

# **Struth Mate;**

**Australian community endeavour in renewable energy generation**

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# 1. Introduction

- 1.1 Australia has just 22 million people yet is over thirty times the size of the UK. Per head of population it has one of the highest rates of carbon dioxide emission of all the developed nations. It is the world's largest exporter of coal, 300 million tonnes leaving by ship every year. Australian coal has been burnt at Longannet Power Station, Scotland's largest, situated in the heart of the Scottish coalfield, yet coal from Australia delivered to the power station gate is cheaper than coal from Scotland. Newcastle in Queensland is the largest port for coal export in the world and is set for further expansion to meet an apparently insatiable global appetite for Australian raw materials. Large parts of New South Wales are earmarked for coal seam gas (fracking) extraction and the country has the largest uranium ore reserves of any nation. Four uranium mines (Ranger, Olympic Dam, Beverley and Honeymoon) make Australia one of the largest international exporters of uranium, and offshore oil and gas fields in Western Australia and the Northern Territory are increasingly important to the Australian economy. The Ichthys gas pipeline alone which on completion will bring gas from the offshore fields of Western Australia to Darwin will carry up to 100,000 barrels of natural gas condensate each day, which through re-export will provide 10% of Japan's total energy requirement.
- 1.2 Australia's mineral wealth is a feedstock provider to world industry and it is this resources boom, based on extraction and export of fossil fuels and other raw materials, that has protected Australia from the world economic recession following the European and North American financial crises of 2008. For some, Australia remains the land of milk and honey.
- 1.3 Yet this is a land of contrasts. One of the six Australian states, Tasmania, produces over 80% of its domestic electricity requirement from renewable energy and King Island, a small community in the Tasman Strait is a world leader in integrated renewable energy generation. Since the 1990s aboriginal communities have developed their own renewable energy systems powering homes and development within some of the most marginalised communities in the country. Cooperatives have been formed to share the benefit of renewable energy projects amongst local

communities, and the trade union movement, active from the 1970s in preserving significant areas of the Australian built heritage through a policy of 'green bans', has through industry superannuation funds engaged in renewable energy generation in Australia and overseas. Activists within the trade union movement are now on the cusp of the manufacture of renewable energy systems through the fledging Earth Workers Coop and associated Eureka Futures Trust. Financed through credit unions solar water systems manufactured and installed by workers co-operatives will be offered to trade unionists through collective bargaining agreements the first such arrangements now being in place where unions and employers have agreed an Earthworker clause to their collective bargaining agreement. Australia, a country the size of a continent, with its history of expropriation and exploitation but also of community resistance and resilience has much of interest to those interested in community endeavour in field of renewable energy generation.

- 1.4 For five weeks, in October and November 2013 I visited Australia funded by the Winston Churchill Memorial Fund. During this time I was hosted by three very different organisations: the Earthworkers Co-op, based at Trades Hall, Melbourne; the Community Power Agency, based at Institute of Science and Technology, Sydney; and Bushlight, an aboriginal renewable energy organisation, based in Alice Springs. I also met with a range of community organisations, representatives and officers of local authorities, state and national bodies, voluntary organisations and individuals. I learnt a great deal about Australian collective endeavour in the field of renewable energy and met some remarkable people. I was inspired and impressed in equal measure. This report tells of what I saw and what I learnt. I hope my observations are of interest.

## **2. The National Context**

2.1 Over the last twenty years, Australia, like many nations, has introduced national legislation and committed to international agreements seeking to address global climate change. In 2007 Australia became a signatory to the Kyoto Protocol of the United Nations Framework Convention on Climate Change later to reaffirm its commitment to the continuation of the protocol in 2012. In the field of renewable energy a national target for generation, the Renewable Energy Target (RET) was introduced by the Howard Government in 2001 requiring 9,500 Gigawatt hours of electricity per annum to be sourced from renewable sources. This was subsequently increased by the Rudd Government in 2009 when it was raised to 45,000 Gigawatts hours, equivalent at the time to 20% of the country's electricity demand. It was the Labor Governments of Rudd and Gillard between of 2007 and 2013 that introduced particularly progressive legislation and ambitious targets with regard to renewable energy, the targets to be reviewed by a Government appointed expert panel. Four key agencies were also established to advise, facilitate, finance and regulate renewable energy whilst in 2012 a carbon pricing mechanism more often referred to as the carbon tax, was introduced to encourage through market intervention reductions in the consumption of fossil fuels and improvements in energy efficiency on the part of large industrial users and local authorities, the revenue raised to be passed on to citizens through reductions in income tax, improved pensions and welfare benefits. The carbon tax was the stick, complemented by the carrot of premiums provided for renewable energy generation which together formed the key planks in Government's Clean Energy Plan.

### **2.2 The Soapy Stick. An Australian Carbon Tax**

2.2.1 The Stern Review on the Economics of Climate Change which was released for the British government in October 2006 by economist Nicholas Stern, chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics viewed climate change as the greatest and widest-ranging market failure ever seen. Focusing on the economic impacts of global warming and recommending environmental taxes as an effective remedy to market failure, the

report became highly influential worldwide and prompted the Howard Government to establish a Prime Ministerial Task Force on Emissions Trading. The Task Force concluded in favour of an emissions trading scheme, a proposal then adopted by the Government. The Labor opposition proposed a speedier introduction and upon their return to power sought to introduce legislation. This was voted down, however, opposed by environmentalists that considered it fell short and conservatives who considered the tax damaging to business and Australian competitiveness. Finally a minority Labor Government with support of the Green Party and a high profile independent, introduced the Clean Energy Act 2011 establishing both the carbon trading scheme (more widely known as the carbon tax) and a Clean Energy Regulator to oversee it. From 2012 large emitters of carbon, outside of the transport and agriculture sectors which were excluded from the tax, paid for permits initially at \$20 dollars per tonne of carbon emitted.

2.2.2 In reality, however, a series of partial exemptions largely to high carbon intensity coal fired generators and the free issue of permits through the 'Job and Competitiveness Program' considerably reduced the impact of the tax and whilst electricity producers were some of the largest net payers of the tax these additional costs were, as anticipated, simply passed on to consumers. Nevertheless, the scheme is credited to contributing directly towards Government targets.

### **2.3 The Carrot. The Renewable Energy Target.**

2.3.1 In terms of the market intervention whilst the carbon tax increases the cost of electricity generated from the burning of fossil fuels, the value of electricity generated from renewable sources is enhanced through the payment of a renewable premium. In this way a generator pays tax on electricity generated from non-renewable sources but receives a premium on electricity generated from renewable sources. In Australia the premium is facilitated through the Renewable Energy Target which is split into two parts: the Large-scale Renewable Energy Target and the Small-Scale Renewable Energy Scheme.

2.3.2 **The Large-scale Renewable Energy Target (LRET)** creates a financial incentive for the establishment and growth of renewable energy power stations, such as wind and

solar farms, or hydro-electric power stations. It does this by legislating demand for Large-scale Generation Certificates (LGCs). These LGCs are created based on the amount of eligible renewable electricity produced by the power stations, with one LGC awarded for each megawatt hour of electricity generated. LGCs can be sold or traded to RET liable entities (principally electricity supply companies) in addition to the power station's sale of electricity to the grid. RET liable entities have a legal obligation to buy LGCs (up to a specified amount) and surrender them to the Clean Energy Regulator on an annual basis. In this way the LRET closely mirrors the UK's Renewable Obligation and the associated market in Renewable Obligation Certificates (ROCs).

2.3.3 The Large-scale Renewable Energy Target specifies the amount of renewable energy to be generated by renewable energy power stations, for every year up to 2030. The 2011 to 2020 targets are:

<b>Year</b>	<b>Target (GWh)*</b>
2011	10,400
2012	16,763
2013	19,088
2014	16,950
2015	18,850
2016	21,431
2017	26,031
2018	30,631
2019	35,231
2020	41,850

*\*One gigawatt hour (GWh) equals one thousand megawatt hours (MWh)*

2.3.4 The Large-scale Renewable Energy Target places a legal requirement on liable entities (typically electricity retailers) to purchase a set number of Large-scale Generation Certificates (LGCs) each year. The number of LGCs to be purchased is calculated using the Renewable Power Percentage (RPP), set annually in the

Regulations. The liable entity applies the annual RPP to the total megawatt hours of relevant electricity that they acquire from relevant electricity grids. This determines how many LGCs they will need to purchase and surrender for that year. Each liable entity purchases their LGCs directly from renewable energy power stations, or from Agents who deal with LGCs. The market price of LGCs is dependent on supply and demand and can fluctuate daily; it has varied between \$10 and \$60 in the past. If a RET liable entity does not surrender its required number of LGCs in a year, it is liable to pay a shortfall charge, currently set at \$65 per LGC not surrendered.

- 2.3.5 At the end of 2011, total investment in large-scale renewable energy power stations stood at around \$10.5 billion. The generating capability of renewable power stations was around 13,700 gigawatt hours (GWh) of eligible renewable energy per typical year. This is equivalent to the residential electricity needs of over 2.1 million households. Without the RET and its associated premium for renewable energy the installed capacity for renewable energy generation in Australia would be considerably lower than it is today.
- 2.3.6 **The Small-scale Renewable Energy Scheme (SRES)** creates a financial incentive for owners to install eligible small-scale installations such as solar water heaters, heat pumps, solar panel systems, small-scale wind systems, or small-scale hydro systems. It does this by legislating demand for Small-scale Technology Certificates (STCs). STCs are created for these installations according to the amount of electricity they produce or displace. RET liable entities have a legal requirement to buy STCs and surrender them on a quarterly basis.
- 2.3.7 The technology covered includes a range of small scale technologies for electricity generation. To be eligible solar hot water systems need to be listed within the Register of Solar Water Heaters managed by the Clean Energy Regulator and for electricity generation, components and installers also require to be accredited.
- 2.3.8 The number of certificates a system can create is based on the amount of electricity in megawatt hours (MWh):



- **generated** by the small-scale solar panel, wind or hydro system, over the course of its lifetime of up to 15 years; or
- **displaced** by the solar water heater or heat pump, over the course of its lifetime of up to 10 years.

2.3.9 This number may vary depending on geographic location, what kind of system is installed, Solar Credits eligibility, and/or the size and capacity of the installed system. STC ownership is generally vested in the owner of the small-scale system being installed, but STCs can be assigned using a STC Assignment Form to a third-party agency, such as a retailer or installer. These agencies must be registered with the Clean Energy Regulator and are known as Registered Agents who co-ordinate the purchase and installation of systems for the owners. They provide a financial benefit (such as a discount off the invoiced price of purchase and installation) to owners in exchange for the right to create and sell the STCs. This financial benefit, generally based around the value of STCs at the time, ensures that the price of small-scale systems remains within reach of many householders, and encourages the installation of more systems.

2.3.10 Solar credits increase the number of small-scale technology certificates created for eligible small generation units. They apply to the first 1.5 kilowatts (kW) for grid connected systems or 20 kilowatts for off-grid systems. Solar credits were introduced to provide an additional financial incentive for solar panel installations by multiplying the number of certificates these systems could create under the scheme. Designed to reduce over time, a 2x transitional multiplier applied for small generation units installed from 1 January to 30 June 2013. For systems installed after this date entitlement to small-scale technology certificates remained, but the solar credit multiplier no longer applies.

2.3.11 The SRES places a legal liability on RET liable entities to surrender an amount of small-scale technology certificates (STCs) each year. The number of STCs to be purchased is calculated using the Small-scale Technology Percentage (STP), set annually in the Regulations with the STP for each year calculated on the estimated:

- value, in megawatt hours, of small-scale technology certificates that will be created for the year;
- amount of electricity that will be acquired by RET liable entities for the year; and
- amount of all partial exemptions expected to be claimed for the year.

2.3.12 This is calculated each year as, under the Act, there is no target on the number of STCs to be generated for any given year. RET liable entities apply the annual STP to the total megawatt hours of relevant electricity that they acquire from relevant electricity grids. This determines how many STCs they will need to purchase for each quarter of that year.

2.3.13 The Clean Energy Regulator also provides RET liable entities with an estimate of required surrender amounts for quarters 1 – 3 of each calendar year. The RET liable entity may purchase their STCs through an Agent who deals with STCs, or transactions may occur at \$40 or under. There is a Government-guaranteed price of \$40/STC (excl. GST) if the seller uses the STC Clearing House. However, certificates may take some time to clear, thus delaying payment to the seller.

2.3.14 RET liable entities must surrender to the Clean Energy Regulator the STCs that they have purchased during the year to prove they have met their required surrender amount. The entities need to surrender STCs in April, July, October and February of each calendar year, to meet their quarterly liability requirements. If a RET liable entity does not surrender its required number of STCs in a quarter, it will be liable to pay a shortfall charge, currently set at \$65 per STC not surrendered.

2.3.15 Owners of STCs may also voluntarily surrender their STCs at any time. Any person with STCs registered to them in the REC Registry can voluntarily surrender their STCs; this includes owners, Agents, and RET liable entities.

2.3.16 RET Liable entities may voluntarily surrender STCs separately to their mandatory liability set by the STP. For example, when a householder opts to use electricity from renewable energy sources the liable entity can buy certificates equivalent to the householder's electricity usage and voluntarily surrender these certificates to the

Clean Energy Regulator. Voluntary surrender creates further demand in the market for renewable energy, over and above the mandatory requirement.

2.3.17 From 2001 to 2011, more than 1,329,000 small-scale installations such as solar panels and solar water heaters had certificates created and validated against them in the REC Registry. The number of small scale installations has grown enormously within Australia since the introduction of Government incentives, without the SRES the installed capacity of small scale renewable energy technologies in Australia would be a fraction of what it is today.

## **2.4 The Key Agencies**

2.4.1 There are four key agencies each established by the Gillard led Labor Government to advise, facilitate, finance and regulate the renewable energy sector. These are;

2.3.2 **The Climate Change Authority** which was established on 1 July 2012 under the Climate Change Authority Act 2011, as an independent expert advisory body on climate change. The Authority conducts climate change research as well as undertaking periodic statutory reviews on a range of Australian Government climate change policies. The Authority is funded by Government, its Board of seven eminent individuals from business and academia being supported by a Chief Executive Officer. Essentially the Authority provides expert independent advice and in so doing some observers have suggested that the Authority removes the politics from Australian Government climate change policy.

2.3.3 There is no directly comparable organisation to the Climate Change Authority in the UK or Scotland.

2.3.4 **ARENA, the Australian Renewable Energy Agency** was established by the Australian Renewable Energy Agency Act 2011 and commenced operations on 1<sup>st</sup> July 2012. Its purpose is to make renewable energy solutions more affordable and increase the amount of renewable energy used in Australia. The agency has a budget of \$2.5 billion to fund renewable energy projects, support research and development

activities, and support activities to capture and share knowledge. Approximately £1 billion of this funding is already committed to programmes.

- 2.3.3 At the time of writing ARENA had the following initiatives and programmes in operation or under development. None of these are aimed at community renewables or targeted in support of the community sector.

#### Open for applications

[Emerging Renewables Program \(ERP\)](#) – supports the development, demonstration and early stage deployment of renewable energy technologies

Southern Cross Renewable Energy Fund – under the [Renewable Energy Venture Capital Fund](#) – provides management expertise and makes equity investments in early-stage Australian renewable energy companies

[Supporting High-value Australian Renewable Energy Knowledge \(SHARE\)](#) – increases awareness of renewable energy solutions and shares research knowledge

[Accelerated Step Change Initiative \(ASCI\)](#) – provides funding for exceptional demonstration, deployment and commercialisation projects not captured by other ARENA programs.

#### Announced initiatives and programmes

[Integrating Renewables in the Grid](#) – examines barriers to the integration of renewables into the electricity grid

[Regional Australia's Renewables](#) (Expressions of interest closed)

[Regional Australia's Renewables – Industry Program \(I-RAR\)](#) – supports the development of renewable energy solutions in off-grid and fringe-of-grid locations

[Regional Australia's Renewables – Community and Regional Renewable Energy program \(CARRE\)](#) – supports the demonstration of technologies that can feed more renewable energy into off-grid communities

[Research and Development Program](#) – supports world-class research and development in priority renewable energy technologies (Expressions of interest closed).

- 2.3.4 Whilst there are various UK and Scottish Government support programmes for renewable energy there is no directly comparable organisation in either the UK or Scotland to ARENA.

- 2.3.5 **The Clean Energy Finance Corporation (CEFC)** was established under the Clean Energy Finance Corporation Act 2012 and became operational in July 2013. It seeks to invest using a commercial approach to overcome market barriers and mobilise investment in renewable energy and lower emissions technologies. In its first six months of activity the CEFC had investments of \$536 million which mobilised on average \$2.90 of private sector investment for every \$1 of CEFC investment and led

to an estimated abatement of 3.88 million tonnes of CO<sub>2</sub>e per annum. These investments deliver a positive return to the CEFC, with a cost of abatement in the order of minus \$2.40 per tonne CO<sub>2</sub>e.

- 2.3.6 Using a wide range of financial instruments, the CEFC co-finances and invests, directly and indirectly, in clean energy projects and technologies focusing on projects and technologies at the later stages of development which have a positive expected rate of return and have the capacity to service and repay capital. The Corporation also considers earlier stage projects which have significant support and a risk profile appropriate for CEFC. Typically the Corporation expects a private sector co-financier will participate with the CEFC to support projects. This ensures that the risk profile to be assumed by the CEFC is broadly market based.
- 2.3.7 To support the sector and achieve its purpose the CEFC also provides concessional finance but does not make grants. The nature and terms of such concessional finance take into account the external benefits the project generates. Concessional finance can be in the form of lower pricing, higher risk and/or longer duration.
- 2.3.8 The Corporation's commercial approach means that it assesses investments on a case-by-case basis, looking to provide funds on the least generous terms possible for a project to proceed (i.e. as close to market terms as possible). Most recently the Corporation estimated the direct financial return on its investments to be 7%.
- 2.3.9 The Clean Energy Finance Corporation shares certain similarities with the UK Green Bank and the Scottish Investment Bank.
- 2.3.10 **The Clean Energy Regulator** was established under the Clean Energy Regulator Act 2011 and became operational in April 2012. It is the Government body responsible for administering legislation to reduce carbon emissions and to increase the use of clean energy.
- 2.3.11 The Regulator incorporates the functions previously held by the Office of the Renewable Energy Regulator, the Carbon Farming Initiative Administrator and the Greenhouse and Energy Data Officer.

Its responsibilities include:

- providing education on the carbon pricing mechanism and how it works
- assessing emissions data to determine each emitting entity's liability
- operating an emissions unit registry
- monitoring, facilitating and enforcing compliance with the carbon pricing mechanism
- allocating units, including freely allocated units, fixed price units and auctioned units
- administering the National Greenhouse and Energy Reporting (NGER) scheme, the Renewable Energy Target (RET) and Carbon Farming Initiative (CFI)
- accrediting auditors for the CFI, the carbon pricing mechanism and the NGER scheme, and
- working with other national law enforcement and regulatory bodies, including the Australian Securities and Investments Commission, the Australian Competition and Consumer Commission, the Australian Transaction Reports and Analysis Centre, the Australian Federal Police and the Commonwealth Director of Public Prosecutions.

2.3.12 Whilst In Scotland and the UK there is no direct equivalent to the Clean Energy Regulator some similar functions, particularly in regard to the operation of the Feed In Tariff and the Renewable Obligation are undertaken by the Office of Gas and Electricity Markets (Ofgem).

## 2.4 **Political Change; a new broom**

2.4.1 On 7<sup>th</sup> September 2013 national elections were held for all 150 seats in the Australian Lower House, the House of Representatives, and for 40 of the 76 seats in the Upper House, the Senate. This led to a centre right Coalition Government of the National Party and the Liberal Party replacing a minority Government of the Labor Party supported in a voting alliance with the Green Party. It was this preceding Government that had been responsible for the introduction of various key pieces of legislation aimed at addressing climate change and promoting renewable energy.

2.4.2 The Coalition Government led by Tony Abbott of the Liberal Party held a clear majority in the House of Representatives with 90 seats but failed by six seats to win a majority in the Senate. The system of proportional representation that applies to the Senate means that various smaller parties are represented some with specific interests, for example the Sports Party (one seat) and the Australian Motoring Enthusiasts Party (one seat). Furthermore some smaller parties are built around individuals such as the Palmer United Party led by Mining Magnate Clive Palmer

which holds 2 senate seats and the Xenathon Party of Nick Xenathon holding a single seat. Together the minor parties comprise a record number of 18 cross bench Senators.

- 2.4.3 The Coalition Parties and the Palmer United Party strongly opposed the Carbon Tax and this became a major issue in the election campaign. The new Abbot Government has since sought to abolish the Carbon Tax, the Climate Change Authority and the Clean Energy Finance Corporation, but the absence of a majority in the Senate has meant these attempts have been thwarted on each occasion the Bills introduced to the Senate being voted down. The Carbon Tax and the agencies therefore remain.
- 2.4.4 Close voting in Western Australia and the apparent loss of over 1000 ballot papers has resulted in the Court of Disputed Returns finding that the result of the Western Australia Senate election should be voided, meaning a fresh election for all six senate vacancies will be required. This will be held on 5<sup>th</sup> April 2014. It seems likely that the hung position of the Senate will be maintained following the election, potentially strengthening opposition to the Coalition's Government policies on Climate Change and renewable energy generation.
- 2.4.5 Interestingly should the Senate twice decline a Bill passed in the House of Representatives, constitutionally this triggers a double dissolution of both Houses of Parliament and fresh national elections. It is uncertain whether the Coalition Government would do this and likewise whether the Labor led opposition would wish such a trigger. In the circumstances a negotiated compromise may prevail.
- 2.4.6 Whilst the Coalition Government wishes to abolish a number of key agencies and the carbon tax, it recognises Australia's international commitments to climate change abatement. It has also not stated that it will seek to abolish the RET but has instigated a review, headed by Dick Warburton, a veteran industrialist and self-proclaimed climate change sceptic. The terms of reference for the review do however refer to the need for certainty in regard to investment in renewable energy as well as impacts on business, and impacts on household energy bills.
- 2.4.6 **Direct Action Package.** The Coalition Government's key policy plank has been to seek to remove carbon pricing legislation (currently thwarted because of its lack of a majority in the Senate) and to replace it with its own Direct Action Package. Whilst

both Labor and the Coalition agree on reducing emissions to 5 per cent below 2000 levels by 2020, their principle disagreement is on the mechanism. Labour wish to apply the stick of a carbon tax together with the carrot of premium renewable energy premiums whilst the Coalition Government wish to set aside the stick and introduce alternative carrots they consider to be more effective and less damaging to the economy. Under Labor's carbon pricing mechanism, the country's biggest polluters pay for the amount of pollution they produce, giving them an incentive to reduce emissions with compensation paid to taxpayers to help mitigate any price increases, such as the cost of electricity, that have been passed on. But under the Coalition, the intention is that businesses will compete to win tenders and be paid to undertake emission reduction projects.

2.4.7 There are four key pillars that the Coalition Government has outlined as part of its environment policy:

- **Clean air** - Emissions Reduction Fund
- **Clean land** - Green Army, Landcare reform and simplified environmental assessments and approvals
- **Clean water** - Commitment to long-term planning for new dams and support for the Murray-Darling Basin Plan (Australia's largest river system)
- **Heritage protection** - New programmes focusing on community and heritage landmarks

2.4.8 **Emissions Reduction Fund.** The main feature of the Direct Action Policy is the creation of an Emissions Reduction Fund, which will cost \$3 billion over four years. The fund will call for businesses to submit tenders for projects that will either lower emissions or offset them. It will operate as a reverse auction, where businesses compete and undercut each other to win a contract and with it, the Government's money. The reverse auction method mirrors the existing National Water Market, which conducts water buybacks from private interests to increase river flows.

2.4.9 In this way emission reductions are anticipated through a range of projects, such as cleaning up power stations, capturing landfill gas, reforesting marginal lands or



improving soil carbon with a project needing to meet two criteria to win a contract from the fund:

- The emission reductions must be additional measures and not just business-as-usual
- The reduction estimates must be credible and verified

Measures that are already required to be carried out by businesses under government regulations cannot be used as projects for the fund and only the projects with the lowest cost per amount of abatement will be taken on by the reduction fund. The fund is capped and Prime Minister Tony Abbott has previously indicated it will not be increased if the 2020 emission reduction target is not being reached.

**2.4.10 The Green Army.** The Coalition also aims to build an environmental workforce made up of 15,000 young people to undertake conservation projects. This Green Army will carry out projects such as re-vegetating sand dunes, cleaning up riverbanks, weed control and regenerating local parks. The workforce will work with and complement local groups such as Landcare, catchment authorities and councils with projects tailored to local environmental priorities. Participants in the Green Army (initially only 17-24 year olds) will be paid a training allowance and the Government expects young people to gain valuable work skills from the group. The training received will count towards the requirements for a vocational qualification in land management, park management, landscaping or horticulture and full-time projects will run for up to 26 weeks in groups of 10 - nine participants and a supervisor. Teams will be given money to pay for equipment and materials needed to undertake a project. The program will begin in 2014-15 with 250 projects, which will be scaled up to 1,500 projects and a 15,000 strong workforce in 2018-19. It is expected to cost \$50 million in its first year and then \$300 million over a four-year period.

**2.5 And so to Communities.** Neither the renewable energy initiatives introduced by the Labour Government of Julia Gillard nor the Direct Action Plan proposed by the Coalition Government of Tony Abbott specifically target community energy initiatives. There is no target for community renewables and no specific funding programme or Government funded support agency to encourage community

renewables. Despite this lack of attention to community endeavour within national renewables strategies, community renewables have been progressed in Australia independent of Government support.

### **3. Community Renewables in Australia**

- 3.1 Within Scotland community interest in renewable energy generation does not arise from a single shared motivation. In some cases motivation may arise from the desire to reduce fuel costs of a community owned or managed facility, such as the numerous community halls in Shetland which have participated in the very successful wind to heat programme, reducing costs and extending the operational hours of the halls concerned. It may arise from a requirement to generate a sustainable income stream to support community investment, such as on the Isle of Gigha, where the island's Dancing Ladies wind turbines have contributed hundreds of thousands towards housing improvement and levered several millions of pounds more from other sources. It may reflect an absence of grid connected power, such as the Isle of Eigg, where an integrated island grid was established fed by a range of renewable energy systems, or it may be a desire to address key environmental concerns affecting the world, as is the case with the community at Findhorn. Or it may be a combination of some or all of these things, or indeed another motivation altogether. This is also the case in Australia.
- 3.2 The support of the Winston Churchill Memorial Fund enabled me to visit and spend time volunteering with, observing and discussing (with the key individuals concerned) three very different community energy organisations in Australia, each arising from very different motivations and each highly inspirational. During the course of my visit I was also able to meet with further community groups running or seeking to establish projects, as well as representatives from key agencies, employees of national, state and local government as well as a number of politicians and other influential individuals supportive of community renewables.

## 4. The Earthworker Cooperative



**AUSSIE JOBS**

Earthworker Cooperative has established the not-for-profit Eureka's Future Workers Cooperative, manufacturing solar hot water systems, to sell through the Enterprise Bargaining Agreements unions and employers negotiate.

We are beginning some of the practical tasks of dealing with climate emergency and the crisis in manufacturing.

Thanks to your union, your EBA now contains the Earthworker Clause, which means you can acquire your solar hot water system through your Enterprise Bargaining Agreement.

*Earthworker Cooperative means:*

- Using your EBA to better benefit you, your family, the country and the planet, taking the opportunity of your wage increase to purchase your solar hot water system.
- You eliminate a third of your electricity bill.
- Aussie jobs and training which never leave our shores.
- A ten year warranty fully serviced in Australia.
- A 5% Fund to provide our elderly with solar hot water.
- 5% of any intake of worker-owners to be Aboriginal and women.

Organise a meeting in your Workplace or Department  
CONTACT DAVE KERIN  
0412 484 094  
dkerin.earthworker@gmail.com  
www.earthworker.org

**EUREKA'S FUTURE WORKERS COOPERATIVE**

An Earthworker Cooperative Project

### 4.1 The Basic Proposition

4.1.1 From the Earthworker Cooperative, based at Trades Hall, Melbourne, is one of worker cooperation, with production and installation of solar hot water systems undertaken by a trade union supported worker co-operative. The market for the systems would be trade unionists, who through their Enterprise Bargaining Agreements (EBAs)<sup>1</sup> can elect to purchase and have installed a solar hot water system as part of their remuneration package. A range of financing options would be available ranging from low interest loans from employer or credit union to direct purchase by single payment. In all cases the system installed would repay its capital cost and deliver further revenue savings. Given the Australian climate and the design of the systems, solar water heating is a very effective technology, providing in many cases all household hot water requirements. The financial return is enhanced by the

<sup>1</sup> Enterprise Bargaining Agreements are negotiated every three years within unionised workplaces

Small-scale Renewable Energy Target and the associated premium paid on energy displaced, which enables an upfront reduction in the capital cost of the system.

- 4.1.2 Whilst the Earthworker Co-operative is the facilitating body, with open membership to those supporting the organisations aims, members purchasing a minimum of five \$4 shares, the actual manufacture and installation of solar systems will be conducted by a sister workers cooperative, the Eureka Futures Workers Cooperative. The intention is that as the movement grows further workers co-operatives will be developed in communities throughout Australia each with support of the Earthworker Cooperative. These may source the systems from the Eureka Future Workers Cooperative or if scale of production justifies, establish their own factories.

## 4.2 The History of the Earthworker Co-op

- 4.2.1 Began in the 1990s when trade unionist activist Dave Kerin met Bob Higginson (now deceased), founder, innovator, and former Chief Executive of Everlast, an Australian manufacturer of insulated water storage tanks. Bob and Dave shared a vision for manufacturing solar hot water systems through small, cooperatively run factories.<sup>2</sup> These ideas were not immediately developed but were later explored by Dave Kerin with representatives of the Electrical Trades Union (ETU), the Australian Manufacturing Workers Union (AMWU), and the Communication, Electrical and Plumbing Union (Plumbers) (CEPU Plumbers). With support and coordination from the Morland Energy Foundation Ltd<sup>3</sup> an award of \$50,000 was secured in 2007 from Sustainability Victoria<sup>4</sup> towards a survey of the members of the three unions, a

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<sup>2</sup> Much of the history of the Earthworker Coop and further comment is taken directly from the Earthworker website [www.earthworker.org](http://www.earthworker.org) and from direct conversation with Dave Kerin and Jacob Grech

<sup>3</sup> The Moreland Energy Foundation Ltd, or MEFL, is an independent not-for-profit organisation. It was established to help reduce greenhouse gas emissions across the municipality of Moreland, in the inner-northern suburbs of Melbourne. MEFL acts as a connection between the Moreland community and the broader climate change action movement.

<sup>4</sup> Sustainability Victoria is a Victorian government statutory authority delivering programs on integrated waste management and resource efficiency. Established under the *Sustainability Victoria Act 2005*, SV's board is appointed by the Minister for Environment and Climate Change. SV has obligations under the *Environment Protection Act 1970* for state-wide waste management strategy and planning, as well as managing the Sustainability Fund.

detailed feasibility study to test the viability of the Earthworker proposition and the development of a detailed business plan.

- 4.2.2 In 2009 the Victorian CFMEU Mining and Energy Division decided to support the project as a means of creating new employment for people in Morwell in the Latrobe Valley. This established a concrete basis for the Eureka Future Workers Cooperative and confirmed the location for the manufacturing enterprise.
- 4.2.3 In 2012 the Uniting Church in Australia, Synod of Victoria and Tasmania (Culture and Context Unit) decided to help the Earthworker campaign by providing ongoing advice and support for the project, and EQubed, a Social Justice Mission of the Anglican Parish of Dallas/Broadmeadows and part of the Anglicare National Network, also assisted with fundraising advice. In 2013 a membership levy from Maritime Union of Australia members in Victoria provided much needed funds for project development and administration.
- 4.2.4 Earthworker also ran a successful crowd-funding campaign earlier this year, which raised the funds necessary to produce the first run of solar hot water units under licence from Australian manufacturer Douglas Solar. Until the Eureka's Future factory in Morwell is operational initial orders will be manufactured in partnership with Douglas Solar and another supportive Australian manufacturing company, Everlast, based in Dandenong.
- 4.2.5 EBAs at three workplaces in Victoria are currently being negotiated to provide workers with the option to order their own solar hot water system from Eureka's Future. This approach will provide a direct link between workers wanting to purchase solar hot water units - saving money and reducing pollution - and the Eureka's Future manufacturing cooperative. Similarly discussions with bankMECU, Australia's first customer owned bank will provide access to low interest loans for participating trade unionists.
- 4.2.6 Further investment is also being sought from a) a 100,000 Australians campaign, whereby individual Australians pledge support for the venture and b) Australian superannuation (pension) funds into which Australian trade unionists and their

employers contribute. As substantial source of investment generally, accounting for 70% of all domestic investment in the Australian economy, the superannuation funds are a significant potential investor in Earthworker. Interestingly the funds have already invested in renewable energy generation within Australia and abroad through Pacific Hydro a company fully owned by the funds. It is also significant that 76% of trade unionists surveyed during the Earthworker feasibility study supported superannuation fund investment in support of the venture.

4.2.7 Once the first bulk order arising from an EBA has been received Eureka will be able to produce solar hot water systems without delay at the Everlast factory. Surplus from these initial orders will go towards purchasing the equipment to get the Morwell factory kitted out.

4.2.8 The motivation behind the Earthworker concept is broad and inclusive reflecting a long term involvement and engagement by trade unions and trade union activists concerned in issues beyond the workplace.

*“The trade union movement has long been at the forefront of innovation in making the world a more liveable place for all Victorians, all Australians. We’re not just talking about a solar hot water heater ... we are talking about looking at the way we run our lives, the way we run our planet, and taking some control over our own actions.”* Jacob Grech, Earthworker team

#### 4.3 **The Green Bans and the Building Labourers Federation (BLF).**

4.3.1 Of direct relevance here is the history of ‘Green Bans’ in Australian cities at the centre of which was the Building Labourers Federation (BLF) of which Earth Worker Founder Dave Kerin was a leading Victorian activist.



4.3.2 Green Bans were first conducted in Australia in the 1970s by the Builders Labourers Federation (BLF) and arose at the request of, and in support of, residents' groups. The first widely acknowledged green ban (although predated by an earlier successful Green Ban in the Carlton area of Melbourne)<sup>5</sup> was put in place to protect Kelly's Bush, the last remaining undeveloped bushland in the Sydney suburb of Hunters Hill. A group of local women who had already appealed to the local council, mayor, and the Premier of New South Wales, approached the BLF for help. The BLF asked the women to call a public meeting, which was attended by 600 residents who formally requested that the BLF prevent construction on the site. The developer, A V Jennings, announced that they would use non-union labour as strike-breakers. In response, BLF members on all other A V Jennings construction projects stopped work. A V Jennings eventually abandoned all plans to develop Kelly's Bush.<sup>6</sup>

4.3.3 The BLF was involved in many further Green Bans in cities throughout Australia. The union represented all unionised builders' labourers in the construction industry and also influenced the opinion of other unionised construction workers. Numerous bans were imposed in the early 1970s which helped to protect historic nineteenth century buildings and land of community or heritage value in cities throughout Australia, preventing, for example, the Royal Botanic Gardens in Sydney from being turned into a carpark for the Sydney Opera House, the demolition and redevelopment of the world famous Rocks area of Sydney and the Queen Victoria Market in Melbourne. In

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<sup>5</sup> Burgmann, M & Burgmann, V 1998, *Green Bans, Red Union: Environmental Activism and the New South Wales Builders Labourers' Federation*, University of New South Wales Press Ltd, NSW.

<sup>6</sup> Burgmann, V 1993. A perspective on Sydney's Green ban Campaign, 1970-7. *Power and Protest*



total over 100 buildings considered of national importance by the National Trust of Australia were saved by Green Bans.<sup>7</sup>

4.3.4 It is interesting to note from a European perspective that the Green Ban movement had a profound impact on Petra Kelly who visited from Germany and closely followed the movement in Australia. The term Green Ban which first coined by BLF NSW leader Jack Munday to distinguish the action from the traditional Black Bans imposed on occasion during industrial disputes, to reflect the fact that the action was in support of broader social and environmental concerns. This led Petra Kelly to adopt 'Green' in the party name when founding the German Green Party in 1979 the first time that the word 'Green' was first applied to politics in Europe.<sup>8</sup>

4.3.5 The Green Ban movement is also acknowledged in transforming the culture of urban planning in Australia with “..greater sensitivity to environmental concerns, better appreciation of heritage, the need to publicise proposed developments well in advance and to seek approval from the people affected..”<sup>9</sup> the actions ultimately leading to the Heritage Act 1977 and the Environmental Planning and Assessment Act (EP&A) 1979.<sup>10</sup>

#### **4.4. Continuing Environmental and Social Concerns.**

4.4.1 Trade unionists including those who remain the driving force behind Earthworker have also participated in further high profile environmental and social campaigns within Australia. These include, for example: Workers Against Nuclear Energy which opposed uranium mining, transport and export; actions to prevent the damming of the Franklyn River; opposition to unrestricted logging; and for the establishment of a nuclear free Pacific. Whilst trade unionists have been on both sides of the argument in each of these areas, the Green Ban approach of trade unionists forging alliances

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<sup>7</sup> See footnote 3

<sup>8</sup> Burgmann, V. 2003. Power, Profit and Protest: Australian Social Movements and Globalisation, ALLEN & UNWIN, NSW

<sup>9</sup> Quotation from an editorial in The Australian newspaper reproduced in Mallory, G. (1999), Review: GREEN BANS, RED UNION: Environmentalism and the New South Wales Builders Labourers' Federation, The Australian Journal of Politics and History, 45.

<sup>10</sup> Freestone, R. (1995), From icons to institutions: Heritage conservation in Sydney, International Journal of Heritage Studies, 1 (2): 79-90.

and working with communities and other agencies and organisations with shared interests remained a notable feature of each campaign.<sup>11</sup>

4.4.2 Broader societal and environmental concerns of trade unionists remain an important driving force within Earthworker. Such concerns are directly relevant to the Earthworker Cooperative members and supporters who seek to build popular support throughout the trade union movement, communities and other groups for social purpose, ultimately through an expansion of the Earthworker movement to create a new social sector, whereby production has a direct social value and where work serves a broader social purpose. In the words of Jack Munday and the Building Labourers Federation during the Green Ban movement “All work performed should be of a socially useful and of an ecologically benign nature”<sup>12</sup>.

4.4.3 The extent to which broader concerns remain of interest to rank and file trade union members was demonstrated in 2007 during the feasibility study for the Earthworker proposition in a survey of Victorian members of three trade unions: the Electrical Trades Union; the Australian Manufacturing Workers Union and the Communication, Electrical and Plumbing Union (Plumbers) Victoria. This showed that over eight in ten respondents (84.7%) were somewhat, very or extremely concerned about climate change and global warming whilst over half (55.2%) of respondents were very or extremely concerned. Only one in seven (15.2%) said they were not at all or slightly concerned with this issue. Almost all respondents were concerned about retaining and increasing manufacturing jobs in Australia. In fact more than eight out of ten respondents (82.6%) were very or extremely concerned with less than one in twenty (4.4%) respondents saying they were not at all or slightly concerned.

4.4.4 Amongst Victorian trade unionists, therefore, and with reasonable likelihood trade unionists throughout Australia there is widespread concern about global warming and the retention and increase of manufacturing jobs. Whether this translates into an interest in purchasing solar water heaters from a trade union supported workers co-operative is an important consideration. In the same survey, however, 86.3% of

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<sup>11</sup> Burgmann V, McNaughton C and Penney J. (2002). Unions and the Environment. TELA Issue 10, Australian Conversation Foundation

<sup>12</sup> Quotation reproduced from Burgmann V, McNaughton C and Penney J. (2002). Unions and the Environment. TELA Issue 10, Australian Conversation Foundation.

respondents say they would consider buying a solar hot water system when they needed a new hot water system, the main motivations for doing so being that the system is more environmentally friendly (38.8%) and because running costs would be lower (26.9%). Furthermore 89.9% said they would be more likely to buy a locally manufactured system than an imported one if this created Australian jobs.

#### 4.5 **Price, Viability and Opportunity**

4.5.1 In addition the survey assessed price sensitivity and identified that more than half of the respondents (51.5%) said they would be willing to pay more than \$2000 dollars for a system with 64% stating that if paying off the capital cost over time they would be willing to pay instalments of a sum greater than the system saved them, whilst 33.7% were willing to pay instalments of a sum equal to the saving made on running costs.

4.5.2 The survey demonstrated the strength of interest amongst trade unionists and concluded that the business model benefitted from certain key advantages;

- **Competitiveness** – removing the intermediaries which exist in the solar hot water industry for other products by taking control of the manufacturing and installation of key parts will result in a reduction of the overall cost to the consumer by taking out the „mark up“. This initiative will also get the benefits of the years of R&D investment made by Everlast on their tank. While systems which currently use the Everlast tank are currently higher cost, the union cooperative will be able to sell an equivalent product at lower cost while still generating a surplus.
- **Niche market** – relates to the interests of a key section of the community who support the aims of the initiative and whose needs have been taken into consideration in the design of the product
- **Volume capacity** – one of the key barriers to price reduction of quality solar hot water systems is the small volume sold by most solar hot water providers. Having a guaranteed niche market would provide the level of volume essential to bringing down the cost and ultimately the price for the consumer
- **Expansion capacity** – successful implementation of this initiative will provide the experience which can be used to shape future initiatives. This will build the profile of the union owned cooperative which can become the market leader for domestic sustainability manufactured goods.

4.5.3 The Earthworker Cooperative is now on the cusp of achieving its aim of establishing through the Eureka Futures Workers Cooperative a manufacturing facility for the

production of solar hot water systems. The first demonstration installations have taken place and the first EBA agreements are being negotiated. Additional investment is required to provide necessary working capital and the Earthworker Cooperative is seeking to raise this directly through fundraising from members and support from industry superannuation funds.

#### **4.6 Conclusions on Earthworker.**

4.6.1 During my time with Earthworker Coop I received the warmest of welcomes from Dave Kerin and Jacob Grech who were exceedingly generous with their time. I met with numerous trade union supporters of the venture including regional secretaries of the Maritime Union of Australia and the National Tertiary Education Union. I learnt a great deal first hand from Dave and Jacob about the history of the trade union movement in Victoria, the activities of the Building Labourers Federation and the motivations behind the Earthworker Cooperative. The concept proposed fully accords with the broader social and environmental commitments of its founder members and of many within the broader trade union movement seeking to build a better place and a better future for working people. A tremendous amount has been achieved by the Co-operative already on very limited resources. Given the clarity of vision of the founders, the broader appeal and the demonstrated viability of the proposition together with the commitment and the tenacity of those involved there is no doubt that the Earthworker Cooperative movement will succeed. The reverberations of this new approach could potentially impact, like the Green Bans of the 1970s, in communities and social movements far from Australian shores.

## 5. The Community Power Agency



### 5.1 Founders and Members

5.1.1 The Sydney based Community Power Agency was established in 2011 by co-founders and Directors Jarra Hicks and Nicky Irson (pictured above at Hepburn Wind Co-op Victoria). Both Nicky and Jarra are social entrepreneurs with a background in environmental activism and community development and both have travelled widely, between them visiting and learning from community energy projects in Europe, Asia and North America. Jarra spent two years as the Project Coordinator of Mount Alexander Community Wind in Central Victoria and has co-founded and worked for a range of community organisations and social enterprises, from food to energy, advocacy to banking. Nicky is currently a Senior Research Consultant at the Institute for Sustainable Futures (ISF) at the University of Technology, Sydney, and an expert in the field of community energy, specialising in energy policy and governance, participatory training and energy options assessment.<sup>13</sup>

5.1.2 Three further specialists each with a passionate interest in community power bring additional expertise in Capacity Building and Operational Development (Manny Pasqualini), Project Management (Franziska Mey) and Marketing and Communication (Tom Nockolds).

<sup>13</sup> Much of the information on CPA and further comment is taken directly from the CPA website [www.cpagency.org.au](http://www.cpagency.org.au) and from direct conversation with Nicky Irson and Jarra Hicks

## 5.2. **Aims.**

5.2.1 The aim of the CPA is to grow a vibrant community renewables sector in Australia, the organisation working at two levels:

a) To work with others to remove institutional barriers to community renewables, influencing the policy and action of Government and key agencies, to provide a supportive environment within which of community renewables may flourish.

b) To work directly with communities, building capacity and providing practical assistance to communities and community groups in the development of community renewables projects.

## 5.3. **CPA Projects.**

5.3.1 Although a relatively new organisation CPA has already worked with a number of community groups considering developing community renewables projects. These provide interesting insight into the CPA approach and its effectiveness in supporting community initiatives. In March 2013 CPA co-ordinated a forum for interested parties in Sydney entitled Empower Our City: Community Renewables for Sydney. The forum attracted 130 people with contributions from speakers from other projects and support organisations. This was followed by a further workshop attended by 25 people which resulted in the formation of **Pingala: Community renewables for Sydney** which is in the process of establishing a community solar project in Sydney. Tom Nockolds from CPA, a Pingala resident is one of the Co-ordinators for the project.

5.3.2 **Repower Shoalhaven Launch.** Community Power Agency was recently part of the launch of Repower Shoalhaven<sup>14</sup> a volunteer-led community group which aims to progress community led renewable energy initiatives in the Shoalhaven. The organisation aims to

a) develop renewable energy projects which are unanimously popular in the community supporting the local economy and the environment

b) Create local, ethical and secure investment opportunities for community members

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<sup>14</sup> See [www.repower.net.au](http://www.repower.net.au)

c) Empower community members and local business through energy education, filling information gaps, and by giving them a direct participatory role in creating local solutions to global problems.

5.3.3 **New England Wind.** Currently, the Community Power Agency is part of the consortium of 12 groups developing New England Wind, New South Wales' first proposed community wind farm, potentially the second community owned wind project in Australia. The Community Power Agency undertook a study into the different definitions of community and the different organisational models available to the project as part of its pre-feasibility study process. The group has continued to progress and has been strongly influenced by the experiences and success of Hepburn Wind in Victoria, Australia's first community wind farm. Like the majority of Australian community renewables project the organisation is a co-operative.<sup>15</sup>

5.3.4 **Southern Highlands.** Having attended and helped to facilitate a successful energy visioning afternoon for the Southern Highlands (NSW), the Community Power Agency along with the Institute for Sustainable Futures and Fresh Energy Consulting will be working with groups in the Southern Highlands to undertake a feasibility study for a community renewables project.

5.3.5 **Blue Mountains.** At the invitation of Katoomba Climate Action Network and Blue Mountains Transition Towns, the Community Power Agency recently gave a talk and ran a half day community renewable energy project inception workshop for the Blue Mountains community. This was well attended and has helped initiate the Blue Mountains Renewable Energy Co-operative (MB Renew) which is in the early stages of developing renewable energy projects within the Blue Mountains World Heritage.<sup>16</sup>

5.3.6 **The Coalition for Community Energy.** Scotland has a national specialist charity and membership organisation, Community Energy Scotland, which represents the interest of the community energy sector to the Scottish Government and other bodies, and provides practical assistance to communities seeking to develop their own projects. The scale of Australia and the development of a number of local

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<sup>15</sup> See [www.newenglandwind.coop](http://www.newenglandwind.coop)

<sup>16</sup> See [www.bmrenew.org](http://www.bmrenew.org)

support organisations and other agencies is such that a single agency for the whole of the country is not considered by CPA to be a viable proposition. However the CPA does consider that a Coalition for Community Energy bringing together the various groups and agencies developing and supporting community energy is an attractive prospect. To this end CPA has lobbied for and secured the funding necessary to hold the first Community Energy Congress at which the Coalition for Community Energy will be launched. This is to be held in the Australian National Library in Canberra on 16<sup>th</sup> and 17<sup>th</sup> June.<sup>17</sup>



#### 5.4 A Fully Networked Body.

5.4.1 The CPA is incredibly well networked. When I approached CPA regarding my study visit both Nicky and Jarra responded very positively and were keen to exchange experiences. During my time spent with CPA and before and after in other parts of Australia I was able to meet with a host of community projects, national agencies, politicians, campaigners, employees of State and City Governments, elected members of State Parliaments, State Ministers and by telephone conference the Adviser to the Minister for Energy of the Federal Government. This provided me with

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<sup>17</sup> See [www.c4ce.net.au](http://www.c4ce.net.au)



an insight into and an overview of the world of community energy within Australia and I am most grateful to CPA for their assistance and hospitality throughout. For meetings in Sydney and Canberra Nicky was exceedingly generous with her time and attended all of these, introducing me and facilitating discussion. She also arranged for a desk for me at the Institute of Sustainable Futures, UTS. The following is a list of the individuals and the organisations I was introduced to by Nicky. Whilst discussions were broad and far reaching in each case I have given a brief description of the organisation or project, often taken from published material. Website links are shown where possible.

**5.4.2 Shaun Scallan. Yarra Community Solar<sup>18</sup> City of Yarra, Victoria**

The Yarra Community Solar (YCS) project is an initiative to establish community owned commercial scale (systems of about 100kW, 400 panels) solar PV in the community. The funds to buy and install the solar are provided by the community. In return, the community investors receive an annual return. The model encourages zero emissions renewable energy to be produced locally and is specifically aimed at those who can't currently have solar on their own roof (renters, those who live in apartment blocks, those with an unsuitable roof etc.).

**5.4.3 David Green OBE. Chief Executive - Clean Energy Council<sup>19</sup> Melbourne**

The Clean Energy Council is a not-for-profit association and the principle body representing Australia's clean energy sector. It is an industry association made up of more than 550 member companies operating in the fields of renewable energy and energy efficiency. Council members are involved in the development or deployment of clean energy technologies such as bioenergy, cogeneration, energy efficiency, geothermal, hydro, solar, solar hot water, marine energy and wind. Funded principally by membership fees, the CEC generates additional income from events and activities such as industry accreditation programmes. It provides a variety of services to members but its primary role is to develop and advocate effective policy to accelerate the development and deployment of all clean energy technologies.

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<sup>18</sup> See <http://ycan.org.au/campaigns/yarra-community-solar/>

<sup>19</sup> See [www.cleanenergycouncil.org.au](http://www.cleanenergycouncil.org.au)

**5.4.4 Leigh Ewbank. Yes 2 Renewables Campaigner - FoE. Melbourne**

Yes 2 Renewables is the Friends of the Earth’s renewable energy campaign. The campaign recognises that whilst the majority of Victorians strongly support renewable energy, the current Victorian Government has chosen not to follow the public’s preference, the government’s energy policy effectively keeping the state tied to a fossil fuelled future. The Yes 2 Renewables campaign calls for a “fair go for wind farms and policies that encourage the rollout of other renewable energy technologies—solar, wave, and geothermal”.<sup>20</sup>

**5.4.5 Simon Holmes à Court Chairman - Embark Australia<sup>21</sup> Waverley, NSW  
Taryn Lane Communications and  
Community - Embark Australia**

Embark Australia is a privately funded, non-profit organisation, governed by an independent board. It seeks to eliminate the barriers holding back the growth of a powerful, community renewable energy sector in Australia. Whether those barriers are a lack of project funding, specialist information and advice, reflexive opposition or the impact of poor policy settings.

Embark seeks to shift the community energy sector into the mainstream, as a proven and financially viable model capable of attracting large-scale investment and growing to meet its full potential. The company supports interested communities by:

- developing a best practice toolkit to help rapidly up-skill communities
- knowledge transfer and expert advice
- building a network of suppliers, contractors, investors and lenders
- aggregating services to capture economies of scale
- identifying and trouble-shooting market failures
- sourcing feasibility and investment funding
- attracting large-scale investment for projects, and
- advocating for policy changes to grow the sector

**5.4.6 Simon Holmes à Court Founding Chair - Hepburn Wind<sup>22</sup> Daylesford, Vic  
Taryn Lane Community Officer - Hepburn Wind**

Hepburn Wind is the community co-operative responsible for the first community owned wind farm in Australia, the Hepburn Community Wind Farm. The 4.1 MW

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<sup>20</sup> See [www.yes2renewables.org](http://www.yes2renewables.org)

<sup>21</sup> See [www.embark.com.au](http://www.embark.com.au)

<sup>22</sup> See <http://hepburnwind.com.au>

wind farm comprises two turbines at Leonards Hill, in Central Victoria, just south of Daylesford and approximately 100 km north-west of Melbourne. Hepburn Wind is the trading name of Hepburn Community Wind Park Co-operative Ltd, which was established in 2007 by the Hepburn Renewable Energy Association, now known as SHARE. The Hepburn Community Wind Farm first exported electricity into the local electricity network in June 2011 and remains a model and inspiration for further community co-operative wind warm ventures. As yet, however, this is the only community wind farm in Australia. Hepburn Wind is owned by its members, numbering more than 1900. Just over half of Hepburn Wind's members identify as local to the project. Since each member receives a single vote at meetings, all members have an equal say. In order to ensure that the interests of the local community remain paramount, the board aims to maintain majority local ownership.

**5.4.7 Susie Burke                      Castlemaine Community Wind                      Castlemaine, Victoria**

Castlemaine is a small city in Victoria, Australia, in the goldfields region of Victoria about 120 kilometres northwest by road from Melbourne and about 40 kilometres from the major provincial centre of Bendigo. Castlemaine Community Wind proposed a wind farm similar to hepburn Wind but ultimately Victoria State planning law allows for a veto of wind farm developments (but not other developments) by those living within several kilometres. A small number of residents objected despite widespread community support. The community is now considering alternative locations.

**5.4.8 Andrew Bray                      State Co-ordinator - VicWind<sup>23</sup>                      Castlemaine, Victoria**

The Victorian Wind Alliance is a non-profit company, registered in Castlemain which brings together communities, businesses and individuals in Victoria who support more wind energy for our state. It was formed in October 2012 with founding members are from Ararat, Bacchus Marsh, Ballarat, Bellbrae, Bendigo, Castlemaine, Creswick, Daylesford, Foster, Hamilton, Korweinguboora, Leonards Hill, Lexton, Macarthur, Melbourne, Portland, Riddells Creek, Spring Hill, Trentham, Waubra and

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<sup>23</sup> See [www.vicwind.org.au](http://www.vicwind.org.au)

Wonthaggi. Founding members include wind farmers, professionals, business people and others.

VicWind aims to become Victoria's leading community-based organisation promoting clean, wind energy and help us cut local pollution and greenhouse emissions. The group has been formed because most Victorians want to see more wind energy but Victoria's wind industry is falling behind the rest of the world. The basis of VicWind is an alliance of groups working together with membership open to non-profit organisations and companies. Individuals can become financial supporters which allows them to become involved in the organising work of VicWind.

**5.4.9 Mark Squires                      Acting Head, State-wide                      NSW Govt. Sydney**  
**Renewable Energy Precincts<sup>24</sup>**

The NSW Government has a vision of a secure, affordable and clean energy future for NSW. Renewable energy is a key part of this vision and will contribute to new jobs and investment in NSW and technological advances. One of the key components of the renewable energy agenda is the Renewable Energy Precincts initiative. Six Renewable Energy Precincts were established across NSW (covering 47 local government areas) in 2009 to promote and encourage renewable energy development in NSW - in the New England North West, Upper Hunter, Central West, NSW/ACT Cross Border Region, Snowy-Monaro and South Coast Precincts. The precincts are a community partnership initiative in areas where significant future renewable energy development – especially wind farms – is expected with the aim of giving local communities a voice and a stake in renewable energy development. The Office of Environment and Heritage has employed six regionally-based renewable energy coordinators until 30 June 2013 to help drive regional initiatives and lead stakeholder engagement to enhance knowledge, understanding and uptake of renewable energy.

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<sup>24</sup> See [www.environment.nsw.gov.au/climatechange/renewableprecincts.htm](http://www.environment.nsw.gov.au/climatechange/renewableprecincts.htm)

5.4.10 **Amy Kean**

**NSW Energy Advocate<sup>25</sup>**

**NSW Govt. Sydney**

The NSW government has developed the Renewable Energy Action Plan to guide NSW's renewable energy development and to support the national target of 20% renewable energy by 2020. The Plan positions NSW to increase energy from renewable sources at least cost to the energy customer and with maximum benefits to NSW. It details three goals and 24 actions to most efficiently grow renewable energy generation in NSW. The strategy is to work closely with NSW communities and the renewable energy industry to increase renewable energy generation in NSW. Amy Kean is the NSW Renewable Energy Advocate, a new position established to support the NSW Renewable Energy Action Plan with specific responsibilities for certain actions. It is the Advocate's role to work closely with NSW communities and the renewable energy industry to facilitate the development of renewable energy projects, increase renewable energy generation in NSW and help remove barriers to and promote investment in renewable energy.

5.4.11 **Peter Nichols**

**Adviser to former Minister for Energy (Labor Govt)**

**Canberra**

General discussion on renewable incentives UK and Australia and potential roll of Government in support community renewables. Peter advised Labor Governments would be generally sympathetic to and interested in community renewables and acknowledged the role played by CPA.

5.4.12 **Ivor Frischknecht**

**CEO - Australian Renewable Energy Agency<sup>26</sup>  
(ARENA)**

**Canberra**

The Australian Renewable Energy Agency (ARENA) was established by the Australian Government to make renewable energy solutions more affordable and increase the amount of renewable energy used in Australia. We have a \$2.5 billion budget to fund renewable energy projects, support research and development activities, and support activities to capture and share knowledge.

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<sup>25</sup> See [www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainableenergy/renewable/renewable-energy-action-plan](http://www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainableenergy/renewable/renewable-energy-action-plan)

<sup>26</sup> See <http://arena.gov.au>

5.4.13 **Dr Lesly Cameron**      **Ministerial Adviser**      **ACT Legislative Assembly<sup>27</sup>**      **Canberra**  
**Shane Rattenbury**      **Minister for Territory and Municipal Services,**  
**Minister for Corrections,**  
**Minister for Housing,**  
**Minister for Aboriginal and Torres Strait Islander Affairs,**  
**Minister for Ageing**

In November 2013, the ACT Government legislated a 90% renewable energy target under the *Climate Change and Greenhouse Gas Emission Reduction Act 2010*. Modelling indicates that around 490 megawatts (MW) of new large-scale renewable energy investments will be required, the Government anticipating;

- Ninety one (91) MW of solar generation capacity will be pursued including a large-scale Solar Auction and next generation solar technologies
- Around three hundred and eighty to (382) MW of wind generation capacity will be required being the lowest cost renewable energy source, and
- Up to seventeen (17) MW of energy from waste generation capacity to be achieved while diverting substantial quantities of waste from landfill.

Using a blend of renewables will create a smoother generation profile, better matched to our demand for electricity from the NEM. For example solar energy peaks during the day and can contribute significantly to summer peaks in demand. Wind generation tends to peak in the morning and evenings, best matching winter peaks.

5.4.14 **Jack Archer**      **General Manager-**      **Regional Australia Institute<sup>28</sup>**      **Canberra**  
**Research and Policy**

Regional Australia is a term used to refer to the non-metropolitan areas of Australia that lie beyond the major capital cities and their immediate surrounding suburbs. Although home to over 32 per cent of the population, regional Australia can sometimes be overlooked in terms of research, planning and investment for a sustainable future. The Regional Australia Institute exists to create a vibrant future for regional Australia – for the benefit of all Australians. Launched in February 2012 with seed funding from the Australian Government, the Regional Australia Institute is an independent, not-for-profit organisation which seeks to develop solutions to

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<sup>27</sup> See [www.act.gov.au](http://www.act.gov.au)

<sup>28</sup> See [www.regionalaustralia.org.au](http://www.regionalaustralia.org.au)

key policy issues through research and an ongoing conversation with the Australian community.

5.4.15	<b>Chris Derksema</b>	<b>Sustainability Director</b>	<b>City of Sydney<sup>29</sup></b>	<b>Sydney</b>
	<b>Dr Chris Briggs</b>	<b>Policy Manager – Office of the Lord Mayor</b>	<b>City of Sydney</b>	<b>Sydney</b>

The City of Sydney has set a target to reduce greenhouse gas emissions across the entire local area to 70% below 2006 levels by 2030. This includes a target of 30% of electricity from renewable sources. A renewable energy master plan has been developed to focus on technologies that deliver the greatest outcome for the City for the lowest cost. A major part of helping the City meet its renewable energy targets is a \$4.3 million project that will install solar panels on more than 30 sites beginning at Sydney Park Pavilion and then Paddington and Glebe Town Hall, Town Hall House as well as a range of libraries, community centres, depots and other public facilities. The largest building-mounted solar panel program in Australia will have a total peak electrical capacity of 1.25 megawatts, reducing annual carbon pollution by up to 2,250 tonnes. The City has already installed solar hot water and/or photovoltaic systems on 18 sites where 240 panels create a peak capacity of 48 kilowatts. The new program will increase the City's solar electricity capacity to a peak of 1.35 megawatts, with more than 5,500 solar panels installed on City buildings providing up to 12.5% of our own energy requirements.

The renewable energy master plan also outlines how 100% of the City's electricity, heating and cooling can come from renewable energy sources, such as solar, wind and energy from waste, by 2030. Based on worldwide renewable energy best practice, the master plan focuses on the mix of renewable energy resources and most effective technologies.

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<sup>29</sup> See [www.cityofsydney.nsw.gov.au](http://www.cityofsydney.nsw.gov.au)

**5.4.16 Alex Brown Ministerial Adviser to Minister for the Environment Canberra  
Greg Hunt**

Tel conference with Jarra Hicks and Nicky Irson. Considerable interest was shown in the idea of communities involved in solar projects, some discussion around the role of grants / loans in this respect.

5.4.17 Presentations were also given and discussions held at open meetings of the Coal Disinvestment Campaign & Solar Share in Canberra, at University of Technology, Sydney and the University of New South Wales, Sydney.

**5.5. Conclusions on CPA.**

5.5.1 I was greatly impressed by the reach of the CPA and it soon struck me that Nicky Irson is probably the individual most known within the community energy field in Australia. Everybody I met who was involved in, interested in, or by virtue of their senior position within key agencies or Government, had the potential to influence or encourage community renewables knew of Nicky and the work of the CPA. Furthermore, at the time of my visit Nicky and Jarra were seeking to establish a Coalition for Community Energy to be launched at a National Congress for Community Energy. This was a key part of their strategy to raise profile, influence those in power and to build a national movement for community energy. At each meeting Nicky and I attended this was the subject of some discussion. At the time however, CPA had no funds to do this, the Coalition and Congress being an aspiration. Six months later the Coalition is in existence to be formally launched at the first ever Congress for Community Power in Australia.

5.5.2 The CPA is a highly effective agency driven by very talented and committed individuals. If Government and the key agencies with which the CPA is engaging, provide the support for community renewables that the CPA and its sister organisations within the Coalition for Community Energy seek, and further exemplar projects demonstrating the considerable benefits of community energy are successfully delivered, the potential for the community energy sector in Australia is, like the country itself, truly enormous.



## 6 Bushlight at the Centre for Appropriate Technology



- 6.1 Bushlight is a Business Unit within the Centre for Appropriate Technology (CAT), an Indigenous Aboriginal organisation and registered not-for-profit agency working with Indigenous communities across Australia and beyond. CAT develops appropriate technical solutions and ensures Indigenous people have the resources and capabilities to use, direct and influence technology to participate in the economy and sustain livelihoods in their communities.<sup>30</sup>
- 6.2 CAT Limited is owned and governed by an Indigenous Board with the head office in Alice Springs and national outreach through offices in Western Australia, Queensland and North Australia. In the context of the housing and infrastructure challenges in remote areas, CAT brings people and technology together, recognising that how people choose, use, maintain and manage the technologies that are fundamental to their lives; whether housing, infrastructure or essential services like water supplies, energy services, transport or telecommunications, directly influences their ability to sustain their chosen livelihood and their ability to participate more widely in the economy.
- 6.3 **The History of CAT and the Struggle for the Rights of Indigenous Communities.**
- 6.3.1 Whilst CAT was formally established in 1980, the history of the organisation goes hand in hand with the struggle of Indigenous Australian communities to assert their rights to land and equality. A celebratory edition of CAT's Our Place Magazine number 36 produced in 2010 provides an insight into the struggle of Indigenous

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<sup>30</sup> Descriptions of the work of CAT and Bushlight are largely taken from the CAT website, CAT publications and direct discussion with Bushlight staff. See [www.icat.org.au](http://www.icat.org.au)

Australian communities and links this struggle directly to the development of CAT. The following draws directly this magazine<sup>31</sup> and other published sources.

- 6.3.2 CAT came from humble beginnings, its seeds being sown with the monumental shift in attitudes towards Indigenous people in the 1960s and in changes following the 1967 referendum when 90% of Australians voted to remove the clauses in the constitution that discriminated against Aboriginal people, who until that point, were not even counted in the national Census. The story, however, began much earlier when in the 1930s Aboriginal activists protested for better conditions. Citizenship was won in 1948 and the right to vote in federal elections in 1949, although it was not until 1968 that voting rights were available in all Australian States and Territories.
- 6.3.3 It was illegal up until 1968 to pay Aboriginal workers more than a specified amount in goods and money. In March 1966, the Full Bench of the Australian Conciliation and Arbitration Commission granted all Aboriginal men employed on cattle stations in the Northern Territory equal pay and conditions, but at the argument of pastoralists the requirement was delayed for three years. The pastoralists assumed that Aboriginal people born on station property would live out their lives meekly, working as dependents of station management.<sup>32</sup>
- 6.3.4 **Union Camp and Wave Hill.** Aboriginal workers, however, were not necessarily prepared to wait. Furthermore discontent was to spread beyond the issue of wages and conditions. In 1966 Aboriginal workers protested for equal wages at Union Camp at Newcastle Waters Station. Their strike focused national attention on the entitlements of workers on pastoral properties across the Northern Territory. Although they lost the strike, the Union Camp stockmen started a groundswell of resistance to the appalling working standards imposed on Aboriginal people and on 22 August 1966, 200 Aboriginal stockmen of the Gurindji people and their families

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<sup>31</sup> See [http://www.icat.org.au/wp-content/uploads/2012/05/our\\_place/ourplace36/index.html](http://www.icat.org.au/wp-content/uploads/2012/05/our_place/ourplace36/index.html)

<sup>32</sup> From Tim Lee ABC reporter 2006 see <http://www.abc.net.au/landline/content/2006/s1717990.htm>

walked off Wave Hill pastoral station, 600km south of Darwin, owned by a British aristocrat Lord Vestey.<sup>33</sup>

- 6.3.5 Led by Vincent Lingiari, a community elder and head stockman at the station, and supported by Dexter Daniels the Aboriginal Organiser of the North Australia Workers Union (NAWU), they set up camp in the bed of Victoria River. The camp moved before the wet season of that year and in 1967 the Gurindji Aboriginal people settled some 30 kilometres from Wave Hill Station at Wattie Creek (Daguragu), in the heart of their traditional land, near a site of cultural significance. The Wave Hill walk-off made headlines throughout Australia and was well supported, with trade unionists in Darwin establishing a strike fund from which food and further supplies were purchased and delivered to the Gurindji and fellow striking workers. While the initial strike was about wages and living conditions it soon spread to include the more fundamental issue about their traditional lands. The Wave Hill walk-off was to become Australia's first Aboriginal peoples land claim.

***“I bin thinkin' this bin Gurindji country. We bin here longa time before them Vestey mob.”*** Vincent Lingiari.<sup>34</sup>

- 6.3.6 The Gurindji Aboriginal people claimed that the land was morally theirs because their people had lived there from time immemorial with their culture, myths, dreaming and sacred places having evolved in this land.

***“This is Aboriginal land. Not a white man's land. Way back, they start shooting people. This is our land. If we want to stay here, we stay here. This is our land, everywhere.”*** Peanut Bungiarri<sup>35</sup>

- 6.3.7 Nationally many people resisted the idea of handing back land to traditional owners but five years later, with the stockmen still on strike, on 16 August 1975, Prime Minister Gough Whitlam handed over title to the land to the Gurindji Aboriginal people—the first act of restitution to Aboriginal people and the start of the land rights movement. The Wave Hill walk-off had paved the way for the NT Land Rights

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<sup>33</sup> See <http://www.creativespirits.info/aboriginalculture/politics/aboriginal-people-strike-walk-off-at-wave-hill>

<sup>34</sup> Frank Hardy. 1968. *The Unlucky Australians*. One Day Hill. Melbourne.

<sup>35</sup> See footnote 32

Act which became law in 1975. In the same year the Gurindji people bought the pastoral lease. After the NT government later threatened to resume the lease, the Gurindji lodged a land rights claim. In 1986 they gained freehold title to the waterhole on Wattie Creek known as Dagaragu. Today 700 Gurindji live in the communities of Dagaragu, on the banks of Wattie Creek and Kalkarinji, formerly known as Wave Hill.<sup>36</sup>



**16 August 1975:** Prime Minister Gough Whitlam pours soil into the hand of Aboriginal elder Vincent Lingiari at the purchase ceremony of the pastoral lease. Photo: Mervyn Bishop, National Gallery of Australia, and **Vincent Lingiari and Mick Rangiari at the sign they asked Frank Hardy to make, 1966.** This was probably the first time Gurindji people had seen their name for themselves written down. **Source:** National Archives of Australia, Darwin

**6.3.8 The Homelands Movement.** Over the next thirty years there was a move by Aboriginal people away from mission stations and Government reserves to over 1000 settlements or 'outstations' established as Indigenous Australians returned to their country, this was the Homelands movement. From the mid 1970s the challenge of resourcing these remote communities grew and the value of appropriate technology was increasingly recognised with the Technical Advisory Group for Aboriginal Homelands (TAGAL) being established in 1978. This group recognised outstations as the strongest Aboriginal inspired community initiative it had found, but considered the movement to be constrained by technical problems around water supply, transport and shelter.

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<sup>36</sup> See foot note 34

6.3.9 At this time Jim Pearse the newly appointed Assistant Principle at Alice Springs Community College approached the NT Government for funding to purchase a building in Priest St, Alice Springs, thinking this may be suitable for a Centre for 'Intermediate Technology' a term borrowed from British economist EF Schumacher, which he later amended to 'Appropriate Technology'. Funding from the Department of Aboriginal Affairs was secured for the recruitment of an Appropriate Technologist and with the appointment of Bruce Walker, the Centre for Appropriate Technology was borne.

6.3.10 Walker believed appropriate technology was more about a process, a way of approaching a situation and approaching people than about a technical solution, that CAT only needed to exist while Aboriginal people wanted it to exist and that technology is a means to an end that people define for themselves. Walker sought to close the gap between between CAT and the communities it sought to serve, a move towards establishing CAT as an Aboriginal governed entity.

6.3.11 One of the first practical actions of Bruce Walker was to make and install with members of the Papunya community, hand pumps at sites where the Paunya people wished to return to their country. Where the pumps were established the people soon followed. Hand pumps were followed by other products, hand powered washing machines, wheelchairs, chip hot water heaters, ovens, latrines and shower blocks. These products were manufactured at CAT Enterprise Training Workshop, an early social enterprise providing employment and training for aboriginal people. Initially funded through government programme the workshop and CAT Extension Services, a company established by CAT to work with communities to install the latrines and shower blocks they had purchased, had become financially self-sustaining by the mid 80s. CAT had grown to a staff of 22 and was working in forty communities in the Northern Territory, Western Australia and South Australia.

6.3.12 CAT continued to respond to changing needs and introduced further training programmes and built residential accommodation for those attending courses. In 1989 CAT became an incorporated body with an Aboriginal Board of Management providing ownership of the organisation to Aboriginal people. During the 1990s the

organisation grew geographically opening further regional offices and broadened its scope of operation. Our Place magazine commenced in 1996 followed by an associated radio programme in 2002. CAT has continued to grow and develop, working with others and playing a leading role in the policy debate. In 2010 the organisation moved to a new base on the outskirts of Alice Springs, a purpose built base, the Desert Peoples Centre where it provides a one-stop shop for information, help, training and education.

6.3.13 CAT has now grown into a multi-million dollar operation with a turnover in 2013 of \$14.5 million (down from \$25.5 million in 2012) and total assets of over \$22.7 million, which after liabilities fall to just under \$13 million net.<sup>37</sup> The organisation is a major employer and responsible for a wide range of projects, programmes and initiatives working with hundreds of communities and serving many thousands of people. CAT has four strategic priority areas: client impact; innovative practical responses; national influence and organisational development with core capabilities in housing and infrastructure, community engagement, project management, technology evaluation and research, and capacity building, training and employment. Whilst CAT faces challenges brought about particularly in the last year by a loss of significant grant income and the death of its Chief Executive Officer, CAT continues to respond to change and to adapt changing circumstances whilst remaining true to its values and objectives.

#### 6.4 **The History of Bushlight.**

6.4.1 During the mid 1980s CAT had responded to a request from communities in the Utopia homeland by designing solar powered lighting units for community clinics to provide light for after-hours emergencies. This had led to a collaboration with other parties to form the Australian Cooperative Research Centre for Renewable Energy (ACRE). ACRE subsequently undertook a survey of the performance of renewable energy systems across rural Australia.

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<sup>37</sup> See CAT Annual Report 2013

6.4.2 The ACRE Report, Renewable Energy in Remote Australian Communities (A Market Survey)<sup>38</sup>, identified a number of critical shortcomings in the performance of renewable energy systems installed in remote Indigenous communities, namely:

- Only two-thirds (64%) of Renewable Energy systems were operational at the time of survey
- Only 26% of RE systems were under some sort of maintenance regime
- Local persons were trained in system care in just 8% of sites
- Consumers had little access to information on the reliability of components and systems
- Communities were not happy with their RE system at 60% of sites.

6.4.3 The ACRE report's recommendations made in relation to the identified challenges were:

- Poor reliability of renewable energy in remote locations - a need for product innovation focused on reducing component count, developing 'standard' systems, increased use of third party accredited testing laboratories and improved quality control during manufacture.
- Lack of trained personnel to maintain and service RE systems - a need for improved education and accreditation of installers for remote areas.
- Lack of back-up for RE systems in remote areas (especially Indigenous communities) - a need to establish a dedicated service for Indigenous communities. Benefits would be expected to flow on to other sectors.
- Demand management problems - a need for consumer education on demand management, development and manufacture of high efficiency end use devices, electronic control solutions for managing demand and looking at demand management and household energy use as a whole.

6.4.4 In response to the findings of the ACRE report, the Australian Greenhouse Office (AGO), the Aboriginal and Torres Strait Islander Commission (ATSIC), the Centre for Appropriate Technology(CAT), and the Australian Cooperative Research Centre for Renewable Energy (ACRE) conceived an "Indigenous Community Support Program"

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<sup>38</sup> See Lloyd, B., D. Lowe, and L. Wilson, 2000, Renewable Energy in Remote Australian Communities (A Market Survey), Australian CRC for Renewable Energy Ltd.

to improve the overall success of RE installations in small remote Indigenous communities and to facilitate improved livelihood options for residents of these communities through the provision of affordable, reliable and sustainable energy services.<sup>39</sup>

6.4.5 The proposal was further developed into the Bushlight Project which officially commenced operations on June 30, 2002. Funding for the initiative arose from a funneling of diesel excise to the programme following lobbying from CAT and others that a proportion of the excise arising from a new Goods and Service Tax should be used to create better renewable energy resources for remote communities.

## 6.5 The Bushlight Renewable Energy Project

6.5.1 The project's required key outcomes, arise from the collective critical issues identified in the market survey and stakeholder objectives into three areas of focus:

- To educate and empower communities to be able to manage and maintain their energy systems;
- To improve the technical quality and reliability of RE systems, including finding appropriate technical solutions to demand-side management issues; and
- To establish skilled technical service provider networks throughout central and northern Australia.

6.5.2 ***Key Outcome 1. To educate and empower communities to be able to manage and maintain their energy systems***

6.5.3 The project emphasises informing, training and empowering communities. Bushlight helps build the social and technical capacities of communities to better utilise their energy services, and to engage with service networks to better maintain them. Bushlight achieves this integration of social and technical issues through its Community Energy Planning Model (CEPM).

6.5.4 **Bushlight's Community Energy Planning Model (CEPM)** was created in order to educate and empower communities to be able to manage and maintain their RE systems. It entails Bushlight staff working directly with community members to

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<sup>39</sup> The description of the work of Bushlight Project is taken directly from Coull P, 2007, The Bushlight approach to Designing and Implementing Renewable Energy, Centre for Appropriate Technology.



provide them with independent advice and information about choosing which energy services are best for them and advice on demand side management and energy conservation. Using a range of pictorial resources, Bushlight invites communities to consider how they use energy and how much it costs them; and with them, look at what options are available for improving their access to reliable energy services. Through workshops and community mapping exercises, Bushlight works with communities to prepare Community Energy Plans (CEPs). These detail the community's current energy needs as well as their future aspirations.



### **Community Energy Planning at Work**

6.5.5 The CEP is accompanied by Community Service Agreements (CSA) which are an agreement between Bushlight and the community, laying out energy budgets and the roles and responsibilities of the community in using and looking after the RE system. The responsibilities of Bushlight, the service agency, and the system installer are also laid out. In this way Bushlight elaborates on the typical RE industry process by involving the community in all key activities and decisions. By doing so it allows

the specific needs of remote communities to be identified and adequately addressed, helping ensure that the delivered product:

- Is socially appropriate;
- Meets current and future needs;
- Is integrated into a technical service network; and
- Is accompanied by appropriate training and resources.

6.5.6 Bushlight's CEPM requires extensive engagement with the community, a high level of responsiveness to community needs, and support from an established, capable and reliable technical service provider network. To assist in this, Bushlight have developed a range of resources including system user manuals, appliance and operation posters, and stickers for power-outlets and appliances. These resources are durable and in a language and format accessible to the target audience. The same set of images and icons are used throughout the community energy planning process to ensure consistency of message and understanding.

6.5.7 Bushlight's Community Energy Planning Model consists of five distinct phases: Prepare Stage; Select Stage; Install Stage; Maintain Stage; and Sustain Stage, all of which require comprehensive engagement with the community. The process is recorded and reviewed, and repeated should need change over time. Bushlight stays in touch after the Community Energy Plan review to provide technical and training support as needed to community residents, Resource Agency or Council staff and service contractors. Important observations and discussions along with system performance data continue to be recorded after site visits. These allow Bushlight to continue to assist communities to work towards their livelihoods aspirations and monitor the level of satisfaction residents have with their energy services. By this stage, Bushlight's goal is for residents to be largely self-reliant in managing their energy systems.

6.5.8 ***Key Outcome 2. To improve the technical quality and reliability of RE systems, including finding appropriate technical solutions to demand-side management issues***

6.5.9 In order to improve the quality, reliability and longevity of RE systems, Bushlight have developed a range of technical solutions to the challenges faced in the rigorous

operating environment in which they work. The underlying philosophies are reliability, usability and self-protection. Technical solutions to demand-side management issues are an integral part of Bushlight's solution.

6.5.10 Bushlight's intent is that essential energy services will be maintained almost indefinitely. To achieve this aim, in conjunction with an adequate number of days of autonomy, Bushlight have developed the concept of Essential and Discretionary power. In consultation with the community, all community loads are divided into essential, discretionary, and generator-only. Essential loads typically include refrigeration, some lighting, and smoke detectors. In some instances, essential loads have included vital medical equipment. Discretionary loads typically include most lighting, fans and appliances. Generator-only, as the name suggests, defines loads that are not viable to supply from RE, namely heavy use appliances, air-conditioning and heating.

6.5.11 During the system design phase of Bushlight's household and community RE systems, allowance is made to supply all discretionary and essential loads as part of the RE budget; three days autonomy is generally allowed for in the tropics, two days in desert regions. If the system's capacity is exceeded, discretionary loads are disconnected to allow continuation of supply to essential circuits for as long as possible. Ultimately, under worst case conditions, essential power will also be disconnected in order to protect the batteries; prior disconnection of discretionary loads, however results in maintenance of power to essential loads significantly longer than would have been possible if the system had been continuing to supply the full load.

6.5.12 With the exception of Bushlight's hybrid systems, Bushlight do not use scheduled generator runtime to supplement the RE component. Bushlight's experience is that systems that do rely on scheduled generator operation are only as reliable as the generator. In the remote communities that Bushlight work in, generators are rarely reliable, either through a lack of fuel availability, a lack of maintenance, a flat battery, or generator breakdown. When implementing hybrid systems, Bushlight work very closely with the responsible agency ensure that the generator will be

available at all times. If, despite Bushlight's efforts to guarantee generator availability, the generator does not start when required, essential loads only are supplied until the generator is once more available. These hybrids are designed such that the essential load component, at minimum, is able to be supplied from the RE portion of the installation.

**6.5.13 Demand Side Management.** Bushlight have developed and use a number of technical demand side management (DSM) measures to assist the user in managing their budget, in conjunction with user training. Circuit timers within the electrical enclosures and individual load timer switches form an important part in assisting the householder with demand management, as do the durable labels developed for power outlets. Most Bushlight installations also involve some reconfiguration of the house wiring to facilitate further DSM.

**6.5.14 Appropriate Design.** Regular battery replacement can form a significant ongoing expense in inappropriately designed RE systems, protection of the batteries is thus paramount in Bushlight's design philosophy. Bushlight design for an average Depth of Discharge (DOD) of no greater than 20%. Under this cycle regime, it is projected that battery lifetime will be governed more by mechanical limitations of the battery casing than by battery failure itself. Indeed, this philosophy has had paybacks in terms of battery warranty; previously unprecedented warranties of eight years have been offered for most of the battery models used by Bushlight. Additionally, battery voltage triggered set-points cause progressive power disconnection to ensure design parameters are not exceeded.

**6.5.15 Appropriate Components.** Bushlight have developed a range of standardised, robust and fit for service electrical enclosures. These enclosures have been specially designed and tested to optimise heat removal in order to prolong the life of the critical components housed within. All enclosures are rigorously tested prior to leaving the factory using Bushlight's specially developed Factory Acceptance Testing (FAT). Specially developed intuitive user interfaces are a feature of the Bushlight enclosures. Of note is the "car dashboard" analogy, with a battery voltmeter or LED display forming the "fuel gauge", and anammeter the "speedometer". Together

these two indicators inform the user of their rate of energy consumption, and the remaining available energy in their batteries or budget.

6.5.16 Two main electrical enclosures, namely the household and community system along with several complementary modular components form the basis of the Bushlight product suite. The main enclosures house the inverter, charge controllers and other key components. Bushlight's hybrid system is based on a variation of the community electrical enclosure.

6.5.17 **Household RE systems.** Bushlight household systems are characterised by the intuitive interaction between the user and the system. Discretionary power shutdown is triggered by a voltage setpoint; hence, with the use of a simple but informative interface that keeps the householder continuously informed of their rate of energy use and the state of the batteries, users soon learn to manage their energy use without suffering the inconvenience of power losses. These systems are notable for their ability to support deferred loads at times of good solar insolation; deferred loads are those that are too large to include in a daily budget and their use can be delayed until appropriate insolation and battery State of Charge (SOC) conditions exist.



**Bushlight's household system shown with the remote user interface (right)**

6.5.18 **Community RE systems.** The major challenge faced by Bushlight in the development of their community RE systems was the need to equitably share energy amongst the community households and provide a guaranteed level of supply whilst retaining the ability to protect the system itself. This problem is exacerbated by the often large numbers of visitors and high levels of mobility among residents of these remote communities. Such population fluctuations have often resulted in an energy demand that exceeds the designed capacity of RE systems. Bushlight's solution to this problem was the development of the Energy Management Unit (EMU).



**Community RE System showing PV array and shed housing battery and generator**

6.5.19 **The Bushlight Energy Management Unit (EMU)** is a unique, innovative socio-technical solution to longstanding issues affecting the effectiveness of RE systems designed, developed and patented by Bushlight to assist energy demand management by households and to provide a failsafe protection from premature

failure of batteries. The EMU maximizes battery life and, in conjunction with the CEP process provides residents with technical knowledge and confidence to use the EMU to manage their energy use in relation to available supply.

6.5.20 During Bushlight's community energy planning process, each household identifies their daily and seasonal energy requirements, their energy budget. As part of the design process, each EMU is allocated a daily energy budget which varies for each month of the year to match seasonal variations in energy use and the designed capacity of the system. In addition, an essential buffer is allocated to each EMU.

6.5.21 At commissioning, each EMU is programmed with its allocated daily energy budget. The EMU then monitors and controls energy use in relation to the household's energy. Each day at midday, the EMU resets the household energy budget. Control of excessive energy demands above energy budgets is enabled by the wiring of essential appliances, such as refrigerators, smoke detectors and essential lighting, onto essential power circuits; the remaining discretionary loads are allocated discretionary power circuits. As energy is consumed (both essential and discretionary), the energy budget is counted down, as indicated by the visual display. A warning lamp flashes when the remaining supply reaches 10% of the household's daily energy budget. If available energy is exceeded, power to the discretionary circuits is discontinued. Power supply to the essential circuit continues after cessation of the discretionary supply. Supply to all circuits is reconnected at the following midday budget reset.

6.5.22 The EMU also allows the supply of generator-only loads. A small local genset can be connected via the caravan type inlet integral to the EMU; the EMU's main switch is switched to "local". Alternatively, in community (not hybrid) installations, the centralised community generator can be run. In both cases, the energy budget is suspended for the duration of the generator connection. With wider use in non Bushlight RE systems, the EMU has saved the significant RE system maintenance costs previously arising from replacement of prematurely failed system batteries.



6.5.23 **Partial Reset.** A novel function of the Bushlight community system is the Partial Reset functionality of the EMU. Under the scenario where the batteries fail to attain pre set voltage targets, a signal is sent to the EMUs causing them to reset the daily energy budget to only 75% of the normal budget. The primary function of this feature is protection of the batteries during extended periods of inclement weather; however it also allows for optimising the sizing of the system if a negotiated statistical likelihood of partial reset events is acceptable. Partial Reset also finds a niche in existing Bushlight community installations where community expansion requires EMU budgets to be stretched beyond the original design intent.



### Energy Management Unit interface

6.5.24 **Quality Installation.** Bushlight aims to ensure a consistently high quality of installation is achieved at all its sites. All Bushlight systems are installed to the Bushlight Technical Specification which forms part of every installation tender; several additional resources have been produced to assist installers at maintaining this install quality. In order to maintain a uniformity of design and function in Bushlight systems, Bushlight free-issues all electrical enclosures containing the system's key components to installation contractors. Contractors are free to use batteries and PV modules of their choice so long as the items are listed on Bushlight's pre-approved component list. All components on this list are rigorously screened for quality to ensure their suitability for Bushlight installations. Bushlight's Capital Works project managers commission every installation to ensure compliance with specifications.



**6.5.26 Key Outcome 3. To establish skilled technical service provider networks throughout Central and Northern Australia**

6.5.27 To ensure the maximum reliability and sustainability of Bushlight's, and indeed any, RE systems it is essential that an appropriate and regular repair and maintenance regime is in place. Bushlight has facilitated the establishment of a three tier support structure for each of their systems to address this need, involving community residents, community resource agencies and qualified electrical contractors, each feeding up to the next.

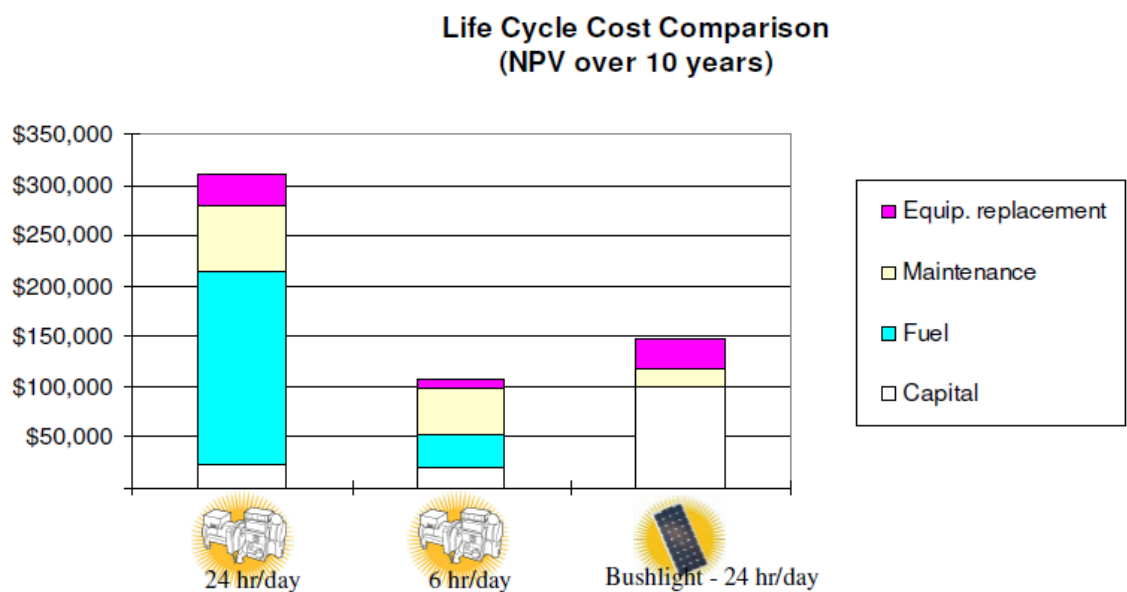
**1. Level One** - the community: Bushlight provides training to as many community residents as possible to assist them to operate and maintain their renewable energy system, to carry out basic troubleshooting and to encourage demand side management practices.

**2. Level Two** - the resource agency: This level of maintenance is provided by organisations that typically provide and maintain essential services in homeland communities, and involves the provision of regular basic maintenance of energy services. Bushlight has assisted resource agencies to develop their technical support capacities through the provision of on-the-ground training courses in RE system maintenance.

**3. Level Three** - technical service providers: This level of technical support is provided by appropriately qualified and experienced electrical contractors engaged under regional service contracts. It includes the provision of comprehensive scheduled annual maintenance (delivered to Bushlight technical standards), as well as unscheduled maintenance to resolve issues not able to be resolved at Levels One or Two. These contractors receive specialist training and comprehensive support from Bushlight. Each system is fully covered for technical defects for a period of one year post-installation. This warranty period includes two scheduled maintenance visits by the system installer who carry out full system maintenance checks. In the period after this first year of operation, Bushlight has a maintenance program in

place under which electrical contractors are engaged under regional service contracts to deliver Level three maintenance services for Bushlight systems.

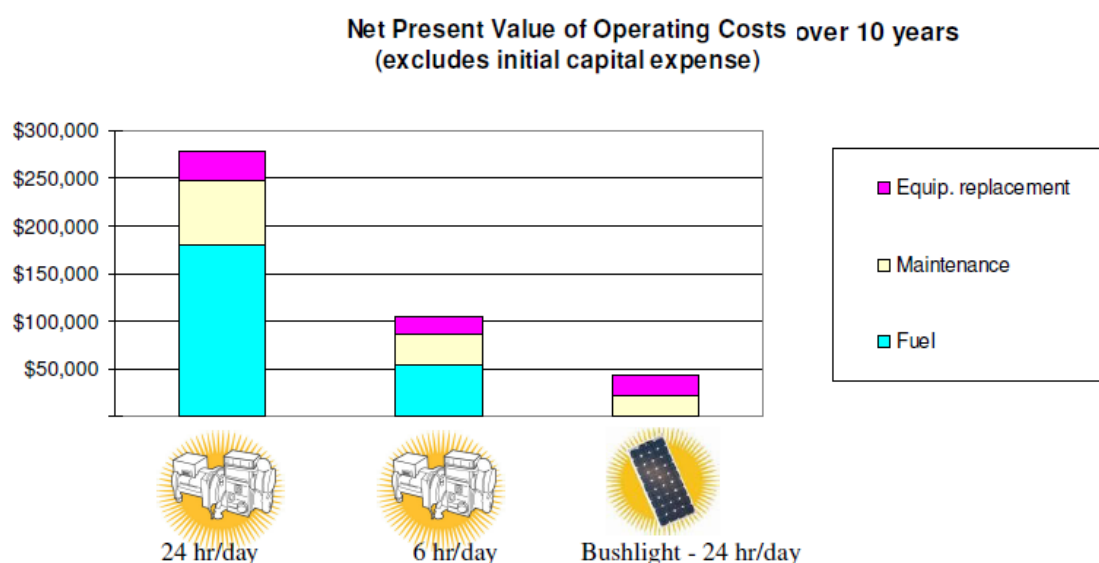
**6.5.28 Financial Implications and Outcomes.** Life Cycle Costing (LCC) is carried out for every Bushlight installation during the design phase; designers are briefed that in some cases, a Bushlight installation may not be the appropriate solution. If this is the case, Bushlight will normally work to facilitate the optimum outcome. Life cycle costings of Bushlight designs is generally carried out in comparison with 24hour diesel (a similar service) and intermittent diesel which is the typical case in the communities that Bushlight support.



**An example LCC for a Bushlight system.**

6.5.29 Typically, as in this example case, a Bushlight system compares reasonably favourably with the intermittent diesel scenario commonly found in the communities Bushlight supports. The Bushlight system, however, provides a far more reliable and user friendly supply than the generator option. Added benefits include the ability to keep food fresh in 24 hour refrigeration and reduced need for trips to town for the purchase of generator fuel. Significantly for the end user, in the example above, the operating cost comparison shows Bushlight as clearly a more sustainable solution for the community. Evidence shows that many communities

have been able to make good economic use of the money saved on generator fuel for community development projects and the initiation of enterprise.



**Operating costs comparison**

## 6.6 Further Bushlight Programmes

6.6.1 Independent evaluation found that, when measured against the project’s goals, Bushlight was meeting or exceeding expectations. The project’s independent review showing that recipient communities were universally satisfied with both their system performance and their relationship with Bushlight. Bushlight had earned a reputation for delivering high quality, rigorously tested RE systems and was seen to be supporting industry development. In the context of upholding quality energy service provision, Bushlight helped to expand the number of RE installation and service professionals, and contributed towards the development of robust components and systems. Importantly, users and key stakeholders received extensive training on system operation and basic maintenance. Through Bushlight, many communities now have access to reliable and sustainable renewable energy services, including an integrated technical support network comprising homelands

support agencies, RE service providers and Bushlight Technical Support to provide service and maintenance.<sup>40</sup>

6.6.2 Since the early success and growth of the Bushlight Renewable Energy Programme Bushlight has developed two further programmes aimed at a) training and education in household energy efficiency to reduce power costs, and b) support for local enterprise and activity development, using renewable energy.

### 6.6.3 **Energy efficiency**

6.6.4 Bushlight believes that everyone should have access to the benefits that come with more efficient use of energy in the home - cheaper power bills, increased comfort in summer and winter, and a healthier environment.

6.6.5 Through their Energy Efficiency Programme<sup>41</sup> Bushlight works with Indigenous people living in urban areas, town camps (aboriginal settlements within larger towns) and large communities across Australia to:

- help people make ongoing behaviour changes that reduce their power bills
- build local capacity by partnering with organisations, and training and employing residents to deliver home energy efficiency education, and
- take simple and direct action by installing energy-saving devices, and collecting household data to inform future renovation options.

6.6.6 Many Indigenous households have higher power bills than average urban homes and often face unique challenges in reducing their power use. Mainstream energy efficiency programmes do not easily cross over to Indigenous households away from town centres and Bushlight have developed a unique program based on a proven approach that is tailored for each community in consultation with local Indigenous people.

6.6.7 In 2009, Bushlight piloted the energy efficiency programme in collaboration with Ergon Energy through the **powersavvy** programme. A small group of local residents

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<sup>40</sup> Cowley, P, 2005, Bushlight Evaluation – Final Report IT Power Australia quoted in Coull P, 2007, The Bushlight approach to Designing and Implementing Renewable Energy, Centre for Appropriate Technology

<sup>41</sup> See Appendix 2 Bushlight Energy Efficiency programme for Indigenous Homes

were trained and then employed by Ergon Energy to undertake home energy efficiency visits to 1800 homes across 3 communities. The programme was very well received by residents, and the independent project evaluation reported that:

***'the programme has been very successful in generating ongoing behaviour change, with 92.3% of residents indicating they were committed to continuing with the power saving behaviours they had learnt about during the consultation.'*<sup>42</sup>**

6.6.8 The Bushlight Household Energy Efficiency Programme is available for use by local councils, Indigenous organisations, utilities, governments and others. Within this Bushlight provides full project management and program delivery services.

#### 6.6.9 **Community livelihoods**

6.6.10 There is a strong link between the quality and reliability of energy services and a community's capacity to pursue development opportunities. In 2009, Bushlight began piloting the Community Livelihoods Project to build on the work Bushlight and a small number of homelands had already done together. The project aims to help communities develop a more secure future through initiatives such as:

- enterprise development
- land management
- access to employment, training and education, and
- cultural activities.

6.6.11 Bushlight staff work with communities to plan, create and further develop activities that depend on, or are enhanced by, the homeland's existing renewable energy system. Through the pilot, homeland residents are working toward:

- establishing an art business
- expanding an eco-tourism enterprise, and
- developing food gardens and healthy community spaces.

6.6.12 The project aims to develop longer-term viability and increased self-reliance in communities.

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<sup>42</sup> See [www.bushlight.org.au/default.asp?action=article&ID=49](http://www.bushlight.org.au/default.asp?action=article&ID=49)



## **6.7 Conclusions and Reflections on Bushlight**

6.7.1 During my time at Bushlight I worked inputting data on battery performance for Bushlight and non-Bushlight renewable energy systems, as collected by Bushlight contractors during routine and non-scheduled maintenance visits to installed systems. This was an exercise instigated by Tim Brand, who held overall responsibility within Bushlight for the performance and maintenance of renewable energy systems. Tim had considered that certain outputs from each battery, could be used to better predict longevity of particular cells within a battery bank. In so doing Tim was using data collected for one purpose, for another purpose, in a manner which hadn't previously been considered. The initial results of the exercise showed the correlation to be greater than Tim had anticipated. The results suggested that routinely collected data could effectively be used for a valuable purpose, not previously envisaged.

6.7.2 Clearly in commenting on this exercise I have avoided any detailed description as my technical understanding is woefully poor, however this exercise which combined an intimate knowledge of the subject, with an inquiring interest and an innovative approach struck me as typical of Bushlight. Knowledge, innovation and vigour, this is the stuff of Bushlight.

6.7.3 I was welcomed to Bushlight by Tim and by Graeme Marshall, Bushlight Group Manager, who holds overall responsibility for Bushlight. I had been hugely impressed by the little I already knew of the organisation and had repeatedly pressed Graeme for an opportunity to spend some time with Bushlight. These requests corresponded

with a particularly challenging time, with changes in the approach of government towards programmes which were aimed at securing better value for public funds but through the law of unintended consequences were potentially having the opposite effect and at the same time compromising some of the work and the associated benefits that Bushlight delivered. This was a situation I was not altogether unfamiliar with having experienced this in part with a Scottish Government programme related to community energy. Nevertheless Graeme responded positively to my request and agreed to a short term volunteer placement. I am most grateful to Graeme for this, the easiest thing for him to have done given the circumstances would have been to decline my request.

6.7.4 Whilst at Bushlight I learned a great deal. I experienced a highly committed workforce, wedded to the CAT/Bushlight mission, with a keen appreciation of and respect for the situation of the communities they sought to serve. After some days of data entry I was able to accompany Bushlight worker Leigh Holdaway to Takaperte (also known as Hamilton Downs) a small community some distance from Alice Springs. The purpose of the visit was to monitor the system performance (a hybrid PV / diesel generator installation), to record usage in the various houses and to discuss matters with community members. It was humbling to see the honesty and quiet respect apparent between Leigh and the community.

6.7.5 During the visit it was explained to me that following the death of a community member, family had moved out of one the houses, and other extended family members had come to Takaperte for a period sharing homes with community members. Some family members who had previously occupied the home now vacated were living in an outbuilding with limited power. It was impressive to see that through an appreciation of cultural realities and with the full engagement of the community through the Bushlight Community Energy Planning Model the system installed did provide the flexibility required by cultural necessities. The system as far as possible was designed to meet community needs rather than the technology impinging on cultural practices. During the visit Leigh was able to discuss the possibility of reassigning some of the energy allocations between households to better reflect the

current need. This put me in mind of an earlier quote I had read from Jim Bray, the Chairman of CAT speaking about his initial interest in CAT.

***“I was interested because the products that were made by CAT didn’t infringe on people’s lifestyles. It benefitted them, but didn’t overload them with electrical appliances. CAT always worked with the people. They didn’t want to damage the culture. We wouldn’t go out anywhere unless we were invited. CAT would get people to work on the projects. And they’d learn to do things. Also they’d get money, which allowed them to develop a work ethic. The important thing is dignity and pride.”*** Jim Bray, CAT Chairman.<sup>43</sup>

6.7.6 The growth of CAT and within this the development of Bushlight is very impressive, just in terms of the number and spread of communities served (over an area greater than the UK, France, Germany and Spain combined), the quality and quantity of renewable energy systems designed, installed and maintained. However, beyond this, the fact that the communities are engaged throughout the process and their ongoing sense of responsibility for the systems installed, demonstrates a genuine and very powerful model of community ownership.

6.7.7 Beyond the provision of systems to meet the needs of households Bushlight is also engaged with communities in terms of broader development objectives, as is apparent in their Community Livelihoods Project. In this way renewable energy systems are also developed to support community enterprises and facilities contributing to community wellbeing. Attached in Appendix 1, are three case studies taken from a series produced by Bushlight which demonstrate the breadth and variety of Bushlights involvement. The first reports on a single household system, the second comprises a range of communities served where the systems installed also provide power to educational facilities, whilst the third is an example of the application of renewables in a manner that supports community enterprise. These three case studies have been chosen from more than thirty published by Bushlight.<sup>44</sup>

6.7.8 Bushlight is an exceptional venture, staffed by a highly talented, highly committed workforce. It sits within the larger Centre for Appropriate Technology owned and

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<sup>43</sup> Quoted in

<sup>44</sup> See <http://www.bushlight.org.au/default.asp?action=article&ID=38>



controlled by an Indigenous Board. In my view Bushlight is an outstanding and unparalleled example of community endeavour in the generation and supply of renewable energy.

## 7. Reflections of a Visiting Pom

- 7.1 Within Australia, Federal Government policy is favourable to renewable energy and provides through the Renewable Energy Target (RET) and its associated premiums significant incentives towards large and small scale renewable energy generation.
- 7.2 In contrast I was taken aback by the exposure given in the Australian media to climate change denial and the willingness of some public figures to make statements of denial or comments encouraging scepticism despite overwhelming scientific evidence to the contrary. Whilst climate change and renewable energy sceptics are given a disproportionate amount of coverage in the UK media in proportion to public opinion or scientific evidence, I was staggered to the extent that this is the case in Australia.
- 7.3 Similarly whilst Federal Government policy may be supportive of renewable energy, policies at State level can act in counterpoint, for example within the State of Victoria, State planning policy discriminates specifically against wind power by allowing developments that would otherwise be within policy to be the subject of veto by property owners within the vicinity. This is the case even when such a veto, is in detriment to the broader public interest. In this way a single householder can stop a development that might have overwhelming public support and be in full accordance with planning policy. To a Town Planning graduate this struck me as counter to the fundamental purpose of a planning system which is generally considered to exist in order to regulate the development and use of land in the public interest. In Victoria, in respect to wind farms, this is simply not the case.
- 7.4 With regard to these initial impressions I recalled an earlier conversation on the community owned Isle of Gigha, Argyll, where I lived and worked for some years. I was working with the community to develop Scotland's first grid connected, community owned wind farm. The wind farm was to be built on land leased to a tenant farmer who was very supportive of the proposition. As construction began the farmer commented to me that it seemed to him that renewable energy had much in common with farming, that the two biggest influencing factors were the weather and politics. This remains the case in Australia as it does the UK.

- 7.5 The community renewable sector in Australia (outside of the specific examples of Earthworker, a workers co-operative, and Bushlight, which is perhaps closer to the development trust model which dominates in Scotland) is almost entirely based on a community of interest cooperative model. This has both strengths and weaknesses but based on my own and undoubtedly partial observations, it seems that the community renewable co-operatives within Australia are characterised by an 'active' cooperation, as opposed to the 'passive' cooperation that arguably typifies co-operative wind farm developments within Scotland. This isn't to criticise the latter just a recognition that the proposition is a different one. I do feel, though, that there is particular potential within the community renewables sector in Scotland to embrace co-operative forms of investment, alongside and within community renewables project led by development trusts. This has the potential to reduce the flow of funds from a project that would otherwise be used to service debt provided by banks, and to redirect it to community investors from within the community or the broader locality within which developments are sited. This is an area I will seek to explore further.
- 7.6 With regard to Earthworker, there is no comparable proposal for a worker co-op manufacturing and installing renewable energy equipment in Scotland. In Australia this approach has grown directly from earlier trade union activities in support of broader social and environmental movements and accords with the desire of many within the trade union movement to work toward to a better way of doing things, where the benefit of labour is retained for broader social benefit. I have no doubt that this approach could be successful in Scotland, and there are examples of manufacturing co-operatives within the UK. Key to this though, as in Australia would be the commitment and tenacity of dedicated individuals prepared to champion the cause. The absence of a regulated structure for Enterprise Bargaining Agreements, to the extent to which they exist in Australia could also create further challenges in the adoption of the Earthworker model in the UK. Nonetheless it will be compelling to watch the growth of Earthworker and once in production to disseminate information on the operation to colleagues within Scotland and the UK.

7.7. Both Earthworker and Bushlight are more recent developments within a broader struggle. With Bushlight the struggle for equality and the rights of Aboriginal Australians, for Earthworker, the struggle by organised labour to build a better world. The history of both organisations is told in this way by those directly involved. Interestingly, and to a degree, this is also the case in Scotland, where community renewables have to a large extent gone hand in hand with land reform, itself a more recent development in a much older movement. In this respect community renewables have developed as part of a desire by communities to exert control over their futures. In many cases in Scotland this was driven out of necessity, what existed before in the private ownership of many estates simply failed to meet the needs of the subject communities. Renewable energy in this respect for many land buy-outs is a means to an end, creating revenues streams for much needed reinvestment, which in turn has stemmed and in many cases reversed the decline in population and led to new opportunities, and to vibrant and sustainable communities.

7.8 I have learnt a tremendous amount from my time in Australia and I am most grateful to the Winston Churchill Memorial Trust for making my visit possible. I also owe a huge debt of gratitude to the generous people who hosted my visit and put up with my incessant questions many of which I am sure were of the daft laddie variety. Thank you to Dave Kerrin and Jacob Grech of Earthworker, to Nicky Irson and Jarra Hicks of the Community Power Agency, and to Graeme Marshall and Tim Brand of Bushlight, individually you are impressive, collectively you are an inspiration.



## Birri Williams

### The Setting

*Birri Williams* is a small outstation situated on the northern coast of Mornington Island some 300 metres from the oceans edge. *Birri* means 'many underground water' in the Lardil language of Mornington Island.

*Birri Williams* is the permanent home of Johnny and Betty Mae Williams and their immediate family. Birri is visited by their many family members regularly and Johnny and Betty Mae provide respite and care to a number of family children.

The outstation is sited on Johnny's traditional country from his father's side and was established about 14 years ago.

The outstation has one main house dwelling and a smaller metal framed shed structure located closer to the beach, which is used for visiting family.

Mornington Island's main town, Gununa is approximately 26kms from Birri Williams by dirt road. This road is accessible during the wet. The outstation is 2 km from Birri Resort, a privately run fishing lodge leased from Mornington Island Shire Council and an outlet for cultural artefacts produced by Johnny and his family.

## Bushlight Approach

Bushlight has established a process for use with homeland communities to plan and manage their energy services.

This process involves a series of facilitated workshops called the Community Energy Planning Model (CEPM). Bushlight regional staff work with community residents through this process.

The process informs residents and helps them to choose and manage energy services that are best for them and that will help them achieve their aspirations.

Residents are provided with technical and other information so they can choose sustainable – that is, affordable and reliable – RE services that will meet their current and future energy needs.

In making decisions about energy services, residents take into account the technical and financial limitations that are associated with their various energy service options.

12 months after installation Bushlight undertakes a Community Energy Plan (CEP) Review with the community to obtain feedback on Bushlight services and assess community outcomes.

## Energy Service Goals

The residents at Birri Williams established with Bushlight in the early stages of the CEPM that their goal was to have access to 24 hour reliable power generation. They saw this would offer a peaceful lifestyle and be more economically viable. The family also wanted power to continue the production of artefacts, supporting the family's livelihood aspirations and assist in respite care provided to youth and family at Gununa.

## Pre-Bushlight Energy Services

In initial discussions with Birri Williams residents it was determined that the community used:

- Firewood for cooking and heating water
- Solar for hot water and two way radio
- Gas for cooking
- Diesel to generate electricity, both domestic and livelihood related activities

An open fire was used for cooking and for heating water. The outstation is surrounded by timbered land and there is plentiful firewood.

Gas was being used for cooking when available. The community had one 45kg gas bottle, and the cost to fill this at the time of CEPM was \$180. The community purchased these when financially able to. Mornington Island Council CDEP delivered these when it was possible.

A solar hot water service was installed during the period that Bushlight was working with the community.

The community has one generator. A 10kVA FG Wilson Lister diesel generator had been used to provide power for approximately 6 hours a day for both domestic and livelihood needs. Power was primarily used for lights, fans, TV/DVD, electric hand tools, a small hot water service and a pressure pump.

The community arranged the purchase of diesel fuel from nearby Birri Resort. The community collected the diesel daily in a 18 litre drum which they transported to and from the Resort in a wheel barrow. Diesel at the time of the initial CEPM was \$1.30/litre and the community was spending approximately \$20/day when they were financially able to. This gave them approximately 15 hours power supply a day. Annually the community was using approximately 6,500 litres of diesel a year, costing \$8,450/annum.



*Birri Williams' Generator*

Mornington Island Shire Council (MISC) CDEP offered some maintenance and servicing of the generator and it was in good condition and running well.

## Energy Services Planning

The *Energy Service Planning* stage of the CEPM allows Bushlight an opportunity to investigate the community's energy needs and issues, social structures, mobility, household members and daily activities. During this process community members build up a greater understanding of issues associated with energy provision and use. This allows both parties to make informed decisions about appropriate energy services.



The residents at Birri Williams had a basic understanding of energy service issues in relation to access and financial implications. Using diesel generated power allowed the use of some appliances that used a lot of power, such as power tools.

The end result of this process is the **Community Energy Plan (CEP)**, a document that details the agreed use of available types of energy.

Birri Williams residents agreed on the following:

- Firewood would be used for cooking
- Gas to be used for cooking when available
- The diesel generator would provide back-up power
- The RE system would provide power to the main house for the lights, fans and entertainment (TV/DVD, radio and games)



*Birri Williams Community Energy Planning*

Birri Williams residents accepted the limitations of the RE system and were happy to include their generator as an energy source in times of heavy electrical loads or extended cloudy weather.



*Bushlight Household System at Birri Williams*

They also agreed to use power from the RE system to run the washing machine and power tools only when the batteries were fully charged and there was plenty of sun.

At the time of the Bushlight CEP Review the community did not have any gas bottles. This impacted on the use of energy services, by putting an extra load on the Bushlight system through use of an electric frypan. (see Training)

## System Specifications

A Bushlight Household RE System has been located at the rear of the house and is designed to provide an average daily AC load of 7.3 kWh/day. The Bushlight household RE system at Birri Williams was commissioned in November 2004. The system is located under the existing verandah, with Mornington Shire Council laying a concrete slab for the system to stand on. The photovoltaic arrays for the system were roof mounted.

Bushlight systems power non-critical appliances via “discretionary” circuits and critical appliances via “essential” circuits. To ensure continuous power to critical appliances, power to discretionary circuits is cut when the battery charge drops below a predefined level.

## Major System Component Specifications

PV Array	3.0 kWp (40 x 75W )
Battery Bank	2,400Ah @ 24V
Inverter	2.2kW @ 40°C
Charge Controller	120A@24VDC

## Costing Information

The total installed cost of the energy system was \$107,667. This figure includes costs associated with two service visits in the first year and additional works, i.e. reticulation connecting the generator, additional house wiring and lighting, energy management fittings and construction of the concrete slab.

The Remote Renewable Power Generation Program (RRPGP) provided a rebate of approximately \$47,811 on the total cost.

The total diesel offset by the provision of 24 hour RE power to the community is equivalent to 16,545 litres per annum. This equates to an annual cost saving of approximately \$25,645, and greenhouse gas abatement of 48 tonnes.

## Community Service Agreement

The Community Service Agreement (CSA) is an agreement between the community, its support or resource agency, the agency funding maintenance of essential services and Bushlight where each party agrees to work together, in a spirit of cooperation, to maintain and sustain the energy services. The CSA clearly articulates the roles and responsibilities of each party as well as describing maintenance and repair arrangements.

As of the 1 July 2006 Bushlight will be responsible for the maintenance and repairs of all Bushlight RE Systems. However the actual delivery mechanism will be determined by local circumstances. Existing CSAs will be renegotiated to include this new arrangement.

The CSA also covers the collection of user contributions to pay for future maintenance carried out by the Resource Agency. The residents of Birri Williams advise that they are happy to participate with 12 people nominated as contributors.

## Community Training



*Initial training at Birri Williams*

Bushlight delivered training to community residents directly after installation and commissioning. The process of training as outlined in the CEPM is to deliver three stages over a period of several months, covering operation and maintenance, basic troubleshooting and energy management. This allows the community to become familiar with the system, before moving onto the next stage of training.

Bushlight revisited certain aspects of training and use of the system at the 3 monthly visit, especially in regard to need for the battery to regularly reach float and the corresponding longevity of the batteries. Although data showed that the battery had been reaching float when the system was first

installed this had progressively dropped off over the 3 month period. The community was happy to accommodate this and undertook to watch the volt meter more carefully when using power tools.

Bushlight staff carried out the CEP Review on a weekend. At this time there were over 20 people visiting Birri Williams. The family had been out fishing. The cooking fire had not been started and some hungry young men proceeded to cook their evening meal using the electric frying pan. None of these visitors had had any training in the use of the Bushlight RE System. This was an opportune time for the Bushlight staff to deliver some impromptu training to 4 family members, showing how quickly the volt meter went down while the frying pan was on for a short time. The men were more than happy to start up the generator to finish cooking their meals.

This highlighted to Bushlight staff the importance of 'real' training experiences, for example switching on appliances whilst demonstrating and the resulting engagement with training for community members.

Similarly, at an earlier visit Bushlight staff identified an energy inefficient freezer that was drawing power 24 hours continuously. This has contributed significantly to the communities high energy use. Bushlight explained to Birri residents the impact this was having on the system and the importance of energy efficient appliances. This highlighted another important module in Bushlight's training which delivers understanding of energy use, not only different appliances and electric motors, but also the importance of well maintained and serviced appliances. The community has undertaken to purchase a new freezer and Bushlight has supported them with information on appropriate choices.

Bushlight Technical Services System Performance Report (August 2005) indicates an increase in energy demand on weekends, in particular on Friday nights. This confirms the weekend of the CEP review as a regular occurrence.

Bushlight has offered to deliver more training to the residents, in particular to visiting family. As Johnny explained to the youth of the family:

*"When you fellas are fathers, you will want this solar system to be still working, so you got to know how it works and to look after it now!"*

*Johnny Williams  
CEP Review  
September 2005*

The residents of Birri Williams have showed a great willingness to accommodate the training and advice of Bushlight staff. They have welcomed Bushlight's proposal of additional training.



In December 2005 Bushlight delivered its Level II Training on Mornington Island. Key areas of training delivered include: basic electrical concepts; RE system components and what they do; basic maintenance tasks; common problems and how to fix them; managing energy use; working safely with RE equipment.

Johnny and his nephew both undertook this training which furthered broadened their knowledge of RE and the components of the Bushlight systems, in particular batteries and their care.



*Level II training at Mornington Island*

The experiences at Birri Williams have highlighted the importance of ensuring that as many people as use the energy services have access to Bushlight training. It is not always appropriate for cultural and social reasons for the main householder to train or compel family members to undertake the needs of the RE system.

## Maintenance and Service

At the 3 monthly visit, Bushlight staff downloaded data from the Birri Williams RE system. Data showed that the system was not regularly reaching float and the household was drawing power in excess of the load design. On further inspection it was found that three trees were shading the PV array from around 12 noon. One tree was removed at the time and the community undertook to have the other two trees trimmed to remove shading. These trees were trimmed in May by the community.

The Bushlight Technical Services System Performance Report demonstrates that there has been a general improvement in the health of the system, supported by new data and measured by battery voltage and an increase in average battery voltage. This has resulted since both the trees were trimmed and further community training undertaken.

Data also shows that the PV input has exceeded the design input 34% of the time over the data set reviewed. This may also explain why the community has been able to draw a load in excess of the design load from the system.



*Trees shading array at Birri Williams*



*Trimmed trees now prevent shading of photovoltaic panels*

As one of the first household system installations, the system at Birri Williams did not incorporate a Remote User Interface (RUI) as have later models. The system was located at the rear verandah of the house, an area not often accessed by the family, thereby preventing regular access and monitoring of the battery volt meter. The Bushlight CEP Review made the following recommendation to help the community manage their energy use.

*Recommendation: Install a Remote User Interface on the front verandah of the house to help assist DSM and make metering more accessible to all the members of the family.*

*Bushlight CEP Review*

*September 2005*

This recommendation was taken up by Bushlight Technical Services and a RUI was installed and

commissioned on the 19th November 2005. Further visits to Birri Williams and discussion with the community will recognise the benefits and outcomes of the RUI and the communities continuing management of their power.

## Community Outcomes

Johnny Williams and his wife Betty Mae told us they were very happy with the Bushlight RE System.

*"Quiet, no noise, no duk duk duk all night long"*

*Johnny Williams  
Bushlight CEP Review  
September 2005*

24 hour reliable power has significantly brought about a change in quality of life for Johnny, Betty Mae and their family. Foremost, the reduction in generator use has resulted in several outcomes for the community.

- The community is well aware of savings from reduced diesel use. Johnny told us that diesel purchase has reduced from \$20/day to \$20/week.
- Particularly important to the community is they no longer experience long periods of noise pollution from the operation of the generator and the community does not have to access and transport fuel in the wheelbarrow everyday, from Birri Resort, approximately 2km away.

This with reduced operation of the generator gives the community more time to spend on livelihoods. For Johnny, he has more time to carry out the role of carer for his wife and the children that stay with them. He does the cooking, cleaning and washing. RE has made these tasks much easier and less stressful.

Johnny is also able to make more artefacts utilising both the free time and the excess power from the RE system during the middle of day to run his power drill and angle grinder. This has allowed him to further develop his sales of artefacts to the tourists that visit Birri Resort and staff from Gununa.

The family is also appreciating access to entertainment, especially for the youth and children who are enjoying watching videos and listening to the radio.



*Birri Williams Youth enjoy videos powered by the new Bushlight Household RE System*

The installation of the Bushlight Household RE system is providing a basis for more of the family to stay at the outstation. Johnny and Betty Mae are enjoying the increase of visitors to Birri Williams. Having the family and their children on the out station relieves a lot of worry from their minds. It removes the burden of worry for the problems in town and allows freedom for the kids to play, swim, and fish and for the parents to relax from work, hunt for healthy food and maintain family unity, story telling and traditional ties to country.



*Johnny and Betty Mae Williams*

## Contact Bushlight

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enquiries@bushlight.org.au



## Focus on Education

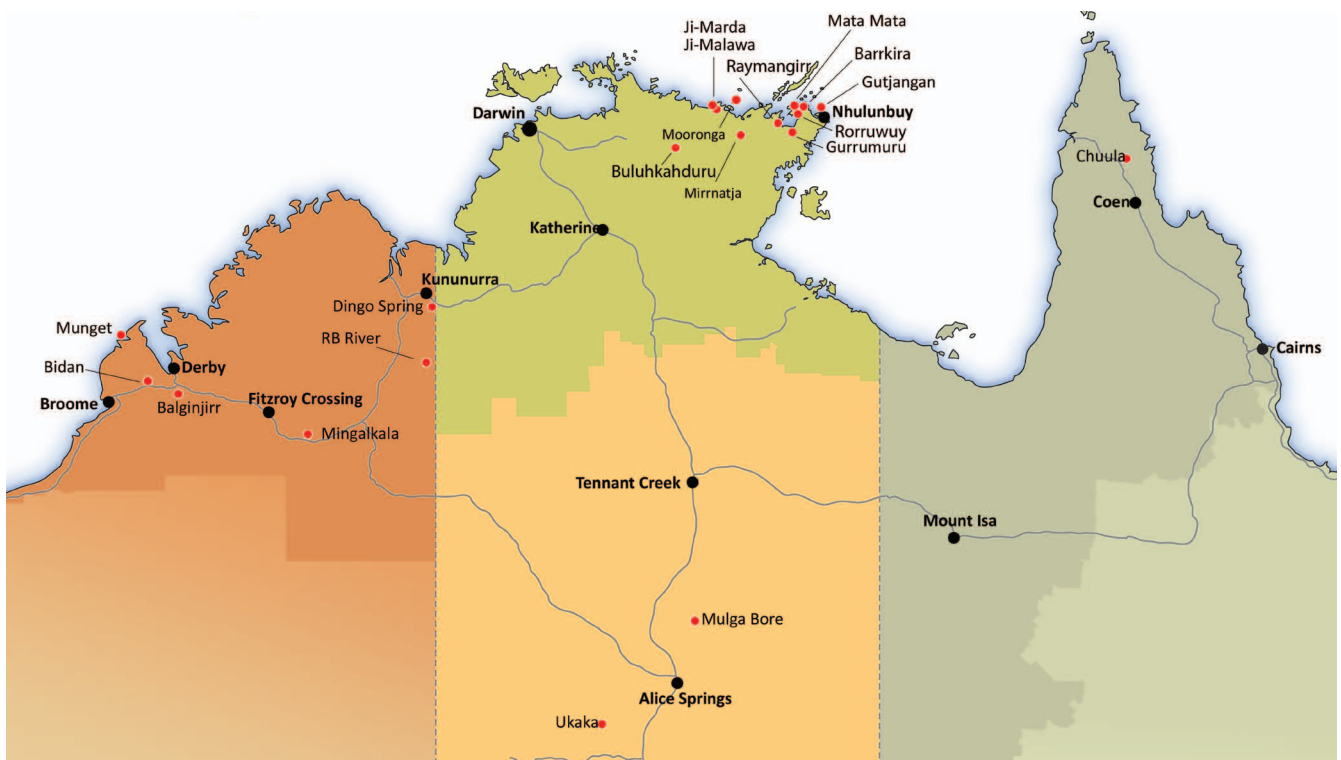
Parents living in urban and regional centres are unlikely to pay much attention to the link between electricity and the education of their children. Grid power provides schools with energy for appliances such as lights, air conditioners and computers 365 days a year and teachers in these settings are able to teach without concern for the availability of electricity.

But for families living on their traditional country hundreds of kilometres from the nearest town centre access to reliable power can be a constant concern in relation to their kids' education. Whether they're relying on School of the Air, home schooling, or have a full time teacher living in the community and working at a Homeland School, ensuring there is sufficient power to run a classroom is never straightforward.

Bushlight and the Centre for Appropriate Technology have long considered appropriate infrastructure and service provision be a critical factor in enabling Indigenous people to live sustainably on their homelands. Accordingly, Bushlight has focused on providing reliable power to small, remote, culturally and environmentally diverse Indigenous communities since 2002.

But once a community has access to reliable power – then what? How does having reliable infrastructure translate into better educational outcomes, more jobs, greater community resilience and increased wellbeing? And what's needed to move communities who do enjoy access to reliable power into more productive use of that power?

This case study explores the links between improved energy services and access to education, focusing on three North Western Australian communities where Bushlight has installed a renewable energy (RE) system.



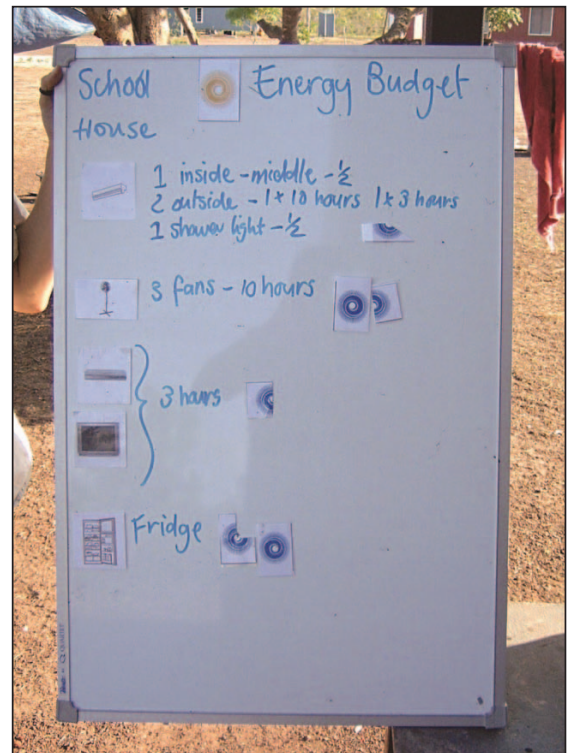
*This map shows Bushlight systems where the power needed for a classroom or home school has been included in the system design. Most of these communities have continued to run schooling since the system was installed.*

## Reliability

Prior to having a Bushlight RE system installed, most homeland communities used diesel generators to supply power. Diesel generators are an excellent way to produce power in settings where generators are regularly serviced, parts are easily available, there is an affordable and consistent supply of diesel and the skills and knowledge to maintain the generator exist in the community. Unfortunately these factors rarely coalesce in remote areas meaning diesel power generation is often unreliable in the delivery of energy services to homeland communities.

With a Bushlight system installed, communities have access to a set amount of solar power every day (an “energy budget”) and can access additional power via a backup generator. This means that Bushlight supported communities can choose to allocate power to:

- Lights and fans in classrooms (lights are especially important where students study at night);
- Radios and the internet for accessing School of the Air; and
- Laptops or computers.



## Home Schooling at Dingo Spring and Bidan

Yvonne and her three boys Joseph, Zachariah and Mathias returned to Dingo Spring just under two years ago. Having a Bushlight system has meant that Yvonne and her family have had access to reliable power and she can home school her kids using the internet to stay in touch with a teacher and access home schooling resources.

Mel Marshall at Bidan has worked hard to provide her three kids with access to mainstream education opportunities. The Bidan school initially operated out of her house but the community now has a small classroom which has a small “energy budget” from the Bushlight system. In 2012, she’ll be running the school herself, making sure the kids access School of the Air via a satellite dish and organising other field trips to support the curriculum.

The strong educational outcomes at both Dingo Spring and Bidan are driven by the determination of the communities to guarantee a good education for their children. There is no doubt that access to reliable power has enabled these residents to pursue educational aspirations for the future wellbeing and success of their families.



Mel Marshall with her son Kegan



These boys from Dingo Spring can now go to school every day in their home community



## Longevity

Quality education outcomes rely on students going to school regularly over the course of many years. Once a Bushlight system is installed, it has a lifespan of 20 or more years, with a battery bank replacement required around 10-12 years. This means there is a guaranteed amount of power available to the school every day. With this in mind, residents are well positioned to make long term decisions and plan for the educational needs of the community in the long term.

## Design

The Bushlight Community Energy Planning process involves a series of meetings during which residents talk about their current energy needs as well as their future aspirations for their community. A Bushlight system is then designed to meet these needs and to expand as required for future growth.

One of the benefits of a Bushlight RE system is that each dwelling has a quarantined amount of power tailored to the needs of the users of that building, an “energy budget”. So, if the school building requires 8kWh a day to function, that energy budget is provided to that building every day and cannot be accessed by other buildings in the community. Having a set amount of power available in a classroom each day allows teachers to effectively plan their lessons without the uncertainty of unreliable power.

## Support

Bushlight provides training to the entire community (from kids through to grandparents), explaining how to use their system, troubleshooting, fault finding, shut down procedures and energy efficiency. Training residents means people can make active choices about how they use their allocated “energy budgets”. By involving the whole community, all power users are well equipped to make decisions about power use, including kids in the classroom.

In addition, Bushlight staff are always available to troubleshoot and provide technical advice over the phone. Investing in community training and then providing this technical support over the phone means that residents themselves are often able to faultfind and fix small operational issues quickly and without the delay and expense of using organised contractors.



*The classroom at Barrkira School*



*Mata Mata School in Arnhem Land*



*Students at the Barrkira School in Arnhem Land*

## Future Initiatives Supporting Strong Education Outcomes:

### TAFE at Mingalkala

**Motivated communities such as Mingalkala show how reliable infrastructure can assist Aboriginal people to earn a living and remain on their country.**

The Mingalkala Bushlight system was installed in 2005 and since then, the community has gone from strength to strength. Access to reliable power played a big part in motivating many people to come back to the community. Mingalkala quickly outgrew the capacity of the original system and in 2011 Bushlight upgraded it to meet current community needs. The Centre for Appropriate Technology, also upgraded the Mingalkala generator in 2011.

In addition to running a fencing business, Outback Fencing Services, community leader Stanley Till is busy making his dream of an on country TAFE a reality. He says a TAFE on his homeland will achieve better educational outcomes than the one in town, where young people are easily distracted. His goal is for relevant training to be available to young people in the region so they're able take advantage of local work opportunities which are often filled by workers from elsewhere in Australia.

Stanley worries about the diminishing support for homeland communities and the impact it will have on Aboriginal people's quality of life. He wants to share Mingalkala's story as an example of how remote homelands can support themselves while remaining on their country. He says that not all Aboriginal people want to live on larger Indigenous communities and that there *are* opportunities for Indigenous people to live and work in remote areas.

To date, he's been donated a number of examining demountables and organised to run the refurbishment of the demountables as a TAFE course in construction (as shown in pictures at right). Stanley and his students have refurbished the interior of the demountables so one can be used as a classroom and the other for accommodation as well as building a deck and shade structure.

At present there is no power to the TAFE buildings. Bushlight will be working with Mingalkala in 2013 to establish the best possible way to supply power to these buildings as well as conducting further training with residents and students about energy efficiency, system operation and system maintenance to enable them to maximise their use of the existing solar power.

Whatever the details, Bushlight is keen to support Stanley with the practicalities of supplying power to the Mingalkala TAFE as a part of the Bushlight Livelihoods Project in 2013.



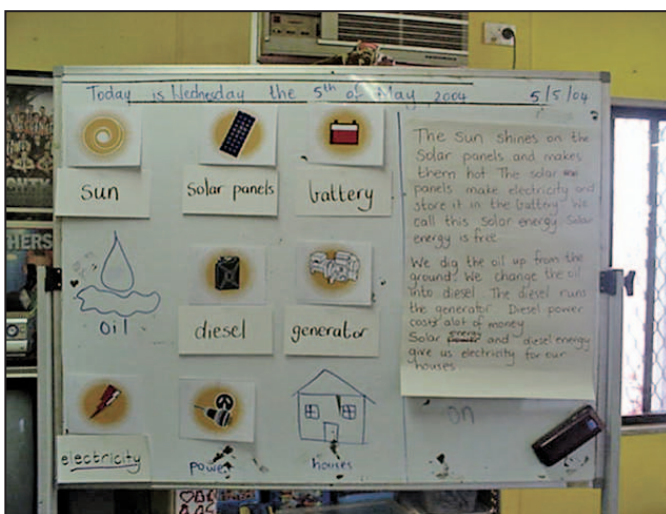


Although educational success relies on many factors both within and outside of community control, access to reliable power can overcome many of the challenges of remote learning.

In many cases, where a quality education is a priority for homeland parents and kids, a reliable power allocation for teaching purposes combined with a solid understanding of how to manage power use may just be enough to keep a homeland school or classroom alive. Certainly, the residents of Dingo Spring, Bidan and Mingalkala have shown how with reliable infrastructure remoteness need not be a barrier to making a good education on country a reality.



*Ukaka School in Central Australia*



*Energy Planning in the Classroom at Mulga Bore, Central Australia*



## Ulpanyali

Living only a few kilometers from one of Australia's most popular tourist destinations provides residents of Ulpanyali community with many opportunities to develop livelihoods and share their knowledge.

Ulpanyali is a homeland situated in the heart of the world renowned Watarrka (Kings Canyon) National Park in Central Australia. There are five houses and four tin shelters at the community which is surrounded by rugged ranges, water holes and gorges. Residents of Ulpanyali speak Luritja and English and have lived in the area for



Iconic Kings Canyon in Watarrka National Park

many years, long before the National Park was established in 1989. The National Park is now visited by hundreds of tourists from other parts of Australia and around the world. The tourists stay at Kings Canyon Resort, which is only 2 kms down the road from the community.

Traditional owners, Julie and Stephen Clyne recognise that Ulpanyali's proximity to such a thriving tourist location has brought many opportunities to the community. Under their strong leadership residents are striving to establish new livelihood activities and further develop existing enterprises.

This story is about the new enterprises and activities in Ulpanyali, and how Bushlight has helped the community to acquire reliable 24 hour solar power to help them achieve their aspirations and live comfortable, healthy and sustainable lives on country.

### Ulpanyali and Bushlight

In late 2007, Ulpanyali was allocated a share of funds from the Central Land Council's (CLC) Uluru Rent Money Community Development Project. This project puts a portion of the entry fee paid by tourists to enter Uluru - Kata Tjuta National Park into a trust fund for local community development projects. This money is then allocated to families that have a strong



### **Bushlight's Community Energy Planning Model**

Bushlight's objective is to improve livelihood choices for remote communities by increasing their access to reliable energy services. To do so, Bushlight works directly with community members to provide them with independent advice and information about choosing which energy services are best for them, and advice on demand side management, and energy conservation. Using a range of pictorial resources, Bushlight invites communities to consider how they use energy and how much it costs them; and with them, look at what options are available for improving their access to reliable energy services.

Through workshops and community mapping exercises, Bushlight works with residents to prepare Community Energy Plans (CEPs). These plans detail the community's current energy needs as well as any future livelihood aspirations. The CEP documents an agreement between Bushlight and the community by setting out household energy budgets and the roles and responsibilities of the community in using and looking after their solar power system. The responsibilities of Bushlight, the community's service agency, and the system installer are also laid out.

After the initial CEP meetings and completion of the system design, Bushlight coordinates the installation of the RE equipment. Following installation Bushlight provides education and training in system operation and maintenance over several visits during the course of the first year. Bushlight's approach elaborates on the typical RE industry process by involving the community in all key activities and decisions.

cultural connection to the country within which Uluru and Kata Tjuta lie.

Ulpanyali residents decided to put a portion of their rent money towards improving the community's power supply. Prior to this time the community was relying on a single phase 31kVA generator for all of their power needs. The generator ran for approximately 11 hours each day which was costing an estimated \$9600 per year in diesel. Relying on this generator for all of their energy needs was not a long term sustainable option for Ulpanyali.

Kings Canyon resort generates their energy via a 225kWp solar power station, with a back up diesel generator. The system is owned and managed by the Northern Territory Power and Water Corporation. It was commissioned in November 2003 and was partly funded by the Australian Government through the Renewable Energy Commercialisation Program and the Renewable Remote Power Generation Program (RRPGP). Power and Water Corporation also contributed funds.

Being situated so close to Kings Canyon Resort, connecting to this power grid seemed like a reasonable solution to Ulpanyali's energy needs. Residents, with the support of the CLC, entered in to extensive discussions with various Government stakeholders regarding the grid connection. Over time, it became clear that connecting to the Kings Canyon grid would take a lot of time, and also be expensive and technically difficult.

Ulpanyali residents started looking for a new solution to improving their power supply.

Residents had heard about Bushlight and how Bushlight has helped many other communities with their energy needs. They decided to investigate the feasibility of having a Bushlight system installed in Ulpanyali.

In November 2007 a series of Community Energy Planning (CEP) (see boxed insert above) meetings commenced whereby residents discussed their energy needs and aspirations for the future. Residents agreed that a Bushlight system would provide the best solution for the community. In July 2008 a 120V Bushlight renewable energy (RE) system was installed in Ulpanyali. Residents contributed a portion of their Uluru rent money to the installation. They are the first Bushlight community to have contributed their own money to the installation of the system. Twelve months on, residents have expressed great satisfaction with their Bushlight system.

Julie Clyne told Bushlight that having solar power has helped the community in many ways and that it is now easier to live on country. Residents have



Ulpanyali residents talk to Bushlight staff member Nardia Bray during a CEP meeting

saved a lot of money because they don't need to run the generator very often and therefore don't need to buy much diesel. They have also saved money by not needing to drive to Alice Springs (450 kms away) as frequently to buy fresh food.

Being able to refrigerate food and water has been a significant positive change in the community. Before Bushlight the fridges and freezers would start defrosting during the hours the generator



Bushlight solar array at Ulpanyali

was not running, and food would often be spoilt. Julie told Bushlight that the children in the community are drinking much more water now that they can keep it in the fridge rather than drink it from the tap. On summer's days tap water is frequently quite hot because the underground pipes are close to the surface of the ground.

Julie said that having reliable energy services has allowed residents to focus more on other developments that will build the community's ability to be strong, sustainable and self-reliant. As discussed below, there are currently four new projects that are getting the young people involved in meaningful work in the community.

## **Ulpanyali Livelihood projects**

### Market Garden

Ulpanyali is in its first year of participation in a cooperative horticulture business with nearby communities Wanmarra and Akanta. With support from Ngurratjuta Aboriginal Corporation and Community Enterprises Australia (CEA), the three communities are nearing completion of the first season of plantings and are preparing for the summer crop.

Ulpanyali planted cabbages, tomato, capsicum and cucumber for winter, and next season they will focus on watermelon and pumpkin. Each community will focus on growing different vegetables to maximise market potential.

The vegetables are sold locally to Kings Canyon Wilderness Lodge and Alice Springs based wholesaler Red Centre Produce.

### Tourism business

Ulpanyali is in the process of establishing a community run tour business. The tours include a guided walk around the iconic Kings Canyon followed by a cultural information session, both led by the younger residents of the community. The cultural component includes discussion about land and the importance of looking after it, as well as providing an insight into the local culture and traditional foods.

Residents have so far conducted a couple of trial tours. One of the groups was made up of young Indigenous students from around Australia, the other were American tourists, who were delighted to experience hunting with the Ulpanyali men. Before these tours, residents went hunting and gathering for bush tucker to provide the tourists with a taste of their traditional cuisine. The tucker included kangaroo, witchetty grubs and bush tomatoes.

A website and brochures are currently under development as part of the communities marketing strategy. The Ulpanyali tourism business has been named is Kurrpurru Tour Company, which means Magpie or Butcher Bird.

### **Collaboration to upgrade facilities**

Ulpanyali residents decided to spend the remainder of their allocated Uluru Rent Money on significant upgrades to two existing structures in the community. The two buildings will become an art centre and a mechanical workshop. The CLC, who is overseeing this project, approached the Centre for Appropriate Technology's (CAT) Projects and Regional Services Team (PaRST) to manage the works. They are responsible for the



Ulpanyali's market garden - the last of the winter crop.



community consultation, design and renovations to the buildings. Bushlight is also involved in these projects to determine how best to meet the energy requirements of the renovated buildings.

### Art Centre

The women of Ulpanyali are looking forward to having a functional workspace to further develop their art business. Currently, two women in the community Julie and Linda, sell paintings at Kings Canyon Resort, but Julie is looking to expand into new art styles and get the young women involved in art. Residents have started studying art through the Batchelor Institute of Indigenous Tertiary Education to develop their skills in fabric



Meeting with Ulpanyali residents, David Havercroft (PaRST), Hilary Furlong (CLC) and Ben Wall (Bushlight) to discuss the design requirements of the workshop upgrade. The meeting took place inside the existing workshop.



Community art centre meeting with CAT Project management Officer, David Havercroft

and lino printing. The ladies hope to continue selling their art at Kings Canyon Resort and expand the enterprise into other markets when they are better established. Having a dedicated workspace will help residents achieve this goal.

### Mechanical Workshop

The men at Ulpanyali are undertaking developments to an existing workshop to make it a functional mechanical workshop. Initially it will be a space to work on vehicles owned by Ulpanyali residents and nearby families. Being so close to Kings Canyon Resort, and with limited services in the area, residents envisage that in the future the Ulpanyali workshop could expand to undertake repairs and maintenance on tourist vehicles.

In August 2009, initial consultations took place in Ulpanyali community. Staff from the CLC, PaRST, Batchelor Institute and Bushlight all visited Ulpanyali to help residents with the design requirements of the buildings.

There is a small amount of 'unallocated' energy available from the existing Bushlight system to cater for some of the energy needs of the art centre and mechanical workshop. For the art centre, most appliances are low energy users,

such as lights, fans and sewing machines, so most of its energy will come from the existing Bushlight RE system.

The workshop, on the other hand, has many energy hungry appliances such as power tools that use too much energy to be appropriate to run from the RE system. These will be powered by the community generator.

### **Looking to the future**

For a small community of around 30 adults, there are a lot of activities taking shape in Ulpanyali. With Julie and Steven's strong leadership, young people are being inspired to take an active role in the new pursuits, and therefore contribute to the sustainability and security of their community. School age children are accessing a mainstream education through School of the Air, whilst living on their traditional country and maintaining their culture and language.

Julie commented that they need more people out there to help with all the new jobs! Family who live in Alice Springs are keen to move back, but the community currently lacks the housing to support more people. Hopefully in the future Ulpanyali will have further opportunities to grow and develop, and Bushlight looks forward to continuing to work with this inspiring community.

## Bushlight Energy Efficiency Program for Indigenous Homes

The widely respected Bushlight project has developed a new energy efficiency program specifically for use in Indigenous households. Our program trains and employs a number of community residents to assist individuals and families to make behavioral changes that result in using less electricity in their homes. The program's engagement strategies and educational tools are based on Bushlight's established approach, which has been used successfully in Indigenous communities for more than eight years. As well as reduced household power bills, the program contributes to positive environmental and social outcomes.

### Issues

Many Indigenous households, whether in urban areas, town camps or remote communities have higher power bills than average urban homes. They also face a number of unique barriers to reducing these costs including:

- Being located in remote, hot and humid locations
- Living in poorly designed and maintained public housing
- High numbers of household residents
- Literacy, numeracy and language challenges

### The Bushlight Program

Bushlight recognises and understands the unique issues facing many Indigenous households, and the difficulty in translating mainstream energy efficiency programs to these circumstances. Our program is developed around a model that is repeatable, documented and tested. The program:

- Assists residents to reduce their household and community electricity consumption through sustained behavior changes
- Trains and employs local residents as energy educators
- Installs a selection of energy efficiency technologies and informs future upgrade decisions by collecting relevant housing information

### Bushlight's Experience

Bushlight is part of the Centre for Appropriate Technology; a 30-year old national Indigenous science and technology organisation. Since Bushlight's establishment in 2002, we have developed and delivered sustainable energy projects to more than 400 individual households in 120 Indigenous communities. All Bushlight programs have respectful design and community engagement at their core.

The Energy Efficiency Program was piloted in 1800 homes in collaboration with Ergon Energy in remote QLD and is now being implemented in Indigenous communities in the Northern Territory.



### FURTHER INFORMATION

The program is available for implementation by local councils, Indigenous organisations, utilities, private organisations and government. Bushlight provides full project management and program delivery services.

For more information on how to work with Bushlight, please contact:

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