Experiences, challenges and barriers on solar thermal energy in Ghana

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Need for Solar Thermal in Ghana

- Energy very important to economic development
- Every economic activity is dependent on energy
- Demand for energy is increasing 8-10% every year
- Constant power crisis in Ghana
- Additional 200MW of power needed yearly
- Less than 0.1% RE consumption presently
Solar thermal usage

• Water heating – mostly in hotels, restaurants and homes
• Drying of crops and raw materials for industries
• Process heating for industry eg. Fresh and Dry company
• Solar Distillation eg. fluoride-contaminated water: Bongo district of Ghana
• Cooking and Baking (prototype levels)
• Solar air conditioning unavailable except for passive cooling

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Other institutions

• KNUST’s Energy centre
  ❖ Masters in Renewable Energy (2014)
• University of Energy and Natural Resources, Sunyani (2012)
• Environmental Protection Agency Training Centre
• Centre for Energy, Environment and Sustainable Development (NGO)
Experiences;
Background on Solar Thermal Energy

• Dept. of Energy Systems Engineering was established in 2008 with the HND level.
• BTech was started in 2013
• Train personnel in the exploitation of alternative energy sources and in the efficient utilization and conservation of available resources
• Areas include: All aspects of Solar Thermal, Solar PV, Wind, Hydro, Bioenergy (Biogas, Biofuels)
Activities

• Training on
  ✓ Renewable Energy production and utilization for students.
  ✓ solar installations for community agents.

• Supervise student Project work

• Research and production of components
  ✓ Mixed-mode solar dryer
  ✓ 100 litre water heater using local materials
  ✓ Solar cooker – box cookers, parabolic cookers, bakers
  ✓ Solar stills

• Industrial visits and attachment

• Seminars, Fairs, Exhibitions and Conferences
Information on Ghana

• No solar collector production companies
• Solar companies are mainly into importation and installation
• Components mainly from China
• Data on solar thermal is hard to come by at the ministry of energy or energy commission

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Existing key barriers for solar thermal energy

- Lack of awareness of the key issues and benefits
- Initial cost of systems
- Implementation of the institutional and regulatory framework. (Lack of government commitment)
- Technical expertise unavailable
Expectations from ECOWAS Solar Thermal Program

• Collaboration with the various players to create awareness of the key issues and benefits
• Share and exchange ideas in whichever form
• Support in the area of equipment
• Technical support in terms of appraisals in new technologies, and materials
• Impress on the various government agencies and institutions in the area of solar thermal to implement their policies if they have one or else formulate one

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Expectations to the Ministry of Energy

- Create the platform for private sector involvement and participation
- Put in mechanisms for easy implementation and achievements of the energy Act
- Communication linkages between the various players

Expectations to the Ministries of Housing

- Collaborate with other ministries to encourage or even make it mandatory for new housing projects to incorporate solar thermal into their energy supply
Expectation to the Chamber of Architects

• They should ensure that solar thermal is incorporated either for domestic or commercial or industrial purposes

• Collaborate with all the ministries involved in the issues of energy to implement the energy laws
What is needed for the dissemination of solar thermal energy

- Awareness creation and education (seminars, media, school curricula, fairs), capacity building
- Technology transfer centres (make available information and easy access to technology)
- Subsidies and incentives for adoption
- Mandatory incorporations
- Local technical infrastructure development
- Institutional and regulatory framework that support the implementation of solar energy, financing mechanism and private sector involvement

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Pictures

- Mixed-mode solar dryer
- Solar cooker
- Concentrated solar water heater
- Industrial applications at Fresh and Dry Co.
- Field trip to Fresh & Dry Co.
- Students tutorial session
Pictures

Solar water heater

Tutorial session for students

Solar box cooker
Thank you!