

# Applying Lessons Learned from the Implementation of Solar Home Systems to the implementation of Hybrid Systems in Developing Countries

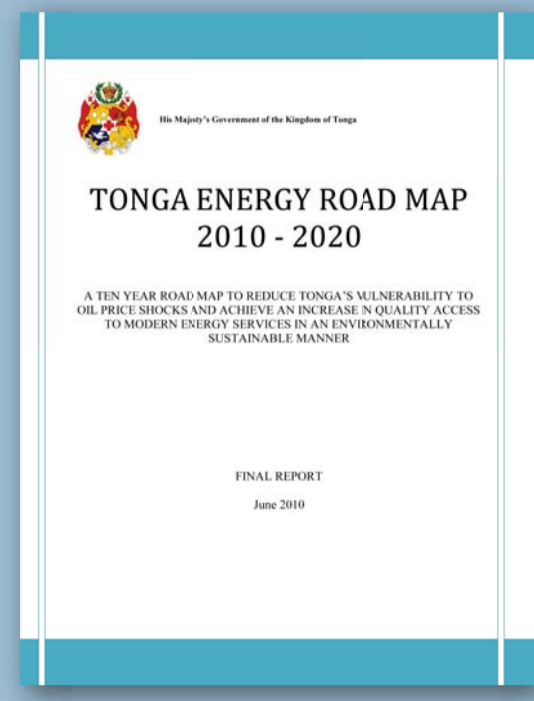
## Role of Government

### Energy Policy

To encourage investment by companies to establish businesses and to sell systems that will provide RE systems in un-electrified regions, it is critical that a country has an overall energy policy which addresses the medium to long term plans for that country.

- Are grid extensions occurring and where/when?
- If renewable energy systems are to be provided will they be Solar home systems or village hybrids? Who will own them? How will they be distributed and serviced?

### CASE STUDY



## Role of Industry

It is important that in all countries where RE systems are being implemented that the industry must be a real and effective industry. Industry associations can be part of the answer.

### CASE STUDY - INDUSTRY ASSOCIATIONS

As in many developed countries a number of developing countries have commenced their own industry associations to raise the profile and also credibility of the renewable energy industry. For example in recent years Industry associations have formed in Malaysia (MPIA), Ghana (AGSI) and the Pacific Islands (SEIAPI)



### Local Industry Involvement in Projects

Where the systems have been supplied and installed by foreign installers who fly in and then out again who maintains them? It is important that local industry are involved with any installations and if necessary appropriate training so local industry can maintain their systems

### CASE STUDY - MALAYSIA HYBRID SYSTEMS FOR SCHOOLS

The Malaysian Government has an initiative at the moment to install PV/Diesel Hybrid systems in Schools in Sabah. The installations are being undertaken. Local Malaysian companies are doing the installations.



25kW system in Sabah, Malaysia-Installed by Hybro Engineering Johor Bohru

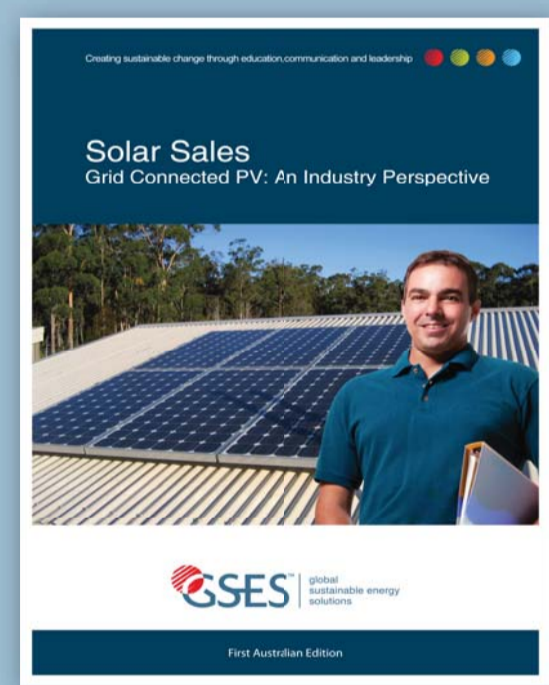
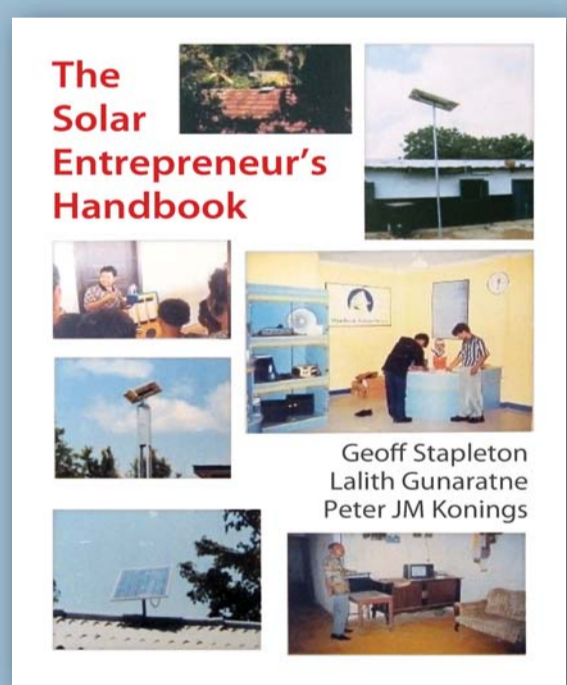


### Consulting Honestly with Customers

The nature of the typical RE system is that the energy output is technically limited, whereas the customer can have unlimited needs for the use of the energy.

The lesson learnt is that for small solar home systems the limitations of the system should be explained prior to the customer making a decision to purchase a system, and not have it explained after they have had the system installed.

Village systems therefore will have many "customers" but the system will typically be designed to provide a specified and limited quantity of energy each day. How much each customer will be allocated daily must be determined at the design stage and this must be explained to the customers.



Three experienced solar technicians/sales people from Australia, Indonesia and Sri Lanka wrote and published "The solar Entrepreneurs Handbook". The book covers the issue of dealing honestly with customers to ensure they are happy with their systems.

GSES developed the Solar Sales book to fill the knowledge gap in the solar industry regarding sales and marketing. Written in a user friendly format, this book deals with the issues surrounding selling solar systems to achieve best end user and business outcomes.

## Energy Services from Solar Energy are NOT Free.

There are ongoing costs—maintenance and particularly battery replacement.

### CASE STUDY - BATTERY REPLACEMENT

There are many systems that never have batteries replaced. This can be dangerous, as seen in the image below.



## Do Not Provide Systems for 'Free'

If you are given something for free, you generally do not value it greatly, you really do not have any ownership or feeling of responsibility for it. In village systems the individual will not "own" the system as they might do with a solar home system, but the person should not be given the energy for free.

## Quality Products

The equipment that is provided should meet minimum quality standards.

## Trained Technicians

Quality equipment on its own does not ensure a system will not fail. Poor design, bad installation and/or lack of maintenance can all result in a system failing even if the equipment is of the highest quality. Engineers and technicians are required to be trained to design, install and maintain systems. This has been an important lesson learnt for many solar home system projects and very relevant for village size systems.

The training itself must also be quality training. Often training is being provided for particular projects via industry. This training could be good quality or it might not cover all that is required and those trained will not know all they need to do their job successfully.

### CASE STUDY - TRAINING IN MALAYSIA

Geoff Stapleton of GSES is a certified ISPQ Master Trainer. In September 2011 he conducted a 3 week hybrid training course for staff from Hybro Engineering and JKR (Malaysian Public Works) on design and Installation of Hybrid Systems



Some examples of poor installations are below.



## Lack of Maintenance / Replacement Plans in Projects

Like any technical product, the lack of maintenance on RE systems leads to equipment failure. Worldwide many RE systems are not working today due to a lack of maintenance or faulty/failed products not being repaired or replaced.

The lesson learnt from solar home system projects to date is that all projects should consider these aspects before being drafted and implemented and ideally the outcome would be a cost effective solution. This is extremely important for the larger village size systems. As previously noted, the fee paid for by the end-user should effectively be used to the maintenance of the systems.

### CASE STUDY - RURAL HOSPITAL IN GHANA

A European country provided solar home system to hospital in rural Ghana. However there was no maintenance agreement confirmed in the project. The solar company stated that they were not requested or paid to provide maintenance and it was 6 hrs to travel to sites—who pays for the maintenance?



Battery only installed 6 months

## Consultation with End-Users

A project should never be planned without consultation with the end-users, i.e. those targeted to benefit from the installation of the RE system. Lack of consultation can quickly lead to a failed project. If the people are not consulted, the project might be providing them with a system they do not want or does not meet their needs. If they do not want it, then they will not care what happens to it and in the case of village systems they might have no interest in paying for the energy received.

## Consultation with all stakeholders

Although the implementation of any RE system project directly benefits the end-users, there could be many other stakeholders who should be consulted during the project's planning stage. The range of stakeholders could include government departments and/or ministries, local industry, NGO's already working in that field and even other businesses that might be affected by the project.



## Capacity Building

During the planning stage of any project or even the development of a new business that will provide RE solutions in a developing country, capacity building will be required. The beneficiaries and the particular capacity building requirements should be identified and implemented.

This paper provides an overview of how to increase the chances of success for village systems (Hybrids or PV only) in developing countries. The authors' opinions are based on their experience working on capacity building projects and involvement and as the Australian expert on the IEA PVPS Task on PV serving Developing Countries.

Naturally there are many key factors required to ensure systems are successfully implemented, but the one overriding requirement is the need for effective consultation and communication with the respective stakeholders.

Successful businesses and successful projects only occur when relationships are built between all the stakeholders. As in life, relationships often fail due to poor communication. This is relevant at all levels in the successful implementation of system systems including end-user, industry, government and NGO's.

