



***REGIONAL WORKSHOP ON ECOWAS SOLAR
ENERGY INITIATIVE:
DAKAR, SENEGAL 18 – 21 OCTOBER 2010***

**Session VIII: Investments and Financing
Mechanisms**

**Solar Energy Market opportunities in
West Africa**

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Presentation outline

1. Background

- ❖ Socio-economic situation: population, economic activities, poverty levels
- ❖ Energy situation: supply and demand, fossil fuels situation, volatility of supplies and prices, renewable energy potentials, solar energy potentials, barriers

2. Renewable Energy potentials in West Africa

3. Supply and Demand Situation

4. Investment/Market Opportunities



ECOWAS: Background

- 15 countries with a land Area of 5 Million m²
- Climate from Semi-Arid to Humid Tropical
- Population >> 270 million people,
- 60% of population lives in rural areas
- Most of the countries in the region are currently categorized as LDCs and also Highly Indebted Poor Countries (along with very low HDI)



Energy Challenges ECOWAS

- Interrelated challenges:
 - energy poverty
 - energy security and
 - climate change mitigation and adaptation



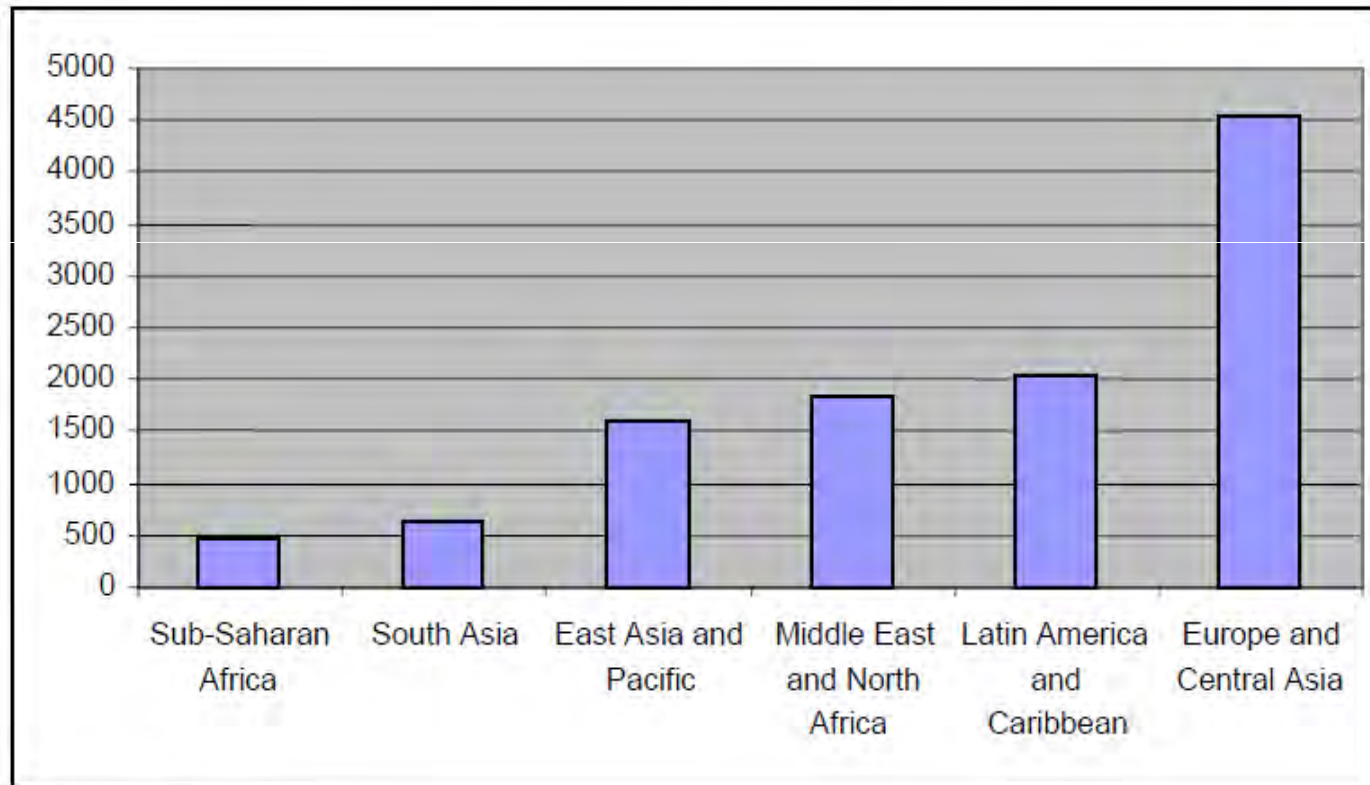
Energy situation in West Africa

- **Low energy consumption and service access**
 - One of the lowest energy consumption rates of the world - 88 kWh/capita ;
 - The poor spend more of their income for low quality energy services compared to the better-off ;
 - Rural areas mainly rely on traditional biomass to meet their energy requirements;
 - Household access to electricity services is only around 20% (40% in urban and 6-8% in rural areas);
 - Electricity networks mainly serve urban and peri-urban areas;
 - Energy poverty has severe impacts on the social, economic and environmental development;



Energy Consumption: By Region

Figure 3: Annual Electricity Consumption per Capita (kWh/Capita) by Regions of the World (2004)



Source: UNDP, 2007



Energy situation in West Africa

- **Energy security concerns**

- High energy vulnerability of the region through fossil fuel price volatility (60 % of electricity generation from oil)
- Gap between rising urban energy demand, available generation capacities and limited investment capital;
- Lack of regional energy trade (region has considerable but unevenly distributed resources: e.g. gas, oil, hydro);
- High losses in the energy systems (e.g. high energy intensity and low demand and supply side efficiency);
- Energy crisis hampers social, economic and industrial development (e.g. cost of blackouts and load shedding)

- **Climate change concerns**

- Increasing energy related GHG emissions (new investments determine GHGs for the next 20 -30 years)
- Climate change impacts vulnerable West African energy systems (e.g. water flows, extreme weather events)



ECOWAS Energy Potential

- The Region has enormous energy potential
 - 30% of Africa's proven recoverable crude oil reserves (3,017 Million tonnes)
 - 31% of African natural gas reserves proved recoverable (3,581 Million m³)
- However, Energy Resources are unevenly distributed
 - 98% hydrocarbon potential in Nigeria
 - hydro-potential concentrated in five countries

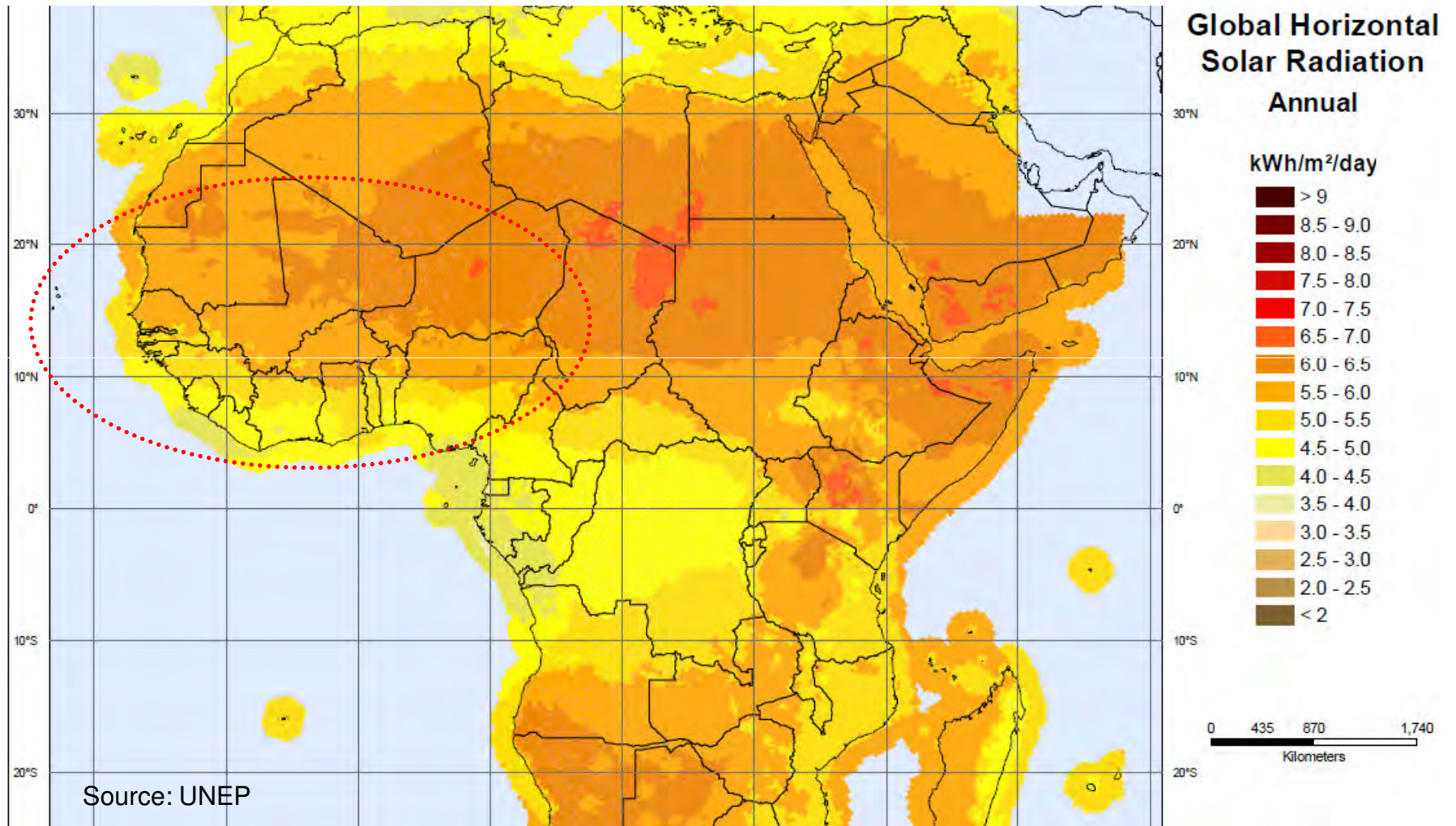


ECOWAS Energy Potential (Contd.)

- **Renewable Energy Potential**
 - 23,900 MW of hydropower potential, only 16% exploited
 - **Average Solar Radiation of 5 - 6 kWh/m² /day (Temperate 3 kwh/m² /day)**
 - Wind speeds of 5-6 m/s recorded in some locations
 - Biomass potential ? (Sustainable utilization)
 - tidal, ocean thermal and wave energy resources some countries



ECOWAS Solar Energy potential

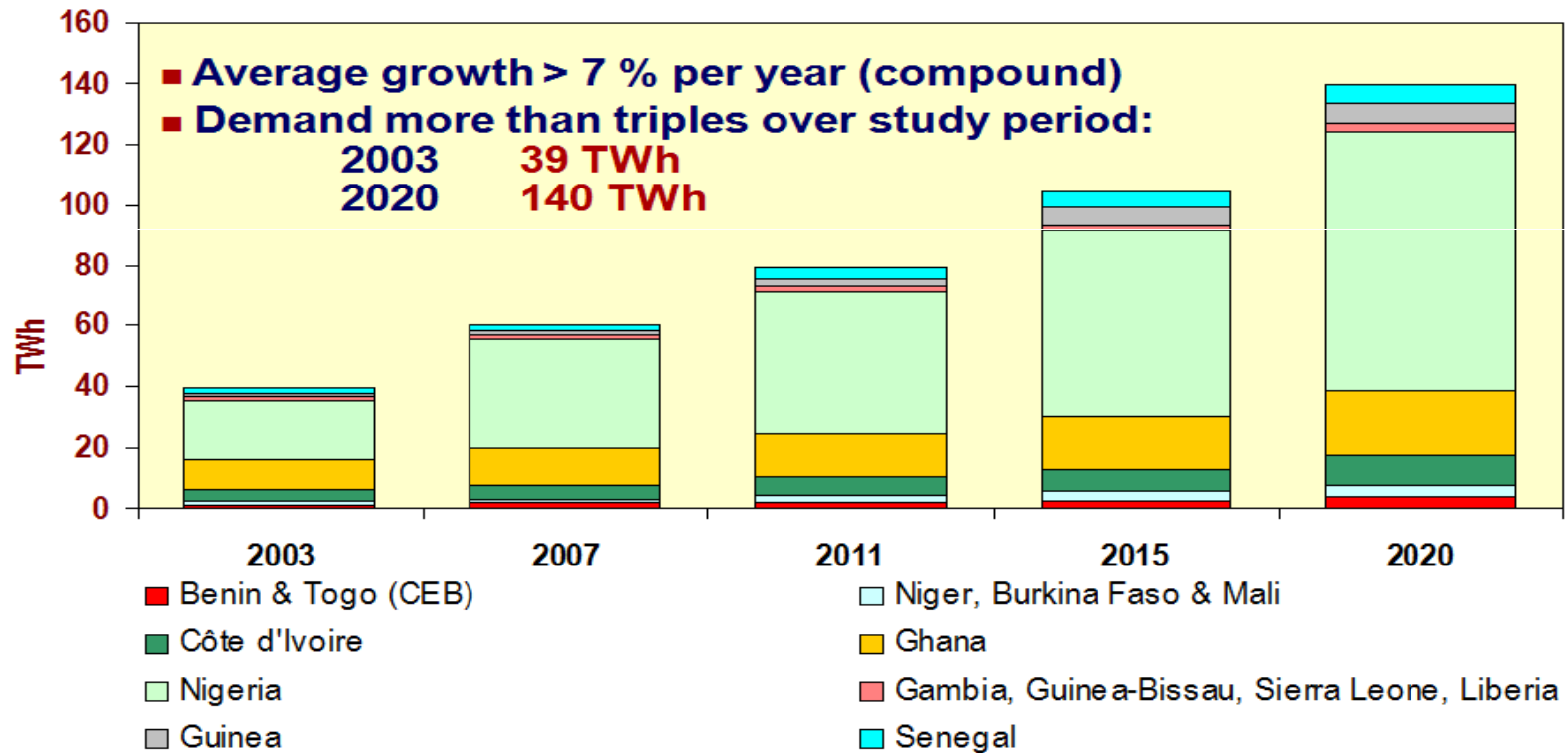




ELECTRICITY DEMAND

Electricity Demand

ELECTRICITY DEMAND GROWTH IN WEST AFRICA





Rising oil prices





DEMAND: Intervention Areas

- Meeting the MDG targets – The Energy Matrix
- Residential: Lighting, heating, cooking, water pumping,
- Commercial/business: lighting, heating, cooling/refrigeration, water pumping, electricity generation, telecommunication
- Industrial applications: production using electricity (motors, pumps), refrigeration, distillation, processing, etc



INCREASING ENERGY DEMAND - Opportunities

PUT THE REGION AT WORK – REVIVES ECONOMIC ACTIVITIES PARTICULARLY IN THE RURAL AREAS

- Jobs especially in the rural areas– stem rural/urban drift
- Income generation – increase (rural) cash incomes
 - reduce poverty
- Stem flight of capital/enhance balance of payment
 - reduces individual and national poverty



DEMAND – Opportunities

(Contd.)

- Reduce import bills especially for energy imports
- Enhances the environment using clean energy
- Reduces the risks of diseases and health/fire hazards
- Enhance the condition for education for children, especially the girl child
 - more time for studies using efficient and safe lighting
- use of Solar for time saving devices – water pumping, dehauling machines), participate in e-learning using internet



DEMAND – Opportunities

(Contd.)

Increased food security

(with the availability of energy for water production especially after the rainy season)

- Most of the Sahel work force are lead to virtual redundancy because the only rainy season has ended,
- no or limited water for increased agricultural/horticultural production;
- water for livestock,



DEMAND – Opportunities (Contd.)

Increased food security (Contd.)

- Transportation of produce to markets enhanced
- food processing and preservation enhanced
- post harvest losses due to lack of processing/ preservation facilities – fish, cereals, fruits and vegetables



DEMAND – Opportunities

(Contd.)

– Enhance market conditions for farmer for access to information on

- markets, new and better products
- better production skills
- protection methods and treatments,
- etc



Investment Opportunities: Improving the standard of living

Homes, streets, schools, health facilities, markets





Investment Opportunities Technologies



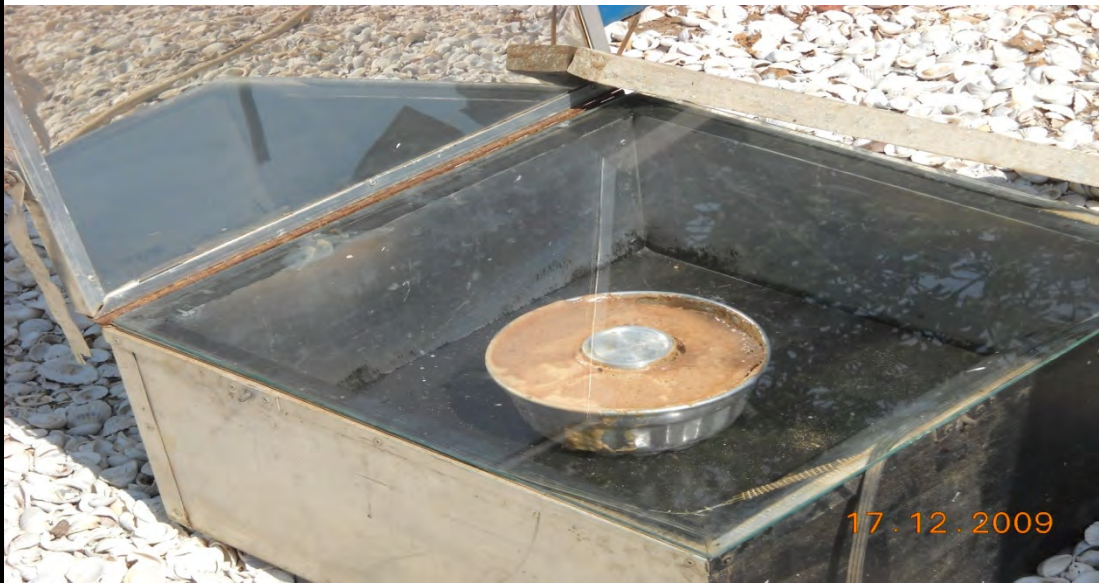
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Investment Opportunities Technologies





Water Pumping





Investment/Market Opportunities

- **Resources Availability:** No question about that – We have GOD-GIVEN infinite resource!!!
- **Technology:** The technologies are mature and market-based
- **Demand:** Already an energy crises in ECOWAS to meet the demand of about 270 million



Investment/Market Opportunities

- (Contd.)

- **Institutional Arrangements:** ECREEE takes the lead as a regional approach to develop the enabling environment for market penetration
- **Volatility in Oil Prices:** How much more oil do we have and for How long will it be available?
- **Climate Change:** Green energy saves our future – We should give back what we received



Investment/Market Opportunities

- (Contd.)

- **Investment for the future: DASH FOR COAL,**
Then DASH FOR GAS AND NOW

–DASH FOR SOLAR/RENEWABLES!!!

**WHAT THE REGION IS LOOKING FOR:
INVESTMENT IN SOLAR AND OTHER
RENEWABLES!!!**



Thank you! Merci! Muito obrigado!



*ECOWAS Regional Centre for
Renewable Energy and Energy Efficiency*

*Centre Régional pour les Energies Renouvelables
et l'Efficacité Energétique de la CEDEAO*

*Centro Regional para Energias Renováveis e
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