



INVESTING IN GRID-CONNECTED SOLAR PV: STRUCTURED FINANCE FOR NDC IMPLEMENTATION IN THE GAMBIA

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ACTION AREA: Mitigation

FOCUS AREA: Financing

COUNTRY: The Gambia

SECTORS

INVOLVED: Energy

TIMEFRAME: September 2019 – September 2024

(a detailed preparation phase for the further development of the program was approved in January 2018)

CASE SUMMARY: The NAMA support project (NSP) „Investing in grid-connected solar PV: Structured finance for NDC implementation“ is based on the two Nationally Appropriate Mitigation Actions (NAMAs) „Rural Electrification with Renewable Energy in The Gambia“ and „Feasibility Study for Grid-Connected Solar Energy Production in The Gambia“, which were developed in 2015 and 2016 with UNDP’s support. Its objective is to support the financing of the country’s first ever independent energy producer (IPP) commercial model for renewable energy, whereby the renewable energy installations will be connected to the regional electricity grids. The initially targeted capacity is 11 MW of solar energy, with an option to increase capacity in the future if the programme demonstrates success. In the solar energy sector, private sector actors recognise the potential of the Gambian market, but their main concern remains the introduction of a credible risk reduction mechanism to address the risk of financial failure of the public companies involved in the project.

The planned project activities are: (i) increasing network capacity, (ii) developing public-private partnerships (PPPs) and (iii) strengthening capacities of various stakeholders. The project qualifies as a good practice because the financial plan systematically addresses private sector investment barriers at the necessary scale and can easily be replicated in other developing countries. The provision of affordable financing options will overcome barriers to private sector investment and have a catalytic effect. Through the structured finance approach, costs of capital for low-carbon technologies will decrease to a level that will make future solar PV additions bankable even in The Gambian context. The proposed finance mechanism will lead to rapid uptake of solar PV investments in the existing regional grids and ensure that there is a pathway for private sector investors. Through the experience gained with accelerated investments in solar PV solar projects in The Gambia, capacity will be built up quickly, leading to scaling-up of investment.





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BACKGROUND: Climate change has a significant influence on the state and evolution of The Gambia's natural resources. Changing climate patterns, illustrated by a downward trend in rainfall since the late 1960s, has put enormous pressure on natural resources and ecosystems. An increase in floods and salinity has led to a decline in the productivity of mangrove ecosystems (Government of The Gambia, 2007). The decrease in rainfall in The Gambia also limits crop production. Cole et al. (2005) estimated that there could be a 40% decrease in agriculture yields due to an increase in temperatures.

The Gambia is at present heavily dependent on imported fossil fuels for energy supply. In a renewable readiness assessment by the International Renewable Energy Agency from 2013, it was stated that the country is almost entirely dependent on petroleum products for transport and electricity generation. The electricity mix was congruently composed of 97 % fossil fuels (2016 est.) and 3 % renewable energies (2017 est.) (CIA World Factbook, 2018). Changes in precipitation and average temperatures as well as increased variability reduce the potential for hydroelectric power.

Electricity remains a challenge for the country, both in terms of access and quality. The existing power infrastructure requires refurbishing and modernising (IRENA, 2013). In 2014, only 45 % of the Gambian population had access to electricity (REN21, 2017). One of the main difficulties is that the country is experiencing a transmission bottleneck that would hamper transmission and distribution even if extra generation occurs. At the same time, The Gambia needs to significantly increase electricity generation to meet the projected energy demand in the country. This demand is increasing due to several factors, including a rising urbanisation rate. Consequently, one of the main pillars of the country's NDC has been the uptake of renewable energies in the Banjul grid and 2 regional grids which are currently powered by Heavy Fuel Oil.

The Gambia signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1994. Since then, the country has taken steps to address the challenges and effects of climate change by developing, submitting and implementing its national communications, the National Adaptation Programme of Action (NAPA), the National Capacity Self-Assessment (NCSA) and the National Appropriate Mitigation Action (NAMA) (The Gambia, 2016). The country also signed the Paris Agreement in April 2016 and ratified it in November 2016.

In its NDC, The Gambia specifies that the country aims to reduce its greenhouse gas emissions by about 44.4 % until 2025 and 45.4 % in 2030 (which refers to emission reductions of 1,34 MtCO₂e, 1,67 and MtCO₂e below BAU, respectively (Climate Action Tracker, 2018)) compared to the business as usual scenario under a combined unconditional and conditional mitigation scenario (see figure 1). The addition of renewable energy to the energy mix of the national grids is a key objective of the NDC.

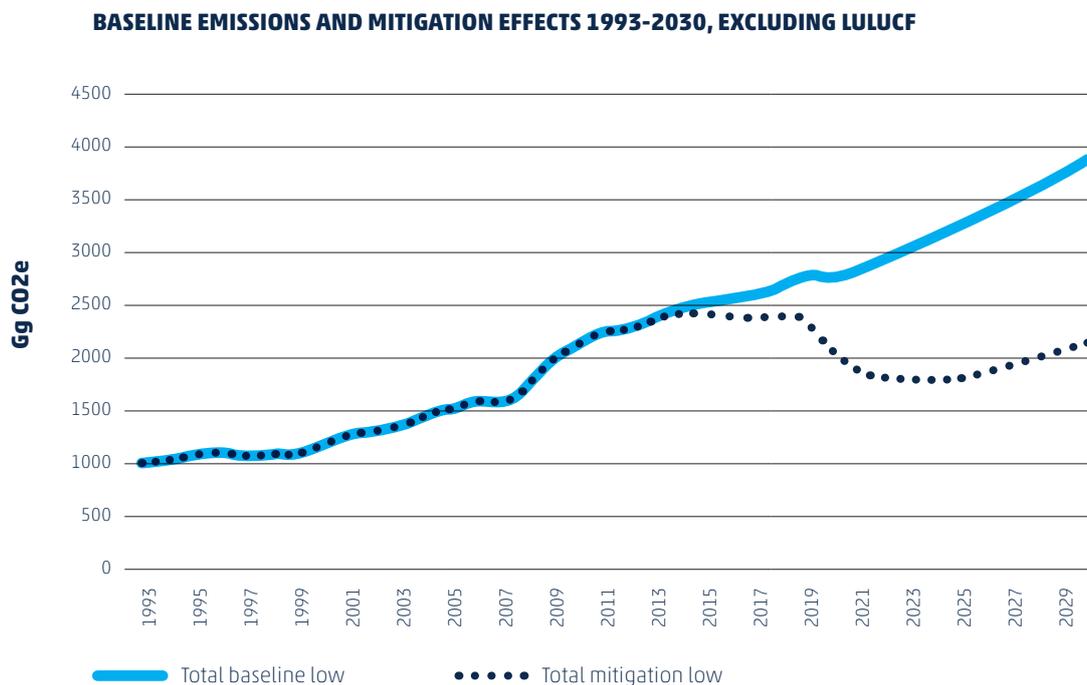


Figure 1: Baseline Emissions and Mitigation Effects 1993-2030 (The Gambia, 2016)

One of the main objectives of the energy sector is to increase access to energy and energy security for all households by 2020, with further improvements by 2030 and beyond. This objective is also related to achieving the goals of SDG 7 on Affordable and Clean Energy. Given the importance of the energy sector, the implementation objectives of the NDC in The Gambia focus on improving the national grid (including interconnection of regional grids), installing solar and hydroelectric power plants to increase sustainable, stable and low-carbon energy supply.

The government has established The Gambia Renewable Energy Center (GREC) and seeks to collaborate with interested entities for the development of renewable energy through research and development.

The Gambia’s power sector is in a poor state and the growing demand exceeds by far the available generation capacity. Persistent blackouts are omnipresent. The national utility NAWEC has been suffering from unsustainable debt management for many years. It is currently engaged with the World Bank in large-scale debt restructuring, which aims to put NAWEC into the position to commence entering into Power Purchase Agreements (PPAs) from 2019 and attract private sector participation in the Gambian energy sector. This fits the broad timetable for this project.

Given its financially precarious situation, NAWEC is unable to invest in new power sector infrastructure. Competitively tendered Independent Power Producers (IPPs) have been suggested to become the main source of new domestic generation if investors can be identified who are willing to invest in new solar powered plants in the Gambia through Power Purchase Agreements for solar powered electricity with Independent Power Producers. Private investors are thus expected to finance new power plants and arrange for managerial capacity to operate these plants, selling the electricity to NAWEC in a single buyer model. This model has been successfully established in many countries around the world. The IPPs will complement NAWEC rather than compete, and the additional generation capacity is expected to stabilise the power supply and distribution situation in the mid-term. IPPs will also bring know-how for new technologies into the country and help implement them.



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However, there exist significant political and commercial risks with regards to a program involving IPPs. Public funding is a critical enabler for overcoming these risks where the market is still nascent and low-cost financing and longer loan tenors are unavailable. Structured finance is needed and will be used to leverage private sector capital to meet the overall investment requirements for the project.

ACTIVITIES: ————— In order to de-risk commercial debt and successfully attract privately funded IPPs, the following activities are planned as part of the programme:

- (i) Increasing network capacity by adding 11 MW solar energy to the existing regional grids;
- (ii) Development of public-private partnerships (PPPs) for the construction and operation of up to two solar power plants connected to the two regional grids at the North- and Southbank of the Gambia river;
- (iii) Capacity building of public stakeholders.

INSTITUTIONS

- INVOLVED:** —————
- Government agencies: Ministry of Environment, Climate Change and Natural Resources (MEC-CNAR), Ministry of Petroleum and Energy (MOPE), Public Utility Regulatory Authority (PURA), National Water and Energy Company (NAWEC);
 - Implementation partner: United Nations Development Programme (UNDP);
 - Other institutions: United Nations Capital Development Fund (UNCDF) and Climate Mundial.

COOPERATION WITH: ——— • United Nations Development Programme (UNDP)

FINANCE: ————— The overall contribution requested from the donor amounts to EUR 10.6 million, which will be used to leverage private sector capital of around EUR 15 million to meet the overall investment requirements of EUR 25.8 million. This leverage is arranged by technical advisor and financial arranger Climate Mundial and shall be achieved by structuring equity funds to de-risking the investment environment through first loss instruments, whereby returns on such investments are subordinated to private sector investments. After refinancing debt, the public funds will guarantee payment failures of the public utility NAWEC under the PPA through a guarantee reserve managed by UNCDF, thereby reducing the operation risk of the Independent Power Producer. The structured finance approach will allow The Gambia to add up to 11 MW of solar PV to its energy mix in the 2 regional grids within the five years project life time.

- IMPACT OF ACTIVITIES:** —
- **INCREASE IN INTERCONNECTOR CAPACITY:** The NSP will target the installation of new solar PV capacity which connects to the regional electrical networks. The planned increase in interconnected network capacity will allow for a future increase in capacity for new private and commercial connections to all grids.
 - **CREATION OF SPECIAL PURPOSE VEHICLE COMPANIES:** Under the PPPs, Special Purpose Vehicle (SPV) companies will be created by private companies to own and operate the project(s) as an IPP, selling electricity to the NAWEC under a PPA.
 - **CAPACITY BUILDING OF STAKEHOLDERS:** Capacity building will be provided to a number of stakeholders by the NAMA Support Organisation (NSO) and NSP implementing partners. Stakeholders who can benefit from capacity development will include the PPP Unit of the Ministry of Finance and

Economic Activities PPP's office, IPPs trained as PPPs and investing in renewable energies projects, regional grid operators and technology providers for solar photovoltaic projects.

WHY IS IT

GOOD PRACTICE:

- **FINANCIAL VIABILITY:** The proposed financing mechanism deploys public finance not as a subsidy to cover additional costs of the project but as a means of funding the construction phase and de-risking commercial project debt during operation. Once the photovoltaic solar power plant(s) are in commercial operation, public debt is refinanced and placed into a third-party account managed by the United Nations Capital Development Fund. This allows commercial lending to replace public finance and achieve a fully privately funded IPP from the first day of commercial operation.
- **SCALABILITY:** With the experience gained from the first few years of commercial operation in The Gambia, network capacity can be increased, and additional investments will be made without needing to request further inputs of public finance.
- **TRANSFORMATIONAL CHANGE:** The planned project is poised to lead to the sustainable diffusion and use of solar photovoltaic systems in rural areas that do not have access to the national electricity grid.

SUCCESS FACTORS:

- **CATALYTIC EFFECT:** The proposed finance mechanism is expected to accelerate investment in solar PV in The Gambia. A single grant invested solely to subsidise the capital cost of the project would probably mean that any new projects in The Gambia would be somewhat reliant on the availability of new grant funds. The overall aim of the financing concept is to reduce or even eliminate this co-dependence for future scaling-up.
- **COST-EFFECTIVENESS:** Investment costs for zero carbon technologies will decrease through the tendering procedures. Thus, the lower investment costs will contribute to an increased financial viability of zero carbon technologies. After the end of the NSP, investment costs for zero carbon technologies are expected to have come down to a level which will make future solar PV additions bankable even in The Gambian context.
- **LONG-TERM IMPACT:** Finding solutions to the financial, social and institutional obstacles has potential to lead to the large-scale diffusion of solar technology in The Gambia. This will also contribute to the reduction of greenhouse gas emissions from kerosene and diesel generators and the combustion of firewood and can pave the way towards a low-emission economy in the long run.



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OVERCOMING BARRIERS / CHALLENGES:

WHAT WERE THE MAIN BARRIERS / CHALLENGES TO DELIVERY?

ECONOMIC

Lack of financial resources. NAWEC is currently restructuring its debt with the World Bank, meaning that attracting private investment into new infrastructure in the electricity sector is difficult.

CAPACITY

Lack of experience in installing medium-size solar PVs. Despite a long history of more than 30 years of solar installations in The Gambia, the total capacity of the planned projects is higher than the capacity of all existing solar PV projects.

INSTITUTIONAL

Lack of experience in managing PPAs for solar PV projects in a medium-size range (around 1 MW installed capacity).

HOW WERE THESE BARRIERS / CHALLENGES OVERCOME?

The application of a financing structure that utilises public funding to mitigate construction and operation risks allows commercial finance to be attracted.

A tender will be carried out to identify suitably qualified international IPPs which can partner with local entities to deliver the planned project(s).

Capacity development for the NAWEC during the NSP will be carried out to overcome this barrier and ensure the expansion of solar PV projects in the country.

LESSONS LEARNED:

· DO NOT LET DIFFICULT INVESTMENT CONDITIONS BECOME A DETERRENT TO FINDING SOLUTIONS:

Provided that the host country is willing and there are available donors with an appetite for innovation, solutions can be found and successful public-private partnerships that advance NDC implementation can be forged.

HOW TO REPLICATE

THIS PRACTICE:

· PROVIDE INCENTIVES FOR HOST COUNTRY SUPPORT FOR THE PROGRAMME:

Solid performance by NAWEC in the first two to three years of the programme will allow decisions to be made about scaling-up the programme. Therefore, structuring strong incentives for continued host country support for the programme are the sine qua non of being able to replicate.

CONTACT FOR

ENQUIRIES:

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FURTHER KEY

RESOURCES:

· Ministry of Environment, Climate Change & Natural Resources (2016). NAMA Facility, NAMA Support project outline. UNDP. Available at: <https://www.nama-facility.org/projects/the-gambia-investing-in-grid-connected-solar-pv/ht>

· ECREEE (2013). 10 MW Solar PV PPA signed in the Gambia. Available at: <http://www.ecreee.org/news/10-mw-solar-pv-ppa-signed-gambia>

- WEBSITES:** —————
- NAMA Facility: <https://www.nama-facility.org/>
 - News story on UNDP and Climate Mundial Partnership in the Gambia: <http://www.africa.undp.org/content/rba/en/home/presscenter/articles/2018/gambia--undp-and-climate-mundial-partnering-to-increase-access-t.html>
 - Blog on accelerating NDC implementation through new partnerships: <http://www.africa.undp.org/content/rba/en/home/blog/2018/accelerating-ndc-implementation-through-new-partnerships-.html>

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- REFERENCES:** —————
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