Alternative Technology Association International Projects Group

Assisting communities to access sustainable technology

2009-10 Project Report

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Overview

For the ATA International Projects Group (IPG) 2009 was another successful year. The team of committed volunteers continued their excellent work promoting renewable energy in Timor-Leste. New projects in areas such as water pumping and training development continued to push the boundaries of what we as a group can do. This has allowed the ATA to open a small office in Timor, thanks to Permatil, the local NGO who share the space.

The Village Lighting project continues to grow from strength to strength. In 2009 another 170 households received lighting systems along with upgrades to an existing 90 locations. Through the wonderful fundraising activities of partner groups we are in the position to deliver a further 400 household lighting systems in 2010!

The IPG is a wonderful partnership between Timorese communities, local administration, Australian volunteers, community groups and electrical and renewable energy industries. All of these partners actively contribute to making an IPG project a special and lasting impact on local development. Please see the next page for all the volunteers, sponsors and supporters the ATA would like to heartily thank.

The IPG has also been recognised by the Victorian Premier, coming runner up in the Premiers Volunteering Award – "Community Volunteering Achievement Award". This is an excellent recognition of the continued hard work of our tireless volunteer team.

This year we have formatted our report a little differently. It now includes a section for communities wishing to work with the IPG to deliver projects. This section outlines the types of projects we have successfully delivered and the types of locations where "solar makes sense". There is also information about the processes required for the ATA to work on your project.

2010 continues to offer new opportunities for the ATA's International Projects. We are embellishing our project portfolio with volunteer opportunities. In 2010 the ATA's International Projects Group is investigating new opportunities including projects and installations in remote indigenous communities in Australia. We will continue our Timor-Leste work and are happy to entertain projects from other locations in the region.

Partners and Supporters

"The Alternative Technology Association exists to empower our community to develop and share sustainable solutions for the way we live"

With over 5,500 members, the Alternative Technology Association (ATA) is a major Australian environmental organisation promoting sustainable technology and practices. With branches and members around Australia and New Zealand, ATA provides practical information about harnessing renewable energy sources such as the sun, wind and water.

Project Sponsors: Friends of Venilale, Rotary Club of Balwyn, Kangaroo Valley Friends of Remixio, Global Ministries, Friends of Aileu, Ballarat Friends of Ainaro, Blue Mountains Friends of Hatu Builico, Bodyshop UK, Whitehorse Friends of Oecussi, International Labor Organisation, AusAID, Campaspe Friends of Lequidoe, Embassy of the Republic of Japan, Methodist ladies College, Damascas College Road Rage.

Industry Partners: RF Industries, Plasmatronics, Selectronics, MH Power, Going Solar, The Environment Shop, Saltwater Solar, Lawrence and Hansen, SolePurpose Moulding, Polygranet, Chin Communications.

Volunteers: Alan Hutchinson, Peter Reichelt, Rowan Dierich, Dave Kells, Michael Oconnell, Chris Moss, Duncan MacGregor, Nathan Martin, Josh Backwell, Mick Harris, Terry Lewis, Jeanette Venables, Greg Thompson, Sandra Fritz, Bill Bennett, Leo Renkin, Patrick Eijsvogel and Oliver Crowder.

Special Thanks: Chris Adams, Permatil, ETWA, Terri Kaitlin, Richard Maunsey, Jorge Teme.

Timor Solar Power Working Group Members: Isabel de Lima, Fonseca Julio, Geoff Collins, Paulino de Albino, Paulo da Silva, Aires Eddie de Almeida, Ian Grimshaw, Jose Perriera, Ismenio Martins, Annie Keogh, Nelso da Silva, Domingos Ricardo, Belarmino da Cruz, Abel da Costa, Gil da Costa, Jose Madiera, Luis Corte Real, Gerson Alves, Jaquilina Deas, Kim Lium Tchia, Manual Da Silva

ATA Training Team: Anton Vikstrom, John Kemp, Michael OConnell, Andrew Blair, Josh Backwell, Jose Xavier, Ela da Costa Xavier.

Report Authors: Anton Vikstrom with contributions by Leo Renkin, Donna Luckman and Libby Turnock.

Timor-Leste Solar Power Training Project

In July 2010 the IPG embarked on its largest single project. The Timor-Leste Solar Power Training Project aims to train trainers to deliver quality education for solar power installation, maintenances and selection. This project is supported by the Australian Governments Aid Program- AusAID and is delivered in partnership with two important Timorese Ministries: SEPE (Renewable Energy) and SEFOPE (Education). INDMO is a subset of SEFOPE and is responsible for the administration of the competency standards.

The first step in the project involved the development and approval of competency standards. These are the basis of determining what level of skills a student would need to show in order to be "competent" to do an installation. The ATA brought together a group of stakeholders from the Timorese solar power industry to discuss, modify and approve the standards. Over a three month period in late 2009 the standards where approved by all the relevant stakeholders. The three competency standards developed where for small scale solar (pv) "Installation", "Maintenance" and "Select and Modify".

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INSTALLING PHOTOVOLTAIC ENERGY SYSTEMS

The next step of the project involved the development of materials to deliver during the training. This involved adapting the lessons of previous Timor training courses, our experience delivering training in Australia and the new competency standards. Over the course of several months materials for "Install" and "Maintenance" where developed. The final materials of "Select and Modify" is still under development.

In February 2010 ATA trainers delivered the first round of training to Timorese teachers. Over two weeks teachers attended the training in Senai, Dili. Overall the materials where very well received. The level of skills of the teachers was reassuring high, however it will be interesting to assess their skills when they have to turn round and deliver the material themselves later in 2010.

The most exciting part of the project will occur later in 2010 and 2011. This is when the trained Timorese technicians will graduate and begin working in the field. The ATA will work with these graduates to help find them work with electrical contractors and installers. We will also be lobbying the government and aid agencies to develop a funded maintenance program for existing solar power installations in Timor. With these measures in place we hope the Timorese solar power industry will become truly sustainable.

Oesilo Water Pumping Project

Oesilo is a small town located in the northern mountainous region of the Oecusse enclave in East Timor. The recent construction of a border post and much needed border market meant that water needed to be carted from a nearby spring for it to function. Theoretically water could be pumped 900 metres to a holding tank positioned 58 metres above the spring. The holding tank could supply gravity fed water to the border posts, border market and surrounding villages. A direct drive solar pump would do the job and importantly, help save money that would otherwise be spent on purchasing and operating a fossil fuel powered pump.

To get to Oesilo one must leave East Timor, enter Indonesia then re-enter East Timor on a new visa. Clearing customs was difficult. Explaining why we had a trailer fully laden with solar pumping equipment for a job in East Timor, when we were actually entering Indonesia, was not so simple. Neither was making arrangements for the project with a local NGO partner, as Oesilo has no electricity, let alone mobile phone or internet reception. The installation of a solar pumping system would provide 12,000 litres a day to a holding tank. The tank was to be constructed by local NGO project partner Fundaceo Solenusat. When we arrived in Oesilo we set to work recruiting local workers to help with the installation. One of those eager to help us was a curious, traditional spirit man of the spring, Pak Abi, whose fingerless hands waved with enthusiasm as he spoke. We came across him one morning conversing with the frogs. Pak Abi advised us of the terms required by the spirits to ensure the project success. Dutifully, with the other workers, we respected the spirit's requests by attending a sacrificial pig ceremony and providing two exit gates from the spring for the frogs. All workers, including the interpreter, were so enthusiastic once work got underway. The seven 130watt solar modules to power the pump controller and Tenesol 1000 helical rotor pump were wired up and ready for action after just a few long hard days.

The longer we spent in Oesilo the more we came to understand the importance of water and its availability in the development process. We often speak of energy savings provided by solar installations and compare them in monetary terms with fossil fuel powered alternatives. In Oesilo, there are no fossil fuel powered alternatives but instead an abundance of women and children carrying 10 litre water containers on their heads, sometimes up to five kilometres a day. Hopefully this project has changed this equation and has improved the lives of these local women and children.

Village Lighting Schemes

The Village Lighting Scheme aims to improve the living standards of remote communities in Timor-Leste. In three different villages a program is operating to replace polluting light sources with solar powered lighting. Each household receives a small power system with two or three lights and contribute an upfront fee and ongoing contribution to a community fund. This fund is used for ongoing maintenance and replacement of broken parts. Community management mechanisms are put in place to collect the fees for reinvestment in system upkeep. Technical knowledge transfers include training in the assembly, installation, maintenance and repair of system components.

Following from the success of the original scheme in Bessilau, two additional communities signed up. In October 2009 communities in Fada Bloko, Remixio sub-district and Laulara sub-district signed up to the scheme. Key elements of this included the formation of a committee of management, technician training and financial/bookkeeping training. ATA volunteers, Mick Harris, Terry Lewis and Jeanette Venables worked with local technicians training them in the fundamentals of solar power. Greg Thompson and Sandra Fritz also contributed by working with the management community, ensuring mechanisms where put in place for the committee to function well.

A review in early 2009 had decided that the systems needed to be larger than previously installed. Key differences including increasing the solar panel size to 10W, improving the regulator and installing an energy efficient 1W LED light. In 2010 another review will be undertaken to measure the improvements and make recommendations for the next round of the project.

The Kangaroo Valley-Remexio Partnership, wanted to provide solar lighting for 120 households in remote parts of Remexio. The big challenge was how to fund it?
Participants were asked to take up the challenge of walking either 14 kilometres or 50 kilometres and invite friends and associates to sponsor them. The idea soon took off and teams from near and far registered for the trek. On September 19, 246 people set off on a scenic bushwalk around beautiful Kangaroo Valley. The weather was perfect and spirits were high. The lighting project captured the imaginations of participants and donors alike, and the amount raised by the trek swelled the kitty for the lighting project to over $75,000, thus reaching the required target several times over.

2009 Project Summaries

Project name	Children on the Edge	Oesilo Pumping Project	Oecussi community Centers	Oecussi community Center	LAHO Silk Factory	Berelau School	Hatu Builico Community Center	Ainaro Health pathology
System type	Solar Power System with inverter	Solar with helical Rotor Pump	Basic 12v Lighting system	Basic 12v Lighting system	Solar Power System with inverter	Solar Power System with inverter	Solar Power System with inverter	UPS System
PV Array (W)	825	900	80	80	640	240	240	n/A
Battery Capacity (Ah)	400	N/A	100	100	330	200	200	200
System Voltage	24	24	12	12	24	12	12	12
Inverter Type	WM1700	N/A	N/A	N/A	WM1700	LD200	LD200	LD200

Project name	Aileu nurses	Mau Nanu Clinic	Lisa Dila School Phase 2	Venilale Admin	Bessilau VLS	Laulara VLS	Remixio VLS
System type	Hybrid System	Basic 12v Lighting system	Solar Power System with inverter	Solar Power System with inverter	10W SPS	10W SPS	10W SPS
PV Array (W)	40	160	1320	320	500	450	1200
Battery Capacity (Ah)	100	100	660	200	7	7	7
System Voltage	12	12	24	12	12	12	12
Inverter Type	N/A	N/A	WM1700	LD600	N/A	N/A	N/A

Children on the Edge

Project Need: The Children on the Edge playcenter provides a vital environment for learning for the children on Viqueque. This system provides necessary electrical services for the site.

Description: This system consisted of a 750W 24V solar array charging a 400Ah battery bank (8 x 200Ah 6v sonnenschein). A 40A Victron Centaur charger was also installed to provide additional charging for the town power supply.

Volunteer team: Duncan MacGregor, Nathan Martin,

Project Sponsor: Bodyshop UK

Oecussi Community Lighting - at Mahata, (Nitibe) community centre, Maunaben (Pante Macassar) medical clinic

Project Need: These systems are part of an ongoing scheme to provide lighting for community centers and medical clinics around Oecussi.
Description: Basic lighting systems consisting of 80W BP panel, 100Ah battery and 12v DC lights.
Volunteer team: Bill Bennett, Anton Cabal
Project Sponsor: Whitehorse Friends of Oecussi

LAHO Silk Factory

Project Need: The LAHO Project produces silk and other woven products from their farm near Bacau. The management required a refrigeration system to keep the silkworm eggs dormant as part of controlling the life cycle of the eggs and ensuring production could be fully managed from Timor. The system installed aimed to power the refrigerator in their incubation room.
Description: The system consisted of a 24V 640W array, charging a 330Ah battery bank. The fridge was operated from a 1700W selectronic inverter.
Issues: A number of issues came out of this project. Paramount amongst those was that the refrigerator supplied used three times the power as that originally specified. An alternative refrigerator was supplied by the ATA on a trial basis and further improvements will be made to tighten the temperature tolerances of this refrigerator.
Volunteer team: Joshua Backwell, Anton Vikstrom
Project Sponsor: ILO

Mau Nanu Clinic, Ainaro

Project Need: Primary health services are critical for the well being of rural communities. This project aimed too improve the services offered at clinics through the provision of basic lighting.
Description: A basic 12v lighting system consisting of 2 x 80W BP solar panels, a 100Ah battery bank and low voltage DC lighting. The large solar array was chosen to maximise available electricity during the extensive wet/cloudy season.
Volunteer team: Alan Hutchinson, Peter Reichelt, Rowan Dierich
Project Sponsor: Ballarat Friends of Ainaro

Ainaro Health Pathology

Project Need: The town of Ainaro is well serviced with electricity and health services. Unfortunately the power is only turned on at night time and the health workers only work during the day. Understandably the laboritory equipment for health diagnosis was under utilised and fundamental tests for malaria and other diseases could not occur. A small system was requested to supply power during the day. Given the reliable town power a system called a *Uninteruptable Power Supply* (UPS) was installed.

Description: The UPS system consists of a 10A battery charger which charges a 200Ah 12v battery bank. The battery supplies electricity to a small 200W inverter which powers a centrifuge, microscope or computer.

Volunteer team: Alan Hutchinson, Peter Reichelt, Rowan Dierich

Project Sponsor: Ballarat Friends of Ainaro/Alternative Technology Association

Hatu Builico Community Centre

Project Need: Hatu Builico is one of the highest towns in central Timor. It is a majestic location at the foot of Mt Ramelau. A newly refurbished community center required a power supply for local administration, community meetings and events.

Description: The installed system consisted of 3 x 80W BP solar panels charging a 12v 200Ah battery bank. The community centre was powered through a 200W Selectronic inverter.

Issues: A planning glitch required a follow up visit by a passing team (Alan Hutchinson and Co). Of interest the high altitude and clear skies of this area produced solar insolation in excess of 1kW/M2 (check this right). This has design implications as regulators, cable and circuit protection all need to be of larger ratings to ensure a safe installation.

Volunteer team: Michael OConnell, Chris Moss, Alan Hutchinson, Peter Reichelt, Rowan Dierich

Project Sponsor: Blue Mountains Friends of Hatu Builico

Aileu Nurses Accomodation

Project Need: Aileu has a hospital that services the surrounding district. While the hospital has reliable power supplies the nurses accomodation was extremly basic. As part of a larger upgrade a 12v lighting system was installed to assist nurses who need to get up late in the night for emergencies and improve the overall security of the area.

Description: This system was a very small hybrid, incorporating a 12v battery charger and a 40W solar panel charging a 100Ah battery. It powered several 12v DC lights.
Volunteer team: Alan Hutchinson, Peter Reichelt, Rowan Dierich
Project Sponsor: Friends of Aileu

Lisa Dila School

Project Need: The Lisa Dila School is a secondary college located far from existing services. Recently dormitories had been built to accomodate students from outlying districts and a water pump had been installed. The ATA was requested to provide a power supply to power these and improve the overall wellbeing of students and teachers
Description: Large 24v RAPS system with 1320W array, 660Ah battery, 1700w inverter, PL60 regulator. Extensive 240v wiring and changeover switching.
Volunteer team: Alan Hutchinson, Peter Reichelt, Rowan Dierich, Josh Backwell, Dave Kells
Project Sponsor: Global Ministries

Venilale Administration

Project Need: The sub-district administration has difficulty with its administration due to a lack of electricity during the daytime. This system was installed in the newly acquired administration office to power basic computing, printing and lighting
Description: 4 x 80W BP solar panels charging a 200Ah battery bank with a 600W selectronics inverter
Volunteer team: Alan Hutchinson, Peter Reichelt, Rowan Dierich, Dave Kells
Project Sponsor: Friends of Venilale

Berelau School

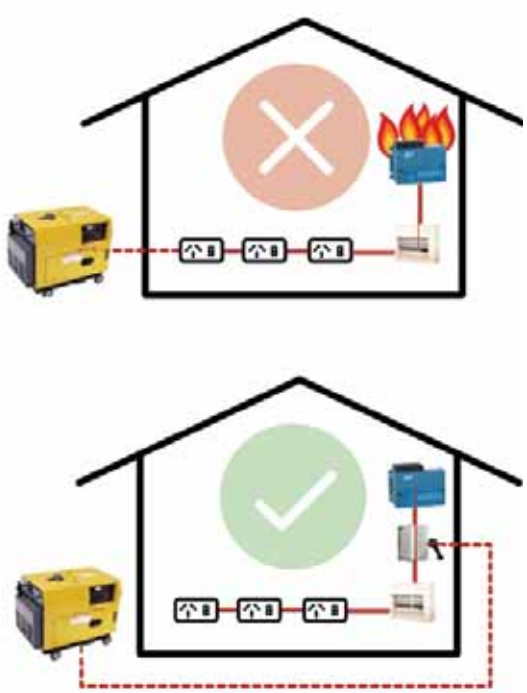
Project Need: The Berelau School is in the district of Aileu south of Dili. Located a significant way from the nearest town a request was made for light and power. A system was designed to light the school and adjacent buildings as well as provide 240V AC power for computer facilities.
Description: The installed system consisted of 3 x 80W BP solar panels charging a 12v 200Ah battery bank. The school was powered through a 200W Selectronic inverter.
Volunteer team: Michael Oconnell, Chris Moss
Project Sponsor: Campaspe Friends of Lequidoe

Oesilo Pumping Project

Project Need: A reliable water supply was required for the Oesilo border market and surrounding community. The ATA in partnership with local NGO *Fundaceo Solensaut* delivered a solar powered pumping system.
Description: 7 x 130 watt solar modules to power the pump controller and Tenesol 1000 helical rotor pump
Volunteer team: Oliver Crowder, Patrick Eijsvogel, Leo Renkin, Bill Bennett
Project Sponsor: Embassy of the Republic of Japan

Village Lighting Scheme

Location	Bessilau	Fada Bloko	Laulara
Number of Systems:	90 systems upgraded + spare parts	120 Systems + spare parts	50 Systems + spare parts
Issues	Increase solar array to deal with wet season cloud cover		Additional 30 systems requested by the community
Sponsor	ATA fundraising	Kangaroo Valley Remixio Partnership	Rotary Club of Balwyn, Methodist Ladies College



Maintenance Review Findings

In 2009 the IPG conducted a maintenance review of a number of our projects in Timor. The aim of this was to see how our systems where functioning, ensure systems where repaired or upgraded if necessary and lessons learnt for future projects. Overall, the results where positive, the majority of systems where functioning and benefiting the recipient communities. The most pressing information that came out of the review was the continued issue off "load creep" and the connection of generators into solar-powered buildings.

- Load Creep: Where the systems being used for more appliances than originally designed for. This appears to be an endemic problem in Timor based on behaviour learnt from using town power. To respond to this a dual strategy needs to be implemented to improve system robustness.
  - design for overuse while incorporating power limiting devices. This may be the case of having a smaller inverter than a system can ideally take in order to reduce continued power consumption
  - Continued user training. This is important for all system users. The IPG has improved its post installation training package and considering a series of follow up visits to installations. This is to reinforce good system management.

- Generator Feedback: The second most common issue arose from damage or potential damage from the connection of generators or EDTL power to existing solar power systems. The common method for this is inserting the bare wires from a generator directly into a power point. With an inverter and generator simultaneously running something is going to blow up, often the inverter.

The IPG will from now on install a changeover switch and wiring point for generators into all installations which will be wired into existing buildings. This will provide a point for generators/town power to be wired into the building and improve overall safety and longevity for the power supplies.

Following on from the review three systems where not functioning properly. Two systems had major maintenance completed on them and a third has a system upgrade scheduled for 2010.

Solar powered electric lights (above) provide a clean, high quality light source. Kerosene wick lamps (below) produce a dirty smoky flame and are expensive to run.

Why Solar Power Projects?

The IPG has worked extensively with solar power/photovoltaic systems. Solar power is an excellent way of generating electricity in certain locations. However, solar doesn't always make sense technically or financially. It is an expensive technology with a set of limitations on its usefulness in certain locations. This chapter intends to demonstrate when solar power is a suitable option, and when other power sources may be more appropriate.

Basic lighting in remote areas.

When a location is remote from the existing power grid the options for installing energy sources are limited, namely candles, kerosene or generator. From experience, solar power systems such as those installed in the Village Lighting Scheme are more cost effective than kerosene lamps or candles. The ongoing cost of feeding a generator is also far greater than the low cost of operating a solar power system. With a cost of between $150-$1500 dollars a solar power system can provide a superior source of light, cheaper than the fossil fuel options

What is a basic lighting system?

In basic 12V lighting systems, the energy produced by solar panels during sunny days is stored in batteries (similar but different to car batteries) for later use at night time or in cloudy conditions. A component called a regulator monitors the charging of the battery and fuses/circuit breakers protect the system from fault or fire. Special 12V lights are used, generally these are compact fluorescent (CFL) but increasing LED lights are being used.

Light and power for a remote community centres and clinics

Solar power systems also excel in situations where there are no other sources of power, but there is a need for appliances such as computers, printers and medical equipment. These systems are larger in size than the basic lighting systems. They also have an appliance called an inverter inserted in the system to provide 220v AC power. These systems will vary in size and price, with smaller systems starting at around $2000 and larger systems in the order of $20,000. The price is related to how much power is being used, thus choosing efficient appliances helps lower the price to a budget system.

The key difference financially is that solar power systems have a high "set up" cost and a relatively long pay-back period. Generators or kerosene lamps have a much cheaper set-up cost, however the on-going fuel bills can quickly become large and unwieldily.

This building is a long way from the power lines – a perfect location for solar

A power supply when town power is unreliable

When existing power supplies are unreliable, then a "hybrid" solar power system may be appropriate. A hybrid system utilises existing power supplies when available eg town power or generator and only uses the solar power stored in batteries when required. Moreover when the town power or generator is switched on it will also charge the batteries. Overall this has the benefit of reducing the size of the solar array required and providing a functioning backup or alternative power source. Some systems are even designed to automatically switch between the town power and solar power so the power supply is seamless.

Hybrid systems may be a cheaper and more effective system than alternative power supplies, but this needs to be calculated on a case by case basis. Systems may vary in size from $1000 to $100,000 depending on the amount of power required.

This large system can automatically switch between town and solar power

Why efficiency is important

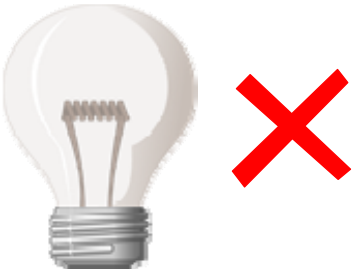
There is an old saying that it is *cheaper to save a Watt than to produce a Watt*. What this means is that using less energy is cheaper than buying the solar panels, batteries and other equipment necessary to produce this energy.

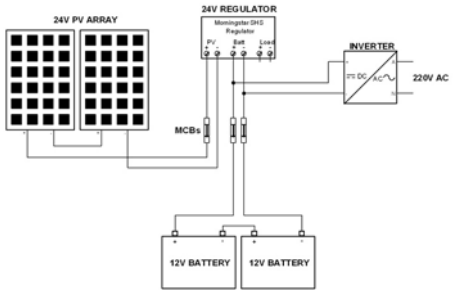
Solar power systems start getting very large and expensive as soon as "power hungry" devices are plugged into them. Generally appliances that heat things up: kettle/rice cooker, or cool things down: air conditioner/refrigerator.

Therefore the first thing the ATA does when presented a system brief is investigate ways that energy usage can be reduced. This includes

- Using energy efficient laptop or micro-pc computers rather than desktop – savings up to 80%
- Using CFL and LED lights instead of incandescent bulbs – savings of around 75%
- Changing behaviour eg turning of lights in underused areas – savings up to 40%

The table below illustrates the case from an ATA installation in 2008. The ATA where asked to design a system to run computers for a school. The cost for the system was estimated to be $65,813. This was too expensive. In the end the client chose to install system (c) whereby computers where replaced and the overall implementation cost was reduced by over $32,000.





Energy Efficiency options	Daily Power Use (Watt/hour)	Efficiency Cost ($ est)	Solar PV System Cost ($ est)*	Total Implemented Cost** ($ est)
a) Base Scenario	8,100	$ -	$ 65,813	$ 65,813
b) Replace Computer Monitors	6,900	$ 2,490	$ 56,063	$ 58,553
c) Replace Computers	3,300	$ 7,000	$ 26,813	$ 33,813
d) Replace Computers and only Power Computer Laboritory	1,200	$ 7,000	$ 9,750	$ 16,750

When is solar a poor choice?

The following is a guide for locations where solar will be a poor choice

- The location is cloud bound, in a deep valley or has poor light
- The power consumption is very large
- Large amounts of energy are required for short bursts of time eg welding
- The user is not willing to learn about how to operate the system within its limitations
- There is not enough money.

Designing for solar power

The basis of designing a solar power system is by conducting a “load audit”. This documents the likely power usage of the appliances in a building. This information is used to calculate the number of solar panels and size of batteries and other components. This is where the art and science of solar power design is conducted - ensuring that appropriate components are specified and combined to provide for the likely set of energy use scenarios. The ATA has spent a lot of time and effort refining the design, procurement and installation of systems to ensure the community receives robust and functional solar power systems.

Solar power differs from generator power because there is a limited energy supply. As a result energy efficiency and energy management are crucial to system function. Efficiency considerations include using appropriate appliances, turning off equipment when not in use and energy efficient lighting.

Projects for your community with the International Projects Group

Project partners are encouraged to approach the IPG to discuss projects in developing countries. The IPG will work with you to determine if a project is feasible in your location and develop a project costing. We are happy to work collaboratively to fundraise or plan for your project. However, the IPG will only take on a project if it meet our objectives, which are:

- Promote and facilitate the uptake of sustainable/renewable and other appropriate technologies in developing countries
- Empower communities to make their own decisions on how to improve their quality of life.
- Provide the ATA members and staff with the opportunity to contribute their knowledge and skills to work on projects of assistance to communities in developing countries.

Indigenous Renewable Energy Partnership (IREP)

The ATA is partnering with Australian NGO's "Indigenous Community Volunteers" ad "Bushlight Power" to promote access to renewable energy in indigenous communities. Through this partnership volunteers can work with communities to assess their needs and work on positive solutions to address these. In 2010 the first two trial projects are underway and we hope these will lead to improved uptake of renewable energy and practical pathways to reconciliation.

Volunteering Opportunities 2010 and beyond!

The IPG is always looking for projects and people. If you are interested in contributing your time get in touch!

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