SREP-GHANA INVESTMENT PLAN

Seth Agbeve MAHU, Deputy Director, Renewable and SREP National Focal Point
Ministry of Power
May 2015
Outline of Presentation

1. Brief Country Context
2. Energy Sector Brief
3. The Renewable Energy Sector
4. Rational for Ghana SREP-IP & Investment Areas
5. Conclusion
Brief Country Context

- Total population = 25.8 million
- Population growth rate = 2.2%
- Nearly half of the population live in rural areas
- Urban population growing at a rate of 3.5%

- **Politically stable** and continues to consolidate democratic governance.

- Relatively **strong economy**; in 2013, GDP real growth rate reached to 7.9%, while the GDP per capita was USD 3,500.

- Service sector which is energy intensive accounts for 50% of GDP, agriculture 21% and industry 29% of GDP.

- Main export commodities (Gold, Bauxite, Cocoa, Crude Oil, etc)
1. Installed electric generation capacity is approx. 3,000 MW (hydropower ≈ 54%).

2. Development of modern RE has been much slower with only 8.2 MW installed so far.

3. Electricity demand in 2013 was 12,874GWh (1943MWp) and projected to reach 28,000GWh (5,500MWp) by 2026.

4. Recurrent droughts makes dependence on hydro unsustainable and moreover large hydro potential exhausted.

5. The shift to fossil fuel thermal generation likely to impact the environment & economy adversely.
Policy goals for the energy sector:

- Ten percent (10%) contribution of renewable energy in the electricity generation mix by 2020;
- Minimize environmental impacts of power supply through increase use of RE and EE&EC.
- Encourage private sector participation as IPP in the Generation subsector
- Explore new generation option to diversify the fuel mix
- Universal access to electricity by 2016;
- 5,000 MW of generation capacity by 2019;
1. Enormous RE resources (e.g. biomass, solar, wind, W2E, S/MHP, tidal wave energy, etc.).

2. RE contributes just about 0.3% to the country’s total installed capacity.

3. RE Act in place since 2011, (Act 832) for the sector.

4. Other policy instruments in place are:
   - A National Electricity Grid Code (2009) for renewable energy,
   - Renewable energy feed-in tariffs
   - Guidelines for renewable energy purchase obligation
   - Net-metering Code developed
   - Off-grid electrification and pricing policy being developed
Key RE Sector Challenges/Constraints

1. Regulatory, contractual and tariff gaps.
   - RE-FiT fixed for 10yrs (PPAs typically 20yr).
   - Perceive commercial risk & affect revenues projection

2. Despite attractive RE-FiT policy, RE sector still not attracting the desired level of investments
   - Weak financial standing of the main off taker (ECG),
   - Limited technological capacity to handle RE installations
   - Challenging financing climate; Inadequate, high cost and unsustainable financing regimes (commercial interest rates as high as 33%/yr)

3. Despite high electricity access (>70%), still a significant % of population with no access to electricity
   - Remote and difficult to reach island/lakeside communities
Program Overall Objective: Enable GoG meet its 10% RE target by 2020 as well as its universal electrification goal through the implementation of flagship renewable energy investments that would provide models for scale-up and leverage additional private and public financial resources to the country’s RE sector.

Rationale for SREP Funding

1. *Increase investor confidence.* Strong signal to investors, development and private sector partners to provide counterpart and/or investment funding. SREP resources essential to mitigate the financial risks and leverage funds necessary for RE investment at a scale not contemplated previously.

2. *Reduce sector challenges.* SREP resources are also necessary to ensure a coordinated approach in addressing the remaining regulatory, institutional and contractual challenges to permit the private sector to partner with the Government and/or other development partners in achieving the RE goals.

3. *Provide necessary technical support and builds capacity.* SREP will work with its partners to attract the necessary technical expertise to undergo and/or complete necessary RE assessments to fill the current information void.
SREP Ghana Program Design

SREP Ghana Program

Investment Projects co-financed by SREP

**PROJECT 1:** Renewable energy mini-grids and stand-alone solar PV systems
- Executed by: MoP and AfDB
- Funded by:
  - SREP: USD 17.5 million
  - AfDB: USD 27 million
  - DPs: USD 12 million
  - GOG: USD 8 million
  - Beneficiaries & private sector: USD 18.5 million

**PROJECT 2:** Solar PV based net-metering with storage
- Executed by: Energy Commission and AfDB
- Funded by:
  - SREP: USD 12.5 million
  - AfDB: USD 15 million
  - DPs: USD 12 million
  - GOG: USD 8 million
  - Beneficiaries & private sector: USD 45.5 million

**PROJECT 3:** Utility-scale solar PV/wind power generation
- Executed by: private sponsors and IFC/AfDB
- Funded by:
  - SREP: USD 10 million
  - IFC: USD 10 million
  - AfDB: USD 10 million
  - Beneficiaries & private sector: USD 20 million

**PROJECT 4:** Technical assistance to scale-up renewable energy
- Executed by: Energy Commission and AfDB
- Funded by:
  - SEFA: USD 1.5 million
  - DPs: USD 2.5 million
Project 1: RE mini-grids and stand-alone solar PV systems

Encourage sustainable public and private financing for scaling-up RE-mini-grids & stand-alone PV systems to achieve universal access, with a special focus on gender (female-headed households and SMEs).

**Expected results**

1. Estimated 55 renewable mini-grids
2. GoG in collaboration with private sector invested in 33,000 stand-alone solar PV systems for households,
3. About 1,350 schools, 500 health centres and 400 communities electrified.
SREP Investment Projects

Project 2: SPV based net metering with battery storage

**Objective:** Develop a comprehensive net metering program, deploy at least 15,000 units of roof-mounted solar PV systems to reduce the economic cost of power on SMEs and households and contribute 25-30MW RE to power mix.

**Expected results**

1. 15,000 grid connected solar PV systems equipped with storage capacity to meet desirable loads installed.
2. Credit recovery facility and financing instruments developed.
3. Decentralized and standard contract application process established
4. Impact of large distribution generation on distribution networks conducted.
5. Certification regime for service providers established and relevant capacities built.
Project 3: Utility-scale solar PV/wind power generation

**Objective:** Assist Government overcome key challenges that prevent the growth and expansion of the utility-scale solar PV and wind market in Ghana by catalyzing the first project-financed utility-scale renewable energy plants, demonstrating the Ghanaian RE sector potential to financiers and helping attract further investment in the future.

**Specific Targets**

1. This project is expected to leverage additional sources of co-financing from the private sector and from the AfDB private sector window.

2. IFC (the World Bank Group’s International Finance Corporation) will be the lead MDB for the implementation.
Project 4: Technical assistance to scale-up RE:

Objective:
1. Assist stakeholders overcome key technical, financial, regulatory and institutional challenges impeding the scaling-up of renewable energy investments in the country
2. Overcome barrier that constrain the successful implementation of the flagship renewable energy projects financed under this program.

Specific Targets
- Transaction support facility to reduce cost.
- Tariff methodology for ancillary services in RE
- Support creation of Renewable Energy Authority.
- Support creation of "one-stop shop" solution to fast track RE transactions, etc.
SREP Program Financing Plan

Funding Sources and Uses

1. Estimated cost of SREP-Ghana IP is USD 230 million
2. CIF/SREP contribution of USD 40 million.
3. The financing plan detailing sources and uses of funds is shown below:

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>SREP</th>
<th>GoG</th>
<th>AfDB*</th>
<th>IFC</th>
<th>DPs</th>
<th>PI&amp;B**</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE mini-grids and stand-alone solar PV systems</td>
<td>17.5</td>
<td>8.0</td>
<td>27.0</td>
<td>0.0</td>
<td>12.0</td>
<td>18.5</td>
<td>83.0</td>
</tr>
<tr>
<td>Solar PV based net metering with battery storage</td>
<td>12.5</td>
<td>8.0</td>
<td>15.0</td>
<td>0.0</td>
<td>12.0</td>
<td>45.5</td>
<td>93.0</td>
</tr>
<tr>
<td>Utility-scale solar PV/wind power generation</td>
<td>10.0</td>
<td>0.0</td>
<td>10.0</td>
<td>10.0</td>
<td>0.0</td>
<td>20.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Technical assistance to scale-up RE</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
<td>0.0</td>
<td>2.5</td>
<td>0.0</td>
<td>4.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40.0</td>
<td>16.0</td>
<td>53.5</td>
<td>10.0</td>
<td>26.5</td>
<td>84.0</td>
<td>230.0</td>
</tr>
</tbody>
</table>

* Including the AfDB private sector window and the SEFA Trust Fund
** Private investors & beneficiaries
## SREP Program Results Framework

<table>
<thead>
<tr>
<th>Result</th>
<th>Indicator</th>
<th>Baseline</th>
<th>Targets by 2020</th>
<th>Means of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SREP Transformative Impacts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>National measure of energy poverty</td>
<td>MEPI(^n) = 0.62 (2008, access rate of 56.1%)&lt;br&gt;Electricity used in 2014: 12000 GWh</td>
<td>MEPI(^n) = 0.1 (access rate of 90%)&lt;br&gt;Electricity used: 4.1 kWh per capita</td>
<td>Country-based reporting using household survey data</td>
</tr>
<tr>
<td>Support low-carbon development pathways by reducing energy poverty and/or increasing energy security</td>
<td><strong>Electricity output from renewables in GWh per year</strong></td>
<td>GWh per year.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>115.6 GWh per year</td>
<td>Utilities and MoP</td>
</tr>
<tr>
<td></td>
<td>Increased annual public and private investments ($) in targeted subsector(s) per country</td>
<td>n/a</td>
<td>USD 230 million</td>
<td>National M&amp;E</td>
</tr>
<tr>
<td><strong>SREP Program Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased supply of renewable energy</td>
<td>Increased annual electricity output (GWh) as a result of SREP interventions</td>
<td>Wind/Solar electricity output: 3.9 GWh&lt;br&gt;Off-grid: 18.0 GWh per year&lt;br&gt;Solar PV Net-Metering: 2.4 GWh per year</td>
<td>Wind/Solar electricity output: 39.36 GWh per year&lt;br&gt;Off-grid: 36.76 GWh per year&lt;br&gt;Solar PV Net-Metering: 39.42 GWh per year</td>
<td>SREP Projects’ M&amp;E systems</td>
</tr>
<tr>
<td>Increased access to modern energy services</td>
<td>Increased number of women, men, businesses and community services benefitting from improved access to electricity as a result of SREP interventions</td>
<td>0.05 (in million)</td>
<td>Wind/Solar electricity Project: ~ 0.0626 million&lt;br&gt;Off-grid Program: ~ 0.5 million&lt;br&gt;Solar PV Net-Metering Project: ~ 0.0949 million</td>
<td>SREP Projects’ M&amp;E systems</td>
</tr>
<tr>
<td>New and additional resources for renewable energy projects</td>
<td>Leverage factor: USD financing from other sources compared to SREP funding</td>
<td>USD 40 million</td>
<td>Additional financing leveraged from the SREP initial resources: USD 190 million</td>
<td>SREP Projects’ M&amp;E systems</td>
</tr>
<tr>
<td>Avoided GHG emissions</td>
<td>Avoided GHG emissions (tons CO(_2)e per GWh) as a result of SREP</td>
<td>n/a</td>
<td>76,664 tons CO(_2)e per year once SREP projects are operational</td>
<td>SREP Projects’ M&amp;E systems</td>
</tr>
</tbody>
</table>
Program Implementation Arrangements

MINISTRY OF POWER (RAED) & ENERGY COMMISSION
Fiduciary and Procurement Responsibilities

SREP Program Steering Committee
SREP Program Implementation Unit (hosted in RAED) for
Program Level Coordination
Program Level Monitoring & Evaluation
Program Level Knowledge Management

Project 1: Renewable energy mini-grids and stand-alone solar PV systems
Project 2: Solar PV based net-metering with storage
Project 3: Utility-scale solar PV / wind power generation
Project 4: Technical assistance to scale-up RE generation

Decentralized Technical Services NGO Specialized Firms Individual Consultants

Advisory Services

Coordination Arrangement
Implementation Arrangement

Local Governments Private Sector Civil Society
Conclusion

- Ghana has an opportunity to propel its future socioeconomic development following a low-carbon pathway.

- GoG is committed to leveraging SREP resources to help achieve its development goals of universal access to modern energy services and 10% share of renewables in the country’s energy mix.

- This requires understanding Ghana’s renewable energy potential and creating an enabling environment for scaling-up renewable energy.

- SREP support will help the country achieve these goals.
Govt prioritises renewable energy

By Lawrence Markwei

John Jinapor, Deputy Minister of Power, has said the government has prioritised renewable energy towards the achievement of the 2029 national goals.

EU Funding for Energy 2015, International Interactive Conference, Berlin

European Academy
To smagbeve@yahoo.com

Dear Mr Mahu,

EU funding and financial instruments can co-finance your investments or research in renewable energy projects! “EU Funding for Energy 2015” is the forum to get up-to-date with advanced financial aspects of EU partnerships for energy in Africa, Asia & Europe.

Find potential partners and funds to finance your energy projects in 2014-2020!

International Interactive Conference
EU Funding for Energy 2015:
Financing Energy Projects in Africa, Asia & Europe
27th - 28th August 2015, Berlin
Thank You