Renewable Energy Masterplan for Ghana – Work in Progress

A coordinated approach towards productive use of Renewable Energy for Productive Use

10th August, 2016
Content

• Background
• Historical Context
• Task Force and approach
• Key Aspects Under Consideration
  • Targets
  • Action Plan
• Stakeholder Engagement
Objectives of REMP

• The specific objectives of the REMP are to:
  • Set clear targets for the development of the various renewable energy resources in Ghana
  • Define actions and strategies to be undertaken to achieve the targets
  • Prioritise the renewable energy technologies
  • Propose sustainable financing models, incentives and support systems
  • Define institutional roles for the implementation of the masterplan
  • Identify risks and mitigation measures for ensuring sustainability.

• The process is being financed by DANIDA under the China-Ghana Renewable Energy Technology Transfer (RETT) project.
Approach

• The Renewable Energy Masterplan for Ghana is developed by a taskforce comprising Ministry of Power, Energy Commission, the National Development Planning Commission and Energy Center.

• The taskforce conducted an extensive desk and field study of past and on-going renewable energy initiatives and programmes to identify success factors and implementation gaps or failures and how gaps identified could be addressed to ensure sustainability of interventions. The taskforce consulted with a wide range of stakeholders (both local and international) throughout the process.

• Renewable Energy Masterplans of other countries such as China were reviewed and lessons learnt were considered in the development of this masterplan.
Building on Existing Plans

From 1980s to date, the promotion of RETs in Ghana have been supported by government/regional policy and strategic documents. Below is a list of the major policies, plans and strategic documents that have been developed since 1986.

- National Electrification Scheme (1989)
- ECOWAS white paper on access to energy services (2006)

- Ghana Shared Growth and Development Agenda 1&2 (2009/2014))
- The Renewable Energy Act, 2011 (Act 832)
- Sustainable Energy for All Action Plan / Agenda of Ghana (2012/2016)
- Mini-grid Electrification Policy (2016)
- Bioenergy Policy Document (draft)
Building on Existing Plans

The National Renewable Energy Strategy (NRES) was seen as the first attempt at developing a comprehensive RE strategy for the country. The process began in 2001 when the Government of Denmark agreed with the Government of Ghana to provide technical and funding support to the energy sector under an **Energy Sector Programme Support (ESPS)**. The support covered three areas, notably the:

- Strategic National Energy Plan (SNEP)
- Traditional Energy Development and Management Programme
- Renewable Energy Development and Management Programme (REDP)

A key output from the REDP was the preparation of a National Renewable Energy Strategy (NRES).
## PROGRESS MADE SINCE THE NRES WAS PUBLISHED

<table>
<thead>
<tr>
<th>Barriers identified</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absence of comprehensive RET Policies</td>
<td>A number of policy documents and regulations have been prepared</td>
</tr>
<tr>
<td>Absence of regulatory framework</td>
<td>RE Act passed</td>
</tr>
<tr>
<td>High initial cost of RETs</td>
<td>Government has supported a number of community off-grid solar projects. Now EC 20,000 rooftop solar programme.</td>
</tr>
<tr>
<td>Inadequate financing schemes for RETs</td>
<td>Under GEDAP, over &gt;70,000 solar lanterns have been distributed to date. However, there is still difficulty in assessing finance due to high interest rate.</td>
</tr>
<tr>
<td>Inadequate public awareness to the benefits of RETs</td>
<td>Solar has enjoyed awareness creation. The Global Alliance for Clean Cook Stoves is also promoting awareness of improved cook stoves.</td>
</tr>
<tr>
<td>Uncoordinated R&amp;D</td>
<td>Still a barrier</td>
</tr>
</tbody>
</table>

The REMP will build on the NRES to address some of the prevailing issues.
Resource Potential and Energy Demand

The REMP considers all the available resources and demand scenarios to establish target that will support economic growth.
## Targets

The targets are presented in 5-year blocks, in line with other sector plans such as the SNEP and SE4ALL action agenda up to 2030.

### INTERVENTION

<table>
<thead>
<tr>
<th>INTERVENTION</th>
<th>UNITS BASELINE</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Utility scale Solar</td>
<td>MW</td>
<td>23</td>
<td>150</td>
<td>225</td>
</tr>
<tr>
<td>2. Rooftop/net metering Solar PV</td>
<td>MW</td>
<td>1.7</td>
<td>40</td>
<td>120</td>
</tr>
<tr>
<td>3. Standalone Solar PV Systems</td>
<td>MW</td>
<td>2.5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>4. Street/Community lighting</td>
<td>MW</td>
<td>1.5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>5. Lanterns</td>
<td>Units</td>
<td>70,000</td>
<td>500,000</td>
<td>1,300,000</td>
</tr>
<tr>
<td>6. Solar Irrigation/water supply</td>
<td>Units</td>
<td>&lt;30</td>
<td>200</td>
<td>350</td>
</tr>
</tbody>
</table>
### Targets – Wind and Solar Mini-Grid

<table>
<thead>
<tr>
<th>TECHNOLOGIES</th>
<th>INTERVENTION</th>
<th>UNITS</th>
<th>BASELINE</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIND</td>
<td>1. Utility scale</td>
<td>MW</td>
<td>0</td>
<td>225</td>
<td>375</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>2. Standalone systems (including net-metered)</td>
<td>MW</td>
<td>&lt;0.1</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3. Wind Irrigation/water pumping</td>
<td>Units</td>
<td>&lt;20</td>
<td>30</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>MINI-GRID (Solar)</td>
<td></td>
<td>Units</td>
<td>&lt;10</td>
<td>50</td>
<td>100</td>
<td>200</td>
</tr>
</tbody>
</table>

Renewable Energy Masterplan for Ghana
### Targets – Wind and Solar Mini-Grid

<table>
<thead>
<tr>
<th>BIOMASS (Solids)</th>
<th>1. Utility-scale/co-generation*</th>
<th>MWe</th>
<th>&lt;10</th>
<th>70</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Woodlot Cultivation**</td>
<td>1000 ha</td>
<td>9</td>
<td>30</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3. Charcoal Production (export)</td>
<td>1000 t</td>
<td>7.43</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Charcoal (local demand)</td>
<td>1000t</td>
<td>4,300</td>
<td>4,600</td>
<td>4,900</td>
<td>5,100</td>
<td></td>
</tr>
<tr>
<td>5. Briquetting/Pelleting</td>
<td>1000 tonnes</td>
<td>19.7</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6. Improved Cookstove (Institutional/commercial)</td>
<td>Thousand Units</td>
<td>1.8</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>7. Improved Cookstove (Domestic) - Solid Biomass</td>
<td>Million Units</td>
<td>0.80</td>
<td>1.6</td>
<td>2.2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

*Based on current capacities and projection by African Plantations for Sustainable Development (APSD), Kwamoka and other IPPs - GOPDC, TÖP, BESNO and Komenda

** Based on current woodlot planted by EC/UNDP and three known private companies. Included the potential of the proposed afforestation project as part of VRA/Asogli coal power plant and APSD’s projection
Targets

- Targets have also been set for:
  - Landfill to power
  - Municipal Waste
  - Agricultural/Industrial organic waste (Biogas)
  - Institutional Biogas
  - Domestic Biogas
  - Biofuels
  - Medium/Small Hydo
  - Tidal Wave Energy
Lesson from Past Projects and Strategies

• Battery replacements was a major drawback in past projects such as Weichau, Isofotun and Respro

• For government supported solar projects, it is recommended that additional capital subsidy be provided for battery replacement. This should be sustainable as such the Energy Fund should set aside a portion of its funds to support this process.

• Assembly of batteries locally will be critical in making the cost of batteries affordable. Bangladesh has championed local battery assembly that has supported their renewable initiative.

• RE projects for rural communities should always remote and isolated communities where grid cannot be extended

• Develop regulation to push commercial properties such as hotels to install SHS. This will serve as a measure to drive demand for the systems.

• Government to provide subsidies for construction of improved cookstoves in public institutions such as hospitals, schools and prisons.
Next Steps

• Taskforce does not have all the answers as such it is seeking to engage and obtain feedback. Continue engagement with Stakeholders.

• Consider and incorporate feedback from various sectors.

• Finalize document 4th Quarter of 2016.

• Establish a monitoring cycle for the REMP.

• Adoption and alignment of the REMP in the country’s planning cycle.
Thank You

Q&A