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FROM THE AMERICAN PEOPLE



Vocational Training & Education for Clean Energy (VOC TEC) Program: Impacts and Lessons Learned

VOCTEC Program: Introduction



Fiji - 2014

VOCTEC Program Overview

- **Sponsor:** Initially funded by the US Agency for International Development
- **Contractor:** Arizona State University
- **Partners:** Appalachian State and Green Empowerment
- **Overall Objective:** To build awareness, knowledge and capacity of local stakeholders in developing countries to sustain renewable energy systems



Fiji - 2013



Liberia - 2015

Program Objectives

- Build local capacity to operate and maintain clean energy systems.
The objective is achieved through:
 - Development and transfer of curricula
 - Development of training centers
 - Training of educators and staff
 - Integration of gender, entrepreneurship, and effective teaching skills
 - Assessment of impacts



India - 2016

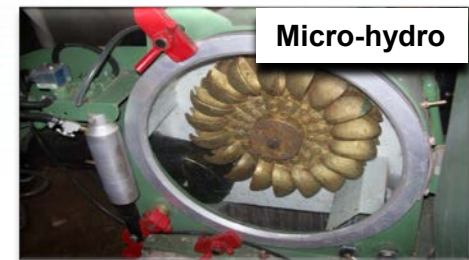
Technologies & Training Levels

➤ Renewable Energy Technologies

- Solar/PV
- Micro-Hydro
- Small-Wind

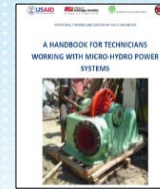
➤ Training Levels

- Workshops for policy and decisions makers (L3)
- Training for educators and engineers (“train-the-trainer”) (L2)
- Technical training for creating skilled workforce (L1)



Training Components

Training Toolkits



Classroom Material



Social awareness & gender inclusion



Hands on, classroom & Online learning

Impact measurements

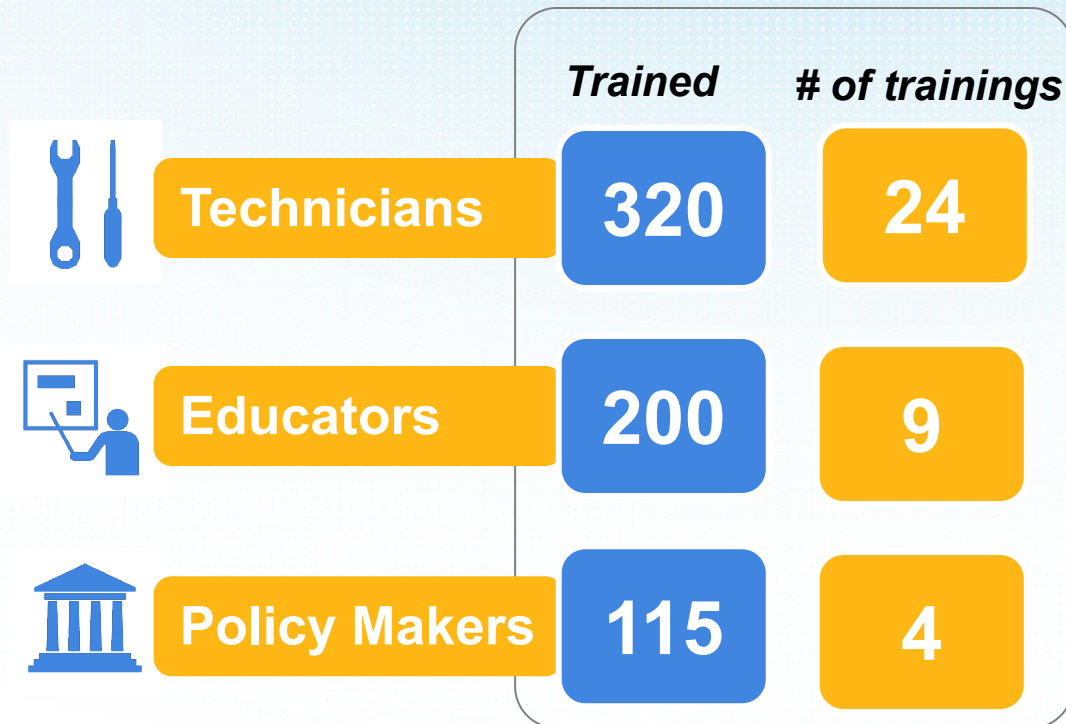


Supporting material (Posters, manuals)



Educational Games

Training Stats (USAID)



**Trainings
Delivered**

37














VOCTEC Project Training Events

| | Solar PV | Wind | Micro-hydro |
|---------------------------|--|---|--|
| 4 Policy Makers trainings | <ul style="list-style-type: none"> Guyana – 2012 | <ul style="list-style-type: none"> Fiji – 2014 Nepal – 2015 | <ul style="list-style-type: none"> Fiji – 2014 |
| 9 Educators trainings | <ul style="list-style-type: none"> Fiji – 2013 & 2014 Palau - 2014 Kenya – 2014 Kenya – 2015 & 2016 (all women) Nepal – 2015 India – 2014 & 2016 (83% women) | | |
| 24 Technician trainings | <ul style="list-style-type: none"> Tonga, 2 Fiji, Vanuatu, Solomon Islands – 2013 2 Samoa, 2 Kiribati, 2 Marshall Islands, Federated States of Micronesia, 2 Palau, PNG, Tonga, Vanuatu, 2 Fiji – 2014 Kenya – 2015 (all women) Nepal - 2015 (all women) | | <ul style="list-style-type: none"> Liberia – 2014 Solomon Islands – 2015 |

Expanded VOCTEC Activities around the Globe



Expanded Partnerships: Organizations

| | | | | |
|-----------------|--|---|---|--|
| Sponsors |  <p>USAID FROM THE AMERICAN PEOPLE</p> |  <p>TNO innovation for life</p> |  <p>IDB</p> |  <p>NEW ZEALAND</p> |
| |  <p>IRENA International Renewable Energy Agency</p> |   |  <p>IUCN</p> |  <p>giz</p> |
| Partners |  <p>TETRA TECH</p> |  <p>THE UNIVERSITY OF THE WEST INDIES ORIENS EX OCCIDENTE LUX</p> |  <p>USP THE UNIVERSITY OF THE SOUTH PACIFIC</p> |  |
| |  <p>BARBADOS COMMUNITY COLLEGE MANY STUDIES - ONE BROTHERHOOD</p> |  |  <p>Strathmore UNIVERSITY</p> | |

Training Stats (USAID + Others)



Key Accomplishments



Nairobi, Kenya, 2016

Solar Curricula and Toolkit Development

- The curriculum design (for educators and technicians)
 - 50-50 class-room lectures to hands-on exercises
 - Mobile Training Toolkits (MTTs) - essentially a “*Lab on the Go*”
 - Interactive games
 - Posters for end-users
 - Pre-and post assessments and surveys



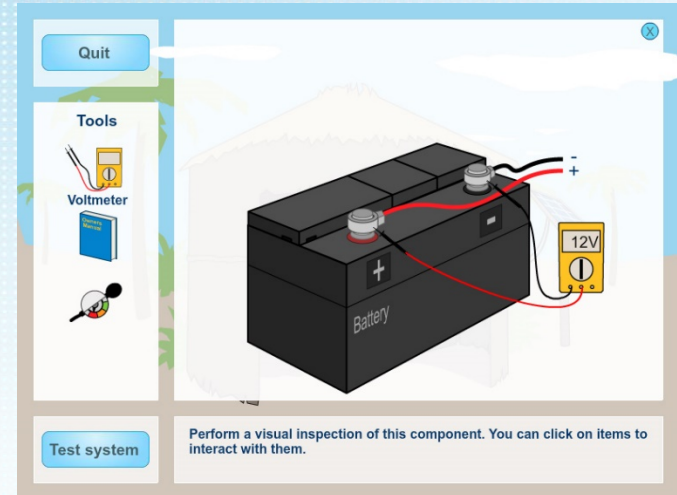
MTT Manual



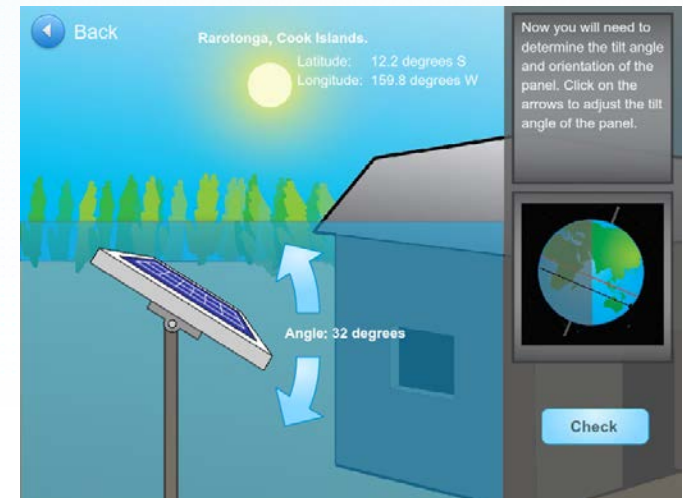
MTT (Expanded and Light)

Educational Games for PV

- Assist in learning about certain topics and concepts
- Reinforce development of a skill or concept in a fun interactive way
- Give learners the freedom to experiment
- Teach them how to set goals while providing them with feedback
- Prepare them to better problem solve and enhance their critical thinking skills



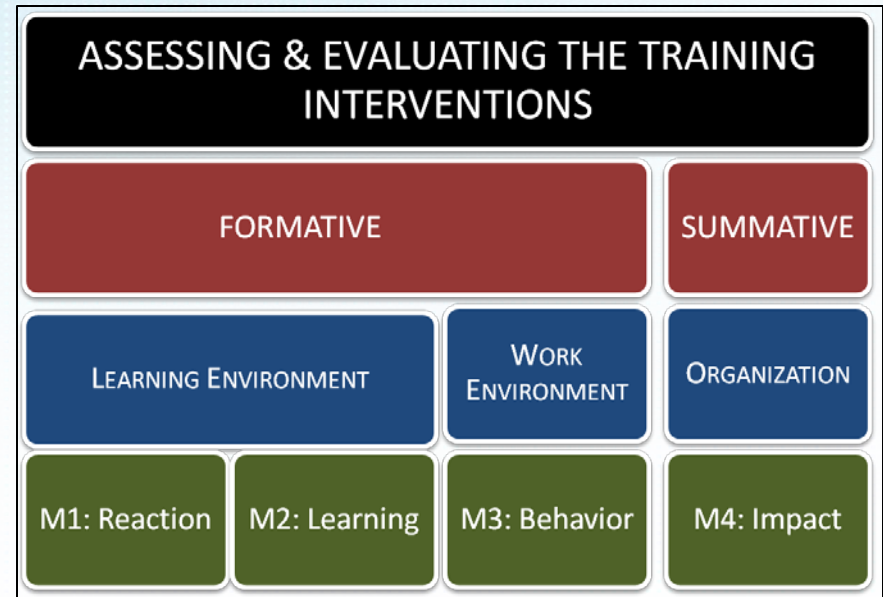
Solar PV Troubleshooting



Solar PV System Sizing

Measuring Impact

- Assess the short term impact of the trainings on knowledge, attitudes and behaviors
- Analyze assessment data for continuous refinement of trainings
- Measure long term impacts, when feasible



Kirkpatrick's Evaluation Model

Lessons Learned and Recommendations

- Strong partnerships are critical for sustainability
- Infrastructure and resources are important for long term sustainability
- Evaluating trainees' learning performance motivates the trainees to succeed
- Follow up with trainees is challenging:
 - Geographic and connectivity challenges
 - Hard to assess the long-term impact on the trainees

Empowering Women (Gender Inclusion)



Kenya, 2015



India, 2016



Nepal, 2015



Kenya, 2016

2015 Kenya Train the Trainer



Source: ASU & Strathmore University

2015 Kenya Train the Trainer



Source: ASU & Strathmore University



WISEE - Women in Sustainable Energy & Entrepreneurship



Aimed at empowering women to acquire, use and promote renewable energy technologies in order to increase their participation in energy and entrepreneurship sector and contribute to enhancing access to clean energy products and services in Eastern Africa.

Source: Strathmore University

WISEE Goals

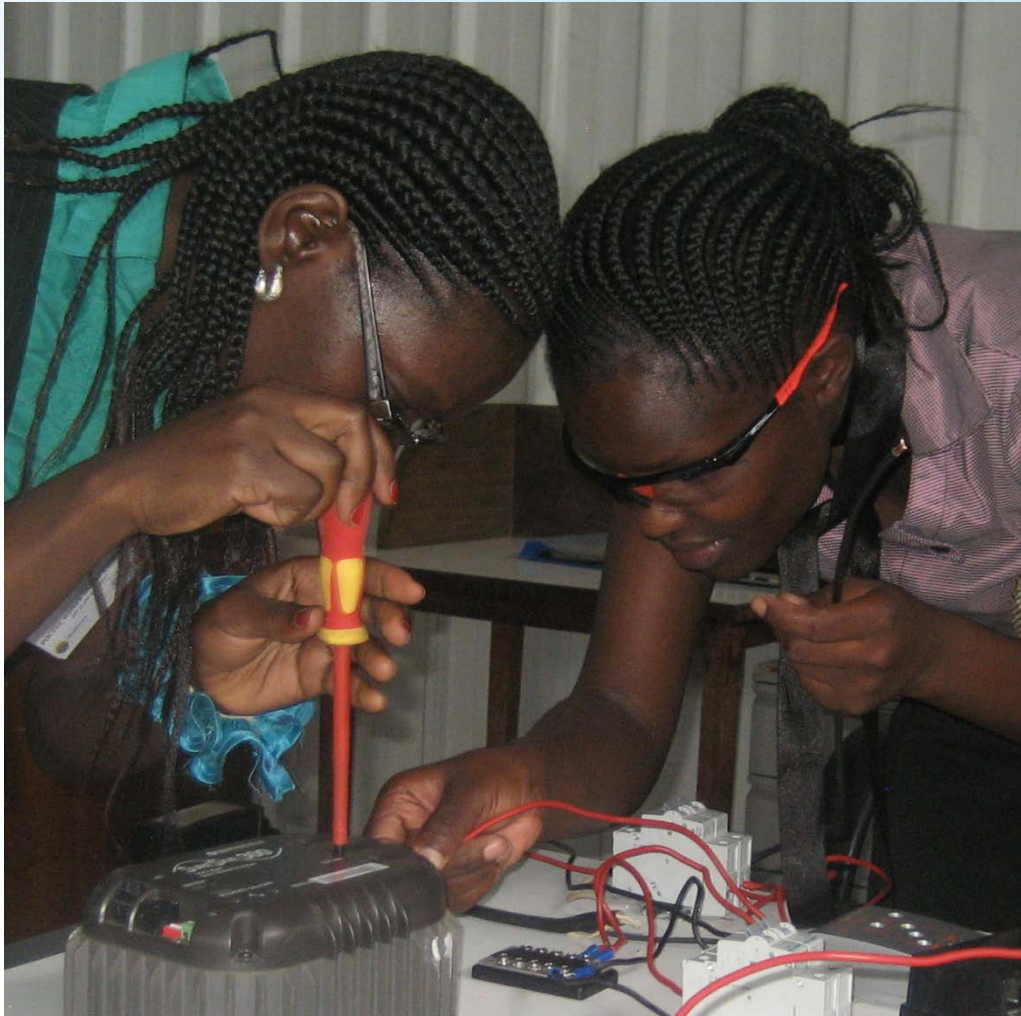
- Train women to design, install and maintain energy systems
- Engage with policy makers to build their capacity
- Build the capacity of women end-users to operate and maintain renewable energy systems
- Provide quality solar PV solutions to customers
- Increase the number of women entrepreneurs, licensed solar installers, and trainers
- Network with like-minded national, regional and international bodies to share experiences
- Conduct research on gender and energy

2015 Kenya Technician Training WISEE trainers



Source: Strathmore University

Increasing Solar Licenses



Source: C. Weis LLC

March 2016

Total Solar License: 267

Male: 251

Female: 16

- From the 16 women,
- 4 were from the 2015 ASU/Strathmore women's trainings
 - 4 more are registered to sit for the exam.
 - 2 are getting their practical experience

Mentorship



2016 Kenya Train the Trainer



Source: Strathmore University

Building Teacher Capacity



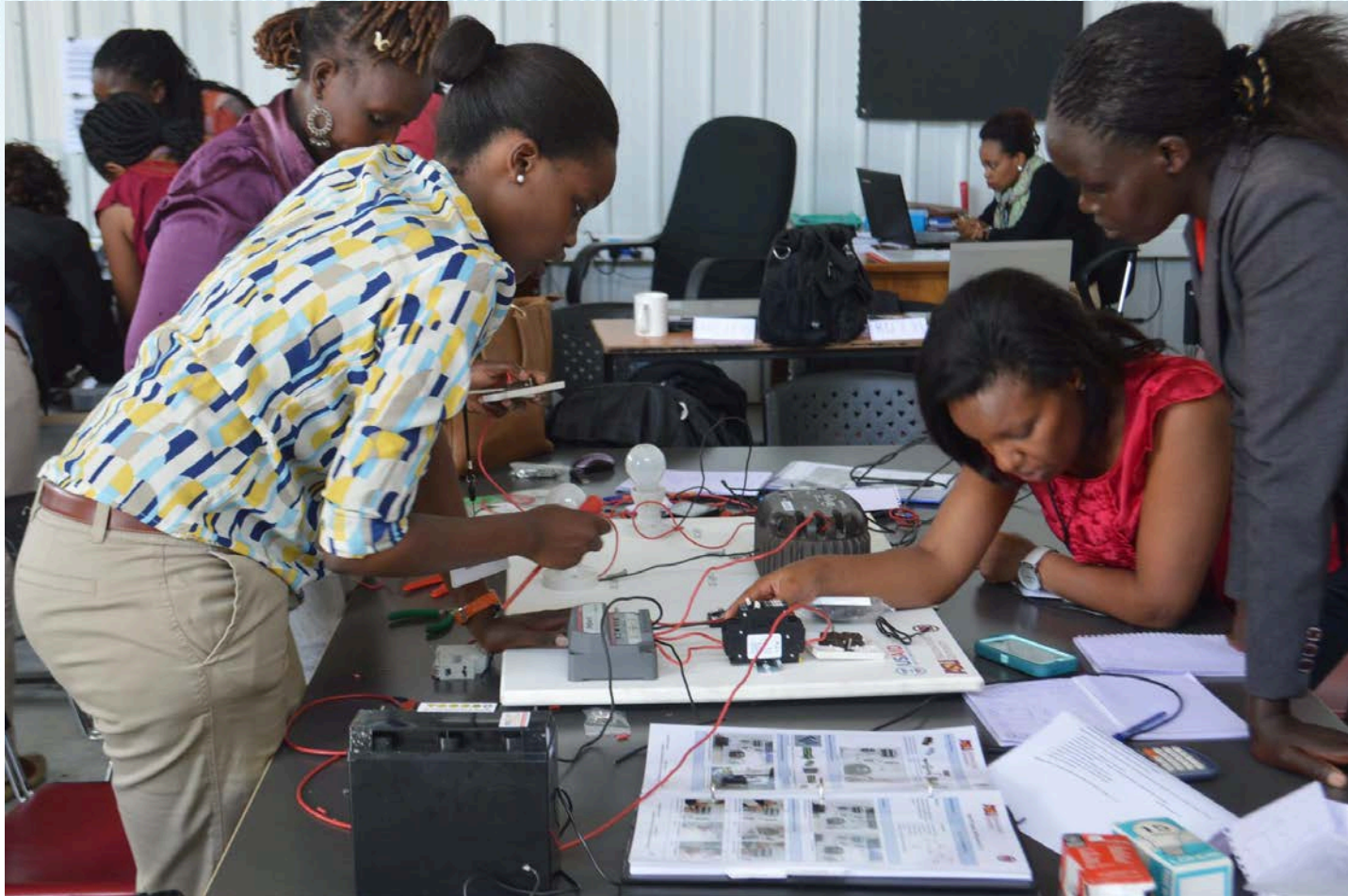
Source: C. Weis LLC

Comfortable Environment



Source: Strathmore University

Less Intimidating



Source: Strathmore University

Learning to use Tools



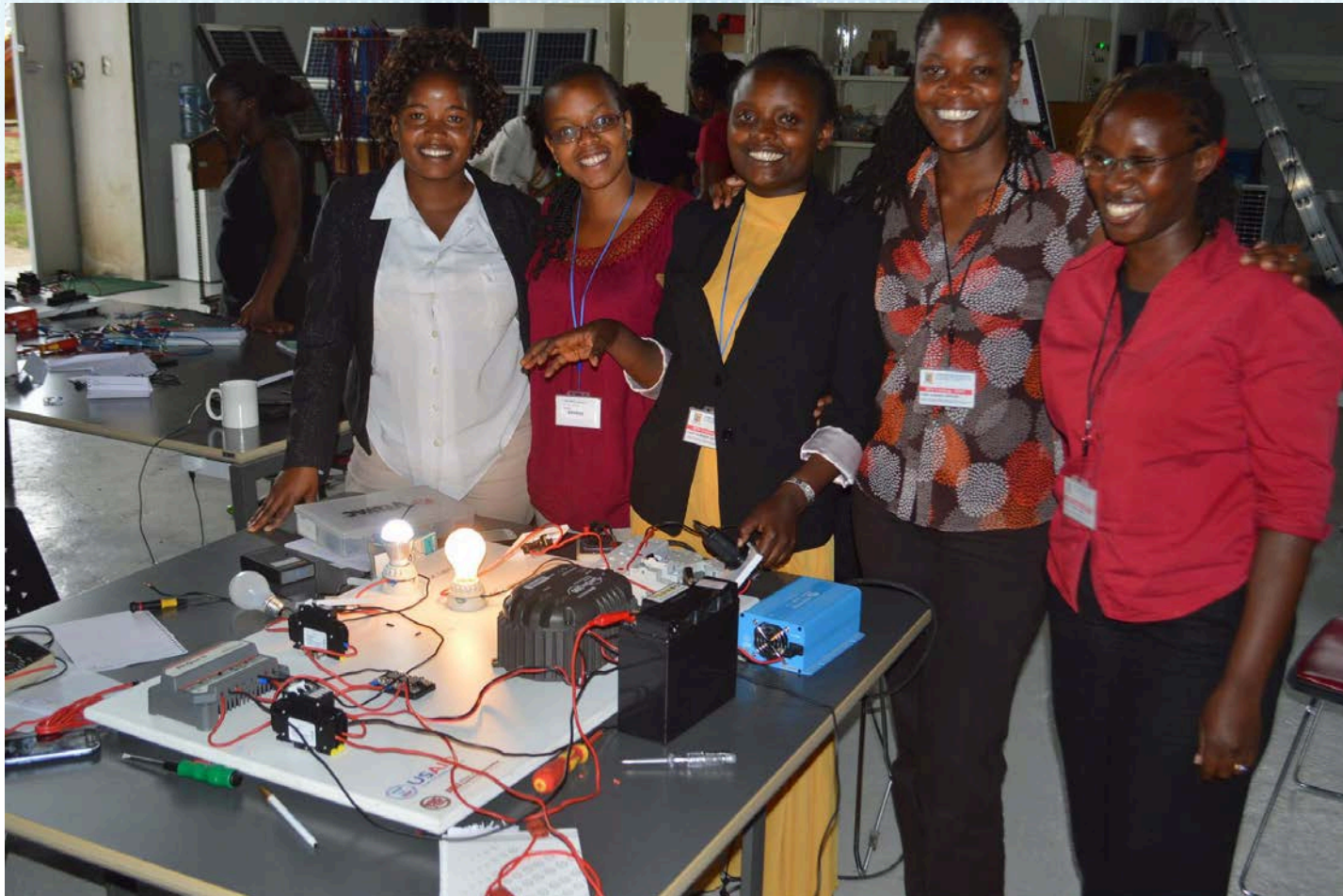
Source: C. Weis LLC

Key Relationships for Women in a Traditionally Male Field



Source: Strathmore University

Taking Pride in a New Skill



Source: Strathmore University

Women Instructors



Presence of female instructors creates a more comfortable environment for female trainees and increases their participation in the class

Source: Strathmore University

Contributing to a Clean Energy Future



Source: C. Weis LLC

Future Trainers of End-users and Technicians



Source: C. Weis LLC (2)

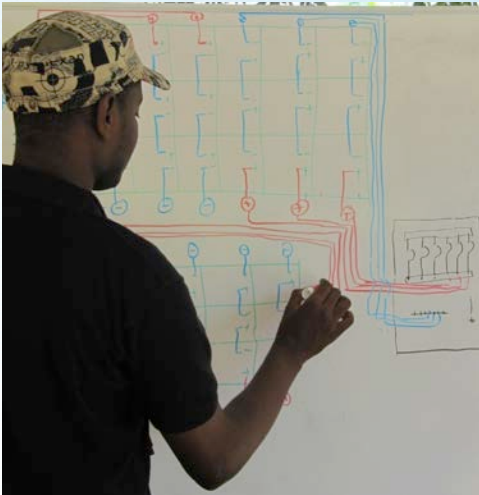
Creating Avenues for Women



Source: Strathmore University

Female recruitment is helped when the trainings are advertised as women-only

Training courses conclusions



Designers



Installers



Onsite Maintenance

- Who is the audience?
- What are the workforce skill set needs?
- Are we training our technicians to educate the end users?



**End
Users**

Technical Training Conclusions

Questions to ask before training

- What jobs will the graduates from this training program be prepared to work at after this training?
- Is the market developed enough to employ trained students?
- Is the program assisting students to enter the workforce as apprentices?

THANK YOU

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