STATUS OF RENEWABLE ENERGY IN RURAL ELECTRIFICATION -ZIMBABWE

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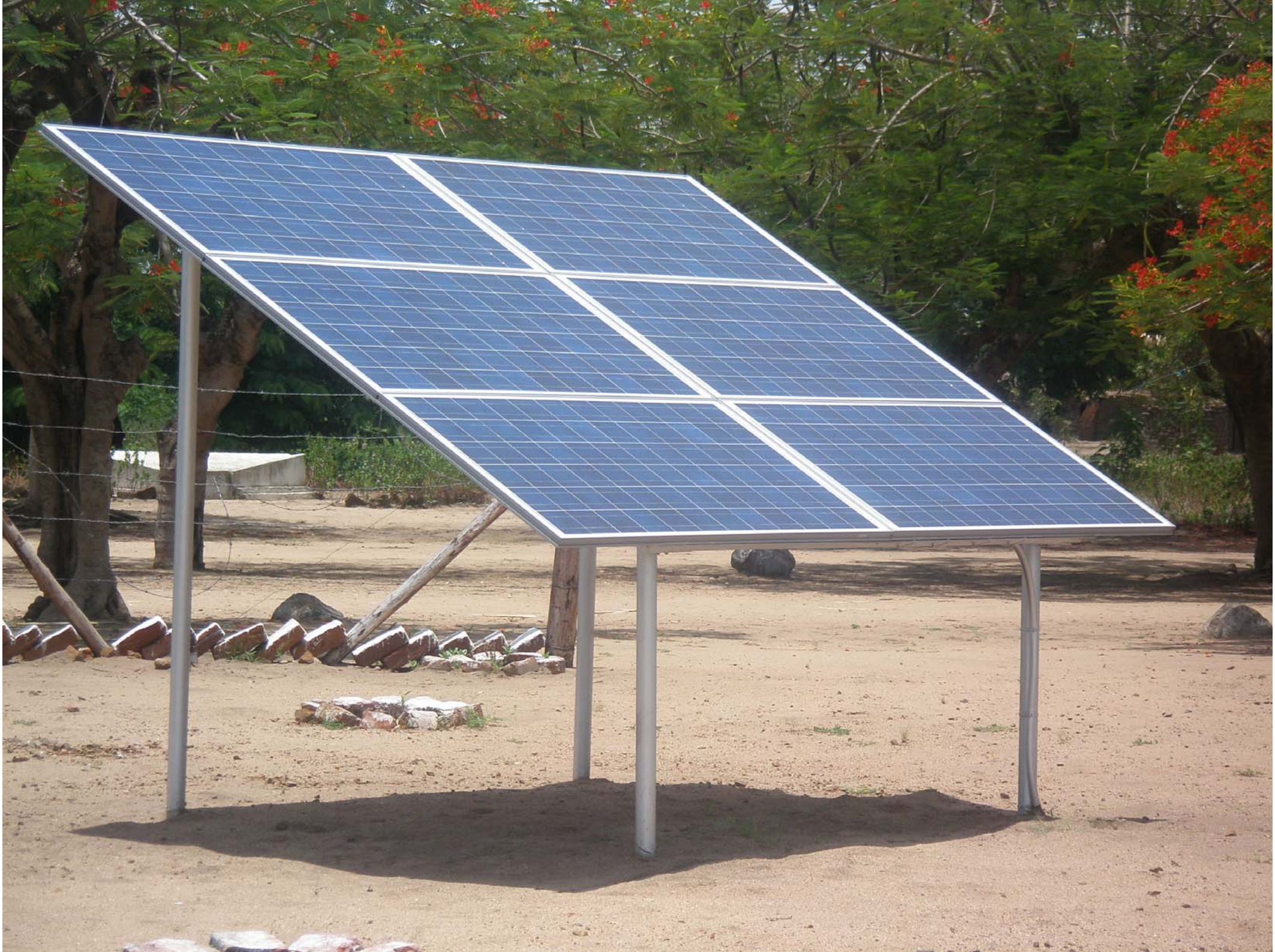
Southern Africa Region AFRETEP Training Workshop
CAPE TOWN, S.A. 24 FEBRUARY 2012

Introduction

- Zimbabwe has a population of about 13 million of which at least 60% live in rural areas.
- 80% of the population in Zimbabwe rely on biomass for their energy requirements
- 5 to 7% of the population in rural areas is connected to grid electricity.
- Zimbabwe with its agrarian reform program has seen most of its new farmers venturing into tobacco farming.

Introduction:-

- This has resulted in the depletion of forest which has caused fuel crisis especially in rural areas.
- However , meeting the energy demands through use of fossil fuels has also resulted in significant environmental pollution at the local, regional, and global levels.
- In a bid to counter these problems, effort has been made in shifting towards RETs interventions.



Solar system electrification in Zimbabwe rural areas

- 373 installations have been commissioned by the Rural Electrification Agency since 2006.
- Solar kits were donated from Italy on a government to government MOU.
- The solar kits consisted mainly of 1200W rated Inverters
- Installed systems have performed very well except for the problem of the original charge controller (30A Annita Omega brand) which has since been replaced with a Tristar 45A.

Solar electrification in rural areas

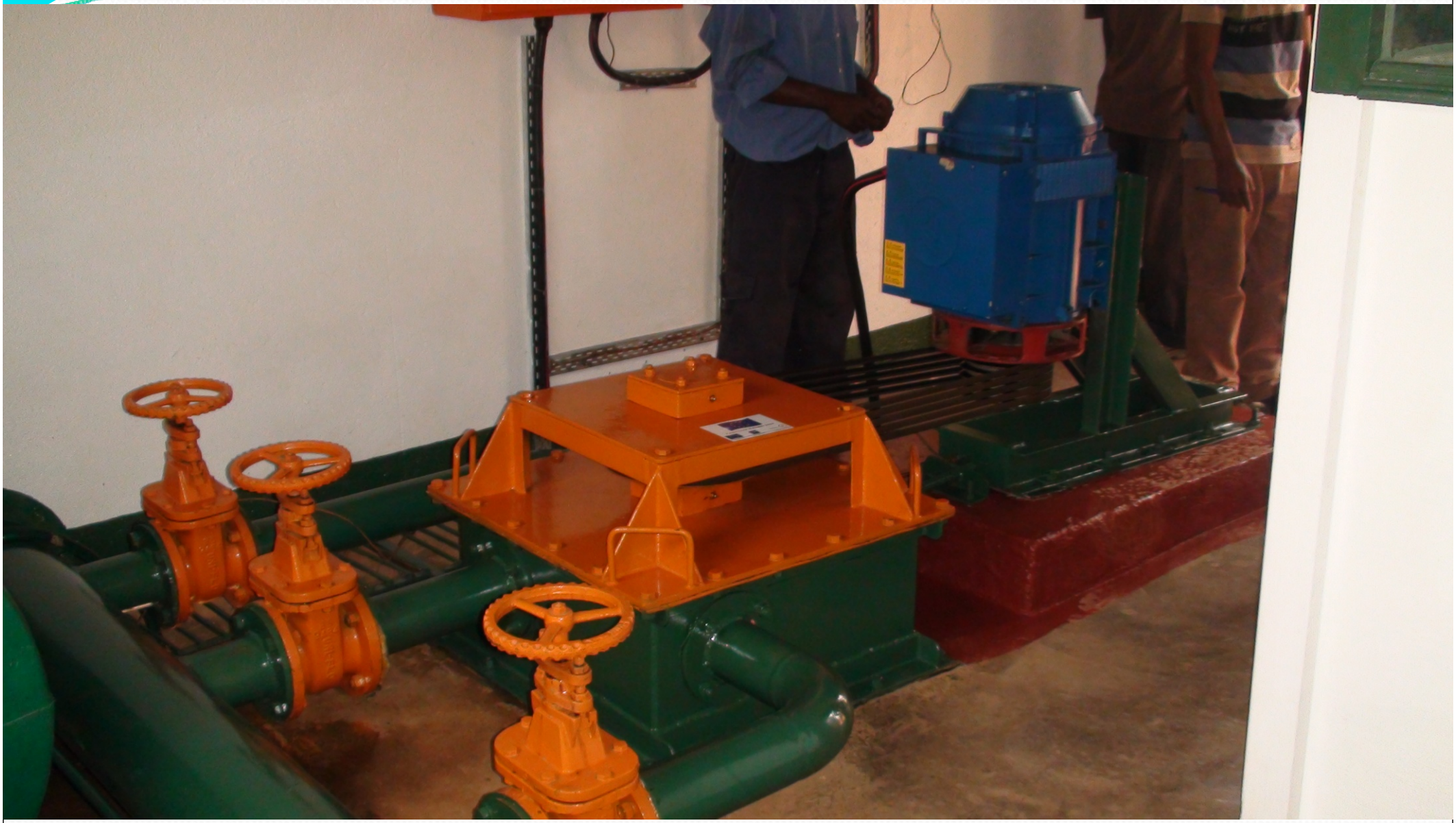
- Beneficiaries: clinics, schools and chiefs.
- Clinics and secondary schools have been given first priority.
- Growth points are catered for by the main grid master plan.
- Private players are also actively involved in the installation of solar home systems (mainly NGO)

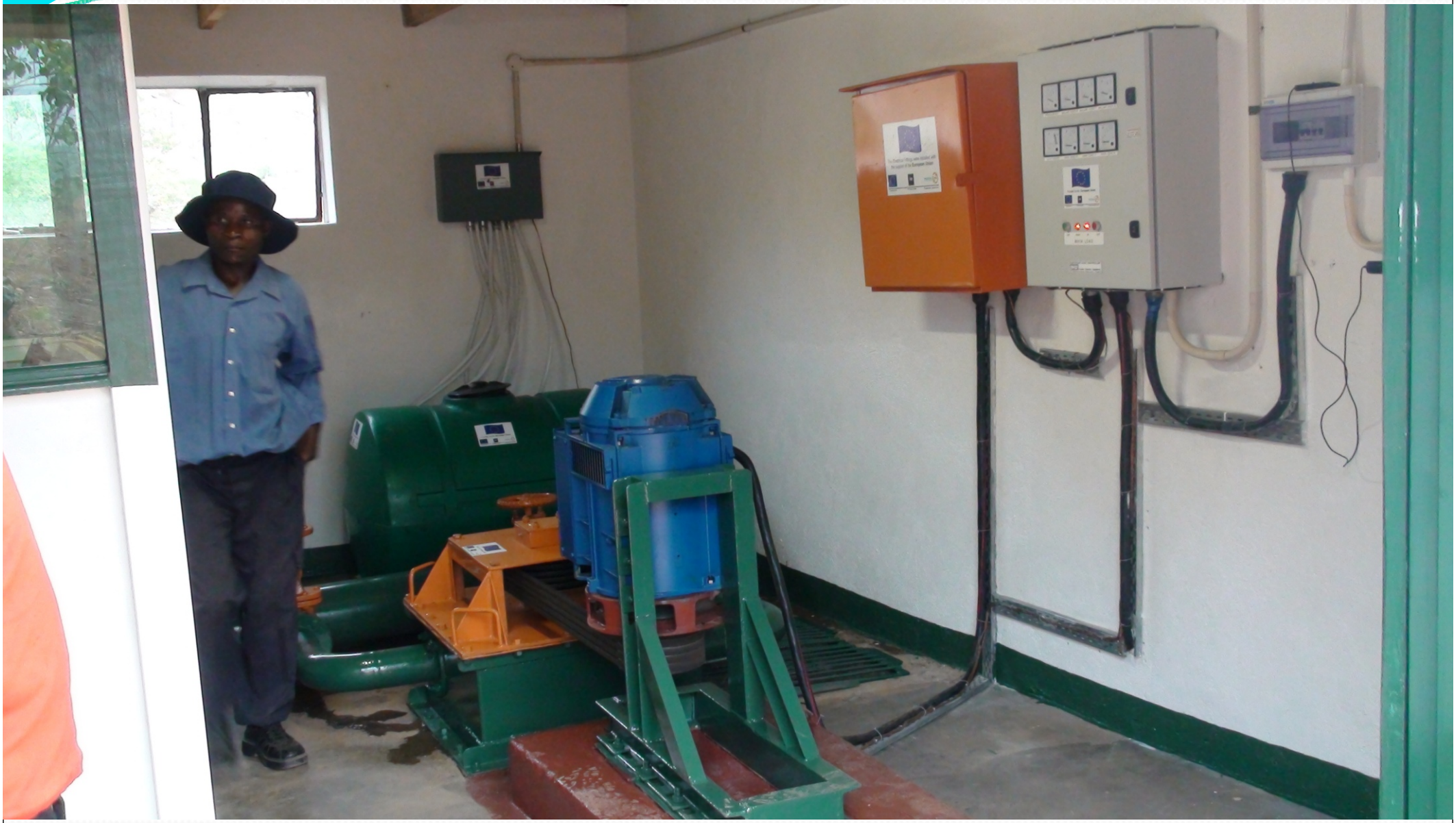
Micro hydropower schemes

- Chipendeke (25kW), Nyafaru (25kW), Dazi (20kW) and Nyamwangu (33kW), Hlabiso(33kW and still under construction), Himalaya (88kW still under construction)

Small Hydropower schemes

- Feasibility studies have been carried out for several run-of-river and small hydro schemes.
- Zimbabwe Power Company and Practical Action have carried out most of the feasibility studies
- E.g . feasibility studies were carried out for the following schemes; Gairezi river (15MW), Pungwe river (10MW),Osborne dam (5MW), Mutirikwi dam (5MW), Siya dam (1.5MW).
- Studies done up to preliminary designs but implementation has been very slow
- Nyangani (1.8MW operational and 2.8MW under construction), Rusitu (700kW but needs refurbishment)



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Wind Energy

- Wind speeds are generally considered low, ave. 3m/s
- Not much investment in WECS and more significant investment in wind mills for water pumping.
- Available data is not adequate for potential investors to make meaningful decisions.
- Need to come up with a more accurate wind energy resource assessment.
- Currently, working on a research project in our Renewable Energy programme at UZ to come up with a wind energy resource atlas for Zimbabwe.
- Main challenge is inadequate resources to purchase long span wind data(e.g 5 to 10 years data) from the meteorological department.

Biomass and Biogas

- Bagasse is used at Triangle Pvt Ltd (Sugar estates) to co-fire with coal a 35MW steam thermal power plant.
- Green Fuel at Chisumbanje also generating more than 100MW from bagasse.
- Border Timbers in Chimanimani has installed a 750kW Steam thermal power plant powered by saw dust.
- Approx. 500 biogas digesters have been constructed in the rural areas through the effort of MOEPD & some donor projects
- However, some of the biogas digesters have since stopped working due to lack of maintenance and some due to inadequate feed stock.

Ethanol Blend fuel

- Green Fuel Ethanol plant has been commissioned and is producing 10% blend fuel using sugar cane.
- Plant has capacity to produce 100 million litres of ethanol per annum. Currently it is producing 150 000 litres per day
- This is not new technology to Zimbabwe since the same process used to be carried out by Triangle Pvt Ltd(Sugar Estates) at 20% blending.

Benefits From the Rural Electrification Programmes

- social and economic benefits have been realized.
- Social benefits : access to information through radio and TV, entertainment, reduced exposure to smoke from paraffin lamps and firewood
- Telecommunication satellite stations powered by PV have been installed in most rural areas
- Economic benefits : improved literacy levels, attraction of qualified teachers to in schools & higher pass rates.
- Health delivery has improved –refrigeration of vaccines, delivery of pregnant mothers done at night in rural clinics, attraction of qualified nurses & doctors.
- SMEs created – Printing, photocopying , cell phone & battery charging, hair saloons done in rural areas


PLASTE
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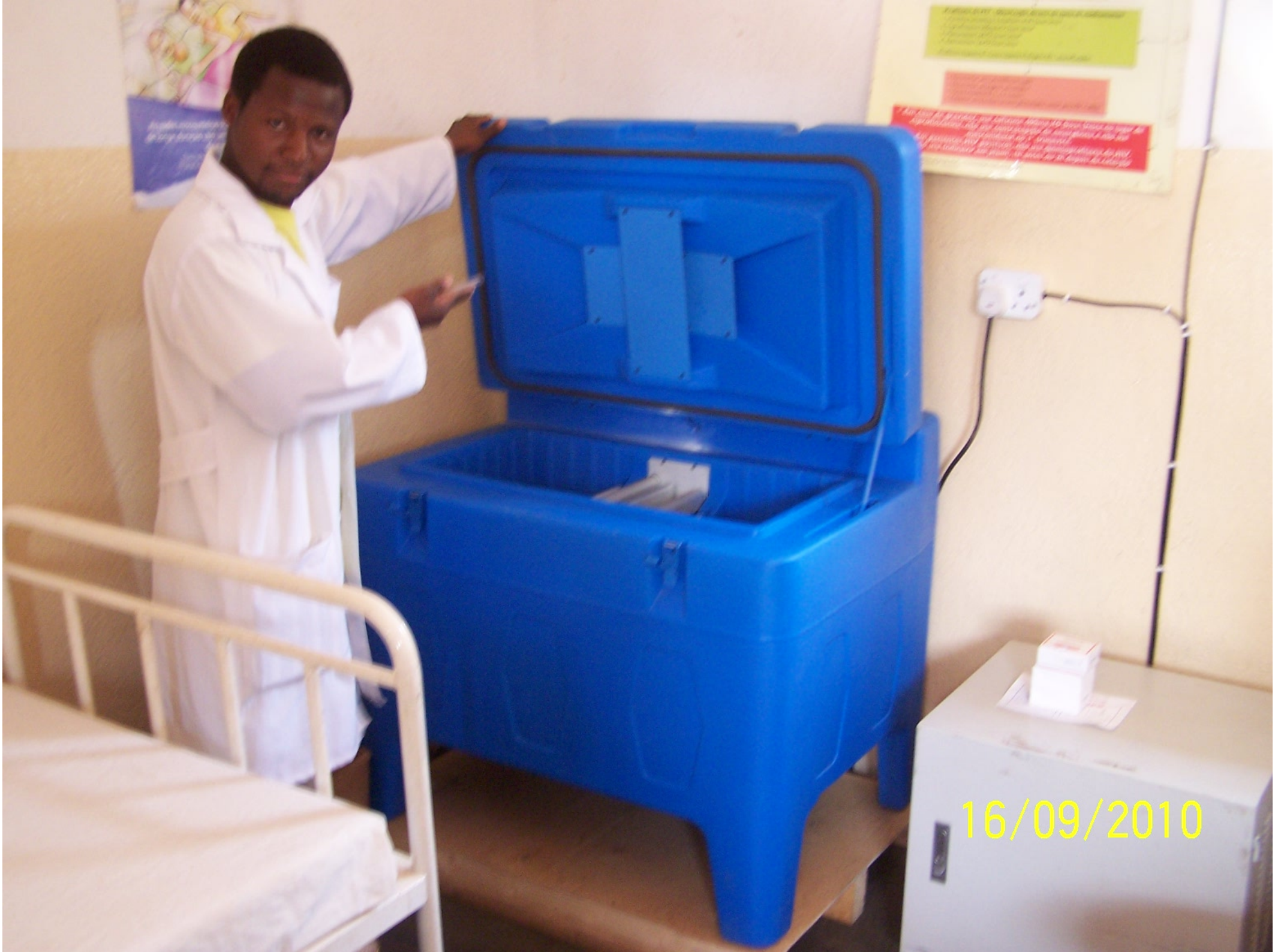
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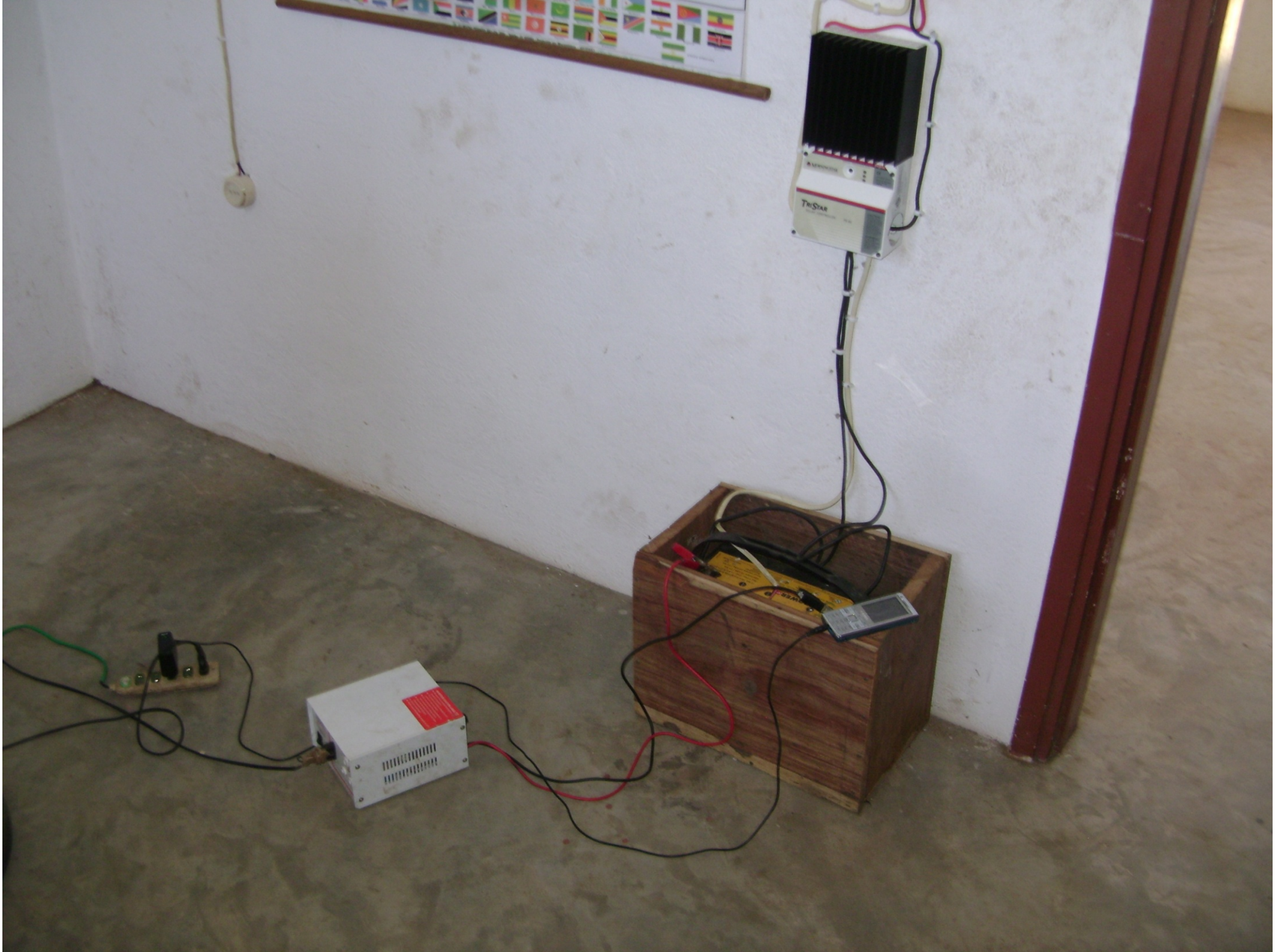
TriStar

Government initiatives to promote RETs

- Incorporation of a significant Renewable Energy component in the Energy policy.
- Substitution of petroleum by 10% - biofuels
- National biogas digester roll out programme in at least 100 institutions starting early 2012 by MOEPD, UZ , CUT & other relevant institutions.
- Exemption of import duty for some renewable energy components like solar panels.

Some Barriers to implementation of Renewable Energy Schemes

- Financial –major barrier for most schemes
- Conflicting interests - especially with National Parks and Wildlife e.g Pungwe river.
- Low Feed in tariffs - when the scheme has to supply into the main grid.
- Political instability - causes lack of confidence in the potential investor
- Inability to write bankable project proposals
- Insufficient or complete lack of well documented meteorological data as is the case for wind energy resource in Zimbabwe.
- Cultural – some potential sites are considered ancestral heritage sites
- Community participation & lack of appreciation of the technologies
- Policy –generally the favoured model of rural electrification in Africa is grid extension regardless of cost.

Training

- **University of Zimbabwe**
- > MSc in Renewable Energy programme
- **Chinhoyi University of Technology**
- > B.Eng (Hons) in Renewable Energy
- > B-Tech (Hons) in Fuels and Energy

Training continued

- **Challenges:-**
- There has been a high staff turn-over since 2007 when the country experienced an economic melt down
- Most of the teaching staff migrated to neighbouring countries particularly SA.
- However, the situation has slowly improved; we have since seen members returning home and taking posts in the institutions.
- laboratory – needs more equipment.

  Staff development – resources are limited.

Conclusion

- The importance of energy in national development can not be over-emphasized.
- Energy is the hub around which the development and industrialization of any nation revolve.
- Any distortion in energy supply chain at any point in time results into serious economic and social hardship.
- The judicious use of renewable energy resources in the overall energy mix helps to reduce negative impacts

- The earth is not an inheritance from our parents but a loan advanced to us by the future generations so we have to use the resources sustainably.

- Thank You !!!