Rural Electrification with Renewable Energy in The Gambia

NAMA Profile # 3 | Seeking support for implementation | July 2015

Background

The majority of electrification in The Gambia is in urban areas, leaving many rural areas without access to electricity. In 2011, the average electricity access rate in the rural and semi-urban area regions was only 12% (Ministry of Energy, 2011). The government lacks the resources to increase electricity generation, enhance access to electricity, and improve the operational efficiency of generation, transmission and distribution infrastructure. Lack of access to a stable and extended electricity system is a major challenge for economic expansion and social development, such as delivery of healthcare and education services (World Bank, 2009). In addition, most of the electricity in The Gambia is produced using fossil fuels (IRENA, 2013), which not only contribute to greenhouse gases (GHG) emissions, but also increase the country's dependency on imported fossil fuels, leaving the country's economy very vulnerable to increasing international oil prices and unfavourable foreign exchange rates.

The study shows that solar radiations are high in all regions of The Gambia year round, enough to power solar energy projects (Lahmeyer International, 2006). Furthermore, average wind conditions in the country are moderate, with higher speeds found along the coast. Renewable energy (RE) projects can enhance access to clean and affordable electricity in rural and remote areas.

However, these projects face some inevitable barriers, such as, *inter alia*: high capital costs, the difficulty of sustaining village level maintenance and the lack of availability of technical know-how.

Sources: The Insider, 2014; DFID, 2011; Gardners, 2014.

NAMA Objectives

The proposed NAMA aims to promote RE projects to electrify rural communities in The Gambia through the implementation of RE ventures. The NAMA will help to overcome exiting technical, financial, policy and institutional barriers that hinder the increased uptake of RE projects.

The five key NAMA objectives are to:

- Increase the level of RE (for electricity) and contribute to the national long-term target of increasing the RE share within the power generation sector;
- Reduce GHG emissions in the power generation sector;
- Increase the rural population's access to sustainable electricity;
- Encourage an increase in rural community income generation, and improve rural livelihoods; and
- Increase the level of private sector participation within the power sector.

NAMA Activities

The NAMA objectives will be accomplished through a number of activities, divided into Phase 1 and Phase 2. Phase 1 activities will include the establishment of two types of ventures, which will connect un-electrified rural communities: RE Community Energy Centres (RE-CEC); and RE Micro -Grids (RE-MGs). Phase 2 ventures will be comprised of RE systems, which will displace thermal generation at existing regional grids (referred to as RE Displacement Systems – RE-DIS) and RE independent power producers (RE-IPPs).

Both RE-CECs and RE-MGs will have a rural productivity zone (RPZ) as a core design component, where community members will be provided energy access that can be used to start up small businesses. These businesses may include setting up a shed where people pay to use industrial equipment or providing irrigation via a water pump. The RPZ will also provide energy to a limited number of public buildings. The key difference between the RE-CEC and the RE-MG ventures is the manner in which electricity is distributed to households: RE-CECs provide electricity through rechargeable batteries, while RE-MGs provide individual household connections. Approximately 50 households will receive electricity access from each of the eight proposed RE-CEC ventures and the eight RE-MG ventures. The business model applied for both ventures will be a public-private partnership, in which a public entity owns the RE system, but a private sector company manages and maintains the system. In addition to implementation of the ventures, on-going capacity building at all levels will take place, including through updating regulations and policies, training sessions and raising awareness. Phase 2 will shift activities to a larger-scale private sector model. Ventures will include six RE-DIS of various capacities, and a seven -megawatt RE-IPP.

NAMA Baseline and Emission Reductions

Phase 1: The baseline scenario for the NAMA was established using the Clean Development Mechanism (CDM) approved "Small-scale Methodology: AMS-I.L.: Electrification of rural communities using RE, Version 03.0." The assumed baseline is the use of fuel-based lighting systems, stand-alone power generators and fossil fuel-based mini grids.

Phase 2: The baseline scenario is the use of electricity generated by diesel generators connected to the regional mini grids or electricity generated by thermal power plants connected to the GBA grid.

The NAMA is expected to result in emission reductions of 12,748 tCO2 from Phase 1 ventures and 109,937 tCO2 from Phase 2 ventures over 15 years.

Photo Source: powerupgambia.org

NAMA Financing Mechanisms

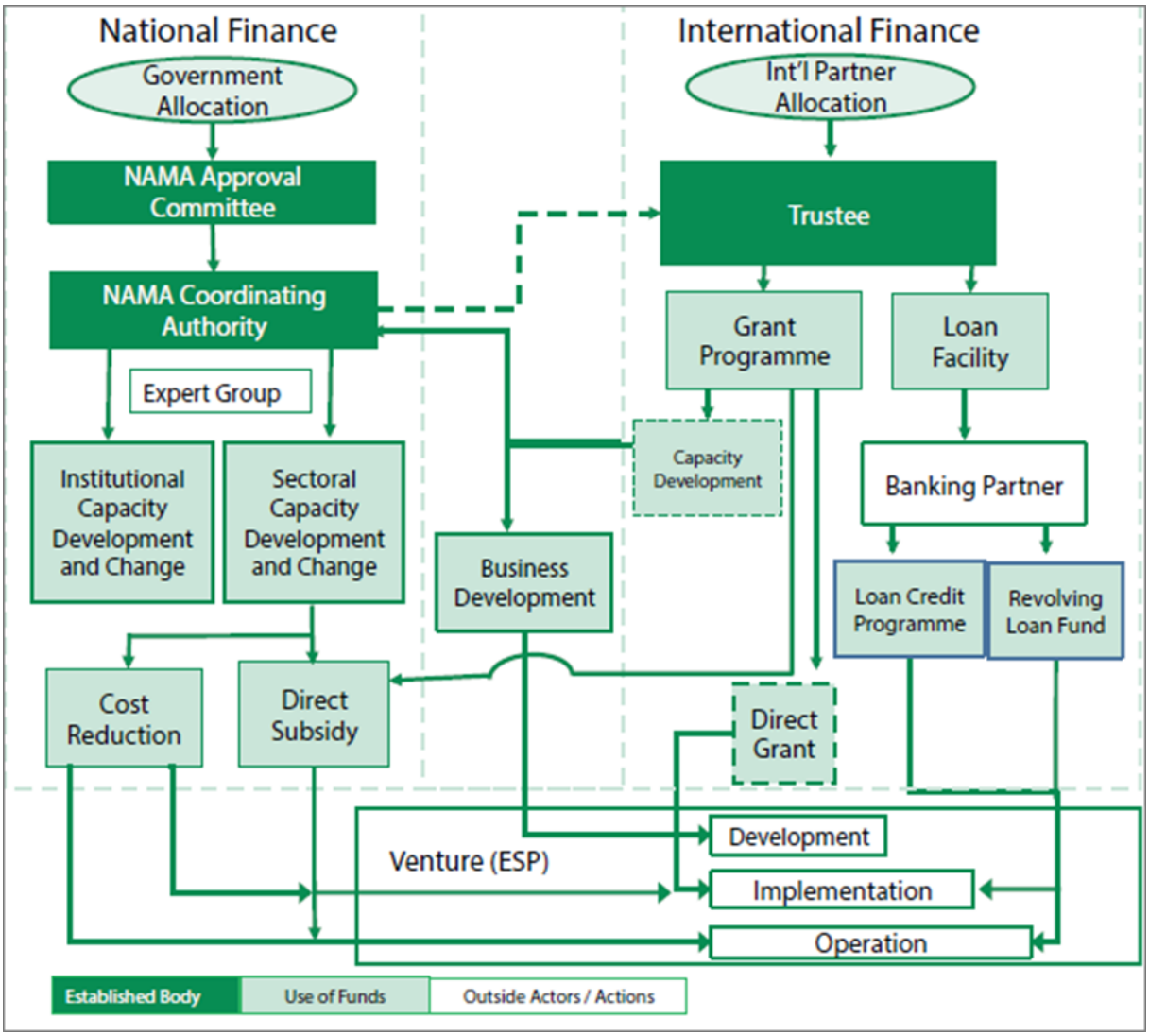
In the context of this NAMA, the main focus in the design of the financial mechanisms is constructing a reliable and transparent structure of financial flows and a system, which serves to enforce the measures needed to ensure the sustainable use of funds. The NAMA will be co-financed by the Government of The Gambia and international support partners.

National Finance: National finance includes capital flows, which take the form of consumer payments, operational subsidies from the Government and cost reduction measures, such as waived taxation. This capital may also contribute to funding the direct operation of the NAMA Approval Committee and NCA, as well as to capacity development under the NAMA, often on an in-kind basis.

International Finance: This finance is linked directly to capacity development actions, direct investment grants, direct operational subsidies, and loan schemes provided by international support partners consisting of multilateral financing institutions and/or multilateral/bilateral programmes. International finance which goes directly to venture entities (through subsidies or grants) or capacity development will be managed by a single Trustee charged with oversight of the funds. Approval of payments and disbursements will come from the NCA.

Each of the finance types consists of two components: 1) management and governance of capital; and 2) disbursement of funds. The figure 1 offers a flow chart for the proposed financial governance and disbursement structure.

Fig 1 : Financial Governance and Disbursement Structure



NAMA Measurement, Reporting and Verification (MRV)

The MRV system focuses on emission reductions, sustainable development and financial support.

In keeping with the UNFCCC's 'Small-scale Methodology AMS-I.L.: Electrification of rural communities using renewable energy, Version 03.0," a default emission factor of 1.0 t CO2/MWh will be applied for fossil fuel-based generated and consumed electricity. The monitored GHG parameter is 'GHG emission reductions avoided by the grid' and each electricity generation system must be equipped with a calibrated electricity meter to monitor the generated electricity supplied to the consumers.

The MRV for sustainable development benefits is based on parameters identified in the NAMA Sustainable Development Tool and for which the baseline is characterized by various indicators related to environment, social, growth and development, and economic domains. Wherever possible, the parameters are quantified; otherwise, a qualitative description will be provided.

To measure the support provided as part of the NAMA, two parameters (international financial support spent per activity and national financial support spent per activity) will be tracked and recorded as per standard governmental tracking procedures.

The NCA will create the necessary reporting form templates and manage the database of all collected data from ESPs. The data and information will be audited/verified by accredited entities under the CDM or under another accreditation system agreed upon by the Government of The Gambia and international partners.

NAMA Institutional Coordination

- NAMA Approval Committee: the NAMA Approval Committee, which is a decision -making body, related to the allocation of national and international funds for NAMA activities (both capacity development and ventures), will provide strategic and financial oversight of NAMA activities.
- NAMA Coordinating Authority (NCA): The NCA will manage and track the operational and financial elements required to implement and operate the NAMA, under which the Renewable Energy Fund Management Team will be based.
- NAMA Venture Approval Expert Group: This Group will provide technical services on overseeing bidding processes and the incorporation of new energy service providers (ESPs)/ ventures into the NAMA.
- Trustee: The Trustee has the critical role of financial oversight of capital used for NAMA activities and will directly allocate funds to the account of the RE Fund.

Relevancy of the NAMA in the National Policy Context

The proposed NAMA is in line with the national policies and plans outlined below.

- Vision 2020 (1996), which emphasizes overcoming existing bottlenecks and ensuring a reliable and adequate supply of energy, both conventional and renewable, at affordable prices.
- Programme for Accelerated Growth and Employment (PAGE, 2012-2015), which acknowledges the importance of the electricity provision to both rural and urban populations and the need to promote RE.
- The Gambia Investment and Export Promotion Agency Act (2010), which lists nine priority sectors with one being energy, including electricity generation, transmission and distribution, and RE sources (solar, wind, hydro and biochemical).
- The Renewable Energy Act (2013), which provides the skeleton of a regulatory and governance framework for the RE sector and establishes a Renewable Energy Fund.
- The National Energy Policy (2005), which prioritizes rural electrification and promotes the use of RE sources, such as wind and solar, for electricity generation, particularly in rural areas.
- Low-Emission Climate Resilient Development Strategy (LECRDS) for The Gambia (2015), which aims to promote and increase the RE mix (solar, wind, biomass) in the production and consumption of electricity.

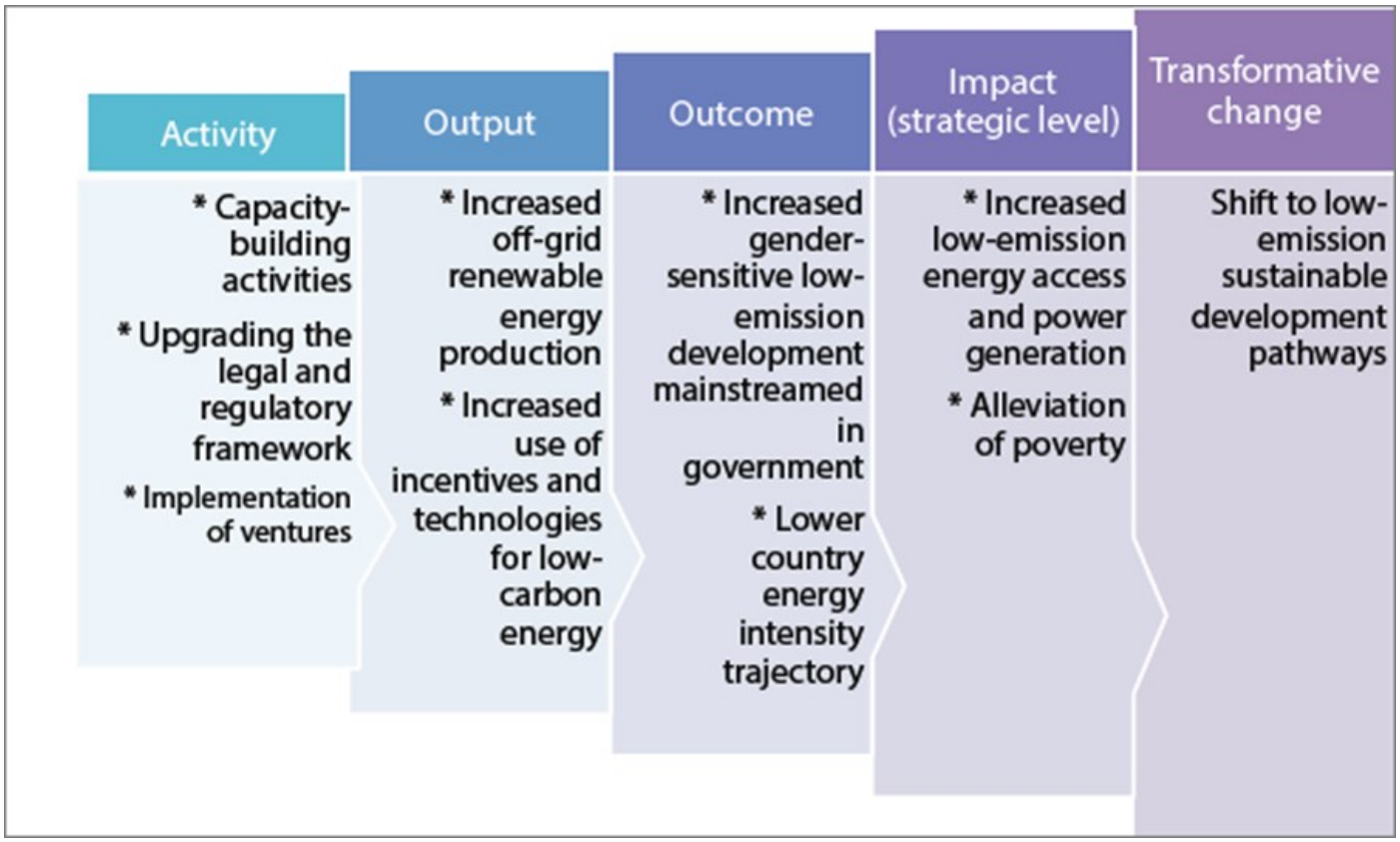
Potential for Transformational Change and Sustainable Development Co-benefits

This NAMA focuses not only on emission reductions but also on sustainable development, national development goals and transformative change. The overall NAMA targets for activities, outputs, outcomes, impacts and an overall high-level paradigm shift can be seen in the figure 2 below.

The proposed NAMA will contribute to sustainable development as measured by the following indicators:

- 320 small- and medium-sized enterprises created using energy from the ventures
- 320 new jobs for females and 320 jobs for males
- 3,112 hours of equipment use per year in the RPZ
- 240 ha land irrigated using water pumped by electricity from the venture
- 800 energy-consuming households connected to the mini grid
- 20 public buildings, such as schools and clinics, connected to the mini grid

Fig 2 : Transformative Change



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A complete and in-depth description of all the aspects presented in this NAMA profile is available in the document produced by UNDP and the Government of The Gambia titled "NAMA Design Document for Rural Electrification with Renewable Energy in The Gambia."

Salient features of the Proposed NAMA

Sector : Energy Supply

Technology : RE Sources

Type of action : National/ Sectoral Goals/ Projects

GHGs covered by the action : CO2

Expected timeframe for the implementation/Operation : 15 years

Implementing entity : NCA, Ministry of Environment, Climate Change, Water and Wildlife

Total estimated cost of the action : $63 million (Venture investments – $29 million; Venture Operation &Maintenance Costs – $31 million; and Capacity Development – $3 million)

Required support for the preparation of the action : International component (grant) – $16 million; and international component (credit) – $13 million

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This series of NAMA profiles is produced by the NAMA and Registry Unit of the Non-Annex I Support Sub-Programme of the Mitigation, Data and Analysis Programme (MDA) of the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, based on the information recorded by Parties in the NAMA Registry. The objective of the NAMA profiles is to enhance visibility of NAMAs, which increases the probability of obtaining international support and encourages similar mitigation actions in other developing countries.

The NAMA Registry is a dynamic, web-based platform to record NAMAs in developing countries, as well as support available and/or provided by Parties and entities for such mitigation actions. Furthermore, the Registry aims to facilitate the matching of NAMAs with available support. Participation is voluntary and the Registry contains only information that has been submitted specifically for recording purposes. For any queries or assistance related to the NAMA Registry, please contact: NAMA-registry@unfccc.int or NAMA-support@unfccc.int

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