Sustainable energy system for Indian village

by Jessica Kleinberg

Jessica Kleinberg and two girls from the children's home dressed up for a festival.

I am a graduate electrical engineer who volunteers with Engineers Without Borders Australia. I chose to do engineering because I wanted to work in a field that allows me to use my skills to make a positive difference to the community and also because I am good at problem solving.

I have worked on a number of interesting projects, but there is one in particular that stands out. In 2009 I spent three months in south India working on a sustainable energy project at a children's home and health care centre. I worked closely with another volunteer to do an energy audit and investigate energy efficiency improvements for the sites. The area, like many parts of India, experiences daily power outages and so a main driver was to increase the reliability of the power supply, as well as to reduce energy costs. I examined various sustainable energy options, focusing on renewable energy alternatives such as solar, wind and hybrid power systems and biogas and solar cooking systems. Our recommendations were given to the local partner organisation to consider.

The children's home is now looking at implementing the biogas system we suggested (which runs on cow-dung). The biogas can be used to reduce the home's cooking gas consumption, which currently costs about $1000 a year.

They are also putting priority on a back-up energy system (eg solar panels and batteries) for the health care centre as the power interruptions are causing problems with the refrigerated storage of vaccines and antibiotics.

The energy efficiency recommendations (eg fixing leaks, swapping incandescent lightbulbs for more efficient fluorescent one) could be implemented straight away as they had a low upfront cost and paid themselves off in a short time due to the savings in energy bills. The renewable energy options have a higher capital cost and so require funding to implement.

This was an amazing experience, not just because of the engineering aspect, but because I had the opportunity to live in a remote Indian village and experience their unique culture and religion. Volunteering in India has enhanced both my technical and soft skills. It has given me the confidence and flexibility to working on new projects in challenging and different environments.

I feel that these skills will be valuable in my career and I have been able to use them in my current job in Energy Australia's graduate program. I worked on the Smart Home Project, which is part of Energy Australia's smart grid trial. The Smart Home showcases the latest sustainable energy and water technologies and distributed generation. I developed and managed the design for the Smart Home energy system, which includes a fuel cell, the Redflow energy management system, batteries and two types of photovoltaic systems, including a solar "pergola".

After I returned from India I wanted to continue my involvement with EWB. I am an executive on the EWB NSW professional chapter team as well as on the national Energy Knowledge Hub committee. A knowledge hub is a network of people with a common passion for a theme central to EWB. Knowledge hubs provide opportunities for EWB members to apply their expertise to make a positive difference in the world as well as developing their own knowledge and skills.

The Energy Knowledge Hub in NSW is developing an Energy Auditing Guide to help EWB field volunteers. We are also looking at starting a local energy auditing initiative as an extension of this. This was a natural spin-off from the work I did in India and means that I still can contribute my skills even though I am back home in Sydney.

Joining a knowledge hub is a great way to get involved in EWB's work, and there are many hubs to suit people's varied skill sets and interests, such as Water, Sanitation and Hygiene (WASH), Information and Communication Technologies (ICT) and Indigenous Australians. ■