

Switched on in East Timor

Anton Vikstrom tells us about the work of the ATA International Projects Group in East Timor, installing solar panels, lights and even a wind turbine, while drinking lots of strong local coffee in the hot sun.

Volunteers from the ATA International Projects Group travelled to East Timor once again in late 2007 to install solar power and help train locals in installation and maintenance. Installation teams criss-crossed the country, from the Indonesian border in the remote south-east, to the highland of Ermera and the island of Auroro. The events of the last few years have left their fresh scars on the already roughened face of the country. On the advice of UNPOL we postponed the implementation of one project, which was located in a troubled area. In other parts of the country things are looking much better; new buildings are being constructed and roads being built. Hopefully this is a sign for the future of East Timor.

Over one month, 19 people were involved in 30 installations including 12 photovoltaic RAPS systems, one wind turbine and the Village Lighting Scheme, which trialled solar powered lighting in 16 households.

Village Lighting Scheme

The aim of the Village Lighting Scheme is to provide lighting for the residents of Besilau in Aileu. The original concept was based on a battery recharge station where users could charge batteries which were configured to provide one or two lamps for individual houses. We also wanted to ensure the system was maintained. So we asked householders to contribute a small amount per recharge to cover the costs of future repairs. The problem was knowing exactly what the situation was on the ground. Where were the houses located? What sort of light did people want? Was the community prepared to contribute? The only way to answer these



Working just fine: Paulo Da Silva proudly displays his new light at home in Besilau.

questions was through consultation and trials.

Before they left for East Timor, members of the IPG looked at the available technology and came up with variations of what might be suitable. These includ-

ed NiMH battery packs of 4.5 amp-hour capacity and a 7.2 amp-hour sealed lead acid pack with low voltage disconnect which would be replaceable with local parts. A variety of globes were assembled and considered. These included LEDs in

a variety of sizes and configurations, and Phocus 3 watt 12 volt globes.

A late addition by IPG participant Alan Hutchinson was the creation of micro stand-alone systems based on 2 watt LEDs, a 5 watt photovoltaic panel and a 7.2amp-hour battery. Alan also designed a charge controller and low voltage disconnect for the system and ran the design through the assembly line at his company Plasmatronics. It was quite an achievement given it was just one of a number of side projects.

Our arrival in Besilau was the real start to the project. The first of many cups of freshly brewed East Timorese coffee kicked off the consultation process. Topics for discussion included the community make-up, geographical spread, the 'light economy' and community management of the project. It quickly became apparent that the community had a strong spirit and desire to share the benefits of the project amongst its members.

In rural East Timor, the biggest home energy source is firewood, which is used for cooking, lighting and heating. Other sources of light include kerosene lanterns, candles and local candlenut. In Besilau, kerosene lamps were popular, with US\$1 to US\$5 per month spent on household kerosene lighting. Unfortunately, kerosene lamps produce poor light as well as pollution, are a fire hazard and the cost is such that people only run them a few nights a week. In discussions, locals agreed to invest \$1 a month (paid in instalments whenever the battery is recharged) towards the ongoing upkeep of the system. This would be invested in a local micro-finance institution for later drawdown. Using this system, people will have reliable clean light seven days a week for the same price as three nights a week of the kerosene alternative.

The community centre was chosen as the location for the charging station. This reduced arguments as it was a neu-



Top: Natalino and Budiman (crouching) and IPG volunteer Chris Moss setting up the recharge station in Besilau.
Bottom: A typical household in Besilau.



tral location, promoted community involvement and was located a short but obscure way off the main road, which was excellent for security. The community centre also came with two live-in caretakers in the form of brothers Budiman and Augusto Tilman.

The charging station needed the capacity to charge a number of battery types, to provide light for the community centre and to have its own battery reserves so that recharging could occur in cloudy conditions. The trial version consisted of two 80 watt panels in series charging a 24 volt, 100 amp-hour battery bank. From this an inverter and stepdown voltage chargers were used

for the various battery configurations. The entire unit was housed in a secure box, where the system managers had access to control panels, but the working wires and so on were hidden from inquisitive minds and hands.

The geographical spread of the village posed the greatest difficulties. We had been informed that Besilau was 'fairly spread out'. This was an understatement. Besilau turned out to be a small region of East Timor, with a number of hamlets and isolated rural holdings. It was apparent that a significant amount of time would be required returning batteries for re-charge. Given that the charge time was around eight hours, this could put a seri-

ous dent in the viability. The solution was a battery exchange; participants could return their flat battery and pick up a freshly charged replacement on the spot.

The recharge station at the community centre was installed in half a day. The system was up and running quickly due to Callum Dougal's excellent pre-fabrication work. The first lights from the system were used for the community centre meeting room and a light in the kitchen/cooking area. It must be said our first look at an East Timorese kitchen was a cause for despair. It was a windowless tin shed with an open fire on the floor with every surface sooty and black. It's not just kerosene lamps that cause respiratory problems—these fires are a health hazard in a league of their own.

The first household installation was in the home of Fransisco Barreta. This elderly man and his family live close to the community centre. The look of pleasure on his face when he turned on the light switch for the first time was indescribable. After seeing that look I knew we were onto the right thing. Over the next two days we split into two teams and installed another 15 systems, including five stand-alone, five two-lamp fixed wire recharge systems and five portable lamp recharge systems. We climbed mountains, drove up rivers and scaled rickety roofs, all the time being encouraged to drink more East Timorese coffee by the proud owners of the houses.

It was sad to leave Besilau on the final Sunday. In a short time strong links had been made along with a commitment to the area to work on more lighting solutions. We will revisit next year to assess how the project is working, obtain feedback on lighting systems and decide on how to make progress with the project. What will the final village lighting scheme look like? We don't quite know yet. The feedback of the users will determine which approach works best. With the help of the Moora Moora community (our

The Lisa Dila School

As the tropical sun beats down on my back, I join the production line as we to and fro with solar panels, batteries, tool boxes and cable from the tightly packed ute. Children stare with curiosity at the larger than life foreigners with their pale and freckly skin, sweating in the unfamiliar tropical heat. They giggle shyly whenever I catch their eyes.

We are at Lisa Dila School in the Liquica, a 17 kilometre 4WD detour from the scenic north-west coastal road. A very basic track follows a dusty dry river bed towards the village. The road is washed away in sections leaving a track barely wide enough for the wheel span to pass. Exquisite huts made from sticks and palm leaves are dotted alongside the track. Village children squeal with delight and surprise as we bumpily drive past.

The community of Lisa Dila and their friend and education advisor, Dr Carlos, welcomed us into their basic modest village to help equip the newly built school building with a resource they have not had the privilege to afford—a power supply.

There's no time to waste. The goal is to produce electric light before the sun goes down. It's early afternoon already and the clock is ticking. Tasks include wiring up the panels and mounting them to the roof, installing the regulator, inverter, circuit breakers, batteries and numerous connections. We split up to coordinate the various activities. Anton takes charge of the panels, Mick and Elvira start the internal wiring and circuit board and my task is to coordinate laying the 80 metre cable between the school and the dormitories.

It is not hard to find helping hands, but a game of charades begins as we try to find the best method of communication. We soon figure it out and in no time we are sharing smiles and laughter as we fumble with the tools. The cultural divide breaks down as we focus on a common goal.

The foreigners lead the activities, but



'First light' at Lisa Dila School.

soon enough the locals get the tasks moving. In fact, too quickly for me to keep up. The group is feeding the wire through the sections of conduit and doing the connections in a leap frog fashion. The 80 metres is progressing at a rapid rate... but are the connections being done carefully? The connector pieces are missing! The message soon gets across and it's just a small setback. In no time the task is back on track.

The hours pass and the sun lowers in the sky. We all work together to solve the problems. How to line up the conduit neatly along the walls? How to secure a screw in the crumbly concrete walls? How much slack to leave for the final connection?

As the sun sets gracefully behind the tin roof of the school, the solar panels glisten, reflecting the beautiful pinks and purples across the vast, serene landscape. The final connections are made and we are ready for the ultimate test. It's getting darker by the minute. I hold my breath as Mick flicks the switch...the light goes on and a big cheer erupts! What a team effort! Everyone has helped, whether it be drilling a hole, stripping a wire, crawling through the roof, digging the trench, mounting panels on the roof in the scorching heat, or cooking dinner to feed the weary workers.

-Ruth McDonald

Ruth McDonald travelled to East Timor with the ATA International Projects Group.

project partners) and the ATA volunteers, we can develop the best combination of technologies and create management structures that work for the locals.

To see photos of the project and to get an idea of the geographical spread of the community, visit the ATA website and take the google earth tour: www.ata.org.au/about/projects/international-projects

Organisation

One week before our shipping container was due to leave Australia we received new information. The health clinics we were going to work on already had small basic systems installed, however, the real load demands were five times what was previously specified. I muttered something while shaking my head. But a few conversations with the project sponsor and designer rekindled my enthusiasm. Pat Jesson from Friends of Suai was on the phone and full of beans, saying 'we can do it'. Alan Hutchinson came up with designs to meet the power and budgetary needs. The next issue was trying to get this material to East Timor in time.

The helpful staff at M+H Power, RF Industries and Selectronic came to the party, and three days later equipment was being loaded onto the Rotary container. The next issue was finding the money to pay for it. Pat was certain that the funding would come. We forwarded our proposal to a number of groups and fortunately Oxfam Australia came to our assistance, offering to fund two health clinics. So along with Friends of Suai and Friends of Zumalai, five health clinics in the farthest reaches of East Timor will receive power.

Perhaps the best thing from the project has been the local involvement. Installation assistance has been provided by the Suai Community centre team led by Graciano. After two years working with the IPG team they are going to work on the final installations by themselves. Good



Wind power is go: the IPG installed its first wind turbine in East Timor this year. The purpose was to demonstrate the viability of wind power in remote parts of East Timor. The generator will provide lighting for the building and will enable wind data to be logged on a daily basis. The turbine is a Rutland 913, installed on a ten metre tower next to the administration building in the subdistrict of Lequidoe, in the central mountain ranges of East Timor. This project was possible due to donations from Herman Hess, Pacific Hydro, Jennings Towers and the Echuca-based Campaspe East Timor Association in Friendship (CETAF). A local electrical trainee, Marino Quintao, assisted with the installation.

luck Graciano.

Where to from here...

The time for renewables and solar power in East Timor is now. The government is getting on board, with hundreds of installations underway in clinics and administration centres (some based on

an ATA model). Ten biogas plants are being built by long-standing ATA member Aires De Almeida. Biodiesel is also being manufactured in Dili. IPG volunteer Geoff Collins was so impressed he is staying in East Timor to set up a solar business. Even East Timor's President Jose Ramos Horta wants his house to be

‘a model solar house’!

The IPG will continue its involvement in East Timor, with a number of projects in the pipeline including phase two of the Village Lighting Scheme. We are working with the East Timorese government to provide training and assistance with curriculum development in renewable energy. We have also received requests to assist with composting toilets, low smoke stoves and chimneys, and solar drying technology. If you have specific skills in these areas we would be interested in hearing from you.

Thanks to all those who made this year’s projects possible: the team members, volunteers, equipment suppliers, sponsors and supporters. Most of all, thank you to the lovely people of East Timor who made this investment of time and resources so worthwhile.

2007 East Timor team

Suai/Ermera: Alan Hutchinson, Geoff Collins, Justin Stewart, Megan Batchelor.

Bacau/Liquisa: Mick Harris, Ruth McDonald, Elvira Cadan, Anton Vikstrom.

Aileu: Chris Moss, Anton Vikstrom,



School children with a new laptop running from solar power.

Callum Dougal, Nick Stephenson, Eric Kissell. **Oecussi/Liquidoe:** Bill Bennett, Oliver Crowder, Leo Renkin, Patrick Eijsvogel. **Dili/Autaro:** Duncan Macgregor, Rob Roy Macgregor, Warwick Johnston.

Special thanks for organisational

assistance: Andrew Savidge, Bill Bland, Peter McDonald, David Hewitt, William Hoare, James Patterson, Peter Breadon, Chris Halliwell Lance Turner and Don Batson. ✳

Anton Vikstrom is manager of the ATA International Projects Group.

The Alternative Technology Association International Projects Group would like to thank the following sponsors



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Latronics, Nicholas Dattner, Pacific Hydro, Infoexchange, Going Solar, Jennings Towers, The Environment Shop, Ian Piggin at Enviromet P/L

Thanks also to the following project supporters

STA Travel Trust, Oxfam Australia, Rotary Australia, Third Ecology, Bodyshop UK, Indigo Arch, Herman Hess, Friends of Aileu, Friends of Oecussi, Friends of Ermera, Friends of Same, Friends of Suai, Friends of Zumalai and the Campaspe East Timor Association in Friendship.