursue.

Simpson Park in the centre of Streatham is an important community facility, but by 2004/5 was in a run-down state with very poor facilities in terms of toilets, barbecues and other amenities. The park is used regularly by various children’s groups as well as being a rest stop for tourists passing through the area.

After community consultation, the action group identified the Simpson Park Redevelopment Project as a priority in its community action plan for 2004/5, and sought council funding for a shelter, all-weather barbeque, new toilet facilities and wheelchair access paths.

Funding was obtained from council and via a grant from Regional Development Victoria for the redevelopment of the park and local community members worked with council to plan the work.



Part of the redevelopment involved using a Biolytix system to treat the waste from the toilets and basins in such a way that the output can be piped away underground to provide water for the gardens and grounds in all parts of the park. The Biolytix container (shown) contains an organic wet-soil ecosystem (worms, beetles, bugs, etc) which treats the waste water to make it suitable for watering use.

SMW Community Development Committee Chairman Dorothy Dunn comments that “we worked hard initially to inform the community of the project via a series of meetings, and once we had broad support it became much easier to seek volunteers and supporters to help with the actual developments”.

The work was completed over a few weeks, followed by a re-opening ceremony and celebration. The community is very proud of what was achieved and they now have an attractive community and tourist park with good facilities in the middle of the town and a state-of-the-art water treatment system which has enabled the flora in the park to stay alive despite the recent dry summer.

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### Wickliffe Recreation Reserve and Wickliffe Common

A little further west along the Glenelg Highway from Streatham is the home of another community project which has used recycled waste water to ensure the health of two of its local amenities – Wickliffe Recreation Reserve and Wickliffe Common. The town of Wickliffe is located on the banks of the Hopkins River at the centre of one of Victoria's premier agricultural areas. The town has a population of a few hundred, comprising farmers and a mix of young families and retirees.

The recreation reserve on one side of town includes facilities for cricket, tennis and football, with the necessary club rooms, showers, changing rooms and toilets. In the town's 2001/2 Action Plan, the community began developing a plan to turn an old hall into a more useful community and tourist facility (the Common), and also proposed the renovation of the facilities at the recreation reserve.

The Wickliffe Common idea stemmed from the Wickliffe Action Group (WAG), who proposed the development of a community facility and roadside stop with toilets and public barbecues. With full community support, the WAG set about raising funds and was able to secure grants initially from the Federal Department of Transport and Regional Services, the State Small Towns Development Fund, Ararat Rural City Council and the CFA. Shortly afterwards, an application for funding under the Federal Community Water Grant Scheme Stage 1 was successful in gaining a grant of \$44,000 to be split equally between the recreation reserve and the new Common.

The key tasks at the two facilities, apart from landscaping, were to improve the water related facilities, as neither was serviced by treated water and the infrastructure was old and inefficient.

The plan involved replacing the old recreation reserve septic tank with a Biolytix system to treat waste water to a quality suitable for native plant watering; installing a rainwater tank with UV filter to provide an additional water source; and replacing existing fixtures with AAA rated toilets, showers, basins, and a waterless urinal. Equally, rainwater tanks with UV filters, a Biolytix system to treat waste water and AAA rated toilets, showers and basins, and a waterless urinal were all installed at the Common.

WAG have set a target of a 30% reduction in treated water use at the recreation reserve as a result of this project and will be monitoring consumption to see if this is being achieved. Both facilities are jointly managed by the community and Ararat Rural City Council, and the council has added additional monitoring and maintenance requirements to the service agreement they have with the town.

The Common, pictured right, is in the centre of town, and was officially opened in February 2007. Apart from some delays to landscaping and the laying of the named pavers caused by the drought, the Common is already proving to be a popular and well used local amenity.





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### **KEY SUCCESS FACTORS**

The common theme running through these three projects is a community action group in a relatively remote and small town recognising that they could make a contribution to more efficient water use whilst also improving their local amenities.

In each case, they have enjoyed the support of the environmentally aware Ararat council (and, in one case, the water authority) and have been able to access funding from either state or federal governments with the help of the council. Importantly, all the projects involved a significant component of community financial and 'in kind' support, and in every case substantial volunteer labour.

Apart from strengthening the community via teamwork on a popular project, these projects have the additional benefit of raising the awareness of water conservation as an issue across the whole community. It is generally felt the projects stimulated many households in these communities to review their own domestic appliances and fittings and to upgrade to more efficient alternatives.

### **REPLICABILITY AND COMMUNITY VALUE**

Almost any community that has sporting or other community facilities that have a water supply should be able to pursue similar objectives to the locals in these three towns. Committed individuals such as Dorothy Dunn in Streatham and Miep Wortel in Wickliffe exist in most towns and can influence and motivate the whole community when the project is seen as topical, worthwhile, and providing benefits to the whole community.

Recent data from the Federal Government's Community Water Grants scheme – now in its fourth funding round since 2004 – indicates that over 450 Victorian water-saving projects have been approved and implemented. Additional water grant funding from the state government and water authorities has also been available, hence there are already many completed projects across the state delivering substantial water savings.

Projects to capture and manage water are relatively easy for communities to support. Water is safe and familiar and most plumbers are able to carry out the work needed to replace old inefficient shower heads or install water tanks. Many public buildings have large roof areas where rainwater can be trapped and then stored in tanks for use on community facilities.

The end result – a healthy and attractive community park or sports facility in the middle of a drought – can be an important psychological boost to ensure that communities stay positive and motivated even in difficult times.



### ***Community Action Group Strategies***

#### **SUMMARY**

The research for this report has identified a significant number of community action groups who are all either embarking on, or have already implemented strategies and programs to tackle energy and water efficiency and supply issues in their communities as part of an overall move towards greater sustainability.

The particular groups who have been reviewed and/or visited as part this research are:

- Ballarat Renewable Energy and Zero Emissions (BREAZE)
- The Mount Alexander Sustainability Group (MASG)
- Strathfieldsaye Community Enterprise (SCE)
- Communities Combating Climate Crisis (C4 Healesville)
- Yea Action Group (Yea)

Below is a discussion of both the formation of these groups and the strategies that these groups have pursued for community engagement, awareness and action towards specific sustainability objectives.

#### **Initiation and Establishment**

Ballarat Renewable Energy and Zero Emissions (BREAZE) came in to being when several like-minded locals supported the national Walk Against Warming campaign in November 2006. To stimulate community interest in their sustainability ideas, they organised a Community Forum at which speakers from the Central Victorian Greenhouse Alliance (CVGA) and Mount Alexander Sustainability Group (MASG) talked about what they were doing to encourage sustainable behaviour. Recruitment via the internet, further public meetings and workshops and networking has lifted membership to several hundred.

The Mount Alexander Sustainability Group (MASG) was formed by an existing small action group in 2005 and was set up as an Incorporated Association in February 2006. It has enjoyed strong support from the local council and the CVGA and has recruited over 400 members through various local initiatives. Amongst the committee are well known 'green' crusaders with broad networks which has enabled the organisation to secure local and state funding, premises, and a reasonable budget with which to pursue its objectives.

The Strathfieldsaye Community Enterprise (SCE) is slightly different in that it has evolved from the Bendigo Bank Community Bank model where a listed company owned by local shareholders is established in the area to own and operate businesses. The profits earned go back into the local community as grants and sponsorships as well as some dividends to shareholders. The local Community Bank and more recently the Community Telco have evolved into Strathfieldsaye Community Enterprise Ltd. The company intends to use its income from banking and telco services to establish and operate sustainable commercial ventures to generate more profits from the local community, to benefit the local community. The business is structured as a company with a board and shareholders to ensure proper and transparent governance.

Communities Combating Climate Crisis (C4 Healesville) is a relatively new organisation still in the process of recruiting members via its website and the networking activities of its core group. One specific project to increase the community use of GreenPower is already under way and others will be added as membership and support grows.



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The Yea Action Group is in earlier stages of development. 'Core motivators' are still trying to develop a larger group into an active action group to address sustainability issues in the area. At this very early stage it is difficult for such people to find the time to do the research to establish a strategy and way forward without external help and support such as that provided in other areas by the Greenhouse Alliance groups.

### Selecting Targets for Action

Most groups form with some core ideas of what they want to accomplish in their local communities. This can range from simply driving awareness about the need for change in the way households use energy and water, to initiating retrofit programs for lights and showers, to investigating and pursuing the generation of renewable energy in the area.

BREAZE has identified increasing the uptake of solar hot water as its priority on the basis that the technology and equipment are well proven, the cost is reasonable after rebates, and there are real savings in both energy use and cost of operation. The BREAZE committee have developed a web-based step-by-step guide which enables householders to decide what they need and to order it from pre-identified suppliers and installers with whom bulk discounts have been negotiated.

MASG has identified a range of projects for 2006/7 including the establishment of a two to five kilowatt (KW) locally owned renewable energy generation facility by 2010; a Ride to Work program to encourage more use of bicycles; engagement with local council and developers to improve the energy and water efficiency of new buildings and renovation projects in Castlemaine; helping to make the 2007 Castlemaine Festival carbon neutral; in partnership with the Central Victorian Greenhouse Alliance and CSIRO explore the possibility of substantially reducing water and energy use by major industrial users in the Shire; and the LoCO<sub>2</sub> Project to help 20 households and 10 businesses become greenhouse neutral this year.

MASG is also a key player in the government-supported Castlemaine 500 project<sup>2</sup> which aims to assist 500 households to reduce their energy use by 15% to 30% through a range of educational and retrofit strategies.

SCE is concentrating on building the amount of business the local community does with the Community Bank and Community Telco in order to increase the commission funds available for other projects. It is also exploring whether the 'Community Bank' model can be applied to energy supplies, insurance, and other business operations. The Strathfieldsaye community has decided that it wishes to become a sustainable community, and the SCE has already initiated an energy monitoring project at the local primary school and other awareness activities. Its current major project is an investigation into the feasibility of establishing a community owned renewable energy generation facility based on PV solar panels and/or wind energy.

C4 Healesville is at an earlier stage of its evolution and is currently concentrating on building its membership and broadening awareness of sustainability issues. It has many initiatives in mind as described on its website, however its first project is to push the adoption of green power in the 3777 postcode with uptake being tracked. This is being promoted via a "Green Energy Thermometer" on their website and simple awareness material distributed within the community.

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<sup>2</sup> [www.castlemaine500.org.au/](http://www.castlemaine500.org.au/)



### Promotion, Marketing and the Internet

For most of the above groups, the internet is an essential tool to communicate news and information, manage events, and in some cases receive orders for goods and services. BREAZE in particular has used the internet to great effect and their website is a model of what can be done<sup>3</sup>.

Other marketing activities used effectively by groups include public forums and meetings – usually with a relevant theme built around either a guest speaker or films such as *An Inconvenient Truth*. BREAZE is again an excellent example in that it has a skilled graphic designer on its team who has produced eye-catching posters and flyers to promote events.

### Accessing External Resources

The greatest weakness of newly formed action groups is a tendency to re-invent what has already been done by others. Sometimes this is a result of “not invented here” or “our community is different” thinking, but more often it is simply ignorance of what others are doing and a lack of knowledge about how to access other resources.

In the early stages of their evolution, groups usually need information and guidance on what projects and initiatives to prioritise and how to go about it. At a later stage they are more likely to be seeking funding for specific projects. Most of the existing action groups such as those discussed here are only too willing to speak at functions and attend meetings to help other action groups get started. In addition various federal, state, local government and private entities are also very supportive including:

- Local councils and local water authorities – obvious first point of contact but degree of knowledge and helpfulness varies widely
- Greenhouse Alliances/Regional Partnerships – <http://tinyurl.com/3b9bc5>
- Sustainability Victoria – [www.sustainability.vic.gov.au](http://www.sustainability.vic.gov.au)
- Department of Victorian Communities – <http://www.dvc.vic.gov.au/>
- Business Victoria – <http://tinyurl.com/3chrf9>
- National Centre for Sustainability – <http://www.ncsustainability.com.au/>
- Village Green – <http://www.villagegreen.com.au/>
- CSIRO Sustainable Communities Initiative – <http://www.csiro.au/science/SCI.html>
- Area Consultative Committees – [http://www.acc.gov.au/contact\\_us/vic.aspx](http://www.acc.gov.au/contact_us/vic.aspx)

### Funding

Once the early hard work is done and specific projects for community action have been identified, the next major challenge is securing funding. Currently many sources of funds for sustainability projects exist in both public and private sectors, however demands are always greater than resources, so a well constructed business case arguing why the project should proceed is essential.

Many of the organisations listed above operate various grant programs which may be relevant to projects being pursued but unfortunately it can be difficult and confusing trying to identify which grant program is being run by which government department and for what main purpose. To further complicate matters, some grant and rebate schemes are operated by the federal government in parallel to state schemes, and help must be sought to identify where to target requests for funding. Local councils and water authorities generally support

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<sup>3</sup> [www.breaze.org.au](http://www.breaze.org.au)



## Community-Based Water and Energy Initiatives

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community projects that will impact water or energy use and sustainability, and can facilitate discussions between state bodies and community groups.

Funding programs for water projects are particularly well evolved, the two main ones being the Community Water Grants (federal)<sup>4</sup> and the Victorian Smart Water Fund<sup>5</sup>. Funding and rebate schemes aimed at improving energy efficiency are less evolved, but various bodies have funds available which they can choose to direct to support well constructed and appropriate projects. Sustainability Victoria has taken a lead role in funding renewable energy generation via contributions to the Hepburn Community Wind Farm and the Biogas Generation Plant near Shepparton.

### Typical Project Priorities

An important challenge facing all action groups once they establish a core group with positive momentum is to decide which projects to pursue as priorities. Typically this is decided by various debates and discussions keeping in mind the particular needs of the community concerned. As Nick Lanyon of BREAZE comments, “we asked one of our early meetings how many people didn’t have solar hot water and about 150 hands went up. Then we asked how many would like it, and 150 hands went up again. Our first area for action was clear”.

The main areas of focus for the action groups in this case study are listed below in the typical sequence which occurs as a group matures and builds its skills and support base:

1. Education programs typically aimed at schools and other community groups to broaden awareness of the key sustainability issues and the need for action
2. Encouraging as many households, businesses and public bodies to purchase green energy to reduce the local ‘carbon footprint’
3. Setting community (households and/or businesses and councils) targets for a reduction in water and energy use and overall carbon emissions by a certain date
4. Programs to reduce energy consumption, energy costs, and emissions by installing solar hot water systems boosted by gas or electricity
5. Capture water from rainwater, stormwater and waste treatment facilities for use in community facilities such as sports fields, parks, schools and community halls
6. Generate renewable energy equivalent to the community consumption from local resources such as wind, solar, or biogas/biomass.

For new action groups trying to establish themselves, it can be very confusing trying to identify who to talk to, who can help and how to move ahead. Many councils have now been exposed to such groups and have established responsible officers to assist. State Government regularly reviews its resources across various departments to deliver the assistance that is needed.

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<sup>4</sup> <http://www.communitywatergrants.gov.au/>

<sup>5</sup> <http://www.smartwater.com.au/>

### 6. APPENDICES

#### *Appendix 1 – Project Methodology*

The project was structured into four distinct phases over the ten week period. These were:

1. **Research Landscape and Develop Criteria** - research known community initiatives sufficiently to inform the development of selection criteria;
2. **Identify Initiatives** – engage as many potential information sources as possible to identify projects and initiatives in rural and regional Victoria for consideration as case studies;
3. **Short List, Research and Document** – filter the identified projects down to a manageable number based on selection criteria, then research and document these by directly engaging with community initiators and other involved parties;
4. **Finalise Report** – complete case studies and summaries including checking facts and assertions with relevant sources both external to and associated with the projects

The selection criteria developed and agreed with CUAC and the methodology used to identify relevant projects and initiatives are described in more detail below.

#### **Case Study Selection Criteria**

The initial review of known water and energy community initiatives suggested that the types of projects likely to be identified would be as follows:

**Water Initiatives** were expected to involve innovative ideas for:

- Water capture from rainfall and/or in-ground sources
- Storage for community use
- Recycling to provide alternatives for domestic/commercial/community use

**Energy Initiatives** were expected to involve innovative ideas for:

- Energy efficiency programs
- Localised power generation from non-conventional/sustainable sources – primarily wind and solar
- Biomass/biogas as an energy source for generation
- Geothermal energy for heating and water supply

Based on this initial assessment, the following criteria for the inclusion/exclusion of initiatives in the study were developed. To be included, projects should be:

- Embraced, implemented and/or supported by (but not necessarily developed/invented by) a community, with benefits flowing primarily to that community;



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- Ideally operational or at pilot stage with sufficient data from which to determine capital outlays, operating costs, cost effectiveness, long term benefits and any potential/actual problems and issues;
- Sustainable in the long term with the expectation of no significant detrimental effects on the environment or users;
- Replicable in similar communities within reason (subject to geographical/geological conditions which may not exist widely);
- Able to be implemented within current state/local government/industry regulations and statutes, or only requiring reasonable and achievable changes to be replicated elsewhere;
- Initiatives should deliver benefits in terms of efficiency and/or reliability and/or affordability, with an overall cost effective gain to community and to ecosystems as a whole.

It was also recognised from the early research that many projects, even though community-based, would also involve key individuals, businesses, statutory authorities (councils, water authorities) or parts of state/federal government. To ensure that community involvement and community benefit were properly reflected in the selected projects, an inclusion/exclusion hierarchy was developed as follows:

PRIORITY	DESCRIPTION OF PROJECT/INITIATIVE	INCLUDE
1	Initiated by community with major benefits for same community	Y
2	Initiated by an individual/business/local authority/government with major benefits for community	Y
3	Initiated by community with major benefits for an individual or a business	N
4	Initiated by an individual/business with major benefits for the same individual/business	N

Finally, it was noted that as far as possible the initiatives selected should cover multiple examples of both water and energy initiatives, and be reasonably widely distributed across the state.

The proposed selection criteria and the decision hierarchy were formally agreed with CUAC prior to the second phase of the project commencing.

## Research Methodology

The identification of initiatives and projects for assessment and subsequent documentation was undertaken by telephone and email over a three to four week period.

A Project Summary was developed (Appendix 2) which was sent to contacts in a wide variety of organisations seeking feedback on the existence of potentially suitable projects. The organisations contacted either as part of the initial identification process or subsequently during more detailed research were:



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Alternative Technology Association members (1000 members in Victoria)	North East Greenhouse Alliance
Alliance Resources	Northern Alliance for Greenhouse Action
Australian Conservation Foundation	Nuggety Water Users Group
Bendigo Bank Community Bank Network (70 branches in Victoria)	Origin Energy Ltd
Bioenergy Australia	Ovens Valley Action Group
BREAZE Ballarat	Ouyen Inc Action Group
Business Council for Sustainability	Parks Victoria
Business Victoria Rural Community Development Offices (10)	Patties Foods Ltd
Centre for Energy and Greenhouse Technologies	Powercor
Central Victorian Greenhouse Alliance	South West Greenhouse Alliance
CSIRO	Sustainability Victoria
CUAC Statewide Network	Syncline Energy Ltd
Department of Sustainability and Environment	Victorian Farmer's Federation
Department of Victorian Communities	Victorian Local Governance Association
Department of Primary Industry	Vox Bandicoot – Sustainability Street Campaign
Department of Infrastructure, Innovation, and Regional Development	Westernport Greenhouse Alliance
Diamond Energy Ltd	Local Councils:
Earth Utility Ltd	Alpine Shire
Envestra Ltd	Ararat
Environment Victoria	Bairnsdale
Energy and Water Ombudsman	Ballarat
Environment Victoria	Bendigo
Essential Services Commission	Hepburn
Federal Community Water Grants Office	Hume
Federal Department of Environment and Water	Mount Alexander
Future Energy Ltd	Mildura
Gasification Australia Ltd	Shepparton
Green Inc	Local/Regional Water Authorities:
Hepburn Renewable Energy Association	Central Highlands Water
ICLEI Oceania	Coliban Water
Landcare Victoria (various regional groups)	East Gippsland Water
Latrobe University Campus, Ballarat	Grampians Wimmera Mallee Water
Moreland Energy Foundation	Goulburn Murray Rural Water
Mount Alexander Sustainability Group	Goulburn Valley Water
Municipal Association of Victoria	Gippsland and Southern Rural Water
National Centre for Sustainability, Ballarat University	

## **Community Based Water & Energy Initiatives**

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Some 35 initiatives were initially identified as a result of feedback from these sources and preliminary telephone interviews with parties involved. Of these, 15 were then selected as being worthy of further research, and most of these have become the subject of a case study in this report.

The selected projects and initiatives were followed up in most cases with an on-site visit, and face to face interviews with key community participants. In circumstances where local councils and/or water authorities were involved with community groups, information was checked with the relevant officers from these bodies.

Wherever possible, case study drafts have been reviewed prior to inclusion in this report by key sources involved in each project to ensure factual accuracy and appropriate representation of views and opinions.

### ***Appendix 2 – Project Summary***

#### **Community-based Initiatives Delivering Better Energy and Water Supplies**

##### **Objective**

The Alternative Technology Association (ATA), on behalf of the Consumer Utilities Advocacy Centre (CUAC), has commenced a project to identify community-based initiatives in regional and rural Victoria that aim to deliver better energy and water supplies.

The project seeks to identify, document and publish case studies of initiatives which have been successful in securing more efficient, reliable or affordable alternative energy and water supplies for their communities.

##### **Examples of Projects**

Water initiatives are likely to involve innovative ideas for water capture from rainfall and/or in-ground sources, and water storage and/or water recycling to provide alternatives for public/domestic/commercial use.

Energy projects are likely to involve innovative ideas for localised power generation from non-conventional/sustainable sources such as solar/water/wind, power saving/storage concepts, energy conservation/management/distribution initiatives, and alternative energy production from biofuels and biomass.

##### **Outline Criteria for Inclusion**

The project is seeking initiatives which have been embraced, implemented and/or supported by (but not necessarily developed/invented by) a community mainly for its own benefit.

Ideally the initiatives should be replicable in similar communities within reason and should deliver benefits in terms of efficiency, and/or reliability, and/or affordability, with an overall cost effective gain to the community and to the ecosystem as a whole.

The ATA is interested in receiving details of any and all initiatives which are thought to be relevant to the project, and your assistance in identifying these will be greatly appreciated.

##### **Responses**

Please provide the following for initiatives you believe should be investigated:

- Short description of initiative and its intended benefits
- Geographical location in Victoria
- Address and contact details of key community contacts involved

Responses should be sent to:

Adrian Nelson, ATA Project Manager  
Tel: (03) 9639 1500 Fax: (03) 9639 5814  
Mob: 0418 102672  
Email: [ahnelson@ozemail.com.au](mailto:ahnelson@ozemail.com.au)

### ***Appendix 3 – Community Action Guide***

How to get traction in your community for a Community Action Group (CAG) interested in sustainability issues:

- Approach your local council and water authority to learn about sustainability projects they may be working on which can form a nucleus for a CAG project
- Follow up any leads they provide such as projects in your area being initiated by a local Greenhouse Alliance, tertiary education establishment, business, or regional representatives of state or central government (e.g. the 16 Regional Development Victoria offices or the Local Area Consultative Committee)
- Organise an information evening with appropriate content such as:
  - Show Al Gore's 'Inconvenient Truth' documentary or equivalent
  - Invite guest speaker from another CAG, Sustainability Victoria, Greenhouse Alliance or your local council/water authority
  - Talk about examples of successful projects from other CAGs
  - Include a 'small groups' discussion session to start to identify local issues and interests so as to guide future direction
- Advertise the event in the local paper, local community internet site and on community notice boards
- Directly engage your personal network and enlist their support as well as other community groups already in existence such as Landcare, Rotary/Lions, sports clubs and school councils.
- If sufficient interest exists at the information evening to move ahead, invite volunteers to form a committee to drive the initiative – six to eight is a good number
- Look for a mix of people with experience including local business, marketing/web use, building or related trades, council and other community organisations.
- Establish a web site with links to other CAGs and motivational and educational information (copy what other CAGs such as BREAZE and C4Healesville have done)
- Refine the discussions down to a small number of projects which ideally can be implemented without substantial cost
- Identify one project as a starting point which can be executed quickly and cheaply and publicised widely as further motivation to the community to get involved. This might be:
  - Free energy audits (seek resources via council or other CAGs) for member households (drives membership)
  - Increased purchase of green energy plus tree plantings
  - Replacement of bulbs with low energy lights – volunteer labour to actually do the changeover, and discounts on purchase of lights from local retailer or in quantity by direct order from wholesaler
  - Water audit and retrofit program – low volume shower heads, taps, etc. along the lines of Project Aquarius

## **Community Based Water & Energy Initiatives**

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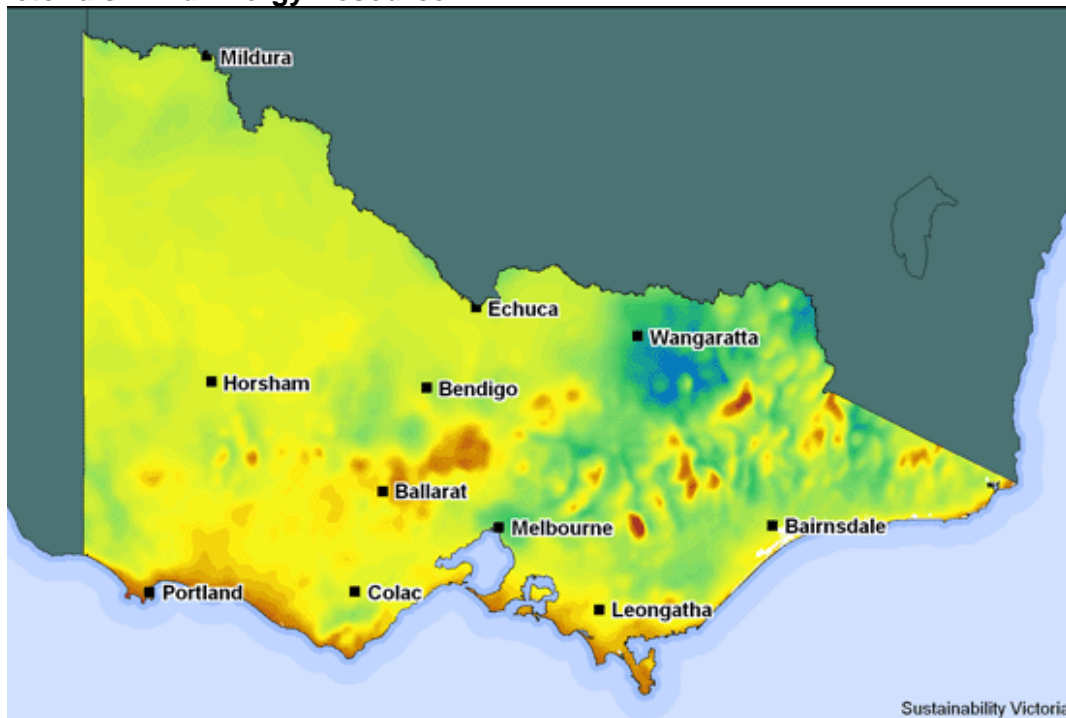
- As membership, interest and confidence grows, more ambitious projects requiring external funding can be planned – seek input from other CAGs to see what works and doesn't work.

### **Appendix 4 - Wind Energy Planning Requirements**

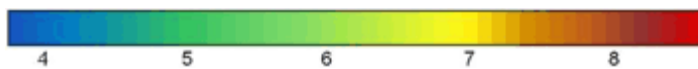
There are a number of requirements which need to be satisfied by proponents of wind energy projects. Section 52.32 of the Victorian Planning Provisions (under the Planning and Environment Act 1987) sets out the application requirements and decision guidelines for councils when considering planning applications for wind farms. When making a determination, the relevant council must also consider, amongst other things, the government's *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria*, released in 2003<sup>6</sup>.

The Victorian Planning Provisions require a number of Expert Consultant Reports be conducted by the applicant, including a Landscape and Visual Assessment Study, a Fauna Assessment, a Noise Assessment, a Geotechnical Report, an Archaeological Assessment, an Assessment of Shadow Flicker and Glint impacts, and an Assessment of Electromagnetic Interference Issues.

#### **Victoria's Wind Energy Resource:**



Average Yearly Wind Speed (metres per second at 65 metres above ground)



Source: Sustainability Victoria - Victorian Wind Atlas<sup>7</sup>

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<sup>6</sup> <http://www.sustainability.vic.gov.au/resources/documents/WindEnergyGuidelines.pdf>

<sup>7</sup> Further information available from:

[http://www.sv.sustainability.vic.gov.au/renewable\\_energy/resources/wind/index.asp](http://www.sv.sustainability.vic.gov.au/renewable_energy/resources/wind/index.asp)

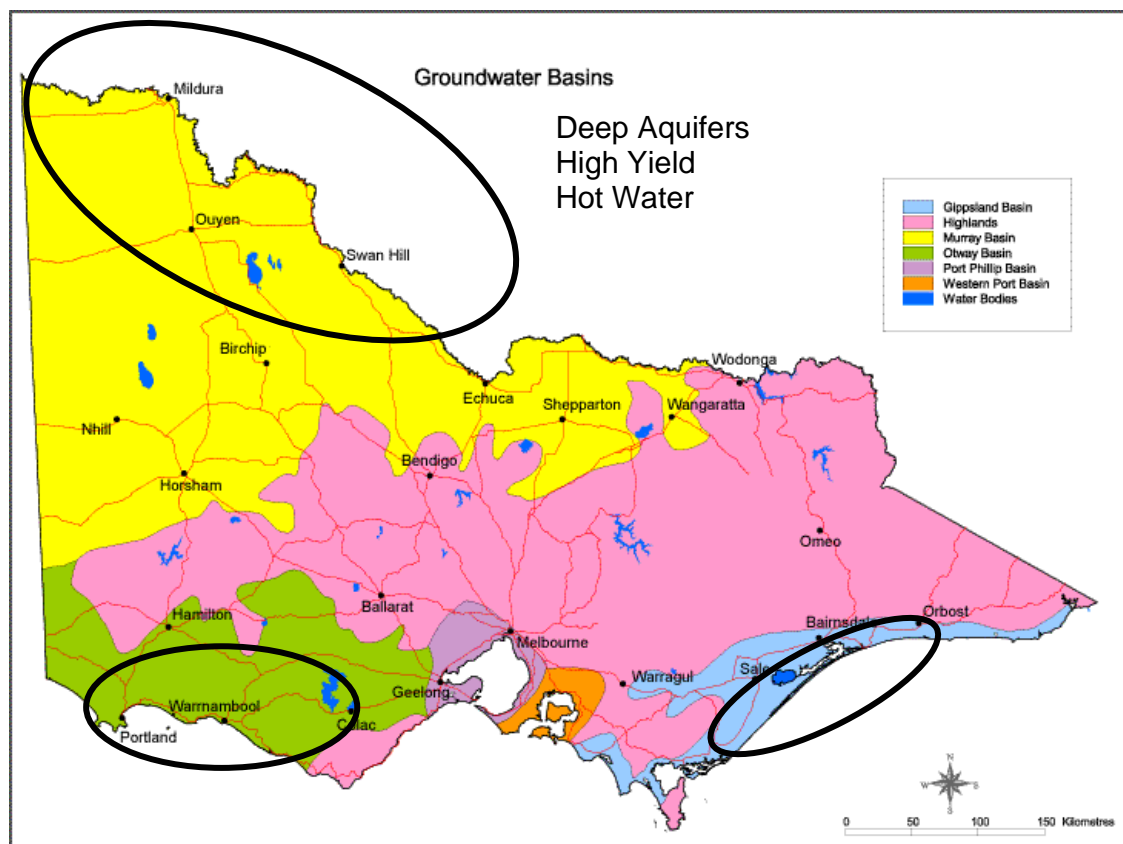
### Appendix 5 –Geothermal Energy Technology

Improvements in geological data over recent years have led to a better understanding of the extent of the geothermal energy opportunities that exist in Victoria. Large hot water aquifers at temperatures up to 70°C exist in the south-west of the State, as well as along the Murray Basin and in Gippsland.

Legislation passed in 2005 specifies that any geothermal energy or water sources in Victoria that are greater than 1km underground, or greater than 70°C, fall under mineral exploration statutes. As a result, 31 geothermal exploration blocks were gazetted in 2006, and to date some 13 exploration licences have been let to six companies. These companies will be concentrating on finding ‘hot rock’ geothermal energy sources with the intention of developing technology to inject water into the hot rock and retrieve it as high temperature steam sufficient to drive large power generating plants.

Geothermal sources not covered by the mining legislation are more easily and cheaply accessed, requiring drilling a bore to the required depth – typically a few hundred metres – and establishing a pumping system to bring the hot water to the surface – none of which requires particularly specialist technology. The area water authorities are responsible for the issuing of Water Extraction Permits in exactly the same way as for any other proposed bore.

#### Victoria’s Geothermal Resources:



## **Community Based Water & Energy Initiatives**

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Geothermal hot water is not a new source of energy in Victoria nor does it require complex or expensive new technology. The Henty Park bore near Portland was drilled in 1982 for the purpose of extracting 2,400 megalitres (ML) annually of geothermal heated water from the Dilwyn aquifer 1.3 km below the city of Portland. Initially the bore water served the dual purpose as a source of water for Portland and for the supply of geothermal energy for the heating of civic buildings. Apart from Portland, geothermal hot water has also been used for some years in a commercial spa in Rye and by the Midfield Meats abattoir near Warrnambool.

In a situation where a community-owned entity and/or local authority might want to harness geothermal energy solutions, the potential benefits are:

- Community access to hot water for a range of possible uses including industrial processes, space heating, agricultural drying, greenhouses, fish farming, spas and bathing and as the heat source for heat pumps;
- Community savings in conventional energy use and carbon emissions;
- Limited adverse impacts on local amenity and few regulatory requirements (except a water extraction permit and possible EPA scrutiny).

An opportunity exists for suitably located communities in cooperation with experts to pursue development and ownership models for geothermal bores to provide heating and supplementary water. Community structures along the lines proposed for the wind energy farm in Hepburn would seem to be equally applicable to geothermal extraction projects. In geothermal areas with no access to natural gas, such a development could offer significant benefits to local residents in terms of energy cost savings, reduced emissions from conventional energy for heating and the generation of funds for other projects.

As noted with the Hepburn wind farm initiative, the expected success of this and similar projects elsewhere requires a collaboration between owner/end-user (in this case the resort developer) and a provider skilled in geothermal extraction and ongoing operation. In this instance the project required little or no community consultation or involvement and is relatively insignificant in terms of impact on amenity.

### ***Appendix 6 – High Rate Anaerobic Lagoon***

The treatment of human and commercial waste water takes place in over 140 facilities around Victoria managed by the various water authorities. Most of these treatment plants utilise open ponds which rely on aerobic bacterial activity, with some chemical additives to remove various wastes and render the water fit to be discharged into rivers or the sea. The major by-products of aerobic treatment are various (odorous) gases and heavy sludge, which requires physical removal from the bottom of the treatment lagoons every few years.

An alternative treatment process – High Rate Anaerobic Lagoon (HRAL) technology – offers a number of advantages, particularly its ability to cope with a high loading of organic waste in the water, lower operating costs, a greatly reduced production of sludge and the elimination of odorous gases. Importantly, in an HRAL plant, the waste lagoon is covered with an impervious membrane, thereby eliminating aerobic activity and capturing the methane and other gases produced.

Converting from conventional aerobic treatment to a HRAL or an alternative anaerobic system is cost competitive and can be particularly advantageous for a water authority due to its lower energy consumption and reduced sludge. A further key difference is that under a HRAL system, significant quantities of principally methane gas are produced. Methane has 21 times the Global Warming Potential of CO<sub>2</sub>, hence from an environmental perspective releasing methane into the atmosphere is highly undesirable; it is preferable to ‘flare’, or burn the methane to convert it into CO<sub>2</sub> and thus reduce the global warming impact of the gas.

However, rather than simply ‘flaring’ the methane to convert it into CO<sub>2</sub>, this valuable energy source can be captured, stored, then burnt for a particular purpose, as is the case with the Tatura project outlined in this report.