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Our Place MAGAZINE

The hard yards of success

TREVOR COOK: INDIGENOUS TRAINEE OF THE YEAR, 2014

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people working with technology in remote communities

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Cover photo: Trevor Cook in the Noel Hayes Training Facility automotive workshop at Alice Springs. Photo by Colleen Danzic

WARNING:
This magazine contains images of Indigenous and non-Indigenous people. Caution should be exercised while reading this magazine, as some images may be of deceased persons.

Centre for Appropriate Technology

news

CAT Projects sharing their expertise in rural electrification with people in India.

Reaching the world from remote Australia

Last November, CAT Projects, a wholly owned subsidiary of the Centre for Appropriate Technology Ltd (CAT), was acknowledged as the Northern Territory Regional Exporter of the Year. The award recognized the firm's success in building an export market for its services and practical solutions across the Asia Pacific.

CAT Projects has developed specific expertise in rural electrification, particularly in the areas of identifying and resolving barriers to infrastructure development in remote areas. Established in 2008, specifically to develop international markets for the knowledge that CAT Ltd has developed over 30 years in its work with remote and Indigenous communities, CAT Projects is now working in India, Nepal, the Philippines, Cook Islands, New Zealand and Kenya. Bruce Walker, Chairman of CAT Projects said: 'This is a great example of sharing our desert knowledge. Too often remote areas are seen as importers of knowledge and capability. CAT Projects has proven that knowledge developed in remote Australia has currency across the world.'

From CAT Inc to CAT Limited

On the 1st of January 2014 the Centre for Appropriate Technology changed its legal status from an Association under the NT Associations Incorporations Act 2012 to a Company, Limited by Guarantee, under the Commonwealth Incorporations Act 2001.

There has been no change to our status as a not-for-profit organisation governed by an Indigenous Board, nor to our core business of providing housing, infrastructure, advice and support services to Aboriginal and Torres Strait Islander people, communities and organisations.

As stated by Peter Renehan, Chair of the CAT Board, 'we hope the change to our legal status, from an association to a company, sends the message to our core clients, funders and partners that CAT is a highly professional organisation committed to delivering outcomes on the ground for Aboriginal and Torres Strait islander people'.

Training Buzz in the Bush

Remote community residents turned out in force to take advantage of a new rural accreditation offered through the Centre for Appropriate Technology, MacDonnell Shire and Central Desert Shire.

The training package was designed for staff working as Civil Works Assistants to provide skills towards future management and leader-ship roles. Through the new Certificate II in Rural Operations the five operational areas of the Regional Council are covered including: parks, machine maintenance, waste, construction and roads.

Organisers were pleased with the high level of interest in the program, which saw 24 staff attending- exceeding the 16 who were initially enrolled. The course was held in Papunya, 250km west of Alice Springs and attendees travelled from neighbouring communities of Mt Leibig and Haasts Bluff. The training offered is wide and varied, reflecting the diverse workload of remote area workers. Environmentally sustainable work practices, planning and organising workloads, small plant and equipment maintenance, weed treatment, repairing potholes and preparation of grave sites are all covered.

The training program is now being rolled out to three further regions incorporating Ntaria, Yuendemu, Ti tree and nearby communities.

The hard yards of success

Trevor Cook and his mum Jeanne Cook were two of the 130 guests attending the inaugural Motor Trades Association's 2013 TIO Automotive Apprentice of the Year Awards ceremony held on the 12th November 2013 in Darwin's Parliament House. Trevor departed Parliament House beaming with pride as he took out the Indigenous Apprentice/Trainee of the Year Award and a voucher to purchase tools.

BY CHRISTINE REEVES

Presentation of award to Trevor at Noel Hayes Training facility, Centre for Appropriate Technology. Left to right: Peter Renehan, Trevor Cook, Peter Donovan and Devender Bohra.

> We supported Trevor all the way through. We never gave up on him. We knew that he could do it and he did. We are very proud of him.

Trevor Cook completed his Certificate I in Automotive Servicing through the Centre for Appropriate Technology (CAT) while enrolled in Year 10 at Centralian Senior School. Continuing on to Year 11 he undertook his Certificate II in Automotive Servicing at CAT as a school-based trainee, completing it just before turning 17.

Not that long ago Trevor's life and future were not looking that good. He was one of the young people featured on the SBS Insight program (April 2013) about disengaged youth in Alice Springs. In that program Trevor, then 16, admitted he was probably going down the wrong track in life. He'd been doing community service for stealing. He also spoke about his dreams of one day becoming a mechanic and moving away from Alice to a place where people were happy and where there was less fighting.

Trevor has had unwavering support from his family, even during the difficult times when he was 'running amok.' His mum, Jeanne Cook, an Alyawarra woman who grew up at Elkedra Station, said 'we supported Trevor all the way through. We never gave up on him. We knew that he could do it and he did. We are very proud of him.'

His father, Trevor Senior, comes from Meekatharra and has worked as a concreter for over 40 years. He moved from Darwin after Cyclone Tracy to Alice Springs, where he met Jeanne, and started their family. (Trevor also has 2 sisters). He did all the concreting for most of the large centres around town, including Yeperenye, Alice Plaza and the Courthouse. Trevor says his dad was a good role model for him, showing him 'what it means to get up every day and go to work. To work hard. To have something to get up for in the morning and to provide for your family.'

Trevor has always loved cars. As a young child he has memories of playing car games on Play Station and them making Lego cars. His mum said he spent a lot of time pulling apart bikes and fixing them up again. 'Our backyard looked like a bike wreckers.' Trevor could work out how to fix things from a young age.

Following on from the program on SBS Insight an incident occurred which would be a catalyst for Trevor to make changes in his life. He could stay on the same downward path or he could prove to those who now condemned him that he could turn his life around and achieve something. Trevor's nephew has also been an inspiration for him. His nephew had just finished a school-based traineeship and secured a great job. He saw how his nephew just focused on what he wanted to achieve and made changes in his life so he could be successful and did the same. He made up his own mind and completed his studies with a determination and application so deservedly recognised with the receipt of the Indigenous Apprentice/trainee Award.

While Trevor does not see himself as a role model or inspiration for others, his mum said he has always been a person that provides encouragement and support to others. Trevor is very grateful for all the people that made it possible for him to win the award; his family, his trainer at CAT, his mentor from CAT, Centralian Senior College, Centrecorp for sponsoring their airfares and the Motor Trades Association

Fig. 1: The existing concrete intake structure upright and in near working order as of September 2005.

Fig. 2: 44 gallon drum sunk into the bedsands of the Port Stewart River to access the subsurface flows.

Far Left – Fig. 3: Excavating the river bed sands at Port Stuart.

Building resilience

PORT STEWART WATER SUPPLY

BY MADELEINE JENKINS

At the end of every dry season, communities located at Port Stewart on Cape York, QLD face challenges accessing a reliable water supply. Residents at Mojeeba and Theethinji are becoming increasingly frustrated with the situation as it is happening year after year without reaching a permanent solution to their water supply issues.

In 2000, a study was undertaken by CAT that determined the most suitable drinking water source in the area was from the bed sands of the Port Stewart River. A new water supply system was installed, which proved to be reliable at first. (See Fig. 1: A photo of the original structure taken in 2005.)

In 2006, Cyclone Monica swept across the Cape followed by floods causing significant damage to remote community infrastructure. The intake structure pictured above had not been seen since as it was buried deep in sediment.

The community now resort to sinking a 44 gallon drum in the bed sands to access the sub-surface flows of the river during the dry season (See fig. 2). This has proven to be manually intensive, particularly during the recent dry year, when it has been difficult to sink the drum deep enough to access the water below the bed sands. This ad-hoc arrangement is also susceptible to contamination of the water supply, potentially impacting resident's health in the communities.

Recognising the urgency of the water supply situation at Port Stewart, CAT worked with the Yintjingga Aboriginal Corporation to investigative the current condition of the intake structure while the river was still dry. With the help of a 3.5 tonne excavator hired from Cairns and a team of employees from Yintjingga Aboriginal Corporation we began excavations prior to the onset of the wet season.

After some serious digging, we discovered the bed sands of the Port Stewart River hold a lot of water even at the driest time of year, so there is no concern about running out. We also discovered the intake structure is close to its original location, completely submerged in sand and lying on its side. With the limited equipment available it was not possible to salvage the structure. Its recovery would be an expensive activity with no guarantee it would be undamaged or reusable. While we were on site, we collected as much information as possible to enable consideration of an alternative design suitable for the communities at Port Stewart.

Over the coming year CAT will work closely with the residents and key stakeholders at Port Stewart to choose an appropriate solution for their water supply system.

This will involve workshops with community members to explore options that will work for them and be technically and operationally robust. For each option we will explore the installation requirements, maintenance requirements, skills required, materials needed, and costs over the lifecycle of the project. The collaborative problem solving and analysis of options will assist the community to make decisions for their water supply that they can afford and manage over the long term. This process will also help determine whether additional funding is required and if so, funding proposals will be written in collaboration with the community. It will include information about the community, accessibility, a summary of the design, material lists, drawings and estimated costs.

At a later phase of the project, we will also re-visit the Port Stewart Community Water Management Plan that was developed with CAT in 2005 to identify and manage the risks and maintenance requirements for the water supply system. A component of the plan will include what to do in an emergency situation such as during extreme weather events like cyclone, floods and wildfires. CAT's community water planning process involves assessing risks under the unexpected change to the water supply, identifying problems, processes for informing community members, notifying authorities as well as fixing the problem if possible. The Community Water Management Plan assists community members and relevant authorities to proactively manage any risks to the water supply, keeping the supply reliable and safe.

Thanks to additional funding support from the John Villiers Trust, CAT continues to provide practical action and support to resolve remote community water supply issues across far, north Queensland

The John Villiers Trust

About The John Villiers Trust

The Trust was established by the late John Villiers who spent most of his life as a jackaroo and pastoralist in Central, Northern and Outback Queensland. The Trust gives grants to Queensland charities, and particularly supports communities to participate in projects which will enrich lives and strengthen social spirit.
The Trust has a special focus on remote north and Central QLD communities.

John Villiers Trust has contributed funding for CAT's Live and Thrive on Country project rolling out over the next two years. The project supports participatory water planning and hands on work to upgrade water supplies. The program also allows for some broader outstation infrastructure assessments followed by sustainable livelihoods planning for those communities that are interested and will benefit from a strategic dialogue around mobilising their existing assets, strengths and capabilities to help achieve long term their aspirations.

This grant enables instant response to urgent needs faced by communities and to be able to afford time in planning, documentation and preparing funding proposals for further works.

Enterprise by design

BY METTA YOUNG

Late last year, the CATFAB workshop teamed up with designer Elliat Rich to design and manufacture benches for the Alice Springs Town Council as part of the town's mall redevelopment.

There were a number of aspects to the bench design. They were fabricated locally in Alice Springs by Aboriginal men employed in the CATFAB workshop and powder coated by a local business. The design incorporated an element of the unknown to the extent the colour strips featured on the base of the benches were fashioned from metal retrieved and cut by CATFAB Aboriginal Employees from abandoned cars in and around Alice. The colour and condition of the strips was in essence a design element incorporating 'happenstance' (what could be retrieved) and the choices of the men doing the work. The strips were cut largely from car bonnets, both in the field and back at the workshop. These were then fitted to the base of the benches with over 200 rivets.

Each bench also incorporates a small plague naming geographical reference points and historical events that helped shape and place the current township of Alice Springs. From 'Rubies' in Glenn Annie Gorge and alluvial gold at Arltunga to the first trig points on Trig Hill, Mt Gillen and Mt Johns, the eight benches help to paint a picture of what was (and wasn't) around when the town was first surveyed by David Lindsay in 1888.

The location and angling of the benches on site in the Alice Springs Town Mall aligns the plaques geographically towards these reference points and locations of historical significance. CATFAB employees installed the benches in the mall following the design guidelines for installation.

The 1888 benches are functional public art pieces incorporating stories from history and today. They depict both the flavor and labour of central Australia, connecting local skills with local stories. A key part of the story within the benches is the employment opportunity enabled for the Aboriginal men who undertook the fabrication and installation.

Above: Phil Coombes stacking the benches post fabrication ready for delivery to the powder coaters.
Top: Aaron Burdett and Phil Coombes with some of the car bonnets they collected and brought back to the workshop for cutting. Sometimes it was just too hard to cut on site out bush.
Left: Phil and Aaron showing off some of the leftover strips next to the completed benches Choosing and laying the strips was an exercise in both art and science.
Far left: Phil found his old car the purple rocket while on the search for abandoned cars. Getting a strip from this vehicle was top priority. Phil reflected that there were a lot of cars from countrymen (including his own) now resurrected and sitting inside the benches in the Todd Mall. These cars had seen a lot of country and could tell a lot of stories and now they and their owners are part of a new story in the centre of town.

Far Left: Fitting the metal strips to the base of the benches.
Left: Aaron reading one of the small plaques affixed to the benches. The plaques on each bench determined how they would be angled and sited in the mall.
Below left: Aaron and Phil checking over the final clean and polish of the benches prior to installation.
Above: Aaron, Phil and Roland installing the benches.
Above right: A close up of one of the plaques. It reads: 110km. Early March 1886. Garnets discovered at Glenn Annie Gorge.
Below: Phil, Aaron, Architect Sue Dugdale, Designer Elliat Rich and CATFAB Workshop Manager Peter Gleeson overseeing the final installations.
Right: The proud workers.

CATFAB

The CATFAB workshop is a social enterprise set up by CAT to provide work experience, skills development and employment opportunities for Aboriginal job seekers in the Alice Springs region.

After many years of delivering accredited technical training through our Registered Training arm it was increasingly clear to us that there was a growing disconnect between gaining skills, being work ready and gaining employment. Whilst our training programs have prioritised experiential and practical learning, gaining and holding down employment also requires a range of less tangible capabilities such as communication, team work and understanding the culture of the workplace. These capabilities are often best shaped and developed on the job.

However, opportunities for gaining entry level 'real' work experience are in decline especially in the areas of manual labour and manufacturing. This type of work has tended to be the door opener to the labour market for Aboriginal men. Whilst the decline in entry level opportunities in these sectors is a trend across the whole Australian economy, its impact in remote Australia and for Aboriginal jobseekers is felt most sharply.

Even in the mining sector the availability of work classified as low skilled manual labour is highly constrained. This type of work also tends to be casual, contract based and short term.

Commitments by mining companies and private corporations to guaranteeing Aboriginal people a job once they have been identified and appropriately skilled has been one response to the issue. This approach effectively takes the cream amongst potential job seekers but does little to establish appropriate opportunities and pipelines to employment for the bulk of Aboriginal job seekers.

The CATFAB social enterprise currently provides employment for Aboriginal people in fabrication and manufacturing. Like any small business operating in the sector, its viability is subject to the ups and downs of the local economy. Diversifying contract and labour hire opportunities through partnerships and other opportunities will be key to the future viability of the business and for expanding the development opportunities for Aboriginal employers as they transition towards long term and rewarding employment

Reliable technology and local economies: the Bushlight story

BY METTA YOUNG, SAL WARD AND LYNDON FREARSON

In the beginning

In the late 1990s, the Centre for Appropriate Technology Inc. undertook a groundbreaking and comprehensive market survey of the use of renewable energy systems in remote area power supplies. Whilst renewable energy (RE) options have been a salient feature of outback living for many decades (the galvanized iron windmill used for water pumping a classic example), by the late 1990s the penetration of RE was limited. Diesel generation remained the most common type of energy supply despite the escalating costs of fuel, growing concern about greenhouse gas emissions and increasing demand from residents for the appliances and lifestyle amenity urban dwellers had long enjoyed.

The survey sought to identify and quantify some of the barriers affecting the penetration of RE in remote Australia. We visited 134 separate sites across remote regions of the Northern Territory, South Australia, Western Australia and Queensland, and assessed over 350 separate power and water pumping systems. In addition, we interviewed landowners, remote community residents, business operators, installers and suppliers. What we found was a suite of structural, performance and service issues that made the reliability of systems very poor and consumer satisfaction very low. There were poor maintenance and service systems in place, complicated by transport costs, distance and the lack of local expertise. Systems installed were an eclectic mix of makes and components with minimal quality control during manufacturing or commissioning and almost nonexistent support at any stage post-installation. In addition, the design of the systems installed did not take into account how users could interact with their system and manage their energy demand. Thus old energy inefficient refrigerators, washing machines and lighting alongside high energy use appliances were being coupled to RE systems resulting in significant losses to utility. End user training and support was minimal and there was a clear disconnect between capital outlay, service expectations and the amenity delivered.

In the small remote Indigenous communities surveyed, 61% had or were experiencing problems with their RE system, only 26% had any sort of maintenance regime in place and only 8% had local people trained in system care. What this meant in day to day terms for residents of these communities was that their energy supply was highly unreliable, and despite having RE systems, they were largely still reliant on high cost diesel generation for intermittent supply. The experience of 'energy poverty' is a serious hindrance to economic and social development. Access to reliable and affordable 'off grid' energy services is critical to the provision of clean water, sanitation and health care, and provides a threshold of amenity — lighting, refrigeration, cooking, washing and telecommunications — that underscores improved nutrition and hygiene and can support education outcomes, employment and enterprise opportunity.

Innovation and community aspiration

The Bushlight Project, an initiative of the Centre for Appropriate Technology Inc., was established in 2002 in response to the market survey's recommendations. Bushlight's remit was small remote Indigenous communities with a mandate to facilitate reliable and integrated RE energy service systems that ensures:

- innovative and robust hardware engineered and designed to mitigate the risks and costs associated with remote area infrastructure;
- focused and tailored end user engagement to inform system design, provide training to support on site system care and demand management strategies; and
- the development of a dedicated maintenance service for RE systems in remote communities including processes for up skilling and accrediting installers.

Since 2002 the Bushlight project has installed 148 RE systems in 130 small remote communities across central and northern Australia, bringing a reliable 24 hour energy supply to some 2500 people. Our approach is underpinned by the recognition that the design, functionality and reliability of any technology are intrinsically linked to the people who use it, what they use it for, and where they live.

Designing, installing and maintaining RE systems, has only ever been part of what we do. We also aim to provide the health and wellbeing, amenity and livelihood opportunities that access to 24 hour power can enable.

> Innovation in technical design and service models emerged from the focus on outcomes for people rather than a focus on supplying and maintaining technology.

Innovation in technical design and service models emerged from the focus on outcomes for people rather than a focus on supplying and maintaining technology. The Bushlight Energy Management Unit (EMU) provides separate circuits for 'essential' and 'discretionary' uses and its user friendly interface supports residents to proactively manage their 'daily energy budgets' (see Sidebar Bushlight infrastructure, right). Our Community Energy Planning Model combines best practice engagement with training and feedback strategies to inform how we design systems (capacity, siting), manage technical and other issues and incorporate future development aspirations (see Sidebar Participatory community Engagement p15). We have developed and implemented training programs for installers and electricians to ensure the service quality of electrical contractors operating in the 'off-grid' market in remote Australia. Our commissioning standards for installation and maintenance have set the benchmark for quality infrastructure provision in remote areas. In addition, comprehensive data sets have been collected and analysed over time to ensure risks are managed, costs are minimised, and improvements implemented. Such feedback loops have also enabled the implementation of the most effective mix of centralised coordination, service cooperation and service outsourcing. The downstream cost savings to both governments and community residents have been significant, as have the flow on social and economic benefits.

Recognition of success

In 2005, an independent evaluation of the Bushlight project was undertaken. The evaluation found that Bushlight was delivering high quality, rigorously tested RE systems to remote communities and was '… achieving strong positive outcomes across many sectors of government; environment,

Roma Puertollano in May 2013, after 6 years of living with her Bushlight RE system. Roma feels the Bushlight system has been a steady partner in ensuring the homeland and business can successfully grow and develop.

A community resident (Phyllis Batumbil) who has lived with her own Bushlight system explains in language how the EMU works to residents living with a newly installed system.

Bushlight Infrastructure

Bushlight infrastructure has been specifically developed for the harsh conditions in remote communities. Our engineers consider both the social impact of the technology and the technical requirements of meeting each community's needs.
Bushlight's well proven design methodology ensures extended battery lifespan and maximum reliability. In addition, the use of purpose built, user friendly hardware, is specifically designed for remote areas and extreme climates. Technical innovation is coupled with the ability to respond to the dynamic nature of remote communities.

The Bushlight Energy Management Unit (EMU) was specifically designed to address the demand management issues that arise with RE in remote communities. The EMU offers a user-friendly interface installed in each house which provides feedback to residents regarding their negotiated 'daily energy budget', so people are equipped to make decisions regarding their energy use throughout the day. The daily energy budget is a tailored amount of energy negotiated with the household during Community Energy Planning and delivered to the house in a 24 hour period. The energy budget is reset at 12pm each day, and should additional energy be required, this is typically provided by a back-up diesel generator. The daily energy budget includes a portion for 'essential' appliances (fridges, medical equipment and one light for safety), and a portion for 'discretionary' power (all other solar-friendly appliances negotiated with the householder) run off a separate circuit.
The technical innovation of the EMU offers social, technical and financial benefits. EMUs ensure there is 'energy equity' throughout the community (one household's energy use does not affect others) but also offers appropriate battery protection, ensuring the most expensive component of the system will last 8–10 years.

Alison Doyle, Mabunji Aboriginal Resource Centre, NT: 'Bushlight have played a crucial role in providing appropriate infrastructure, excellent technical support and regional capacity building to ensure residents of our homelands have access to appropriate, reliable and well maintained infrastructure'.

Participatory community engagement

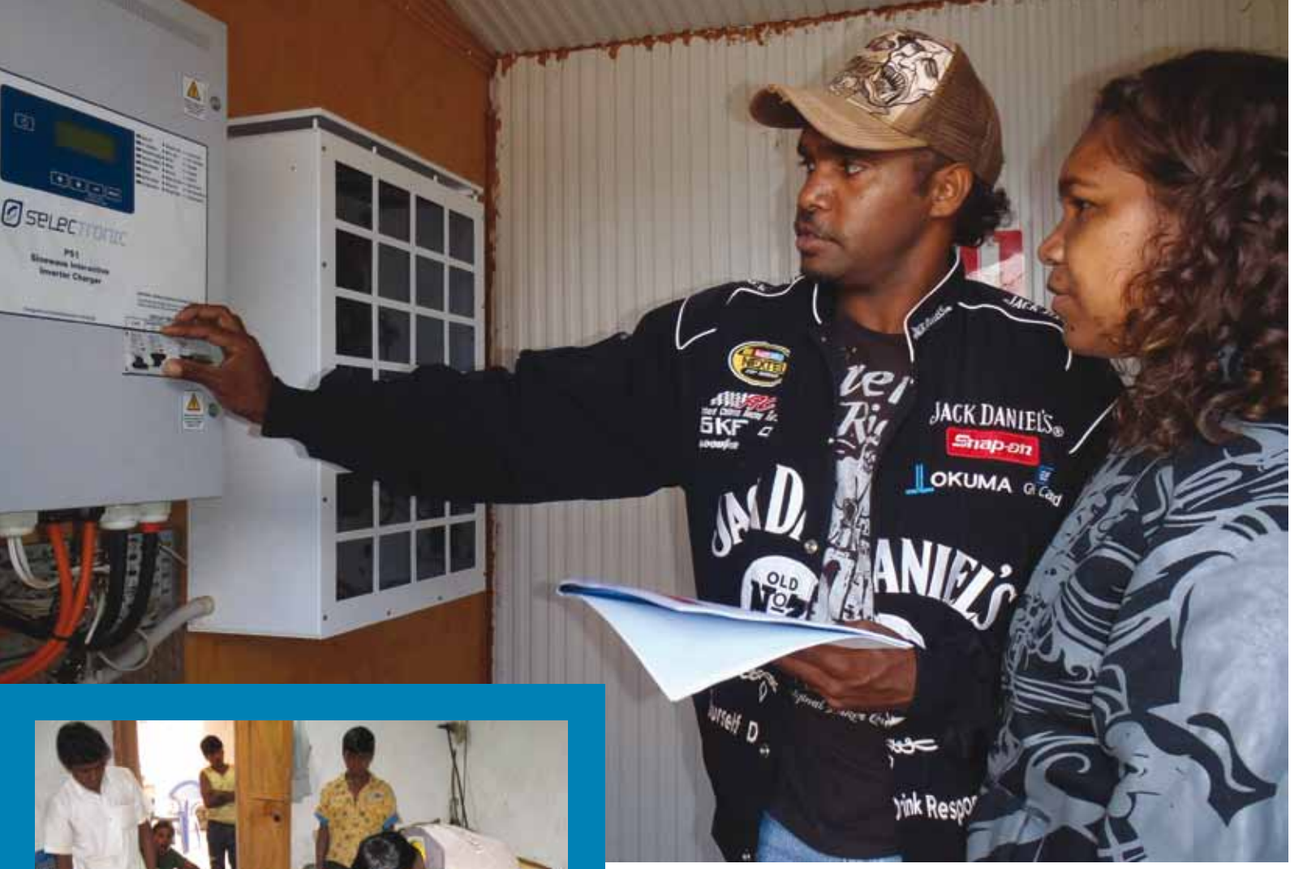
Participatory community engagement lies at the heart of Bushlight's work. Our Community Energy Planning Model ensures a two-way dialogue with residents of Indigenous communities in each step of the process, from initial planning meetings right through to ongoing support and training years after installation of a system. Taking the time to build a relationship and to share information means that:
residents are in a position to make informed decisions about the benefits and limitations of RE and what is right for their community, and Bushlight has accurate information to design a system that meets the needs of residents on a household and community level.
Bushlight's specialist field staff use a toolkit of image-based materials and hands on activities to facilitate understanding about what energy is, how it's produced and how to use it efficiently.

Residents provide Bushlight with a good understanding of the current and future aspirations of the community and how energy services can help them achieve their goals, and a 'daily energy budget' is negotiated for each occupied building.

Upon installation residents are trained in system operation, troubleshooting and basic maintenance. This training represents the first tier of support to communities living with RE systems. If there is a problem with the system, residents themselves can troubleshoot and seek assistance from Bushlight in the first instance over the phone. Small faults can be identified and fixed in this way, often saving the thousands of dollars it would cost to send a contractor to site to address the issue.

Robert Watson, Balginjirr community, WA — I have admired the effectiveness of the staff to help sort out concerns and issues as they arise over the phone, the consistency of repairs and general maintenance and the constant consultations with the community. I believe we have built good relations and the reliability of (the) service is the best service anyone could ask for.

Deborah Siposado and Stephen Nicholls, Djugarargyn community, WA : 'Then Bushlight turned up and "set the bar". Since their very first visit they have shown utmost respect to all who have had dealings with their employees and representatives including their preferred contractors. They work efficiently and effectively and have delivered to a very high standard.



Bushlight India Model

The Bushlight India Project was established to share the successes, skills and experiences gathered through the Bushlight project, with the rural energy sector in India and determine whether the 'Bushlight Model' could be successfully adapted to other social and geographical contexts. Through the project, CAT Projects worked with a network of community organisations and RE industry participants in India, including the Government of India, to develop the Bushlight India Model — an optimised model for remote village electrification. Adapted from the original Bushlight model through a collaborative development process with our partners, the Bushlight India Model was then demonstrated in two remote and geographically distinct villages in India: one in the Sundarbans region of West Bengal, and one in the district of Kalahandi, in western Orissa.

employment, health, education, indigenous welfare and culture' (IT Power, 2005, p x). It noted that the costs of the Bushlight project were within range of the costs of commercially delivered systems and showing a downward trend. The community development practice integral to Bushlight's approach was, by 2005, well-oiled and driving improved reliability and capability rather than increasing costs. In 2006 the Bushlight Project was the recipient of an Engineers Australia Engineering Excellence Award, Northern Division.

In 2008, the Board of CAT Inc. established a wholly owned subsidiary company. CAT Projects Pty Ltd offers engineering services and solutions designed to enhance the sustainability of remote and urban communities across Australia and the Asia Pacific, which are people focused, innovative and practical. In 2011 CAT Projects Pty Ltd was awarded the highest accolade Engineers Australia confers on a project, the Sir William Hudson Award, for its work on the Bushlight India Project. The Bushlight India project drew on the successes, skills and experiences of the Bushlight Project in Australia and delivered an optimised model for remote village electrification in India (see Box 3). More recently CAT Projects PL has been awarded a Northern Territory Export and Industry Award. The innovation and opportunity intrinsic to the Bushlight model, in Australia and elsewhere, is the understanding of the relationship between technology, people and place and the engineering of this relationship to leverage social and economic impact.

"In 2011 CAT Projects Pty Ltd was awarded the highest accolade Engineers Australia confers on a project, the Sir William Hudson Award, for its work on the Bushlight India Project."

A Bushlight staff member shows Max Priest of Corella Creek the solar demonstration kit.

Technology and economy

We are poised at the threshold of a new era in Indigenous Affairs. The Prime Minister has direct oversight of the Indigenous Affairs portfolio. There is a sharpened focus on identifying and replicating what works to 'close the gap' between Indigenous and non-Indigenous Australians. Much of the current discussion centres on economic participation — improving Aboriginal employment in local service delivery and the private sector. An important step forward is to identify and engage with the drivers and levers that can stimulate economic development in places where underdevelopment, underemployment and economic stagnation has long been the norm and where local enterprise initiative is repeatedly thwarted by distance and the disinvestment in basic but essential infrastructure.

Economic Development

Corella Creek is located approximately 350kms north east of Tennant Creek, in the Barkly Tablelands of the Northern Territory. There are 60 permanent residents of the community. Corella Creek families grew up and lived at the neighbouring cattle station 'Brunette Downs' until 1994 which is when they returned to set up a permanent homeland. Max and Joy Priest have since established a very successful business called 'MTP contractors' that contracts local stockmen from Corella Creek to all the neighbouring cattle stations, Brunette Downs, Eva Downs and Anthony Lagoon. In 2006, Corella Creek had a solar power system installed that failed to supply reliable and adequate power to the community within a few years. As a consequence, Corella Creek was reliant on diesel generators again which required a weekly diesel run to Brunette Downs and only 10 hours of power overnight which was expensive and time consuming. Since Bushlight significantly upgraded the existing system in 2012, Corella Creek residents rarely purchase diesel anymore and can now direct their time and hard earned money on core activities to further develop their community and business.

Kabulwarnamyo is located on the remote and rugged western Arnhem Plateau in the Northern Territory. In 2007, the Warddeken Land Management group was established and has been operating from Kabulwarnamyo since. Warddeken are the primary land managers for the Indigenous Protected Area which expands across 14,000km of the East Arnhem Plateau. Since the installation of a Bushlight RE system at Kabulwarnamyo, the rangers can now manage their activities from the solar powered office, and come home to peace, quiet and cold water from the fridge. Warddeken can now spend more of their time and funds on core business rather than the constant struggles with generator maintenance and ensuring diesel is available. When diesel is a slow 3.5 hour 4WD drive away and only accessible in the dry season, that's a significant saving in all ways.

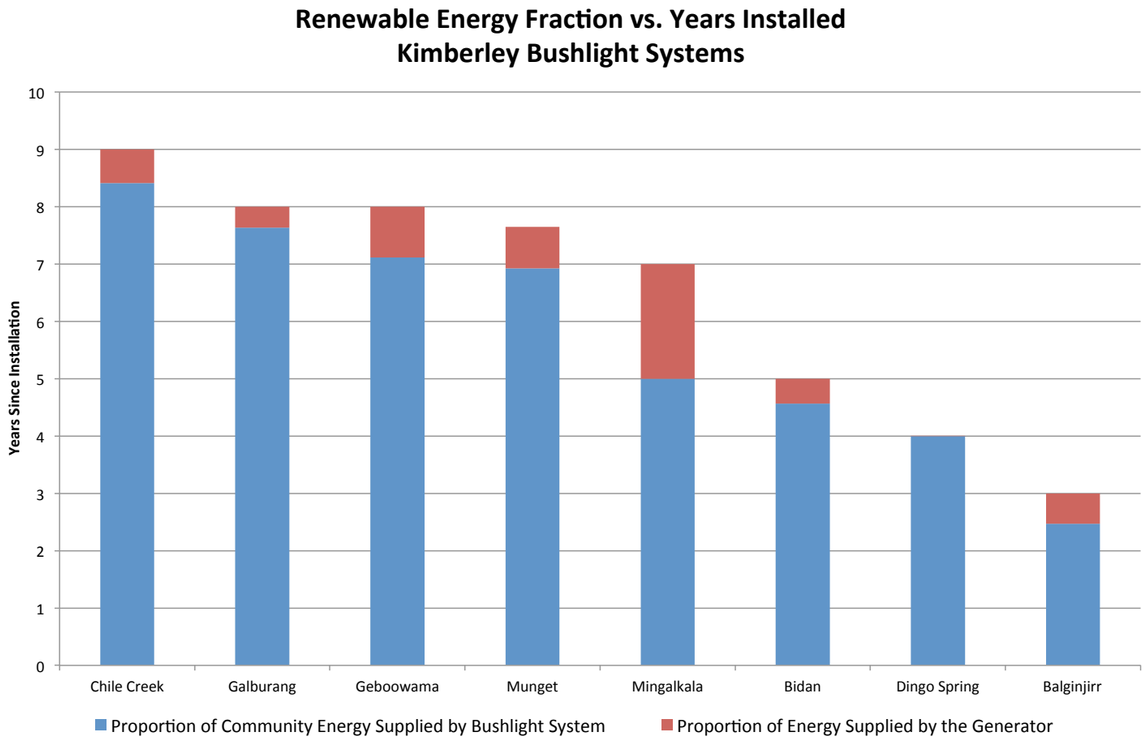
System Reliability

CAT's Bushlight project has designed, installed and maintained RE systems in 32 communities across the Kimberley since 2004. Having learnt from the communities we work with that reliable and affordable 24 hour power can be a catalyst for lasting social and economic change, Bushlight systems afford communities the chance to forwardly organize their livelihoods by proving a reliable and thrifty partner in the development of many community enterprises. In the words of Roma Puertollano from Chile Creek 'We've got reliable power, so we can have tourists — it's as simple as that'.

Bushlight systems achieve this high level of availability (ie. they are very reliable) by utilizing and building upon existing know-how and capacity within communities, and coupling this with an approach that places a premium on regular maintenance, effective knowledge exchange and support services, along with a comprehensive program of local monitoring.

With Regional teams working closely with residents to help them manage the systems optimally and manage their energy demand, many Bushlight systems provide between 85–90% of a community's total energy demand, quickly realizing significant savings in both time and money for the community and the Commonwealth.

This approach has delivered 24 hour reliable renewable energy, economic benefit and economic development for communities, extending the system life and performance and reducing the need for costly component replacement in these remote and very remote communities.



Warddeken Land Management workers hard at work in the office.

> ... the outcomes delivered though the Bushlight project and its unique approach sets the benchmark for measuring the effectiveness of the 'new' service model for remote area RE system installation and care.

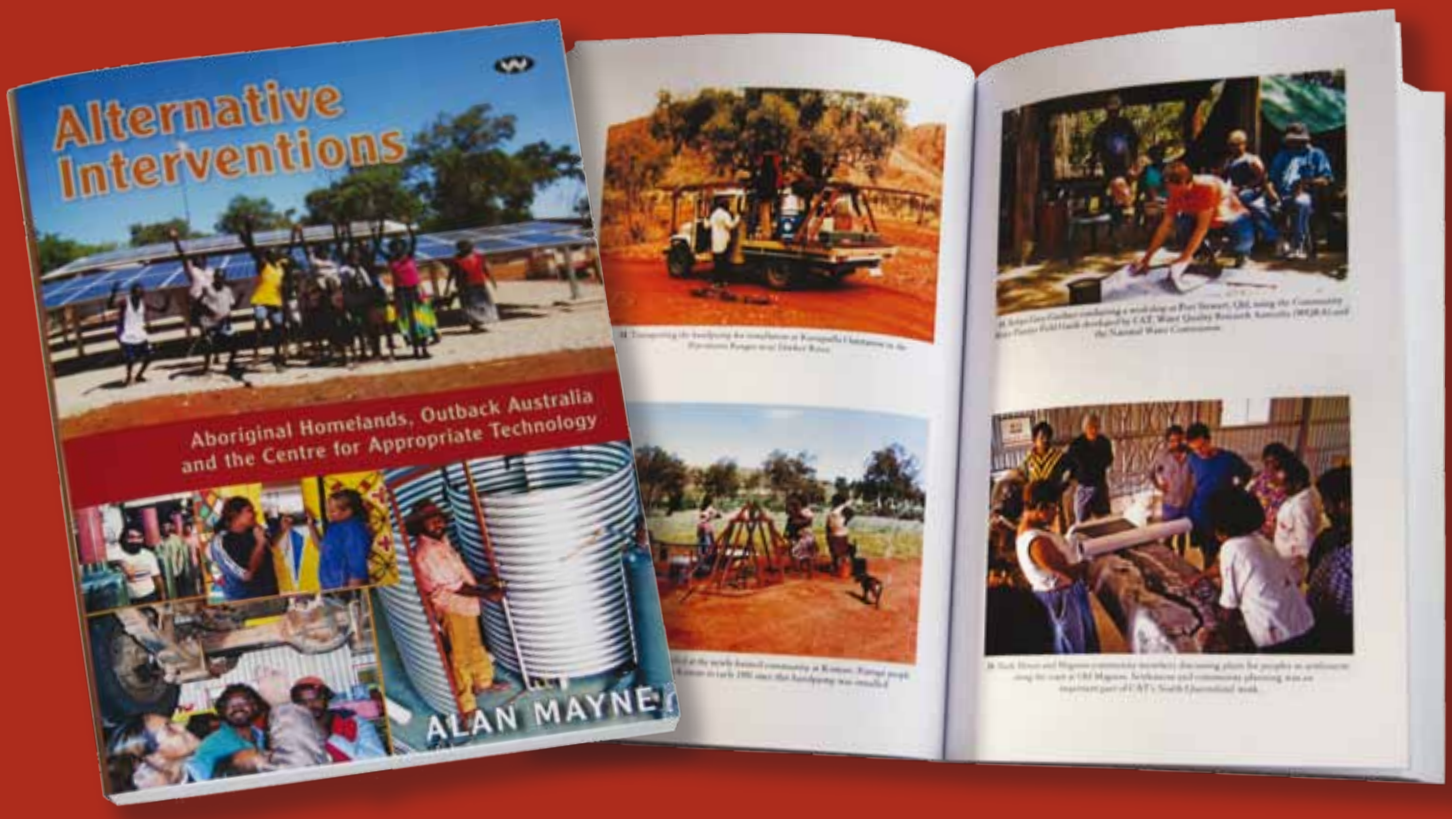
Based on twelve years of evidence captured over the life of the Bushlight Project in Australia, it is clear that the provision of reliable energy services provides an essential foundation for economic development. Many small remote communities where Bushlight systems have been installed and maintained have started enterprises (see sidebar System Reliability p18). Economic activity often emerges where energy planning engages with community aspiration, system design incorporates future development plans and people are supported to manage demand. Whilst the viability of these enterprises will be subject to the same range of market factors affecting all small businesses, without reliable 24 hour power, enterprise activity would remain but a dream. As stated by Roma Puertollano after 6 years of living with her Bushlight system 'we've got power, so we can have tourists. It's as simple as that.'

Learning Lessons

One of the key lessons from the Bushlight Project is the importance of designing and managing each step in the supply chain. We have been able to ensure RE system quality and performance whilst driving additional benefit through also managing the value chain. In practice this means that in remote areas, where distance drives up costs and challenges service reliability, integrated and holistic approaches deliver better outcomes than the conventional approaches with multiple service providers delivering discrete parts of an essential service. The whole is indeed much more than the sum of its parts.

Unfortunately, current understanding of 'what works' in remote Australia, given different market conditions and the complexities of distance, tends to become subsumed by the assumptions and expectations derived from urban experience and the related suite of standards and regulations for service delivery and procurement.

Despite clear evidence of the success of the Bushlight approach, a new model for remote area RE system installation and maintenance is being rolled out. This model uncouples parts of the process — project planning, energy planning, system design, maintenance, capital works, training and capability development — and puts them each out to competitive tender amongst pre-qualified suppliers. Multiple providers across multiple locations, each delivering but one part of the service system, is rolling out. This is a very complex and costly system for government to administer and it would appear that the 'care and coordination role', central to the outcomes achieved by the Bushlight Project, has been overtaken by government contract management regimes and the inevitable additional red tape. This raises significant concern about the lack of a process for ensuring regular feedback from system monitoring, contractor activity and end user experience so critical to sustaining system reliability and end user amenity. The outcomes delivered though the Bushlight project and its unique approach set the benchmark for measuring the effectiveness of any 'new' service model for remote area RE system installation and care. This Bushlight benchmark is the reliability and amenity consistently provided to people so they have a foundation for economic development and independence



ALTERNATIVE INTERVENTIONS

Aboriginal Homelands, Outback Australia and the Centre for Appropriate Technology

By Alan Mayne

It is clear that it is the human dimension of science and technology about which the least is known.

Not all interventions in Aboriginal Australia are inspired by external agents, politics or ideology. Some interventions arise from simple, pragmatic responses to community needs where people and their aspirations are central.

Historian Alan Mayne unravels a story of people, place and relationships. At once both personal and intensely political, this is a journey of ideas into action; intervention through innovation.

In 2010, thirty years after an initial start up grant of $40,000 , an Aboriginal owned science and technology organisation (CAT) was operating with an annual turnover in excess of $20 million and a staff of 130 providing technical services to over 500 remote Aboriginal communities spread across the northern half of Australia. An institution linking people with technology, sustaining livelihoods on country.

'This remarkable story of persistence and purpose should be told as an inspiration to all concerned with the development of appropriate technologies to meet new challenges in human societies. It encourages optimism about the future of Aboriginal people in a climate of uncertainty.'

Professor Basil Hetzel AC, former Chancellor University of South Australia and Emeritus Professor University of Adelaide

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