SOLtrain West Africa

Technical Training for Professionals

In the Frame of the ECOWAS Solar Thermal Training and Demonstration Program

Implementing Organization:
ECREEE: ECOWAS Centre for Renewable Energy and Energy Efficiency

Technical Partner:
AEE INTEC, INES

Agenda: 21 - 24th April 2015

Venue: CERMI, Centre for Renewable Energy and Industrial Maintenance
Praia, Cabo Verde

Austrian Development Cooperation

MINISTERIO DE ASUNTOS EXTERIORES Y DE COOPERACIÓN aecid

ECOWAS Solar Thermal Training and Demonstration Program
21 – 24 April 2015, Praia Cape Verde

As part of the efforts of ECREEE to promote the use of sustainable and renewable energy resources and technologies in West Africa, ECREEE launched the ECOWAS Solar Thermal Training and Demonstration Program (in short: SOLtrain West Africa). The strong political will of ECOWAS countries to use established solar thermal energy for water heating in schools, hospitals, buildings, hotels and even for industrial processes was formulated within the ECOWAS Renewable Energy policy and approved by Head of States Authorities in 2013.

The objective of the program SOLtrain West Africa is to make a significant contribution to the switch from a fossil fuel based energy supply to a sustainable energy supply system based on renewable energies, especially on solar thermal.

The Kick off Meeting and Regional Technical training is funded by the Austrian Development Agency (ADA) and Spanish Development Cooperation (AECID) to officially launch the program and kick start the building of capacities of the participants and 6 partner institutions working on solar thermal energy in West Africa.

A. Background

Direct solar heat is much more efficient and cheaper than electricity or energy from biomass, even more in countries with a big lack of electricity or wood. The solar fuel costs are for free. Solar thermal energy is highly needed for schools, clinics, hospitals, hotels, buildings, laundries, industrial and agricultural processes as e.g. as process heat in food and beverage industry and drying of crops, herbs or fruits. As the potential and solar radiation in most ECOWAS countries is high or very high, ECREEE created a solar thermal capacity building program in the ECOWAS region.

The meeting is a follow up activity to the program defining and consultation workshop organized by ECREEE in June 2014. This workshop informed the participants on the potential and the availability of different solar thermal technologies – not only for solar water heating in buildings, but also for use as process heat in the industry. Lessons and experiences from the equivalent solar thermal program SOLtrain in Southern African countries were shared as SOLtrain has been running successfully in 5 SADC countries since 2009 funded by the Austrian Development Cooperation (ADC).

As one result of the consultation phase in June 2014, West African solar thermal experts were identified including key training needs for planning, installing and maintaining three solar thermal technologies, in this average ranking:

- Thermo-syphon systems up to 10 m2 collector field
- Solar thermal high quality drying of fruits, crops, herbs, meat or fish medium
- Pumped systems for water heating from larger than 10 m2 collector field.

Responding to the needs and expectations ECREEE in collaboration with AEE INTEC elaborated the program document SOLtrain West Africa as a 4-year program (2015 - 2018) with a strong focus on capacity building and training of existing selected partner universities and polytechnic schools in 5 West African countries Capo Verde, Burkina Faso, Ghana, Nigeria and Senegal. These partner institutions will be trained on planning and installation of new systems and how to practically monitor, analyze and improve existing solar thermal systems. The partner institutions will be involved in getting two high quality demonstration systems at their institutions and planning and installation of 25 solar thermal energy systems at social institutions such as hospitals, schools etc.

This program was designed considering the lessons learned of the program SOLtrain in 5 Southern African countries running since 2009 and will capitalize on the experience and expertise of the same technical experts.

B. Objectives of the Kick Off Meeting and Technical Training

- Kick Off Event:
  - Officially Launch the SOLtrain West Africa program.
  - Acquaint selected project partner institutions and relevant stakeholders about the content and the organizational structure of the project.
  - The meeting will also seek to structure the work programme in detail including addressing financial issues.
- Technical Training:
  - Build the technical capacities of participants on solar thermal systems and applications.
  - Create opportunities for networking between solar thermal professionals and experts from within and outside the ECOWAS region.

C. Participants

The event will feature the participation of representatives from the selected project partner institutions, which are

- CERMI, Centre for Renewable Energy and Industrial Maintenance, Cabo Verde
- University of Cabo Verde - Uni-CV, Cabo Verde
- International Institute for Water and Environmental Engineering (2ie) in Burkina Faso,
- Université Cheikh Anta DIOP in Senegal
- Koforidua Polytechnic in Ghana,
- National Centre for Energy Research and Development, University of Nigeria, South Nigeria
- Usmanu Danfodiyo University, Sokoto, North-East Nigeria

Also representatives of the Center for Renewable Energy and Industrial Maintenance - CERMI in Cabo Verde (Praia), Ministry of Energy in Cabo Verde, GIZ, the Luxemburg Development Cooperation - LuxDev, and other technical partners shall be invited.

D. Key outcomes being sought

- Participants are adequately informed the content, processes, responsibilities, reporting and organizational structure of the program
- Capacities of partner institutions are enhanced and improved on solar thermal systems and applications.
- The key points and considerations for the ECOWAS program SOLtrain West Africa and its capacity building measures are discussed and further defined to structure the program for successful implementation.

E. Contact to Implementing Organization ECREEE

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Agenda Technical Training for Professionals
21 – 24 April 2015, Location: CERMI, Praia, Cabo Verde

Tuesday, 21 April 2015	
09:00 h	Welcome and Overview on Training Hannes Bauer - ECREEE
09:15 h	Solar Heat Worldwide An overview on the worldwide developments (markets and political support mechanisms) Werner Weiss – AEE INTEC
10:30 h	Coffee break
11:00 h	Overview on systems, design concepts and applications Werner Weiss – AEE INTEC • Domestic hot water systems (pumped and thermosyphon) • Medium-scale hot water systems for hotels, hospitals… • Industrial applications (food and beverage industry, metal and mining industry) • Recent developments - large-scale systems
12:30 h	Lunch
14:00 h	Preconditions for solar energy utilization and the solar resource Xavier Cholin, INES
15:15 h	Coffee break
15:30 h	Types of solar collectors and manufacturing possibilities European standards for collectors and systems Werner Weiss – AEE INTEC
17:00 h	End of 1st day

Wednesday, 22 April 2015	
09:00 h	Efficiency and performance of collectors Werner Weiss – AEE INTEC
10:30 h	Coffee break
11:00 h	Building integration of solar collectors Werner Weiss – AEE INTEC
12:30 h	Lunch
14:00 h	Thermal energy storages Xavier Cholin, INES • Small domestic hot water tanks • Large, long term storages • Recent developments with PCM and thermo-chemical storages
15:15 h	Coffee break
15:30 h	Other relevant components of solar thermal systems Pumps, heat exchanger, controller, expansion vessels … Rudi Moschik, AEE INTEC
16:15 h	Visit of the demonstrated systems as collectors, chiller, cooling for the building and further wind and PV systems at CERMI in 2 groups
17:00 h	End of 2nd day

Thursday, 23 April	
09:00 h	System design and dimensioning of solar water heating systems General introduction Werner Weiss – AEE INTEC
10:30 h	Coffee break
11:00 h	Split into two groups (in two rooms with computers Rudi Moschik, AEE INTEC and Xavier Cholin, INES - Hand calculation - RETScreen simulation
12:30 h	Lunch
14:00 h	Split into two groups Rudi Moschik, AEE INTEC and Xavier Cholin, INES - Hand calculation - RETScreen simulation
15:15 h	Coffee break
15:30 h	Collector hydraulics Werner Weiss – AEE INTEC
16:00 h	Industrial applications and sea water desalination Werner Weiss – AEE INTEC
17:00 h	End of 3rd day
Friday, 24 April	
09:00 h	Solar air conditioning and cooling - overview Xavier Cholin, INES
10:30 h	Coffee break
11:00 h	Solar drying- overview Werner Weiss, AEE INTEC
12:00 h	Feed-back and next steps
13:00 h	End of training course
13:00 h	Lunch

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