

A Case for Solar Energy in Botswana

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By

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- **Data cited in this presentation is for 2003/2004 as the current data could not be available.**
- **However, it is representative of the current energy scenario in Botswana, and is considered to be sufficient for the present discussion.**

Energy Mix in Botswana

- Energy use in Botswana is dominated by fossil fuels, and wood fuel.
- Wood accounts for 34%, petroleum 45%, electricity 12%, coal 9%, and others .0% of the net energy supply.
- Only about 30% of the total electricity consumed is generated within the country from coal. About 70% is imported, mostly from the neighboring RSA.
- Refined petroleum products, mostly used by the transport sector, are imported from RSA.

Energy Supply, and Usage

- **Nearly 30% of the population in the remote, rural areas has either very limited or no access to electricity, petroleum products, and coal because of the lack of distribution infrastructure.**
- **In most cases these energy sources are also beyond the financial means of the poor populations (in the remote and rural areas).**
- **Wood fuel is the only source of energy for such population for cooking and heating.**

Environmental Consequences of Energy Use in Botswana

- **Coal, wood, and petroleum being the dominant primary energy sources in Botswana, have associated adverse environmental effects in terms of GHG emissions, and deforestation.**
- **While wood is a major contributor of CO and CH₄, petroleum products and coal contribute CO₂, CO, oxides of nitrogen.**
- **Petroleum, coal and wood are also responsible for the non-GHG emissions like SO_x, HC, and suspended particulate matter (SPM)**

Environmental ... (Contd.)

- **Large volumes of water used for coal-thermal power generation is a scarce commodity in Botswana. It also poses a potential threat to underground water contamination.**
- **There is land degradation from coal mining, and deforestation from wood fuel usage.**
- **Waste disposal, for example ash from the power plant, and used oils products from transport sector pose a environmental challenge.**

Energy Security in Botswana

- In recent years, demand of electricity amongst the SAPP (Southern African Power Pool) countries has been exceeding the installed generation capacity. This has posed a threat of energy security for Botswana which is the largest importer of electricity from RSA.
- While the problem is being addressed, it will take time to put the measures in place. In the mean time power deficit shall continue to grow.
- At the same time solar energy has a vast potential in Botswana which can ease the energy deficit. It is also the GREEN ENERGY.

Solar Potential in Botswana

- With mostly clear skies, and very little air pollution, Botswana is a sunny country across, and throughout the year .
- There are 280 to 330 sunny days, and 3100 hrs to 3500 hrs of sunshine per year.
- Daily average sunshine duration ranges from 9.9 hrs in summer to 8.2 hrs in winter.
- Two or more consecutive cloudy days are uncommon, and far between.
- Average total solar radiation on a horizontal surface is 21 MJ per m² per day.
- This makes solar an energy source of vast potential, and ideal for remote rural areas on the country.

Why Solar ??

- **To mitigate GHG emissions from the use of fossil and wood fuels which are the main primary energy sources in Botswana.**
- **To increase accessibility to clean energy to remote, inaccessible areas.**
- **To improve energy security.**
- **To increase energy sustainability and self sufficiency.**
- **To minimize the use of wood fuel in order to ease deforestation.**

Impediments to use of solar in Botswana

- Despite its vast potential, solar has remained a insignificant source of energy (< 1%) in Botswana. Most of it's use is limited to solar water heating. Some of the reasons are:
- High cost of devices, and lack of affordable financing schemes.
- Lack of awareness and campaign to promote solar as a green, free energy.
- Lack of in-country production of devices. Majority are import commodities with lack of maintenance and support infrastructure.
- Lack of trained manpower for maintenance of devices and systems in use.
- Lack of consumer education on the use of solar system.
- Device loss and failure due to vandalism, theft, ill-maintenance and inappropriate use. This also results in the lack of consumer confidence in solar system and devices.

What Now and How ???

- Introduction of appropriate training courses at every levels of energy personnel ranging from maintenance to decision making personnels.
- Awareness and public education campaigns to promote the use of solar energy.
- Promotion of research and development in solar energy materials, devices and systems. CSRSE at UB has been established with this objective.

Interactions at International forums such as this offer opportunities to facilitate collaborative approach to spearhead the challenges...

It is just the beginning !!!

**THANK YOU ALL
FOR YOUR
ATTENTION
AND ATTENDANCE**