



# **RENEWABLE ENERGY TECHNOLOGY FOR PRODUCTIVE USES THE SIERRA LEONE EXPERIENCE**

**MINISTRY OF ENERGY & WATER  
RESOURCES SIERRA LEONE**

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**ENERGY EXPERT**

**24 OCTOBER 2011**



# PRESENTATION

- 1. SIERRA LEONE ENERGY POLICY – RENEWABLE ENERGY, SEPTEMBER, 2009**
- 2. SIERRA LEONE MULTISTAKEHOLDERS GROUP ACCESS REPORT – 21-23 FEBRUARY, 2011**
- 3. TECHNOLOGIES APPLICATION IN SIERRA LEONE – BENEFITS AND CHALLENGIES**
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# SIERRA LEONE ENERGY POLICY

## SEPTEMBER, 2009 -

### RENEWABLE ENERGY



#### POLICY STATEMENTS – RENEWABLE ENERGY

- **GOSL will continue to promote the development of the hydropower resources in the country, including development of micro hydro schemes.**
- **GOSL will take measures to reduce the rate of deforestation and land degradation and minimize threats on climate change in the use of biomass resources.**
- **GOSL will formalize the marketing of firewood and charcoal.**
- **GOSL will establish administrative institutions to preside over all aspects of RETs.**
- **GOSL will support research and development work in renewable energy matters, as well as linkages with countries active in RET research and development.**
- **GOSL will encourage agro based industries to produce electricity from their wastes.**
- **GOSL will ensure that environmental considerations are included in all renewable energy planning and implementation and will enhance co-operation with other relevant stakeholders.**

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# SIERRA LEONE ENERGY POLICY - RENEWABLE ENERGY SEPTEMBER, 2009 (CTD.)



- **GOSL will institutionalize and internationalize the supervision of RETs by setting up Mechanisms to exploit Climate Initiatives such as the Clean Development Mechanism (CDM) with other stakeholders to assess and package renewable energy projects geared towards sustainable development of the renewable energy sources.**
- **GOSL will seek national and international cooperation with relevant stakeholders to support the development and management of RETs in the country.**
- **GOSL will support training in RETs in tertiary and other learning institutions.**
- **GOSL will provide incentives for the importation and application of renewable equipment/devices.**
- **GOSL will encourage the development of RETs in remote and underdeveloped areas of the country.**
- **GOSL will remove barriers hampering the effective development, implementation and dissemination of RETs, including reduction of taxes and levies on RETs .**

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# SIERRA LEONE MULTISTAKEHOLDER GROUP ACCESS REPORT 21-23 Feb. 2011

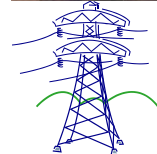


REPORT

  
GOVERNMENT OF SIERRA LEONE  
MINISTRY OF ENERGY AND WATER RESOURCES



NATIONAL MULTISTAKEHOLDERS' GROUP  
ON ENERGY ACCESS



INAUGURAL  
MEETING

FREETOWN,  
21 – 23 February 2011

Sierra Leone Ministry of Energy & Water Resources



# RENEWABLE ENERGY TECHNOLOGIES FOR PRODUCTIVE USES



- **TECHNOLOGIES** - SOLAR (PV & THERMAL), BIOMASS, SMALL HYDRO, BIO-FUELS
- **APPLICATIONS** - FOOD PRODUCTION, PROCESSING & STORAGE, EDUCATION, HEALTH CARE, DRINKING WATER, COMMUNITIES/SOCIAL SERVICES, COTTAGE INDUSTRIES
- **BENEFITS** – SOCIAL SERVICES, STREET LIGHT, COMPUTER, INTERNET, INCOME GENERATING ACTIVITIES
- **CHALLENGES** - FUNDING, CAPACITY BUILDING, AWARENESS, CO-ORDINATION, TECHNOLOGY, INSTITUTIONS, POLITICAL

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# CURRENT SITUATION



- **The Universities of Sierra Leone (USL)–  
Research/Experiments on Bio-digester, Cow dung, kitchen wastes, Pico/Micro Hydro (10watt), Solar Cooker, Crop dryers, Water Heaters, Biogas**
- **Freetown Technical Institute(FTI) – Local Manufacturer of Solar Dryers for Crop Drying and Solar Water Heaters.**
- **Barefoot Solar Training College - Solar PV Installation & Maintenance. Programme targets illiterate women living in rural communities. Each premise is installed with 50W panel, 5 of 7-10W d.c. Bulbs and 10A charger controller. Each household pays Le7,000 equiv. US\$1.5 monthly. College is Located at Newton.**

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# CURRENT SITUATION



- **Growth Centre for Productive Use. Coordinated by the Ministry of Trade & Industry. Local Community responsible for monitoring and supervising the pilot scheme. Each community is installed with 3KW solar PV, powering a deep freezer, 10 CFLs, 2 computer, 1 laptop, 2 fans, 1 32" TV and 1 DSTV Receiver. The solar PV have been installed at Five (5) Group Centres Communities namely: Newton (West), Binkolo (North), Bo (South), Pujehun (South), Koidu (East), Kpandebu (East). Plan is underway to increase solar PV rating to 20KW to power heavy machinery (i.e. welding machines, graters, grinders, carpentry equipment).**
- **Installed Solar Borehole Water Pumps at Makeni, Kabala, and Bo Government Hospitals (800watt in each town with a 2000L water tank).**
- **Installed Solar PV at Kabala Hospital to serve the blood bank, theatre, and freezers to cool drugs. The programme will be replicated at other Hospitals and Health Centres across the country.**





# CURRENT SITUATION



- **Planned Installation of Solar Street Lights**

**Twelve (12) Rural District Headquarter Towns, Freetown (Capital City) and Lungi Township are to benefit.**

- **Planned Installation of Micro Hydro Plants at :**

**Moyamba – 10MW**

**Port Loko - 4MW**

**Orugu Bridge – 2MW**

**Charlotte - 3MW**

**Makalie - 120KW**

**Yebe - 500KW**

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# CURRENT SITUATION



- **Planned Solar PV Electrification of Communal facilities (Clinics, Hospitals, Schools, Community Centres and Space Lighting ) in all Chiefdom Capitals.**
- **Over 70% of the install capacity of Electricity is Renewable Energy (Bumbuna & Dodo Hydro Power)**

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# CURRENT SITUATION



- **Solar Radiation (1,400 – 1,800) KWH/Sq m per Year, virtually untapped**
- **Need for Solar Electric Systems is great due to the Solar Radiation and very low access of Electricity in the Country**
- **Pilot Solar Lighting is still being demonstrated in villages over the Country (Konta Line, Tombo, etc.)**
- **A few private firms provide Solar Home Systems**
- **A few institutions are using SPV for Water Pumping**
- **A number of sample Solar PV street-Lighting units are installed all over the Country**
- **Total Solar Generating Electricity has increased to about 55kW**
- **An FAO Study on the potential of bio-fuel including small scale production and use at the local level is currently underway.**



# PROPOSALS PRESENTED TO MEWR



- **120MW CONCENTRATED SOLAR THERMAL ELECTRICAL GENERATING CAPACITY**
- **25MW/50MW/100MW SOLAR PV GENERATING PLANTS**
- **SERIES OF 4MW PLANTS FOR FREETOWN & DISTRICT CAPITALS**
- **2MW SOLAR PV PLANT IN FREETOWN**
- **SOLAR PV MICRONETWORK FOR 100/300 INHABITANTS**
- **SYSTEMS FOR PV PUMPS FOR HAND-DUG WELLS**
- **MUNICIPAL WASTE TO ENERGY (BIOGAS)**
- **AGRICULTURAL WASTE TO ENERGY (BIOMASS)**

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# OBSERVATIONS



- **Growth of solar PV electricity installations is much faster than predicted by most**
- **Increasing markets ensure that PV electricity prices are continuously declining.**
- **Photovoltaics is one of the most important building blocks for decentralised rural electrification.**
- **PV electricity is an important building block to realise a decarbonised Energy Supply**
- **GOSL is showing great commitment in the pursuit of Energy for Productive Use**
- **Considerable Financial support both Local and Foreign towards Solar Energy installed facilities so far**
- **Concern about the Sustainability of some Renewable Energy Programmes**

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# CONCLUSIONS



- **PROSPECTS FOR THE PRODUCTIVE USE OF RENEWABLE ENERGY IN SIERRA LEONE IS GOOD**
- **FOR SMALL-SCALE WATER PUMPING, SPV SHOULD BE THE TECHNOLOGY OF CHOICE**
- **SOLAR LIGHTING AND REFRIGERATION WILL PROVIDE MUCH NEEDED ALTERNATIVE SUPPLY**
- **STAND-ALONE AND DECENTRALIZED SYSTEMS HOLD GREAT PROMISE TO PROVIDE POWER IN REMOTE AREAS**
- **GRID-CONNECTED SOLAR POWER GENERATING PLANTS, WHILE HOLDING GREAT PROSPECTS FOR POWER GENERATION IN THE FUTURE ARE NOT YET READY FOR APPLICATION IN SIERRA LEONE, IN THE LIGHT OF POSSIBILITIES FOR GENERATION BY HYDROPOWER, ALTHOUGH THIS COULD CHANGE IN THE NEAR FUTURE IF COSTS OF SOLAR GENERATION CONTINUE TO DECREASE**



# THE END



## THANKS FOR LISTENING



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