

# **AFRICAN RENEWABLE ENERGY DIALOGUE**

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***THEME:* RENEWABLE ENERGY FOR SUSTAINABLE  
DEVELOPMENT IN AFRICA**

**PROPOSALS FOR A RENEWABLE ENERGY-  
DRIVEN SOCIETY IN SIERRA LEONE:**

**BY**

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***The wits Club, University of Witwatersrand,  
Johannesburg, Republic of South Africa***

# **PRESENTATION OUTLINE**

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**1.0 INTRODUCTION AND BACKGROUND**

**2.0 BENEFITS OF RENEWABLE ENERGY**

**3.0 THE ENERGY SECTOR IN SIERRA LEONE**

**4.0 THE WAY FORWARD**

# 1.0 INTRODUCTION AND BACKGROUND (1)

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- Sierra Leone is a small country along the west coast of Africa with an estimated population of 6 million inhabitants.
- Following the hike in oil prices in the 1980s, the local costs of petroleum products became prohibitive and in some cases scarce. This led to acute power outages, which disrupted production and distribution activities, leading to job losses and rising poverty.
  - n The situation exacerbated in the 1990s with the onset of a civil conflict which destroyed the physical and economic infrastructures, displaced 2.5 million people, with 50, 000 losing their lives.

# 1.0 INTRODUCTION AND BACKGROUND (2)

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- Continued inability of government to provide sustainable energy for commercial and domestic uses, led businesses and individuals resorted to the use of private generators with concomitants higher costs in the form of fuel and spare parts and in some instances fire outbreaks, leading to loss of life and property.
- with the election of President Ernest Bai Koroma in late 2007, tremendous efforts were expended toward increasing energy output especially in the capital city in the first year of his administration.
- In November 2009, the first phase of the Bumbuna hydro electric project was completed, thereby augmenting power generation by 50 megawatts. (Capacity in the dry season is 18 MW.)

# 1.0 INTRODUCTION AND BACKGROUND (3)

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- n These efforts have been followed by installation of thermal power plants as well as solar generated electricity in the district headquarter towns, health centres, hospitals and schools.
- n These efforts have spurred up economic activities across the country, not sparing better health and education outcomes, among others.

## 2.0 BENEFITS OF RENEWABLE ENERGY (1)

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- Renewable energy in the form of wind, solar, hydroelectric, biomass and geothermal generates substantial benefits for our climate, health, and the global economy.
  1. Renewable energy produces little or no global warming emissions as opposed to other forms of energy production namely, thermal electricity, natural gas-fired power plants, etc.

## 2.0 BENEFITS OF RENEWABLE ENERGY (2)

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2. Wind, solar, and hydroelectric systems generate electricity with no associated air pollution emissions. Their use is usually associated with improved public health and environmental quality.
    - n wind and solar energy require essentially no water to operate and thus do not pollute water resources or strain supply by competing with agriculture, drinking water systems, or other important water needs.
    - n Replacing fossil fuels with renewable energy has been found to reduce premature mortality and lost workdays, and it reduces overall healthcare costs because of the reduction in air and water pollution.
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## 2.0 BENEFITS OF RENEWABLE ENERGY (3)

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3. Renewable energy sources can provide a vast and inexhaustible supply of energy.
  - n In Sierra Leone, for example, there is plenty of sunshine, abundant rainfall; strong winds in some parts of the country; heat from the earth; and many lakes and rivers can each provide a vast and constantly replenished energy resource supply.



## 2.0 BENEFITS OF RENEWABLE ENERGY (4)

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4. Renewable energy has the capacity to generate more employment and other economic benefits.
  - n Given that the renewable energy industry is more labor-intensive compared to fossil fuel technologies, more jobs are created for each unit of electricity generated from renewable sources than from fossil fuels.
  - n Aside from jobs created directly in the renewable energy industry, growth in renewable energy industry creates positive economic “ripple” effects. (e.g. Owners of the land on which wind or solar projects are built will receive lease or royalties payments. )

## 2.0 BENEFITS OF RENEWABLE ENERGY (5)

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- Renewable energy has the potential of providing affordable electricity across the continent and can facilitate energy price stabilisation in the future. (The costs of renewable energy technologies have declined steadily, and are projected to drop even more.).
- With these benefits and available resources in Sierra Leone, the government and people of Sierra Leone decided to invest in renewable energy.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (1)

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- In late 2007, nationwide electricity generation in Sierra Leone had significantly reduced to 7 MW.
- At present National Power Authority (NPA) output stands at 75 MW.
  - n Mining companies and other private companies are producing more than 200 MW.
- It is estimated that with the current population, the minimum residential power requirement for the country is 1,000 MW; and this is expected to increase to at least 2,000 MW by 2018.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (2)

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- Sierra Leone's energy sector policy goal is to ensure energy security for sustainable development by providing an enabling environment for the effective and efficient management of the country's indigenous energy resources.
- The second phase of the Bumbuna hydro-electric project is expected to generate an additional 40MW of electricity.
- Independent power producers (IPPs) are producing energy for their industrial and home use without selling to the national grid operated by NPA.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (3)

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- A more sustainable way of generating electricity to complement existing electricity generation technologies is an urgent necessity if the gains of economic and political reforms are to be sustained and accelerated.
- In its recent energy policy, the Government of Sierra Leone is actively considering renewable energy sources, especially solar and hydro-electric to make good the energy deficit and protect the environment.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (4)

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- Public actions in this direction have included, but not limited to,
  - n Construction of a 2MW mini-hydro dam for Port Loko in the North of the country; Moyamba (South) with a potential of 7 MW, and Makalie (North) and Charlotte (West) with 1 MW and 3 MW, respectively;
  - n Provision of solar street lights;
  - n Replacing/strengthening electricity distribution networks;
  - n Purchase and installation of additional thermal plants; and
  - n Promotion of biomass energy generation.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (5)

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- The use of solar technology in private energy generation has kicked off in Sierra Leone with some commercial houses and NGOs supplementing the national grid with solar electricity as well as many individuals in the high- and low-income brackets.
- Small-scale business enterprises have also cashed-in on electricity provided by solar panels to provide services to private individuals in areas of the country with irregular or non-existent power supply.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (6)

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- Government has established a training institute called the Barefoot College with support from the Government of India to train both literate and illiterate solar technicians.
- “Barefoot Engineers” are providing solar energy for low-income households in rural communities at a cost of US\$2.0 per month for lighting their homes.
- Private companies are also involved in production and supply of renewable energy solutions to the public.



## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (7)

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- In the Finance Act 2011, the government removed all taxes on solar-related products.
  - n Huge initial outlay involved in acquiring solar components remains a big challenge to access solar energy technologies.
- There is a dearth of both dealers of solar products and availability of qualified solar technicians to install and manage the technology.

## 3.0 THE ENERGY SECTOR IN SIERRA LEONE (8)

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- The NPA (Amendment) Act 2006, which removed the monopoly of the NPA over the generation, transmission and supply of electricity, makes way for the participation of independent power producers (IPPs) in the power/energy sector.

## 4.0 THE WAY FORWARD (1)

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- There is a future for renewable energy supply in Africa, and Sierra Leone is no exception.
- Given the country's hilly landscape, abundant rainfall for at least 5 months in a year and the rest being sunshine, conscious efforts by government, development partners and key stakeholders will significantly help tap into these natural opportunities for sustainable and affordable electricity.
  - n This will eventually consolidate economic growth and reduce poverty.

## 4.0 THE WAY FORWARD (2)

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- The following actions by the government are required for the realisation of these desirable outcomes:
  1. Continue to collaborate with development partners to provide renewable energy solutions to public places/ streets and public offices and utilities, namely educational institutions, health centres, agri-business centres, government offices, and hospitals, etc.
  2. Promote use of renewable energy, especially solar through the permanent removal of taxes/tariffs as well as non-tariff barriers to the importation and use of solar products.

## 4.0 THE WAY FORWARD (3)

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3. Encourage commercial houses and industrial establishments to embark on 'green paths' in the form of windmills, mini-hydros, solar, and biomass to sustainable development.
4. Promulgate laws that provide streamlined and targeted incentives in the form of income tax exemptions and subsidies for businesses and individuals engaged in renewable energy production, distribution and use.
5. Conduct massive public education campaigns on the use and potential benefits of generating electricity through renewable energy sources on our lifestyle and the environment.

## 4.0 THE WAY FORWARD (4)

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6. The Public-Private Partnership Act 2010 in conjunction with the NPA (Amendment) Act 2006 would minimise funding constraints in the energy sector. However, the holistic implementation of the provisions of these Acts with the establishment of a level playing field for all IPPs and public-private partnerships (PPPs) will contribute significantly to the augmentation of the energy output nationally.
7. The use of renewable energy for cooking, especially solar cooking stoves is a must for Sierra Leone and Africa if we are going to protect and preserve our forests and the environment from the harmful effects of global warming and climate change.

# HUGE SUNLIGHT POTENTIAL FOR ELECTRICITY GENERATION IN SIERRA LEONE



# ABUNDANT WATER SUPPLY FOR HYDRO ELECTRICITY GENERATION IN SIERRA LEONE





# A GAUGE MEASURING WIND SPEED LOCATED AT THE UNIVERSITY OF SIERRA LEONE



# A HEALTH CENTRE IN SIERRA LEONE PARTLY POWERED BY SOLAR ENERGY



# LABORATORY EQUIPMENT SUPPORTED BY SOLAR ENERGY



# A TYPICAL SOLAR STREET LIGHT INSTALLED IN MANY PARTS OF THE COUNTRY



# A SOLAR STREET LIGHT INSTALLED IN MASINGBI, IN THE NORTHERN PROVINCE OF SIERRA LEONE

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# INSTALLATION OF SOLAR LIGHTS PROVIDING EMPLOYMENT IN A VILLAGE IN SIERRA LEONE



# INSTALLATION OF SOLAR PRODUCTS PROVIDING EMPLOYMENT AND ENERGY IN SIERRA LEONE



# INSTALLATION OF SOLAR EQUIPMENT IN SIERRA LEONE





# DEMONSTRATING THE INSTALLATION OF SOLAR PANELS IN RURAL SIERRA LEONE



# PART OF THE CAMPUS OF THE BAREFOOT WOMEN SOLAR TRAINING CENTRE IN SIERRA LEONE



# BAREFOOT WOMEN SOLAR TRAINING CENTRE IN SIERRA LEONE



# BAREFOOT WOMEN SOLAR TRAINING CENTRE ADMINISTRATIVE BUILDING



# SOLAR ELECTRICITY IN A RURAL MINING COMMUNITY



# SOLAR LIGHT IN A VILLAGE SHOP



# A PARTLY SOLAR-POWERED RESIDENCE IN THE MOUNTAIN RURAL DISTRICT OF THE WESTERN AREA OF S/LEONE



# A PARTLY SOLAR-POWERED RESIDENCE IN THE MOUNTAIN RURAL DISTRICT OF THE WESTERN AREA OF S/LEONE





# THE END

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- THANK YOU FOR YOUR KIND ATTENTION!
- COMMENTS AND QUESTIONS!