Renewable Energy in West Africa

Pradeep Monga, Ph.D
Director, Energy and Climate Change Branch
UNIDO
Outline

• Energy Situation in West Africa

• West Africa GEF Energy Programme

• ECOWAS Regional Centre for Renewable Energy and Energy Efficiency

• Renewable Energy - The Way Forward
Energy Situation in Africa

• About 14% of the global population, yet uses less than 4% of globally electricity

• 1 of 4 people in Africa has access to electricity

• Africa contributes to 12.5% of global oil production but consumes only 3.5%

• Only 7% of hydroelectricity and 1% of geothermal potential so far being used

• Over-dependence on traditional biomass resources (583 million people in SSA)

• Substantial investments needed – in RE sector alone, $ 10 billion are required per annum to make a difference (AU / UNIDO meeting at Dakar 2008)
Energy Use in Africa

Electricity Generation in Africa by Sub-Regions

- Northern Africa: 35%
- Southern Africa: 48%
- Western Africa: 9%
- East Africa: 4%
- Central Africa: 4%

Source: IEA, 2007

Energy Mix by African Sub-Regions

- Northern Africa: Natural Gas, Electricity, Petroleum
- Southern Africa: Natural Gas, Coal, Electricity
- SSA except SA: Biomass, Coal, Coal based Electricity, Electricity
Lack of Energy and its implications for the HDI
(Linkage between Energy Poverty and Human Poverty)

Electricity Consumption per Capita (kWh)
(log scale)

Human Development Index (HDI)


Poverty Reduction through Productive Activities • Trade Capacity Building • Energy and Environment
West Africa: Socio-Economic Context

• Total population: 262 million - projected to reach 320 million by 2015 – 2.65% growth rate.

• Region has 40% of population in SSA that lives on less than 1US $ per day (13 countries are LDCs)

• Agriculture is the main economic activity in the region

• Rapid migration from rural to urban areas - population in urban areas expected to change from 43% to 50% in 10 years

• Recent studies revealed that most countries in the region will not meet the MDGs by 2015
Renewable Energy Potential in West Africa (ECOWAS Region)

**Key Facts about Renewable Energy in the ECOWAS region:**

- **Hydropower Potential** app. **25,800 MW**

- **Solar radiation** > **5kWh/m²/day** (in comparison to 2 – 3 kWh/m²/day in Germany were an overall capacity of 3800 MW is installed)

- Many locations with wind speeds of **more than 6m/s** which is the threshold for economic wind energy production

- **Enormous biomass potential**
Existing Production (circled)

Note: high regional hydro (blue)
Bio-energy Opportunities for West Africa

Africa has huge potential for sustainable bio-energy, estimates 410 Exajoules but:

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<tr>
<th>General Challenges</th>
<th>West Africa - Specific Challenges</th>
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<td>How to make bioenergy production and use cost-effective as well as environmentally sustainable?</td>
<td>Range of technological options (big-medium-small scale)</td>
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<td>How to balance biofuels production with food needs?</td>
<td>Infrastructure, logistics and markets</td>
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<td>How to scale up and promote bio-energy markets to a next phase which could overcome the above challenges?</td>
<td>Market demand and Trade (at local-regional level)</td>
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<td>How to benefit rural population and local SMEs from biofuels?</td>
<td>Balancing food production versus bio-fuel production (land use changes)</td>
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Poverty Reduction through Productive Activities  •  Trade Capacity Building  •  Energy and Environment
Energy in West Africa: Key Challenges

- Significant but unevenly distributed energy resources
- Very low access and energy consumption rates
- Heavy dependence on fossil fuels for commercial energy
- Energy efficiency not prioritized
- Renewable Energy potential huge but largely untapped
- Weak policy, institutional and capacity linkages
- Energy markets small and under-developed
West Africa GEF Energy Programme
West Africa GEF Energy Programme

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TOTAL SIZE: $ 150 MILLION
GEF GRANT: $ 46 MILLION
West Africa GEF Energy Programme
Taking a programmatic approach to promote renewable energy and energy efficiency projects in countries of the region

KEY OBJECTIVES

• Scaling up access based on renewable energy and promoting energy efficiency measures in industrial, households and public sectors

• Creating markets to catalyze private sector investments and public-private partnerships
Strategic Focus of the WA GEF Energy Programme

• Promoting renewable energy based decentralized mini-grids for enhancing access and supporting productive capacities

• Promoting sustainable energy production from bioenergy (i.e. main focus on Jatropha)

• Promoting energy efficiency in the residential and commercial buildings, and industrial sectors

• Promoting sustainable innovative systems for urban transport
Initial Project Concepts Received from Countries in West Africa (overall 57 Projects)

- Energy Efficiency: 12
- Other Areas (including Agricultural Sector): 15
- Sustainable Bioenergy: 6
- Minigrids Using different RES: 13
- Solar Energy: 7
- Small Hydropower: 4

Renewable Energy
Budget Allocated to 27 Final Projects on Renewable Energy and Energy Efficiency

- Energy Efficiency: 12 Mio US$
- Renewables: 33.3 Mio US$
  - Solar Energy: 4 Mio US$
  - Small Hydro Power: 7 Mio US$
  - Different RES (including Bioenergy): 22.3 Mio US$
Process and Milestones

• **Consultative meetings** at country and regional levels (May- June 2008)

• **Joint meetings of GEF Focal Points** from West and East Africa (June 2008)

• **Ministerial Declaration** on the Programmatic Approach at Cotonou, Benin (August 2008)

• **GEF Approval** of the West Africa Energy Programme (November 2008)

• **Submission and approval of PIFs and PPGs** (June 2009)

• **Implementation** of the GEF Energy Programme – about $ 150 million (2010 – 2014)
ECOWAS Regional Centre (ERC) for Renewable Energy and Energy Efficiency
ECOWAS Initiative on Access to Energy Services: Ambitious Goals

OBJECTIVES:

To provide, by 2015, access to modern energy services to at least half the population living in rural and sub-urban areas:

• 100% of the total population with access to improved cooking fuel;

• At least 60% of people living in rural areas reside in localities with access to motive power to boost economic activities and access to modern community services; and

• 66% of the population to have access to electricity supply

Expected Changes between 2005 and 2015

- Improved cooking fuels
- Electrification Periurban & Urban
- Decentralized Electrification
ECOWAS Regional Centre (ERC): Background and Genesis

- ECOWAS/UEMOA White paper for regional policy for increasing access to energy from MDGs, adopted in 2003-2006.

- ECOWAS Conference on Peace and Security, held in Burkina Faso in 2007: the Austrian Minister for European Affairs and International Affairs pledged support for setting up of proposed Center on RE and EE

- ECOWAS approached UNIDO to assist in designing the proposed Center on RE and EE in 2008
Overall Goals

- Contribute to the achievement of the MDGs in West Africa by providing at least half of the population with access to modern energy services using renewable energy and energy efficient technologies.

- Provide a platform to lead and coordinate the implementation of the priorities listed in the ECOWAS/UEMOA Regional White Paper on Energy Access.
Key Objectives of the ECOWAS Regional Centre

- **Funds Mobilization for Scaling up**
  Raise funds for the regional plan of action and assist Member States in mobilizing funding for RE&EE programmes at national, regional and international levels

- **Policy and Capacity Development**
  Build the capacities of public and private actors for developing harmonized policy and institutional frameworks

- **Knowledge Management and Outreach**
  Document and share knowledge on good (and poor) practices, promote RD&D and dissemination, reinforce regional integration by promoting cross-border cooperation within the region and beyond

- **Demonstration of RE & EE Technologies**
  - Facilitate the design, development and deployment of RE&EE technologies and build business models for operation and maintenance of such facilities
  - Facilitate the establishment of National Systems of Innovation and a Regional System of Innovation to foster technology incubation and commercialization
Milestones Achieved

• Consultative meetings at various levels held

• Ministerial Declaration on the establishment of the ERC

• First draft presented to both parties i.e. ECOWAS and the Austrian Government

• Final Document and Business Plan under Finalization

• MoU for the ERC to be signed during the International Energy Conference, 22-24 June 2009 (ADA to provide 1.8 million Euro for the first phase of ERC)
Lessons Learned

- Decentralized mini-grids based on renewable sources of energy could greatly augment rural electrification in countries of West Africa

- Linking energy services with productive uses holds the key for sustainability of rural energy initiatives in countries of West Africa

- Energy efficiency needs to be prioritized in building, industrial and transport sectors in West Africa

- Development cooperation can play a strategic role in capacity building and designing regulatory and policy frameworks for promoting renewable technologies and markets in West Africa
Renewable Energy in West Africa: The Way Forward

KEY AREAS FOR ACTION:

- Strengthening **Policy and Institutional Framework** for Integration of RE Markets at regional level
- Demonstrating **Renewable Energy Technologies** for decentralized mini-grids for Productive Uses and **Energy Efficiency** in Buildings, Transport and Industries
- Building **Database, Capacity, Research and Development and Networking**
- Promoting **Knowledge Management, Coordination and Cooperation**
- Mobilizing **Resources** through private investments, EU, GEF, CDM, Carbon Markets
- Promoting **Partnerships** with UNF, IRENA, GEF and REEEP etc.
Thank you for your attention.

p.monga@unido.org