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REPORT ON TRAIN-THE-TRAINERS ON RENEWABLE ENERGY EXPERT TRAINING



GEF-UNIDO PROJECT

FROM 7th -11th JULY 2014

VENUE: GTTI

[Draft]

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INTRODUCTION

The Gambia's limited expertise in Renewable Energy (RE) has been acknowledged in several studies and report. Most recently the RE Gap Assessment funded by UNIDO highlighted the need for vocational and academic institutions in The Gambia to further integrate RE in their curriculum. severally as outcomes of many studies.

It is in the light of this that the GEF-UNIDO project entitled "Promoting Renewable Energy Based Mini Grids for Productive Uses in Rural Areas in The Gambia" encapsulates training of trainers to be able to both develop curricula for integration into existing tertiary and secondary schools in The Gambia and also train RE experts to implement the developed curricula.

For the sustainability of such a long term goal, the training workshop will utilize the manuals developed for this training and tool kits may be used where necessary.

The first workshop titled "Train-the-Trainers" was carried out in four thematic areas namely solar PV, Wind Energy, Solar Thermal and Renewable Energy Training Softwares(HOMER) resulting from the training needs assessment which had been carried out.

The objective of the workshop is to train the participants to the level that they can also train students at the tertiary institutions such as UTG, GTTI etc. The four trainers came from the Energy Center of the Kwame Nkrumah University of Science and Technology in Ghana. The trainers were highly skilled with years of experience and requisite track record in executing similar activities.

There were field visits to some existing renewable energy projects in The Gambia using technologies such as Solar PV, Solar thermal and Wind technology. Visits to key demonstration sites notably Fandema/Mbolo Women's Association was very helpful in the illustration of various separate units and their functional integration in using renewable energy to meet daily needs of life.

Participants also carried out practical work setting up demo- PV installations within a set time and measuring various parameters.

The practicals were conducted with kind support from local private sector and training institutions who donated lots of materials including PV panels and other tools.

There were twenty-five selected local experts from academic-higher formal and informal educational institutions, regulatory and end-users participated in the programme. The minimum criterion for selection is a diploma in any engineering/science discipline.

At the end of the training participants were provided with all the necessary course materials used in the training.

OPENING CEREMONY

The second day of the experts training began with an official opening ceremony of the five day train the trainer workshop by officials from UNIDO/GEF, NEA, MOE and GTTI; which lasted for two and half hour.

At the official opening the **Hon. Edward Saja Sanneh, Energy Minister**, said the objective of GEF/UNIDO project is to develop and promote a market environment that would stimulate investment in renewable energy based mini-grids for productive uses in the rural areas in The Gambia.



Figure 1 : Group Picture with the Hon. Minister of Energy after the opening ceremony

Minister Sanneh was speaking during the opening ceremony of a five-day training of trainers on renewable energy expert held recently at the GTTI premises by the GEF/UNIDO 4 project in The Gambia.

"It is salient to mention that no government can single-handedly finance and manage the whole energy sector without the direct involvement of the other key stakeholders, particularly the private sector," said the energy minister.

He said that some of these incentives include tax holidays and zero-tax on all imports for major renewable energy components meant for specific projects.

He said that currently the ministry of energy is working closely with all relevant stakeholders to review the list of renewable energy components that would benefit from zero tax on importation.

"My ministry strongly believes that when all these incentives are available to the project developers it would ease the financial burden on them and hence increase investment in renewable energy in The Gambia," he said.

Energy sector and in particular the renewable energy could not develop sustainably without building the requisite capacities and skills to tackle "the numerous challenges that this sector faces" including proper design, installation and maintenance of the various renewable energy technologies.

He commended the GEF/UNIDO 4 project for attaching so much importance to capacity building and training on renewable energy prior to this training.

Mrs Ndey Bakurin, executive director of National Environment Agency (NEA) who double as the chairperson of GEF/UNIDO project steering committee, said it was indeed a great pleasure to witness this training of trainers on renewable energy expert workshop organised by promoting renewable energy based mini-grids for productive uses in rural areas in The Gambia.

"The sustainable management of our environment and natural resources is the cornerstone for meaningful development, therefore a high priority area for our country," he said.

She said the Government of The Gambia, in partnership with GEF and UNIDO, is implementing this important project and one of the key components of the project is capacity building, which includes training of trainers.

"The importance attached to this workshop is reflected by the turnout which has drawn members from the public institutions, NON-governmental organizations (NGOs), and the private sector," she said.

She added that it was a matter of truth of claim that the workshop had come at the right time, as the world is in the era of sustainable energy and the project was a good contribution to it.

Mr Alois P. Mhlanga said the United Nations Industrial Development Organization (UNIDO) recruited an international consultant from the energy centre to conduct capacity need for assessment on renewable energy training and renewable energy curriculum development for tertiary institutions in The Gambia.

Director general of Gambia Technical Training Institution (GTTI) said her institution and UNIDO are working closely in the past and a lot of strives has been put together to ensure successful programme. She said this is a valuable opportunity for GTTI to host such an important training, while welcoming all and sundry especially our friends from Ghana to be part of the programme. The official opening ceremony was moderated by Mr. Doudou Gaye GEF-UNIDO Gambia project manager.

FIRST DAY

The first day began with a presentation by Mr. Sompo Ceesay the local Renewable Energy Expert who gave an overview of Renewable Energy in The Gambia where he talks about its historical perspective, evolution of different government policies , the Renewable Energy master plan, legal and regulatory framework, recent project intervention areas and challenges.

According to Mr. Ceesay between 1980 – 2000s Renewable Energy solar used mostly for water pumping for rural dwellers, although solar PV was very expensive (\$7/W) and solar thermal was not only expensive but bulky too. Wind energy was initially used for water pumping for irrigation.



Figure 2 : early use of RE in The Gambia

In 2005 -2010 the Energy Policy shifts and Renewable energy became more recognized because rising cost of electricity, which declining cost of solar PV

Mr. Ceesay stated that, in 2010 – 2014 a good number of projects were implemented by both public and private, in Kombo Beach (Novotel) 2007 and the Grid Connected Renewable Energy which was a Community Driven Wind Project in 2009.



Figure 3 : Community wind turbine at Batakunku

One of the key issues about Renewable Energy is skills transfer or Know –how and we need a home groom skills who would provide not only the skills to handle RE related issue but also give advice as to how RE equipment's and materials are handle.



Figure 4 : Solar power Streetlights along the Bakoteh road

In the area of Legal and Regulatory Framework, Ceesay said RE Act was enacted in December 2013. Some of the key provisions in Renewable Energy Act 2013 include the establishment of Renewable Energy Fund, general incentives for Renewable Energy facilities, streamlining the permitting process, adequate training for installers of RE equipment and the development of Feed in Tariff Rules (FIT).

The Renewable Energy Facilities -General Incentives among them were the exemption from paying import tax and duty, corporate tax exemption 15 years from commissioning, exempted from Value Added Tax and retail tax for 15 years from commissioning date and proceeds from sale of carbon emission credits exempt from sales taxes.

He said: Installers must be appropriately trained to install RE equipment with certification and they must provide guarantees to client for proper installation at least six (6) months minimum guaranteed Period.

Next was Mr. Isaac Adjei Edwin from The Energy Centre (TEC), College of Engineering, KNUST, Kumasi, Ghana said TEC is proud to be recognized as the sub-regional leader in solar electric power training; thus ready to support the efforts of participants to apply photovoltaic technology to solve electrical power problems, whether you are individual designing your own system or a system designer working on large application.

He began by giving an overview of PV technology and talked about the fundamentals of PV technology such as irradiance, geometric effects and show diagrams on how the effect on irradiance of changing the inclination of a plane. Solar module in relation to Sun's Altitude,

Magnetic North and True North, atmospheric effects and direct and diffuse radiation amongst others.

Isaac went on discuss about the basic of photovoltaic under which he briefly explained on the sun solar electric technology and solar cells. While outlining the numerous benefits of Solar Electricity such as energy independence, minimal maintenance, maximum reliability, system easily expand amongst others.

Break

The next presenter was Dr. Emmanuel Wendsongre RAMDE Acting Sectional Head, Thermo-fluids and Energy System department of Mechanical Engineering, Kwame Nkrumah University of Science and Technology, Kumasi dwelt on solar thermal technologies under solar resource and climatic data.

Under this chapter highlight fundamentals of solar radiation; in which more or less accurate assessment of solar resource always remains a challenge in many locations in the world.

To him, measurement of solar resource was focused on sunshine duration, with the appearance of modern solar technologies, accurate assessment of solar energy has become more and more important.

However, currently solar data can be obtained in meteorological agencies, in institutions promoting solar technologies as well as in research centers.

He went on to discussed the sun position and direction of beam radiation and later on low temperature solar thermal and low temperature solar collectors highlighting all the parameters ranging from unglazed solar collectors and glazed solar collectors amongst others.

One of the key issues participants were exposed to was the modelling and sizing of flate-plate sola collectors under which absorbing plate, fluid flow piping, glazing and insulation and their various functions as collectors.

End of Day 1

SECOND DAY

Break

After the formal opening of the training in the afternoon, participants converge to continue lectures on solar PV by Mr. Isaac described the process on how solar cells change sunlight into electricity and also the process to make modules.

In his explanations Mr. Isaac said the single crystal silicon technology used in Siemens solar cells was not only the technology the method for fabricating solar photovoltaic devices.

The relationship of battery and module work together; thus the importance of understanding the difference between energy and power can be presented in the context of a photovoltaic system; because most photovoltaic systems use batteries to store the energy converted by solar modules during a day into chemical energy for use during the night or stormy days.

According to him the battery acts as a reservoir of energy and mediates between the power that might be available at any moment from the solar modules and the power that the loads might want to draw at that instant.

Lunch Break

Dr. Emmanuel Wendsongre RAMDE then gave a lecture on solar thermal including solar water heating which he described as active solar water heaters and passive solar water heaters. He went further to discuss on different types of solar drying, solar cooking and solar cooling.

He also focused on the solar photovoltaic and solar thermal technology where he explains the thermo-mechanical process including the Rankine cycle.

Coffee Break

After the break the next presenter was Mr. Eric Osei Essandoh The Energy Center at Kwame Nkrumah University of Science and Technology did his presentation on Wind Technology where he gave an overview of what wind power is all about and basic phenomenon of wind flow.

According to him, the power of wind has been used for several purposes since antiquity-to sail boats, mill grain and pump water mainly for irrigation and domestic purposes.

This wind generated electricity has become necessary due to the fact that the wind resource is renewable, clean and doesn't pollute the environment nor cause global warming.

To him, the world continues to see huge numbers of wind power installation from 2000 through 2009 about 11% of all the global newly installed net electric capacity additions came from new wind power plants.

Currently Denmark generates more than 25% of its national energy from wind power which followed by several other countries like Spain and Germany who also generate significant proportions of their national energy supplies from wind power.

End of Day 2

THIRD DAY

The third of the training commence with a recap of what has been dealt with in the previous day in a form of question and answers session, before Mr. Isaac Adjei Edwin continued his presentation on PVsystem controllers emphasizing batteries are heart of stand-alone power systems, which must be protected from overcharging and from discharging below their cut-off voltage, which can this cause permanent damage to the battery and loss of capacity.

Damage caused by overcharging is evidenced by excessive water loss, swollen plates and loss of active material and this active materials will build at in the bottom of the plates and regulators. Sludge may then eventually cause a short circuit across the bottom of plate.

Dr. RAMDE then took the participants through concentrating solar power which uses only Direct Normal Irradiation (DNI), consequently they can only be installed in regions where there is enough DNI. From literature it has be determined that a DNI of about $1800\text{kwh/m}^2/\text{year}$ is the minimum value required to obtain and economically viable output.

According to him, some of the components of a concentraing solar power plant include solar field, pipe network, power unit, auxiliary heat source and storage system.

Another key issue discussed was the modelling of solar thermal power plants and sizing of solar thermal power plants. The discussion was later expand to hybrid systems and storage; thermal energy storage media-hybridization an or co-production.

Practicals

Participaints then moved to The Gambia Renewable EnergyCenter (GREC), next door where they conducted practical excercises. The objectives of the practical was to assess and also ensure students could:

- i. Identify different PV componenents
- ii. Use of tools
- iii. Wire simple PV installations (off grid)
- iv. Connect loads
- v. Earthing requirements
- vi. Connect d.c loads
- vii. Measures basic parameter suchs as Ioc and Voc
- viii. Observe different solar cooking

Three groups of about 5-8 students were identified and each given a set of batteries, 50W panel, electrician's tools, inverters, conduit pipes etc. They were required to install simple circuits on a demeonstration board. In the end Mr. Edwin observed and advised during their installation any problems they encountered.



Figure 5 :Participants installing a solar PV system with connected loads during the practicals

Lunch Break

After lunch break Mr. Eric Osei Essandoh talked about wind turbine performance characteristics Wind turbine and wind mills are devices generally used to convert wind energy into useful work or another useful form of energy. This chapter focused on wind turbines describing the various types of wind turbines and explains some technical characteristics available.

Wind turbines can again be divided into two main categories namely: vertical axis wind turbines and horizontal axis wind turbines.

Participants were also instructed on the fundamentals of wind power calculation from first principles and its relation of the kinetic energy in the wind. The relations to swept area, wind speed, air density and temperature were all illustrated.

Coffee Break

Ebenezer Nyarko Kumi then introduced the Hybrid Optimization Model for Electricity Renewable (HOMER), the micropower optimization model simplifies the task of evaluating designs of both off-grid and grid-connected power systems for a variety of applications. According to him, during a power system must make many decisions about the configuration of the system.

To him, the number of technology options and variation in technology cost and availability of energy resources make these decisions difficult. Hybrid Optimization Model for Electricity Renewables optimization and sensitivity analysis algorithms make it easier to evaluate the many possible system configurations.

End of Day 3

FOURTH DAY

On Thursday 10th July was the fourth day of training and following the usual recap, Mr. Eric Essandoh continued on wind energy generation simulation saying that, is a model of set of wind energy phenomena which can be used to characterize wind flow and to estimate the annual energy production of a wind turbine, the layout of a wind farm, the zone of visual influence, the issue of noise and other outputs of wind turbine generator.

According to him, the accuracy of these software vary due to the different simulation parameters, therefore its of interest to make an in-depth study of the accuracy of these soft ware in relation to the chosen simulation parameter.

It is also an interest to study the inherent limitations in the different wind simulation software in order to determine the type of software that suitable for a certain type of landscape and how the simulation should be carried out.

Coffee Break

Ebenezer Nyarko Kumi continued with the training on how HOMER uses these inputs to stimulate different system configurations or combinations of components and generates results that you can view as a list of feasible configurations sorted by net present cost.

According to him, HOMER also displays simulation results in a wide variety of tables and graphs that help you can export the tables and graphs for use in reports and presentations. When one explore the effect that changes in factors such as resource availability and economic conditions might have on the cost-effectiveness of different system configurations, can use the model to perform sensitivity analyses.

In order to perform a sensitivity analysis one can provide HOMER with parameters that described a range of resource availability and component costs. HOMER simulates each system configuration over the range of values and one can use the results to identify the factors that have the greatest impact on the design and operation of a power system.

Lunch Break

Moses Gabriel Cambell Head of Training Centre – NAWEC presented a lecture on energy efficiency and domestic wiring techniques & safety precautions and some of the regulation targets. He talks about the importance of inspection and certification, type approval and renewable energy projects.

He highlighted on Energy Savng Lamps, which he said it save energy, use 80% less energy, less heat, lower bills, environmentally friendly, less CO₂ emission and improve system voltage & stability.

Some of the recommendations he outlined include the creation of incentives and encourage widespread use of Solar, replace existing provincial power stations with solar power plants, shift from Oil based Generation to renewable forms of power generation, ban both the importation and use of incandescent lamps, implement a type approval regime and start testing and certification of installations.

Coffee Break

Mr. Kumi continued this lectures on HOMER. He discussed about the relationship between sensitivity analysis, optimization and simulation; thus the eleven steps to be followed to use HOMER namely: formulating question, create a new HOMER file, enter load details, enter component details, enter resource details, check inputs and correct errors, examine optimization results, refine the system design, add sensitivity variable and examine sensitivity analysis results.

The HOMER training also included practical demonstrations and class exercises to measure the understanding of the participants.

End Day 4

SITE VISITS

The last day (5th day) of the training was field visits to some of the demonstration sites on renewable energy projects within the country, through the use of technologies such as Solar PV, Solar thermal and Wind technology.

The first place visited was in Senegambia Beach Hotel to see solar heating installation, the team was taken round to see for themselves and obtained first hand information on the solar project.



Figure 6 : large solar water heating system at Senegambia Hotel



Figure 7 : Participants being shown the installation

According to Mr. Sri Ram Reddy chief engineer explains how hot water is being generated for 350 rooms on daily based; which he said there are ten tanks which has the capacity to hold 1000 litres of water each.

The hot water provided in the rooms were generated from solar automatic since the heat exchange system with solar panel-in the process cold water goes in and hot water comes out and for the guests at a degree of 50 centigrade.

Only one degree heat loss from the rooms using the PPRC pipes.

He said, there 215 solar panels installed at a cost of \$300, 000 saving 250litres of fuel used per day to generate hot water for the rooms. Its environmental friendly, cost effective and easy to manage.

The next place to visit was lemon creek key demonstration sites for solar pv installation-60kw were Mr. Dodou Gaye started explaining about the hybrid system solar pv, making reference the type of system to be established for NAWEC in Kaur.

According to Gaye, with this system in place is now saving over \$50,000 annually from buying fuel for their conventional machines and with this 60kW it providing about 80% energy and energy in the hotel.

The team was led by Mr. Sanna Sambou chief engineer who took the team round to see installation sites and explains how it works. According to him, the system is designed in such a way that even in days when there is no sunlight the generator will automatically provide the energy needed to charge (11/2 hour) the batteries to continue its function independently.

At Fandema/Mbolo hybrid system demonstration shows the combination of wind, solar and generator hybrid system functioning/ integrated in using renewable energy to meet daily needs of life.

Founded in 2010, Fandema is community based project aimed to empower women through strengthening their productive capacities and abilities through skills acquisition within Tujereng, according to Mr. Malang Sambou.

Mr. Sambou further said, when they started in 2010 with 7 solar panel using three computers, they 42 students were enrolled but due to electricity failure. However, with the support from GEF-UNIDO project in 2012 it enhanced the energy system needed to catered for students as a result we have 82 student and 200 are on the waiting list thanks to the hybrid system-wind, solar and generator.



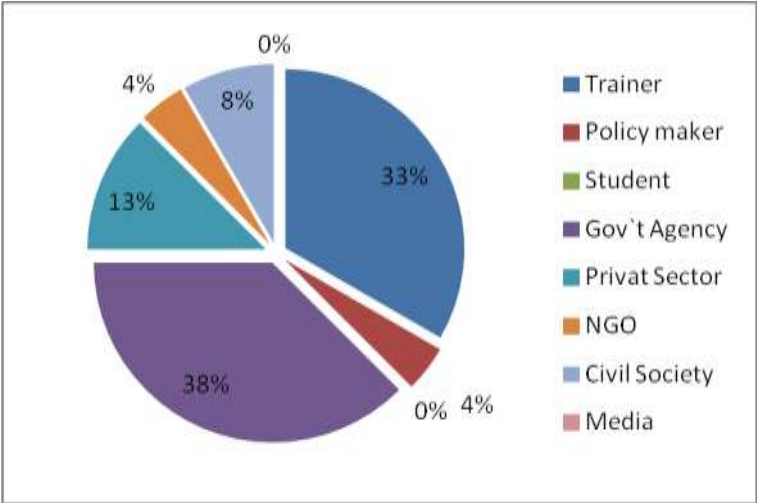
Figure 8 : 6kW off grid solar system at Mbolo

In closing the training after the field visit Mr. Dodou Gaye expressed satisfaction and appreciation to the participants, who dedicated all their time to attend and participate in the week long programme without any problems. He informed them that their certificates would be forwarded soon.

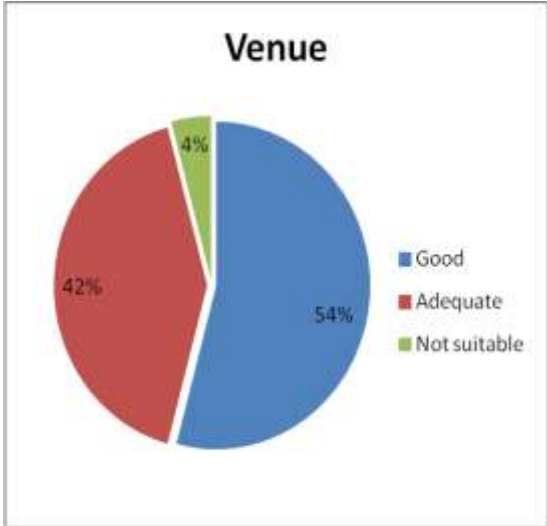
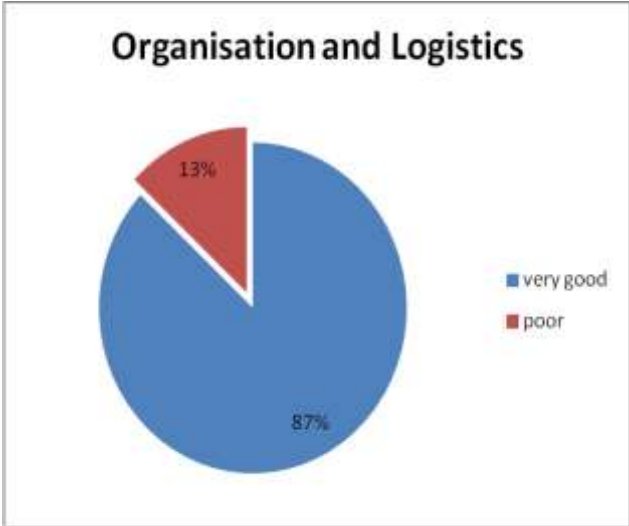
EVALUATION SUMMARY & FEEDBACK FROM PARTICIPANTS

The evaluation sheet was distributed to all participants during the last day of the training. In total there were 24 respondents.

The majority of the participants were either trainers from training institutions or from government or state agencies. The private sector was also well represented.



Venue & Logistics



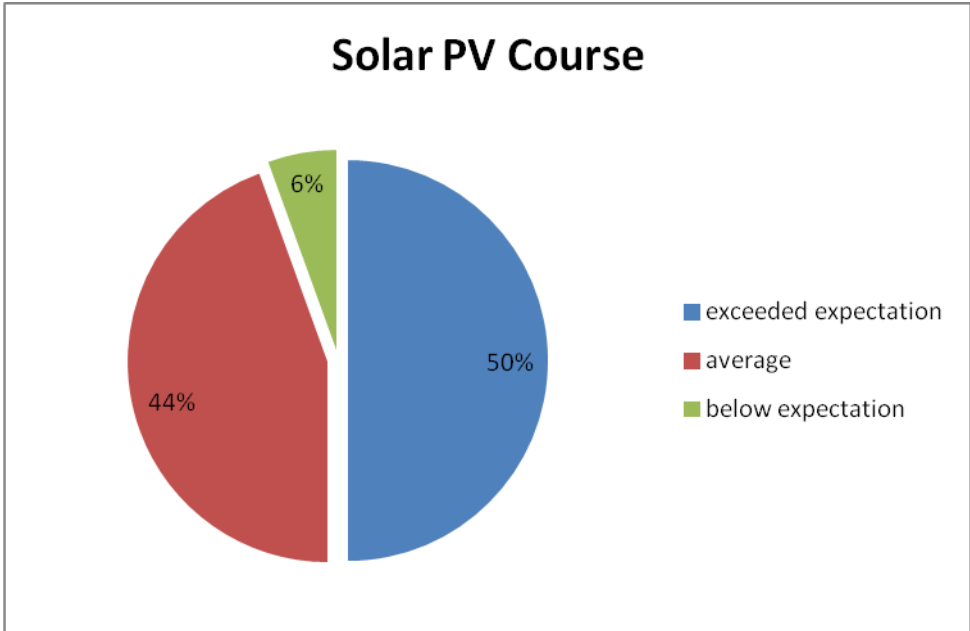
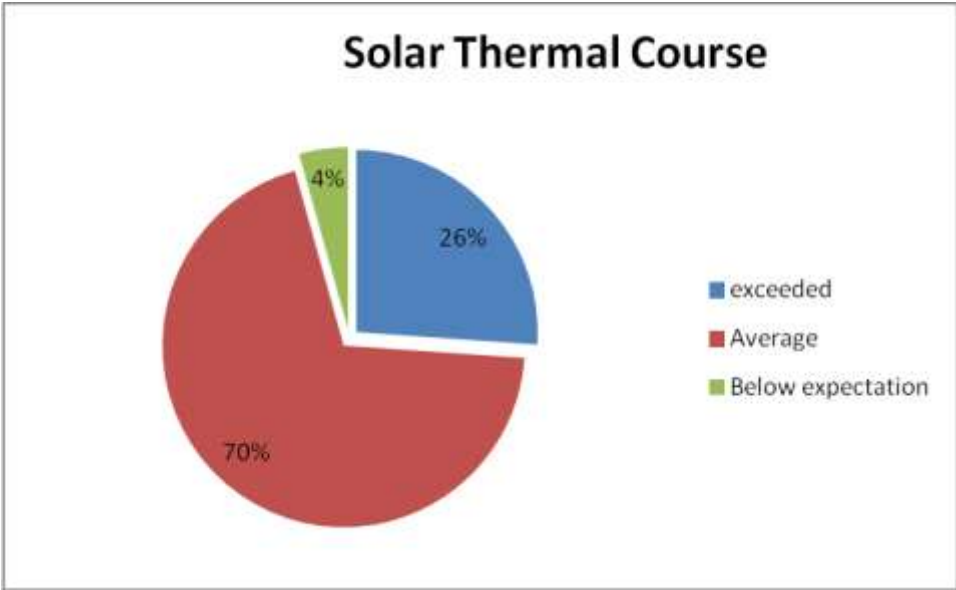
The location of the training was found to be just satisfactory by most participants with just over half indicating that it was good. Participants were also happy with the organisation, however there were complaints about the provision of food during the Ramadan. Participants expressed regret that no certificates were issued to recognise their participation in this training event.

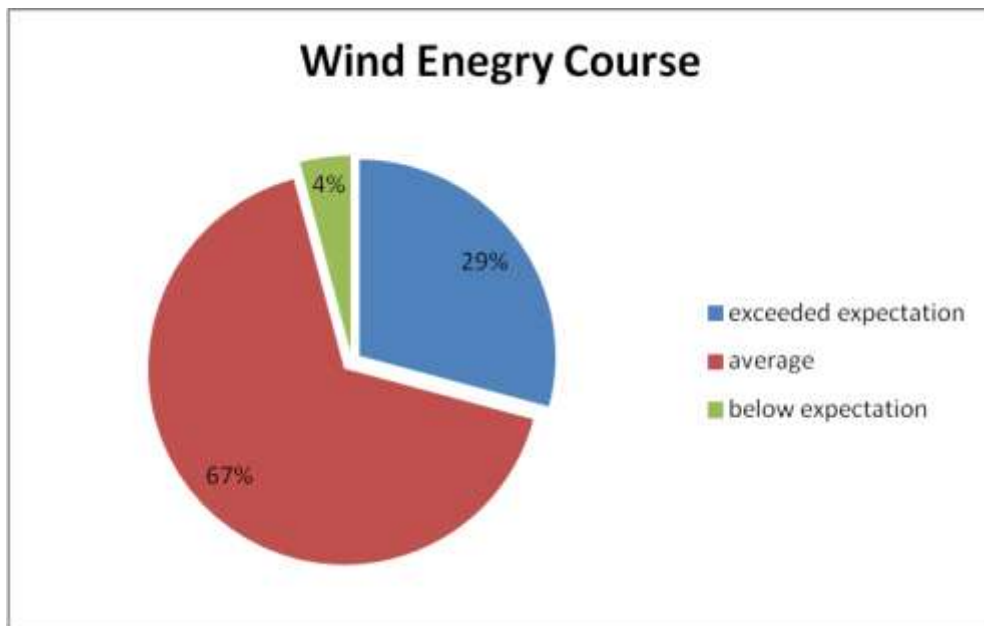
Course Delivery and Materials

All the participants appreciated the course material and all found them useful. The solar thermal course material received the highest grading.

The Homer Course was perhaps the most well received by participant with all (100%) participants indicating that it exceeded their expectations. This probably indicates that they are new to Homer and or previous Homer training didn't impact the same level of understanding of the software.

Nonetheless, in the other courses about 30% of participants (50% with Solar PV) indicated that the course lectures delivered exceeded their expectations.





Practical Training

Overall participants indicated that there was a right balance between theory and practical. However the majority (63%) indicated that the time was too short for such a programme.

All participants indicated that more training should be conducted and that they would also like to be contacted for future training especially if held at GREC the venue of the practical sessions.

A few expressed reservation on the lack of training equipment to illustrate of the pointed discussed in the lectures.

RECOMMENDATIONS

Most of the recommendations can be summarised as follows:

- i. Time was too short and should be at least two weeks
- ii. More discussion and group work/ exercises amongst participants should be encouraged
- iii. More women should be involved in such training
- iv. Practicals should be on diversified technologies and not only on solar.
- v. Future training should involved complete field based installations
- vi. More local experts should be involved.
- vii. Certificate should be issued to participants.
- viii. The presentations should have been given to the trainers especially after the course.

ANNEX I

Below are snapshots of some of the recommendations from participants.

Was there a good mixture of Theory and Practicals ?

Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	No suitable <input type="checkbox"/>
If No, please indicate below <i>the time we have for Practicals was too short</i>		
Too much theory <input type="checkbox"/>	Inadequate equipment for Practicals <input type="checkbox"/>	Time was too short for Practical <input checked="" type="checkbox"/>

Would you like to be involved in future training at GREC?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
--	--------------------------------

What did you think of the overall organisation & logistics?

Very Good <input checked="" type="checkbox"/>	Poor <input type="checkbox"/>
--	----------------------------------

Recommendations (Please indicate any recommendations)

<i>The lecturers are excellent and the courses were also interesting but the number of days allocated for the courses were too short.</i>

Was there a good mixture of Theory and Practicals ?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No suitable <input type="checkbox"/>
If No, please indicate below		
Too much theory <input type="checkbox"/>	Inadequate equipment for Practicals <input type="checkbox"/>	Time was too short for Practical <input type="checkbox"/>

Would you like to be involved in future training at GREC?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
--	--------------------------------

What did you think of the overall organisation & logistics?

Very Good <input checked="" type="checkbox"/>	Poor <input type="checkbox"/>
--	----------------------------------

Recommendations (Please indicate any recommendations)

if training period can be ~~expens^m~~ the nearby distance training that will help participant to understand better what they have being ~~to~~ found on. women should at all cost be involve in training of this kind.

Was there a good mixture of Theory and Practicals ?

Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	No suitable <input type="checkbox"/>
If No, please indicate below Much of the training could be done practically about 75%		
Too much theory <input type="checkbox"/>	Inadequate equipment for Practicals <input type="checkbox"/>	Time was too short for Practical <input checked="" type="checkbox"/>

Would you like to be involved in future training at GREC?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
---	-----------------------------

What did you think of the overall organisation & logistics?

Very Good <input checked="" type="checkbox"/>	Poor <input type="checkbox"/>
---	-------------------------------

Recommendations (Please indicate any recommendations)

Future training particularly the practical aspect should be project based sites

Future trainings should include installing a complete small project of solar systems for one or two home systems.

A wind turbine of a small capacity of maybe 50w capacity should install ~~some~~ as a demo at any of the Government/NGO/Civil Society locations

ANNEX II: EVALUATION FORM

GEF UNIDO Training of Trainers in Renewable Energy Training Evaluation Sheet 7th – 11th July 2014

Please note that all data is collected anonymously and there is no link to your identity, or institution. Please do not indicate your name on the sheet.

Background
I am a / from

TRAINER <input type="checkbox"/>	POLICY MAKER <input type="checkbox"/>	STUDENT <input type="checkbox"/>	GOVERNMENT AGENCY <input type="checkbox"/>	PRIVATE SECTOR <input type="checkbox"/>	NGO <input type="checkbox"/>	CIVIL SOCIETY <input type="checkbox"/>	MEDIA <input type="checkbox"/>
--	--	--	--	---	--	---	--

Please Evaluate the Training Venue (GTTI)

GOOD <input type="checkbox"/>	ADEQUATE <input type="checkbox"/>	NO SUITABLE <input type="checkbox"/>
--------------------------------------	--	---

Courses

SOLAR THERMAL				
EXPECTATIONS ABOUT THE COURSE	EXCEEDED EXPECTATION <input type="checkbox"/>	EXPECTATION AVERAGE <input type="checkbox"/>	BELOW EXPECTATION <input type="checkbox"/>	
COURSE MATERIAL AND HANDBOOK	EXCELLENT <input type="checkbox"/>	USEFUL <input type="checkbox"/>	POOR <input type="checkbox"/>	HAVE NOT READ IT YET <input type="checkbox"/>
EXERCISES	GOOD <input type="checkbox"/>	USEFUL <input type="checkbox"/>	CHALLENGING <input type="checkbox"/>	
INSTRUCTOR	EXCELLENT <input type="checkbox"/>	VERY GOOD <input type="checkbox"/>	GOOD <input type="checkbox"/>	

Solar PV

Expectations	Exceeded Expectation <input type="checkbox"/>	Expectation Average <input type="checkbox"/>	Below Expectation <input type="checkbox"/>	
Course Material and Handbook	Excellent <input type="checkbox"/>	Useful <input type="checkbox"/>	Poor <input type="checkbox"/>	Have not Read it yet <input type="checkbox"/>

Exercises	Good <input type="checkbox"/>	Useful <input type="checkbox"/>	Challenging <input type="checkbox"/>	
Instructor	Excellent <input type="checkbox"/>	Very good <input type="checkbox"/>	Good <input type="checkbox"/>	

Wind Energy

Expectations	Exceeded Expectation <input type="checkbox"/>	Expectation Average <input type="checkbox"/>	Below Expectation <input type="checkbox"/>	
Course Material and Handbook	Excellent <input type="checkbox"/>	Useful <input type="checkbox"/>	Poor <input type="checkbox"/>	Have not Read it yet <input type="checkbox"/>
Exercises	Good <input type="checkbox"/>	Useful <input type="checkbox"/>	Challenging <input type="checkbox"/>	
Instructor	Excellent <input type="checkbox"/>	Very good <input type="checkbox"/>	Good <input type="checkbox"/>	

Homer

Expectations	Exceeded Expectation <input type="checkbox"/>	Below Expectation <input type="checkbox"/>		
Course Material and Handbook	Excellent <input type="checkbox"/>	Useful <input type="checkbox"/>	Poor <input type="checkbox"/>	Have not Read it yet <input type="checkbox"/>
Exercises / Simulation	Good <input type="checkbox"/>	Useful <input type="checkbox"/>	Challenging <input type="checkbox"/>	
Instructor	Excellent <input type="checkbox"/>	Very good <input type="checkbox"/>	Good <input type="checkbox"/>	

Was there a good mixture of Theory and Practicals ?

YES <input type="checkbox"/>	NO <input type="checkbox"/>	NO SUITABLE <input type="checkbox"/>
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IF NO, PLEASE INDICATE BELOW

TOO MUCH THEORY <input type="checkbox"/>	INADEQUATE EQUIPMENT FOR PRACTICALS <input type="checkbox"/>	TIME WAS TOO SHORT FOR PRACTICAL <input type="checkbox"/>
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Would you like to be involved in future training at GREC?

YES <input type="checkbox"/>	NO <input type="checkbox"/>
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What did you think of the overall organisation & logistics?

VERY GOOD

POOR

Recommendations (*Please indicate any recommendations*)

ANNEX III : PROGRAMME OF THE TOT