REPORT ON TERMINAL EVALUATION OF THE RENEWABLE ENERGY PROJECT: GREENING THE PRODUCTIVE SECTORS IN THE GAMBIA -

Promoting the use and integration of small to medium-scale renewable energy systems in the productive sectors

9/4/2022

Ministry of Petroleum and Energy in Partnership with UNIDO

Gambia Petroleum House, MoPE

Gambia National Petroleum Company (GNPC)
(Adjacent Fuel station)

Submitted by:

Ndey Naffie Ceesay (Consultant)

And

Lamin Nyangado (Senior Evaluation Expert/Lead consultant)

List of figures, tables and boxes

List of figures

List of tables

List of boxes

Abbreviations and Acronyms

AfDB	African Development Bank
ATU	Appropriate Technology Unit
BAC	Basic Co-operation Agreement
BBC	British Broadcasting Corporation
CBG	Central Bank of the Gambia
CO_2	Carbon Dioxide
COO	Chief Operations Officer
COVID	Corona virus disease
CRR/S	Central River Region/South
DCD	Department of Community Development
Demos	Demonstrations/ models
ECOWAS	Economic Community of West African States
ECREEE	EOCWAS Center for Renewable Energy and Energy Efficiency
ET	Evaluation Team
FGD	Focus Group Discussion
FIT	Feed in Tariff
GBoS	Gambia Bureau of Statistics
GCCI	Gambia Chamber of Commerce and Industry
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GMD	Gambian Dalasi
GMG	Green Mini-Grid
GNPC	Gambia National Petroleum Company
GoTG	Government of The Gambia
GREC	Gambia Renewable Energy Center
GTTI	Gambia Technical Training Institute
HQ	Headquarter
IPP	independent power producers
Kg	Kilogram
KII	Key Informant Interview
kVA	kilo-volt-ampere
KW	Kilowatt
LDCs	Least Developed Countries
M&E	Monitoring and Evaluation

MDGs	Millennium Development Goals
MoFEA	Ministry of Finance and Economic Affairs
MoPE	Ministry of Petroleum and Energy
MoU	Memorandum of Understanding
MRC/G	Medical Research Council/Gambia,
MW	Megawatt
NA	Not Available
NAWEC	National Water and Electricity Company
NDP	National Development Plan
NEA	National Environment Agency
NEDI	National Enterprise Development Initiative
OECD/DAC	Organisation for Economic Co-operation and Development/Development Assistance Committee
PAGE	Programme for Accelerated Growth and Employment
PFAN	Private Finance Advisory Network
PMC	Project Management Committee
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPP	Public Private Partnership
ProDoc	Project Document
PRSP	Poverty Reduction Strategy
PSC	Project Steering Committee
PUG	Power Up Gambia
PURA	Public Utilities Regulatory Authority
RBM	Results Based Management
RE	Renewable Energy
REAGAM	Renewable Energy Association of the Gambia
RFI	Radio France International
SDGs	Sustainable Development Goals
SJGH	Sulayman Junkung General Hospital
SPP	Small Power Producers
TE	Terminal Evaluation
ToC	Theory of Change
ToR	Terms of Reference
UNDP	United Nations Development Programme

UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNWOMEN	United Nations Women
UTG	University of The Gambia
VC	Vice Chancellor
WB	World Bank
WYE	Women and Youth Enterprise

Executive summary

a) Evaluation purpose and methodology

This summative evaluation was commissioned by the United Nations Industrial Development Organization (UNIDO). The purpose was to assess performance of the GEF 5 RE projects vis-à-vis, activities implemented, results achieved, risks identified, lessons learned and likelihood of sustainability after phase out.

This terminal evaluation (TE) covered the duration of the project between March 1st, 2015 and December 31st, 2021. The evaluation focused on design, management, stakeholder engagement, and monitoring and evaluation across the project's performance targets.

The evaluation employed the theory of change approach; carried out a comprehensive desk review, stakeholder consultation and project site visits. Qualitative and participatory approaches were the main techniques used in collecting data. The UNIDO Evaluation criteria and guidelines and GEF policies were handy and used as basis for assessing the change pathway. The OECD/DAC evaluation criteria and questions (**Relevance, Coherence, Effectiveness, Efficiency, Impact and Sustainability)** were main guidelines for the evaluation process and reporting. The materiality and extent of project co-financing and its administration were also cross-checked and analysed. Mainstreaming cross-cutting gender issues was also examined.

b) Key findings

The project formulation was comprehensive and addressed the anticipated barriers to the application of renewable energy in the productive sectors for economic growth. Key among them included; lack of supportive regulatory framework, proof of viability and limited awareness and capacity of the people. Public-private partnership; increasing awareness and building capacity on RE; and case studies on adaptability and replicability of the models and demonstration of potential to reduce GHG emissions were instructive. A project logical framework with clear pathways for achieving results, supported by a delivery structure was elaborated.

Building on the experiences of its predecessor, GEF 4, this project's (GEF 5) design carefully considered and aligned its activities to the Government of The Gambia's development priorities, which remain relevant to the RE ambitions. The RE objectives integrated poverty reduction targets of the national development plans and related policy frameworks for addressing the aspirations and human rights of Gambians.

The project focus was also in alignment with UNIDO/GEF's policies and priorities of promoting industrial development for poverty reduction, inclusive globalization and environmental sustainability within a partnership cooperation framework.

With the exception of the Medical Research Council, Gambia, (MRCG), all the RE developers negotiated amendments to their original plans but ensured steady progress towards achieving planned targets. The potential of RE systems to support economic activities and well-being of people was demonstrated through the pilots. Yet, the Gambian economy remained locked-in and, relying persistently and almost entirely on the dominant but costly fossil fuel based electricity supplied from NAWEC to drive the supply chain.

Although government demonstrated high commitment to RE and set up the Gambia Renewable Energy Center (GREC) since 1984, the innovators decried the slow pace of putting in the requisite regulations. Government's expressed call for increased participation of women and youth entrepreneurs was demonstrated in some respects in recruitment and programme development and delivery. An RE Fund was also created to support women and youth led RE enterprises in the productive sectors.

Faced with finance and credit challenges, the GCCI and PUG forged and created new partnerships which helped to close the financing gaps and supported their expansion efforts. The knowledge and experiences

gathered thus far are important lessons that the Gambia can disseminate and share in country and across the ECOWAS community.

c) **Conclusions and recommendations**

On the whole the project went beyond its target of installing 1.2MW and instead installed 1.3MW with all developers (except one) while satisfying the technical requirements. Some of them indeed uploaded their excess power unto the NAWEC grid. Some respondents reported having realised financial savings, and by extension reduction of GHG emissions through clean energy generation using solar. However, putting in the requisite and pending regulations is urgent if RE objectives will be attained and sustainably.

Successful implementation of the capacity building activities helped strengthen local expertise and enhanced technical skills of participants. The prepared investment prospectus facilitated developers in elaborating bankable project proposals; and the developed training manual was a critical guide and a necessary tool for the integration of RE in relevant training curricula. Though, achievements in attaining the focal area outcomes e.g. favorable regulatory environment and increased investments in RE were less successful.

The PMU staff conducted regular monitoring visits to demo-projects, assessed and reported on implementation progress. The monitoring visits could be better with PMU's own plans whilst taking cue from the project logical framework.

Minutes of PSC meetings and interactive field visits were indicative of commitment and encouraging steps towards ensuring good project governance practices were upheld. Project coordination meetings especially between developers and stakeholders to assess progress and review relationships were very much desired and recommended for the future. The co-financing ratio put in by the developers was believed to be high for an innovator and could negatively impact the demonstrations and results. Formalising the RE fund is critical for the government to encourage private sector contribution for augmentation and sustainability.

d) Project ratings

Developing the strategy and regulations, MoPE advised the project to consider the ministry's on-going assignment on similar works to avoid duplication. The PSC at its meeting of July 7th, 2017 decided to reallocate this activity line budget for entrepreneurship training. Although the proposed regulations are not yet in place, the following documents on Green Mini Grids is in place at the ministry of Energy: policy document, regulatory frame work, and feasibility study report of ten sites. One of the sites(120kW)has been developed by Unique Energy, one of Gambia's most diversified business corporations.. This is activity rated: 2: SATISFACTORY.

The target of installing 1.2 MW of renewable energy systems was exceeded, instead the project installed a total of approximately 1.3MW excluding the Biomass Generator. The developers demonstrated leadership and willingly invested hugely on the trials. The demos exhibited strong potential for up scaling/ replication. The high co-financing cost was a major query and remained a concern among developers. On the other hand, GEF/UNIDO and PURA according to reports signed a contract in 2017 and implemented an 18 month youth and Women targeted projects to promote RE-based enterprise development for the productive sectors. This partnership registered striking progress on the ground albeit some challenges.

Achievement on solar installation targets and demonstrable private sector involvement were high. A significant number of youth and women centered RE projects established. Yet overall achievements fell short of expectations and the activity was rated: 5: SATISFACTORY.

Discussions with PURA indicated implementing some training sessions with women and youth during the period under review. Monitoring reports indicated that PURA facilitated training of representatives of three

beneficiary project portfolios, (Youth Farmers Association of Gunjur Sambouya; Eye Africa online TV at Wellingara; and Barry enterprise) on basic project management principles.

Training on Entrepreneurship was also reported but missed to specify level and number that attended. There was evidence of accomplished youth and women's training activities through the RE fund, however, achievement of the output targets was considered short of anticipated results and the activity was rated: **4: MODERATELY SATISFACTORY**

A fairly good number (10) of monitoring visits were undertaken by the PMU, as observed from trek reports. A review of the project implementation plan showed the number of monitoring visits over two and a half years which coincides with the ten visits reported. The terminal evaluation is on-going but the Mid-term review was a missed opportunity. However, considering the number of staff (only two) at the PMU and their position within the project management circle substantial progress was registered. Without a dedicated staff for the function, integrating the project M&E function into the established MoPE system would have been more progressive and sustainable. Therefore the activity was rated: 4: MODERATELY SATISFACTORY

e) Tabular overview of key findings – conclusions – recommendations

Key findings	Conclusions	Recommendation	Responsible stakehold3er
Project achieved its target of installing 1.2MW and satisfied the technical requirements.	The RE law created the environment to promote the initiative	The second level policies (strategy and regulations) must be put in place and urgently to ensure project sustainability	MoPE PURA and NAWEC assisted
Presence of project logical framework with clear pathways for achieving results. This was supported by a defined delivery structure.	Sound project implementation frame established for delivery coordination and impact	The delivery structure needs to be a bit more responsive to avoid overlaps. Equally, project systems alignment to earlier international partnership cooperation frameworks, and improved coordination will facilitate sustainable achievement of results	MoPE (PSC) UNIDO/GEF
The project was substantially aligned to National Development Plan priorities, SDGs and consistent with donor (UNIDO/GEF) policies	The applicable policies and strategies remain relevant to the RE ambitions.	Periodic reviews of the project are critical and will ensure sustainability. Introducing a phase out plan at project design will perhaps minimise uncertainties and avert major risks.	MoPE Supported by UNIDO
Potential (viability) of RE systems to support economic activities and well-being of people, demonstrated.	The demonstrations substantially supported this premise with initial financial savings & reduction in GHG emissions reported to have accrued from the pilots	Enhanced government partnership with the private sector is key to sustaining this assumption. Pilots must be adequately supported to avert risks of missing learning opportunities from research trials.	MoPE supported by MoECCNAR GCCI & REAGAM

A RE fund established to promote training and enterprise development	Establishing a RE fund was inspirational and an encouragement for project sustenance	The government must formalise the RE Fund, encourage private sector contribution for augmentation and sustainability. Invest dedicated efforts to maintain confidence and fast-track fund utilization to enable recipients plan future investments particularly on RE technologies and systems.	MoPE PURA & REAGAM assisted

1 Introduction

1.1 Evaluation objectives and scope report

This report gives an account of the in-depth assessment of the UNIDO/GEF 5 RE project vis-à-vis performance of key parties associated with the project and governance of major interventions. The process also examined activities implemented, results achieved, risks identified, lessons learned and likelihood of sustainability after external support is phased out.

The purpose of this summative evaluation was to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. Specifically, the evaluation:

i. Assessed the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress toward impact; and,
ii. Developed an assortment of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

This terminal evaluation (TE) covered the whole duration of the project from its starting date of March 1st, 2015 to estimated completion date of December 31st, 2021. In particular, the analysis focused on design, implementation and management, stakeholder engagement, and monitoring and evaluation across the three strands of the project's performance targets (outcomes) as per the implementation logic:

i. Existence of strategy and regulation on the integration of small-medium scale RE systems in economic sectors
ii. Demonstrating technical feasibility and promoting investment – Demos and incentives for participating women and men
iii. Renewable energy projects entrepreneurship skills development – business portfolios and people's capacity

In order to contribute to evidence-based policies to better address renewable energy challenges in the country, attention was paid to areas such as policy and institutional frameworks, planning, funding/ co-financing, capacity and partnerships, as well as underlying challenges for RE development and growth.

1.2 Overview of the Project Context

Balancing actions between how people utilize natural resources and development ambitions, calls for just, fair and equitable approaches that provide for our current needs and safeguard our future in a more sustainable way[1]. Hence, building on the gains of the Millennium Development Goals (MDGs), the community of the United Nations made further commitments (2030 Agenda) that seek to ensure inter-generational equity with regards to availability of natural resources and eradication of absolute poverty through green economy[2]. This section presents the context of the GEF 5 Renewable Energy project and provides a solid anchor for RE policy and programme interventions in the Gambia.

1.2.1 Socio-Economic

The Republic of the Gambia is located in the drought-stricken Sahel of West Africa between latitudes 13^{o} and 14^{o} N and 16.30^{o} W; and occupies an area of 10,689 km^{2}. It has a population of 1,882,450 people (50.5 percent female and 49.5 percent male), growing at a rate of 3.3 percent, *(GBoS Census, 2013)*. With a

[1] Transforming our world: the 2030 agenda for sustainable development, (UNDP, 2016)
[2] Low emission and climate change adaptation actions, jotoafrika (April issue, 2016)

population density of 201.43 persons per km², the Gambia is one of the highest in Africa, putting extreme pressures on the productive sectors of the economy.

The Gambia has a youthful population with 72.7 percent under 30 years[3]. Youth and women are key drivers of change in the economic growth of the country (including agriculture) but whose potentials have not been fully exploited. They constitute a significant portion of the population and can be potential enablers of RE economic transformation.

The Gambia is a signatory to many Multilateral Agreements and implemented series of reforms in close collaboration with its international partners. This evaluation comes on the heels of various global economic crises, e.g. COVID 19 pandemic and Russia/Ukraine war, all too critical for sustaining development gains.

The main drivers of the Gambia's economy are the Agriculture and the Services Sectors (GBoS, 2013). The Vision 2020, The Gambia Inc. (Expired) was the main anchor, having set the tone for the direction of the economy towards achieving the National Development Plans (PRSPs, PAGE) and the Millennium Development Goals.

> "transform The Gambia into a financial centre, a tourist paradise, a trading export- oriented agricultural and manufacturing nation, thriving on free market policies and a vibrant private sector, sustained by a well-educated, skilled, healthy, self-reliant and enterprising population, guaranteeing a well-balanced ecosystem and a decent standard of living for all, under a system of government based on the consent of the citizenry"
>
> ***..."VISION 2020. The Gambia Inc"..***

The Gambia is amongst the Least Developed Countries (LDCs) with (GDP) per capita recorded at 809.40 US dollars in 2019 (World Bank). Agriculture forms the backbone of the economy with nearly 70 percent of the working population involved in the sector and contributing 30% to GDP. The services sector though, is the biggest contributor to GDP, at 60 percent. The Industrial sector is very small and its contribution to GDP is estimated to be only 9%. The limited amount of manufacturing is primarily agriculturally based (e.g., food processing)[4]. Agriculture remains a prime sector with potential to grow small and medium industries to serve particularly the rural population. Yet, performance of the sector continues to be challenged especially by limited technologies.

The tourism industry is one of the fastest growing sectors of the economy, and provides significant foreign exchange earnings and employment. The industry is highly urbanized and depends heavily on costly NAWEC overhead mini-grids and private stand-by generators for electricity supplies with attendant pollution problems these cause the environment. The potential to expand to rural areas for eco-tourism - essential nature-based products that could attract tourists and generate income for the residents can also be limited, as long as these sites remain off the national grids and without alternative energy sources. The lack of or poor electricity supplies undermines rural community-based tourism and other business opportunities, e.g. household micro-enterprise development.

The role of the industrial sector as the engine of growth has been widely acknowledged in development literature, which also established a strong correlation between the growth of industry/manufacturing output and the growth of GDP[5]. Thus, with the right policies, the sector can propel the economy, create jobs, employment and improve living standards[6] by diversifying and expanding the domestic manufacturing and enterprise base. However, to achieve this, would require investments in electricity connection and indeed renewable energy to make the investments more sustainable. The Government of the Gambia (GoTG) in its overarching policy statement (Vision 2020) intimated the importance of industry and its vital role in economic

[3] Population Census, GBoS, 2013

[4] Renewable Energy Study: "Energy Demand Assessment and Projection" (The Gambia, 2005)

[5] Role of Industrialization on Economic Growth: The Experience of Senegal (1960-2017). American Journal of Industrial and Business Management, 8, 2072-2085, (2018)

development. Regrettably, the Gambia's first generation PRSPs failed to take advantage of this consciousness and like its peers in the group of LDCs has not been very explicit on the role of energy services in the economy during MDG implementation.

1.2.2 Climate change and Environment

The Gambia's environmental concerns include deforestation, desertification, pollution, population pressures, unsustainable use of natural resources and weak institutional and regulatory mechanisms for protection and enforcement. The environment situation is worsening due to impacts of climate change and climate variation, which threaten the key sectors of the national economy and have the potential to reverse the development gains in poverty reduction. For instance, the unprecedented erratic rains experienced between 2006 and 2013, and recently in 2020; have led to serious destruction of vital infrastructure, property loss including lives. On the other hand, failure of the rains caused serious drought, crop failure and food insecurity, limiting national efforts to attain National Development Plans targets and the SDGs. The need to mainstream environmental considerations into national development policies, plans and strategies, therefore, becomes urgent and imperative.

Given that the rural poor depend on the availability of natural resources for their livelihoods, efforts to conserve natural resources and reduce pollution may not succeed without opportunities for local people to feed themselves. Thus, Government agencies and development partners like the UNDP initiated measures such as capacity development for achieving environmental sustainability in the Gambia.

1.2.3 The energy sector

Electricity is fundamental to the socioeconomic wellbeing of Gambians. However, the sub-sector suffers from low electrification rate (only 35 per cent of the population have access); high electricity tariff, due to heavy dependence on fossil fuel; low operational efficiency of the utility company, and high electricity losses, mainly due to ageing generators, transmission and distribution infrastructure[7]. The National Electricity and Water Company (NAWEC) is therefore challenged and finds it extremely difficult to meet consumer demand and service the growing import oil bills particularly for electricity generation.

Hence, the availability and supply of modern energy services are crucial for the development of the productive sectors and value addition; improvement in services for the domestic sector, all contributing to economic growth[8]. The lack of reliable power and the high cost of energy are seriously limiting investment in The Gambia and restricting growth in productive sectors such as agro-processing and manufacturing. With the rapidly expanding economy, a substantial increase in the energy supply is urgently needed to meet current demand and forestall major shortages in the future[9].

The in depth assessment of the Gambia's energy sector[10], showed that the energy resource base of the country is limited and supply of energy is unreliable and unsustainable. The electric power supply has, over the last three decades been grossly inadequate, inefficient, erratic and extremely unreliable, negatively impacting on investment and production. The over-reliance of the city and major urban centres on fuel wood and charcoal is destroying the country's forest resources and natural vegetation cover at an alarming rate, reducing the country's capability to cushion climate change impacts and causing wide-ranging environmental degradation.

[7] Program for Accelerated Growth and Employment (PAGE 2012-2015)
[8] Sustainable Energy for All (SE4All): Rapid Assessment and Gap Analysis, (The Gambia, 2012)
[9] National Energy Policy (2015-2020); UNIDO/GEF 5 Project Document (ProDoc)
[10] Renewable Energy Study: "Energy Demand Assessment and Projection" (The Gambia, 2005)

1.3 Overview of the Project

The energy sector in The Gambia is characterized by low levels of access to modern energy services, high dependence on traditional biomass fuels and an unsustainable dependence on imported fossil fuels for electricity generation. The Gambia's electricity prices are among the highest in the world, which makes solar and other cheap energy sources attractive alternatives. With rising population, demand for energy has increased and far outstripped the ability of the state-owned utility, NAWEC, to supply the country[11].

The total installed electricity capacity of The Gambia is just over 100 megawatts (MW) with actual generation levels at approximately 40MW and excess demand levels at 50 MW. Nationwide, roughly half of the population has access to electricity, leaving significant room for growth in the energy market to bolster economic activity throughout the country. In the rural-urban divide, only 13 percent of rural population and 71 percent of urban population have access to electricity. The Electricity Act of 2004 partially liberalized the energy market, essentially opening up electricity generation to independent power producers (IPPs). Also, in March 2019, NAWEC launched the clean energy program[12].

The potential for solar energy in the Gambia is immense, receiving roughly 3,000 hours of sunshine yearly. The minimum daily solar production capacity of The Gambia is 4kWh solar power radiation per square meter. The National Development Plan (NDP, 2018 -2021) sought to increase the share of renewable energy from 2 to 40 percent so as to improve efficiency, promote green energy and substantially reduce the high cost of energy and burden on Gambians.

The Government is committed through policy and regulatory frameworks to address the energy deficits in the country, and has set high targets for renewable electricity coverage by 2030. It 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 government is encouraging use of other energy sources and at the moment utilisation of solar PV equipment is increasing in the country for industrial, commercial and domestic uses. The Gambia is a signatory to the ECOWAS pledge to have renewable energy account for 10 percent of the total energy generated in the country by 2020. Currently, 98 percent of the power generated and distributed by NAWEC is sourced from fossil fuels. Several other options for renewable energy remain underexplored.

The UNIDO in partnership with the Ministry of Petroleum and Energy (MoPE) and the National Environment Agency (NEA) implemented six demo projects aimed at reducing greenhouse gas (GHG) emissions by developing and promoting a market environment that will stimulate investments in renewable energy in The Gambia. Experiences and lessons learned from the pilot projects are expected to induce capital incentive for women and youth to develop high impact renewable energy projects focusing on the productive sectors.

[11] International Trade Administration, U.S. Department of Commerce, 1401 Constitution Ave NW Washington, DC 20230, (2020), Accessed, May 2022

[12] Strategic Electricity Sub-sector Roadmap 2021 – 2040, Cabinet Approved, November, 2021

1.4 Theory of Change (ToC)

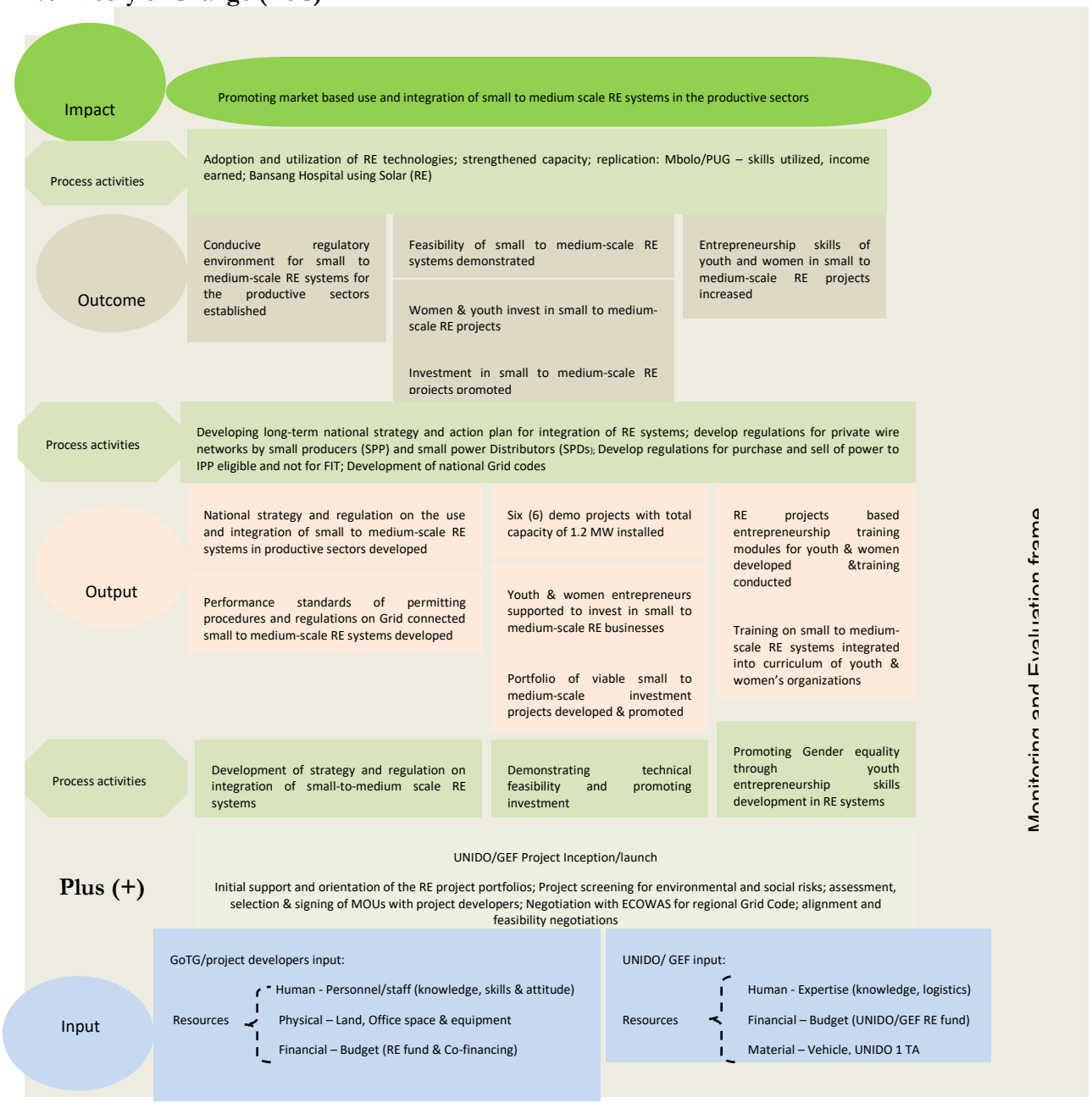

Figure 1: Critical change/impact pathway

1.5 Evaluation Methodology

The ET employed the theory of change approach and selected techniques based on their comparative advantage and the value each would add to the mixed bag. The process involved a comprehensive desk review and stakeholder consultation with project developers, beneficiaries, regulators and policy makers involved with the project, and site visits to identified demo projects. Majorly, qualitative and participatory approaches were the key techniques used for constructive consultations with identified stakeholders. This approach collected data from various sources and informants at both policy and practice levels for the triangulation of the different perspectives.

The survey questions raised issues consistent with the UNIDO Evaluation criteria and guidelines as a basis for assessing the change pathway towards the attainment of the project's intended objectives. The GEF policy guidelines for conducting terminal evaluations and relevant standards for GEF implementing and executing agencies were equally observed. The OECD/DAC main evaluation criteria and questions (**Relevance, Coherence, Effectiveness, Efficiency, Impact and Sustainability)** were used as guidelines for the evaluation process and reporting. The assessment covered project design, targets, implementation, results and follow up issues. It further analysed project outcomes and impact with a view to generating evidence-based propositions to inform future programmes formulation on integration of sustainable RE systems in the productive sectors.

The materiality and extent of project co-financing and its administration were also cross-checked against plans and reasons for any amendments analysed. The ET also evaluated the risk table for any emerging risks and the adequacy or otherwise of the mitigation measures employed to reduce their impacts on project outcomes. Mainstreaming cross-cutting gender issues in the RE project design and execution was also examined during data collection.

1.5.1 Data collection methods (techniques/tools)

1.5.1.1 Desk Review

A comprehensive review of the relevant documents was done and the information obtained used to inform the development of the guidelines (tools and indicators), and the report content. Current and contemporary literature on good practices were used to conduct policy and impact analysis of the RE project pilot interventions in the country. The book review further assessed the extent to which the project objectives were aligned with Government of the Gambia's priorities and SDG 9 of the 2030 Agenda. The specific policy outcomes were cross-referenced with the primary data that was generated during the key informant interviews.

The review of these documents enabled the team to better understand the background and context of the project, attendant limitations, challenges involved during conceptualization as well as anticipated outputs, outcomes and change dynamics. Appraising these documents helped the consultants accomplish most of the specific tasks and also compliment the other assignments suggested in the ToR.

1.5.1.2 Interview of key informants

The consultants had interviews with the identified/listed stakeholders (key informants) across project communities, especially with people who have in-depth knowledge about their institutions and the project environment. Interviews were conducted with representatives of the six project developers[13] on site and

[13] Medical Research Council (MRC); Power up Gambia/ Bwiam General Hospital, Foni; Gambia Chamber of Commerce and Industry (GCCI); Gambia National Petroleum Corporation (GNPC); Green Tech Company Ltd (The Gambia); Mbolo Association; and NAWEC

NAWEC. Interview sessions were also conducted with the policy and regulatory authorities of the Ministry of Petroleum and Energy (MOPE) and Public Utilities Regulatory Agency (PURA), and the UNIDO Project Management Unit, Gambia (PMU/G).

1.5.1.3 Focus Group Discussions (FGDs)/Observations/Case studies

The FGD sessions, observations and case studies were planned to be conducted with the primary project beneficiaries in communities. However, this exercise was a missed opportunity being limited by factors beyond the Evaluation Team's (ET) control. In some instances though, discussions with project developers were held in groups

1.5.1.4 Data collation and Analysis

Findings from the interviews and observations were summarised and collated in line with the requirements of the TOR. The ET made follow up calls to developers and policy hubs to further clarify issues that raised concerns.

The COVID situation in the country has not posed major threats for the field/project site visits due to the limited numbers involved. However, some caution was exercised by the team, and in the process observed WHO and GoTG's guidelines on COVID 19 prevention measures.

1.6 Limitations of the Evaluation

The duration of the evaluation was short for the amount of work required, which did not give space for qualitative and deeper community consultations, which was the main assessment technique for this evaluation.

Overlap of GEF 5 project and its predecessor and change of leadership in the middle of this evaluation. In one meeting it was not until several minutes had passed before we realised much of the responses related to GEF 4 and 6 implementation before discussions were retracted.

Data from stakeholders was not straight-flow and coming in bits and pieces, and for some too late especially for key results areas and critical for rating of performance.

Difficulty securing meetings and change of scheduled meeting dates for some stakeholders/respondents. Also failure of some respondents to complete the Key Informants interview questionnaire was considerable.

2 Project's contribution to Development Results - Effectiveness and Impact

2.1 Project's achieved results and overall effectiveness

Majority of the RE developers negotiated amendments to their original plans either reducing targets or time extension due to implementation delays. For instance, GCCI sought and received no-objection to scale down its solar generation capacity from 109.25KW to 106.52KW; and Power Up Gambia (PUG)/ Bwiam Hospital from 110 KW to 64 KW, due mainly to difficulty in securing the requisite co-funding. On the other hand, GNPC and Greentech sought for extension due to circumstantial delays. At the time of writing this evaluation report Greentech was still testing the efficacy of the biogas generators in meeting the required temperatures for competitive production. As detailed in section 2.2.2.2 below, two developers (GCCI and PUG) forged new partnerships and raised additional funds to support their initiatives. Despite these changes, progress towards achieving planned targets though challenging, has been steady for all model projects.

Given the objectives set against the baseline, the systematic assessment of implementation status through data collected from desk review, field consultations and questionnaire administration, documented the extent to which targeted outputs and outcomes of the project have or have not been met. To start with, stakeholder's financing portfolio (budget) interacted with people's knowledge, skills and expertise, and key assumptions to produce targeted outputs and outcomes as demonstrated in the critical change pathways (Fig 1). The table (adapted) below presents a summary analysis of the extent to which delivery of project outputs and achievement of outcomes have progressed in line with the theory of change. The rating adopted and applied UNIDO's six-point rating system, i.e. 6 (highly satisfactory) to 1 (highly unsatisfactory) to assess performance of project indicators, detailed in the table below:

Table 1: Project results achieved and overall effectiveness

Expected results	Indicator	Baseline	End-of-project target		Achievement rating	Justification for rating
			Target	Actual		
Component 1: Develop strategy and regulation on the integration of small to medium scale RE system						
Outcome 1.	1. Adoption of regulation and tariff system for private wire networks 2. Adoption of regulation for the operation of SPP 3. Adoption of grid code for the integration of RE	1. RE law and FIT rules exist 2. Regulation. for operationlisation of the law and grid code do not exist	1. Regulations for governing the operations of private wire networks & SPP are developed & adopted 2. Recommendations from the study on the grid capacity are being implemented & the grid code as well	NA	**2 Moderately satisfactory**	The RE Act, 2013 (not planned) reported achieved. No evidence of regulations passed on Actual plan targets under review (e.g. FIT; Grid codes; SPP, Private wire networks) seen. Hence, the core targets remained substantially missed and under achieved.
Output 1.1	Regulations developed & adopted for the operation of private wire networks	No RE regulation in place	1. Regulation on small to medium scale RE systems developed & adopted 2. Grid code developed & adopted	NA	2 Moderately satisfactory	
Output 1.2	1. Regulations developed & adopted for the operation of SPP 2. Grid code and performance standards developed and adopted	1. No RE regulations in place 2. Absence of study on grid absorption capacity & grid code	1. Regulations developed and adopted 2. Grid code developed and adopted	NA	2 Moderately satisfactory	
Component 2: Demonstrating technical feasibility and promoting investments						
Outcome 2.1	Increased deployment of RE systems in servicing a wide range of productive activities	Productive use of RE focused mainly in the Tourism sector & in terms of service, water heating	At least a 50% increase in the use of RE for alternative purposes	NA	4: Moderately satisfactory	The target of installing 1.2 MW of solar fields was largely met less the Biomass Generator. High participation, high investment and leadership demonstrated by developers/innovators.
Outcome 2.2	Enhanced private sector participation in the development of the RE market	Low private sector	At least 50% increase in the	Highly promising	4: Moderately	

		participation in the RE market	number of IPPs in the RE market		Satisfactory	Due to the unfinished Biomass Generator project the target 50% increase for productive use in tourism sector was under achieved. Evidence of established RE business portfolios and employment records not seen. Expectations fairly met and balanced. Yet there is still some level of concern about the business portfolio establishments under review for the tourism sector.
Output 2.1	Total installed capacity of portfolio projects	UNIDO/GEF 4 demonstration project 2X450KVA & one 150KVA wind	1.2 MW installed by 2017	1255 kW (1.3MW)	5: Highly Satisfactory	
Output 2.2	1. No. of RE businesses established by youth & women 2. No. of young women & men employed (or self employed) in RE sector (at least 50% are women)	None	At least 10 new businesses established with 5 of them headed by women		5: Satisfactory	
Output 2.3	No. of pipeline projects in the portfolio	None	At least 10 viable projects are identified	7 selected	5: Satisfactory	
Component 3: promoting gender equality through youth RE entrepreneurship skills development						
Outcome 3.1:	No. of young people engaged in RE businesses	None	At least 10 young people are engaged in RE businesses		5: Satisfactory	Discussions with PURA indicated implementing some training sessions with women and youth during the period under review. Monitoring reports showed PURA facilitated training of representatives of Youth Farmers Association, Eye Africa online TV, and Barry enterprise on basic project management principles. Training on Entrepreneurship conducted for some 20 participants. . Training Modules on RE developed by consultants hired by UNIDO. One of the modules is on RE entrepreneurship .There was evidence of accomplished youth and women's training activities through the RE fund, however,
Output 3.1	No of trainings conducted	None	At least 5 ToTs sessions & 60 trainings conducted for youth (with over 50% women)		3: Moderately satisfactory	
Output 3.2	1. No. of enrolments on the RE Enterprise Program 2. No. of young men & women trained	None	1. At least 30 new enrolments 2. At least 15 young men & 15 young women trained		4: Moderately satisfactory	
Component 4: Monitoring and evaluation						
Outcome 4.1	Project monitored and evaluated	None	1. Monitoring visits 2. Monitoring reports		4: Moderately satisfactory	Ten (10) reports on monitoring visits undertaken by PMU were seen. Significance of this number without a baseline could not be established. Although the terminal evaluation is on-going, the Mid-term review was a missed opportunity. However, with only two staff at the PMU, performance is significant and above expectations
Output 4.1	Mid-term and end-project evaluation reports	None	Evaluation reports		4: Moderately satisfactory	

Explanation of process and results (Table 1 above)

Project outcome 1: Strategy and regulations developed on the integration of small to medium scale RE system

On development of strategy and regulations, MoPE advised the project to consider the ministry's on-going assignment on RE policy related initiatives, e.g. the Green Mini-Grid (GMG) Project to avoid duplication. Consequently, the PSC meeting of July 7th, 2017 agreed and decided to reallocate the activity line budget for entrepreneurship training. Although the PSC endorsement (minutes) existed, no further communication/advice on the process of reallocation, e.g. approval for budget movement and utilization, and variance reports, was seen. The Project Implementation Report (PIR) for the period July 2020 – June 2021 on the other hand, indicated that FIT model was developed and further support was being sought from EU Delegation office to develop Net Metering Guidelines. The report further stated; *'in light of the above, UNIDO and MoPE agreed to reallocate the budget for the training of the PSC'.* A training was eventually carried out for GEF6 PSC members on RE in the last quarter of 2021. The PSC members of GEF6 are the same as that of GEF5 except that GCCI is replaced by TGSB. Training modules were developed by two consultants hired by UNIDO. Some of the modules included Climate Change, Gender Renewable Energy and Regulation. National Platform members for Nexus Issues also benefitted from this training. A training report was compiled by the consultants and a copy of the modules/Toolkit was given to the participants. Field trips to GEF5 RE sites including Fandema were conducted during the training. The RE Act, 2013, facilitated under GEF 4 was in place, and some FGD sources indicated process towards developing the proposed by-laws and regulations. This activity was rated: **2: MODERATELY SATISFACTORY.**

Project outcome 2: Demonstrating technical feasibility and promoting investments

The target of installing 1.2 MW of solar fields was largely met, even though the target for the biomass Gasifier remained underachieved. The high participation, leadership and the huge investment put in by first time innovators/developers clearly demonstrated potential and is promising for up scaling of the pilot projects. The high co-financing cost was reported and remained a concern for the project developers. The successful lessons from the models will not only benefit the developers but more importantly the country, ECOWAS and beyond.

The ET could not get to see the established businesses in the field due to time limitations. However, its review of project reports revealed that 1, 255 kilowatts of PV solar were installed for 8 different RE related projects throughout the country, benefitting (youth and women) individual and community business ventures.

The achievement on the solar target; high commitment demonstrated by the developers under the circumstances and the number of business portfolios established by women and youth for self employment, overall have reasonably satisfied expectations for the component. Yet there are shortcomings and concerns in regard to performance. Therefore the activity was rated: **4: MODERATELY SATISFACTORY.**

Project outcome 3: promoting gender equality through youth RE entrepreneurship skills development

Discussions with PURA indicated implementing some training sessions with women and youth during the period under review. Monitoring reports indicated that PURA facilitated training of representatives of three beneficiary project portfolios, (Youth Farmers Association of Gunjur Sambouya; Eye Africa online TV at Wellingara; and Barry enterprise) on basic project management principles.

Having identified and selected WYE participants, PURA facilitated training for representatives of beneficiary groups and individuals on Essentials of RE systems, basic business concepts and principles using experiences from case studies. There was evidence of accomplished youth and women's training activities through the

RE fund, however, achievement of the output targets was considered short of anticipated results and the activity was rated: **4: MODERATELY SATISFACTORY**

Project outcome 4: Monitoring and evaluation

A fairly good number (10) of monitoring visits were undertaken by the PMU, as observed from trek reports. A review of the project implementation plan showed the number of monitoring visits over two and a half years, which coincides with the ten visits reported. The terminal evaluation is on-going but the Mid-term review was a missed opportunity. However, considering the number of staff (only two) at the PMU and their position within the project management circle substantial progress was registered. Without a dedicated staff for the function, integrating the project M&E function into the established MoPE system would have been more progressive and sustainable. Therefore the activity was rated: 4: MODERATELY SATISFACTORY

2.2 Progress towards impact

2.2.1 Behavioral change

2.2.1.1 Economically competitive - Advancing economic competitiveness

The financing plan estimated US $ 4,495,023 to implement the four project outcomes including project management cost. Out of this 70.6% (US $3,175,388) was co-financing amount and 29.4% (US $1,319,635) was GEF/other contributions. Fig 2 shows summary budget allocations to different project outcomes as represented in chart below.

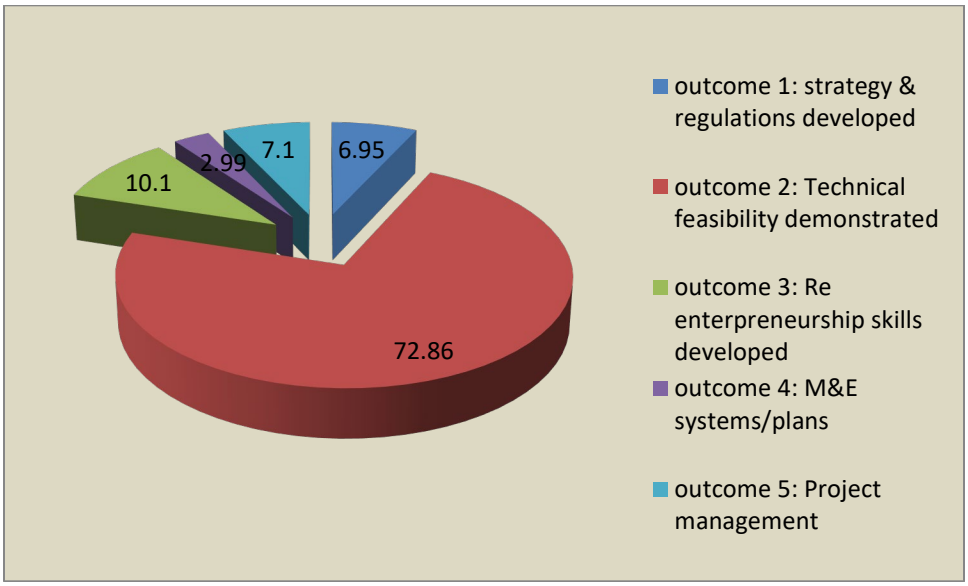

Fig 2: Budget allocations to project outcomes

The UNIDO budget execution (Grant n. 2000003014) on the other hand showed a total expenditure of US $1,296,552.52 over the seven-year project period (2015 – 2021). Details of annual expenditures are also represented in the following chart.

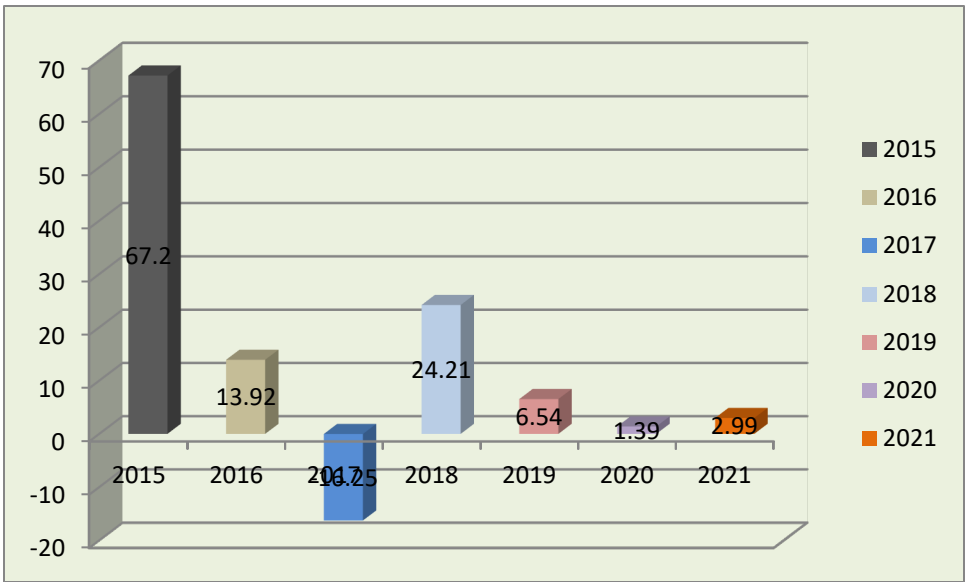

Fig 3: Annual budget expenditure figures

The potential of RE systems to support economic activities and well-being of people has been well documented and also confirmed by stories generated from trials in the Gambia. Reports indicated that the two 450 kW wind system installed in Tanji (2012) through UNIDO GEF 4 demonstration project and the 120 kW Grid-tied community initiated wind project in Bato kunku were both functional and had in the past, contributed to the economic activities and welfare of people in these communities[14]. On the other hand, the costly and highly dependent fossil fuel based electricity from the grid, continues to dominate the supply chain, hikes up production cost, discourages investment and limits growth in the productive sectors. This notwithstanding, the Gambian economy continues to persistently and almost entirely rely on fossil fuels for production activities. The six RE pilot projects have amply demonstrated some financial gains (economic benefits) derived thus far, from installation of solar fields in their various locations. Our field consultations with developers and to some extent desk reviews, revealed as follows:

a) **Power up Gambia/Sulayman Junkung General Hospital (SJGH), Bwiam**

Fig. 4: Solar energy system – connected wards @ SJGH, Bwiam

Power up Gambia in partnership with the Ministry of Health and Social Welfare (MoHSW) installed 64 kW at Sulayman Junkung General Hospital in Bwiam in 2018. This solar field now provides reliable electricity serving the critical units of Surgical, pediatric, medical school blocks. Solar resources are now substituting for some of the fossil fuel use at the hospital. Reliable and unfailing power supplies especially to sections like the surgical unit, labour ward, laboratories etc. ensure timely and quality health care and patient services while averting risks associated with frequent power outages from the NAWEC grid. The hospital serves populations in the entire five districts of Foni, parts of Kiang west and nearby Casamance villages. It was reported during the FGDs and feedback through the

[14] GEF 5 project terminal evaluation FGD (2022) and GEF UNIDO CC – M Gambia, 5609 (2014)

questionnaire that all engineering work was done by the hospital technicians/electricians (men and women) with supervision by an international consultant, while enhancing on-the-job skills and after service maintenance capacity of the technicians involved.

> "…The inverters keep a running tally and recorded 339.5 Megawatt hours of clean solar energy for the hospital's use and for the NAWEC's grid since the project was commissioned in 2018…"
>
> Lynn McConville, (KII, 2022)

According to respondents, an anticipated additional 100 kW solar field under a feed in tariff would help finance sustainability. The project was replicated at Bansang hospital (another major referral center) with a capacity of 54 kW installed and running on robust Lithium ion Batteries, which last longer.

b) **University of the Gambia (UTG)**

The UTG and a private contractor, Gam Solar installed 100 kWp solar system connecting the Chancery - main administration building, School of Information Technology and Communication, and the Faculty of law. While the Vice Chancellor (VC) of the University described impact of the project as positive, citing regular electricity supplies and convenience in administration, the project focal person remarked; ***"installation of the solar facility saved the university a monthly payment of D1.4 million to NAWEC between January and May 2022".*** The Evaluation Team (ET) could not ascertain the impact on student learners as they were not contacted for their views and also because the pilot was yet to be completed/certified.

The VC informed the ET that there are plans to secure and install additional 100 MW from other sources to power the Faraba Banta main campus and the remaining blocks at Kanifing. Also, there is an on-going D154 million partnership with the German Federal Ministry of Education and Research, for a 4-year climate project (started in 2021) with RE component.

c) **Gambia Chamber of Commerce and Industry (GCCI)**

The GCCI also reported making nearly D700, 000 in savings on electricity bills since the solar facility was inaugurated in 2019. Although the commissioning of a 20kW for their office at Bijilo and another 80 kW at its Trade Fair Grounds improved service delivery, they did not report on any local skills built because their facility was installed exclusively by a consultant. Installing solar facility at the trade fair grounds was strategic and an advocacy measure to popularize the technology for social acceptance and market expansion. The partnership forged with AfDB enabled the GCCI access additional funds to fill their funding gap and achieve the solar project targets.

Fig 5: Vice President Dr. Isatou Touray (with GCCI CEO, Alieu Secka) visits the GCCI Trade Fair Grounds with electricity supplied by solar in Bijilo

d) **Mbolo Association**

The UNIDO/GEF 5 demonstration project built on GEF 4 experience with Mbolo Association/Fandema women's development centre in Tujering. Fandema/Mbolo Association trained women on design, installation and maintenance of photovoltaic systems and other vocational skills, e.g., construction of energy-saving-cook-stoves, for income generation. The Fandema centre for sustainable community development, offers vocational training for women, especially those with limited schooling (drop-outs), to give them technical skills and economic opportunities in society[15]. Mbolo produced 5,000 face masks during COVID 19 pandemic; developed a laundry service and set up an independent women's cooperative as alternative business strategies. They also forged linkage with Group Juboo, a groundnut marketing and business hub in Upper Saloum, CRR North to process groundnuts into oil and other products, using solar.

e) **Medical Research Council (MRC)**

The MRC installed 501 kW solar systems, the largest array of solar panels in the country. The installation service was delivered by Azimut 360 RE Company in Spain, in collaboration with the women from Mbolo association. Both the MRC Headquarters in Bakau and field office in Manduar, Kiang West benefitted. The MRC carries out science-led research into public health and disease and offers medical services to the population in the Gambia. The project did not only bring cost savings to MRC but also contributes to operating within a friendly energy-environment. In the process, the Unit transformed the reliability and cost of its electricity supply by saving an estimated 290 tonnes of CO2 emissions and reduced fuel consumption by 103,000 liters per year.

"It is hoped that this project will be a catalyst and inspiration to the members of the ordinary population of the country that visit our clinical services to think more about green/renewable energy resources"[16], added David Mwakanma, Chief Operations Officer (COO).

f) National Water and Electricity Company (NAWEC)

Our discussions with NAWEC revealed that their inability to actualize the 500KW solar PV in Farafenni was due to co-financing constraints. The representative confirmed setting up a RE unit for solar integration and

[15] TE FGD, Mbolo Association, (Tujering, 06/06/2022)
[16] TE KII, MRC, Gambia, (Bakau, 02/06/2022)

promotion within the energy mix. He lamented however, the lack of capacity within but are now training staff on RE at the heels of the World Bank (WB) funded 20 MW RE project located in Jamburr. The respondent Mr. Mr. Edriss Jarju, Deputy Managing Director deplored the lack of FIT (Draft, 2015) and other regulations, which are impediments to enhanced private sector participation. At the same time, he lauded the gains with the current Net Metering as well as on-going negotiations with both commercial and household customers.

2.2.1.2 Environmentally sound – Safeguarding environment

The dominant variable in the Gambia's energy mix is woodfuel, constituting firewood and wood charcoal, accounting for nearly 79%. The indiscriminate extraction of wood threatens the health of the forests thus reducing the latter's ability to cope with GHG emission and the broader environmental shocks. Hence the UNIDO GEF 5 initiated demonstration projects to develop alternative sustainable energy models and reverse this trend. The ET visited all six pilot demos to examine potential for replication and scale-up of the initiatives undertaken so far.

The 5 established solar photovoltaic projects and the biomass-based Gasifier visited by the ET, have demonstrated good potential for replication, grid-connectivity and stand-alone power/electricity generation source. The accomplished pilot projects plus the Gasifier (in addition to existing RE technologies), when expanded are capable of contributing to GHG emission reduction; addressing the energy deficit; transforming the current energy profile; and driving the market-based deployment of small-medium scale renewable energy technologies in the country.

Table 2: Pilot Demo projects - performance table

	Innovator/Developer	**Plan (kW)**	**Achieved (kW)**	**Cumulative Kt CO_2 saved over project life**
1	Sulayman Junkung General Hospital (SJGH)	110	64	2.49
2	University of The Gambia (UTG)	100	100	3.89
3	Gambia Chamber of Commerce and Industry (GCCI)	109.25	106	4.12
4	Mbolo Association	20	20.7	0.78
5	Gambia National Petroleum Company (GNPC)	455.59	456	17.72
6	Medical Research Council (MRC/G)	500	501.33	19.49
7	Greentech (Not delivered)	60	NA	NA
	Total		**1.255 (1.3 MW)**	**48.49 Kt)**[17]

The investments and installation of 6 demonstration projects cumulatively achieved 1,277.03 kW, (approx. 1.3 MW) and by factor calculation, this is equivalent to approximately 297.52 (0.297Kt) of CO2 emission reduction. This data is skewed by the MRC/G figures because of the huge investment the health facility put into an on-going project.

Gasifiers rely on briquettes, a switch from wood fuels to products from agricultural waste and other biomass products to supply needs of major users primarily in the tourism industry.

[17] PMO corrected

The uptake and high investment in the green demos are encouraging signs of the leadership role the private sector intends to assume in promoting the technologies.

> "…this initiative also includes serving as a demo-site as per the UNIDO-GEF to enable replicability, through collaboration with the GTTI, and eventually scalability for use across sectors in the promotion of Renewable Energy (RE). The interest in the gasifier system being that it provides energy on demand without being dependent on imports or nature (i.e. sun and/or wind)…"
>
> …..Managing Director, GreetTech… (31/05/2022)

However, the innovators expressed concerns about government's slow pace of putting in the requisite regulations, and are worried that this may diminish their confidence and subsequently cause inertia in their mobilisation and expansion efforts. The non implementation of the feed-in tariffs and grid codes have equally dampened the developers' spirits and stunted their expectations.

2.2.1.3 Socially inclusive – Creating shared prosperity

The preparation of this RE project was quite participatory in view of the wide stakeholder consultations undertaken. As part of the preparatory process, the local banks and insurance companies were consulted, and they committed to engaging as co-financiers and to set up revolving funds to support investments in small to medium-scale renewable energy projects in Gambia. To begin with, selection of the 6 supported demo projects, though rigorous, it was very competitive, transparent and inclusive, and indeed ensured value for investment.

The government demonstrated high commitment to RE for sustainable development since 1984 by setting up the Gambia Renewable Energy Center (GREC), a special office dedicated to promoting the use of RE resources and adoption of the technology. Among other regulations, the RE law was also enacted in 2013 and provides the legal, economic and institutional basis for the promotion of RE in the country. The RE project was therefore strongly aligned with Government of The Gambia's (GoTG) development priorities, and the Sustainable Development Goals (SDG 9) of the 2030 agenda, all aimed at promoting investment for accelerating economic growth, sustainable development and poverty reduction.

The project has established a well defined delivery structure, an elaborate programme with clear and monitorable targets/indicators of performance. This was supported by an institutional framework and dedicated responsible offices and budget, to facilitate accountability and promoting the rights of project participants and especially the primary beneficiaries (vulnerable women and youth etc.). The partnership with the University of the Gambia (UTG) and Gambia Technical Training Institute (GTTI) is a strategic step towards building project related skills and capacity for the purpose of up scaling and expansion.

The government expressly encouraged the unconditional participation of women and youth entrepreneurs to take up RE and leverage their replication potential and also bring about transformational socio-economic change. This was demonstrated in some respects in recruitment and programme development and delivery. An RE Fund was created to support women and youth entrepreneurship RE projects.

The project administrators (PURA) and developers, e.g., Mbolo Association also provided training to their partners and beneficiaries in the communities for income generating ventures through skills for development.

2.2.2 Broader adoption

2.2.2.1 Mainstreaming

The Gambian electricity sub-sector is monopolized by the NAWEC, providing inadequate and often unreliable power supplies. Renewable energy constitutes only 1% of the total share of electricity generation. Literature has shown that renewable energy can advance considerably if governments enact and apply the

right mix of policies. Similarly, growth of renewable energy in the Gambia depends highly on development and adoption of a mix of strong policies and regulations that are RE sensitive. Off-grid electrification has become a policy priority for the Government of The Gambia (GoTG). The 2013-2014 Renewable Energy Act clarified some of The Gambia's feed-in tariff rules, including for the off-grid sector. The Act applied a tariff scheme for smaller generation systems (below 200 kW) in on-grid areas for the off-grid sector. However it did not fully establish the policies and regulations necessary to engage the private sector in off-grid market development. Regulations on the feed-in tariff will guarantee market stability and security of investors, bring about price stability and increase demand for renewable energy, while serving as incentives for grid operators. Although the GoTG has recognized the importance of the off-grid solar in electricity generation, it has yet to develop specific regulations to promote development of the sector, an opportunity missed during the UNIDO/GEF 5 project implementation.

With support from the ECOWAS Center for Renewable Energy and Energy Efficiency (ECREEE), the Government outlined its commitments and initiatives to develop renewable energy and meet its electrification targets in its National Renewable Energy Action Plan (NREAP)[18]. The GEF 4 project has set the foundation by supporting the development of the Renewable Energy Act (2013) and initiated several promotional activities to put RE at the centre of development policy. The outcome of the six (GEF 5) pilot projects (TE) clearly demonstrated feasibility and replicability of the (tested) technologies. Therefore, to sustain the schemes there is the expressed need to increase their recognition and integration into national social development policies and strategies. Apart from protecting and guiding the business operations, improving regulations will incentivize businesses to operate in a friendly environment. If the current policy framework continues to operate business as usual the adoption rate of RE will be slowed down and achieving low emission reductions targets will also be farfetched.

It is therefore urgent to develop effective ways of mainstreaming RE issues within and across sector reform initiatives and programmes driven by strong political will at national, regional and community levels. The policies developed subsequently, must facilitate access to quality markets, guarantee financial incentives, allow concessionary and low interest loans, and promote standards in education service delivery, encourage public participation and ownership in the RE development process. The regulations must also encourage through legislation, integration of RE into sector planning and strategies especially for PV systems to electrify off-grid health clinics, schools, and women's centers in the country.

Institutional and Market Actors in the Energy Sector need to strengthen relationships with each other and more especially the PPP unit of the MoFEA and develop stronger cooperation agreements (MOUs) to deliver the national RE agenda. Investing in building the national capacities of energy players in economic policy-making and poverty reduction is also a critical tool for RE mainstreaming. Integrate RE activities into the national planning and budgeting processes and increase the share of renewable energy in the total electricity generation and supply.

2.2.2.2 Up-scaling and Replication

Majority of Gambian households especially vulnerable women are accustomed to eking their livelihoods from climate sensitive natural resources, which they also use as source of energy for heating and cooking in the homes. Fossil-fuel based electricity supply is challenged in terms of efficiency to support the socio-economic development of the country. The RE system on the other hand, is fairly new and relatively low cost in the long term, but a reasonable alternative for providing sustainable electricity supplies for the productive sectors. Its adoption though, may be constrained by the initial investment cost and the shift into a new paradigm especially in a typically conservative society like the Gambia.

The Government's Renewable Energy Act (2013) set a foundation for feed-in tariff rules, including for the off-grid sector. Hence there is reasonable awareness in country on how to generate the next level policies and

[18] The least developed country report for the Gambia, (November, 2019)

regulations for the RE sector operations. The knowledge and experiences gathered thus far are important lessons that the Gambia can disseminate and share in country and across the ECOWAS community.

Considering the finance and credit constraints, the project innovators/ developers forged ahead and created new partnerships and invested massively in the RE pilot demos. For instance, the African Development Bank (AfDB) financed the GCCI project, paying the chamber's entire counterpart budget. Power up Gambia also sought and received solar panels on gratis from Johnson & Johnson Company in the US, which enabled them to complete the installation in Bwiam and replicate same in Bansang hospital with better and quality batteries. The willingness and ability of the developers to invest in these projects will certainly impact the replication of the demonstration projects and broaden the long-term market for renewable energy.

The GCCI is now totally dependent on solar for lighting both their office and exhibition centre in Bijilo. The electrification of the GCCI exhibition centre with solar arrays and battery banks is innovative and a model in the renewable energy market in the West African region. The tested model serves as good demonstration and potential for replication at varying scales in The Gambia and other ECOWAS Member States. The office and the exhibition center referred to as 'Kerr Jula' (home of business/entrepreneurship) has created an annual trade (fair) forum, open to national and international business exhibitions and good ground for promoting business as well as for learning and sharing. The Mbolo Association on the other hand, also used solar to electrify their training center, which offers capacity building in various skills and develops energy-efficient stoves and prototypes for energy saving. The center trained mainly girls who dropped out of mainstream schooling in "Non-traditional skills for women" such as solar fixing and maintenance. As mentioned earlier, Mbolo trained girls/women supported and installed the solar facilities for the Medical Research Council in Bakau in partnership with a Spanish solar consultant. The Public Utilities and Regulatory Authority (PURA) also received a total of 57 applications (60% women) for the Women and youth entrepreneurship fund and supported only 5 entrepreneurs. The remaining 52 are potential constituents for possible expansion of the project especially with more awareness considering the short period of public consultation and information dissemination.

These demonstration projects helped create business models to support broader replication in The Gambia and the ECOWAS region. The role of ECREEE in advocating and popularising these proven technologies and good practices, as a regional hub in RE is critical to disseminate the experiences across the ECOWAS and beyond.

The curriculum, training modules and materials developed (by Beltech, January 2017) to facilitate training (or training-of-trainers) workshops, in the Gambia are expected to facilitate the replications of similar training activities in other countries in the region (through knowledge exchange and collaboration). This Renewable Energy Curriculum for the country will serve as the national platform to build the human resource capacity of the country in this critical need area.

3. Project's quality and performance

3.1 Design

The project formulation process undertook a comprehensive approach to address the many barriers that could prevent the application of renewable energy in the productive sectors for economic growth. Key among them include; the lack of supportive regulatory framework, proof of viability and limited awareness and capacity of the people. An effective strategy based on the principles of public-private partnership; increasing awareness and building capacity on RE; and case studies on adaptability and replicability of the models and demonstration of potential to reduce GHG emissions, was also developed. A delivery structure (fig. 3, adapted from the ProDoc, Page 40), delineating roles and responsibilities of players, was clarified to implement activities in line with the established project framework for achieving results (planned outputs and expected outcomes). This was supported by an inclusive consultation with stakeholders to bring about country ownership, alignment and managing for results, perhaps in accordance with the Paris Declaration on Aid Effectiveness (2005) and Accra Agenda for Action (2008).

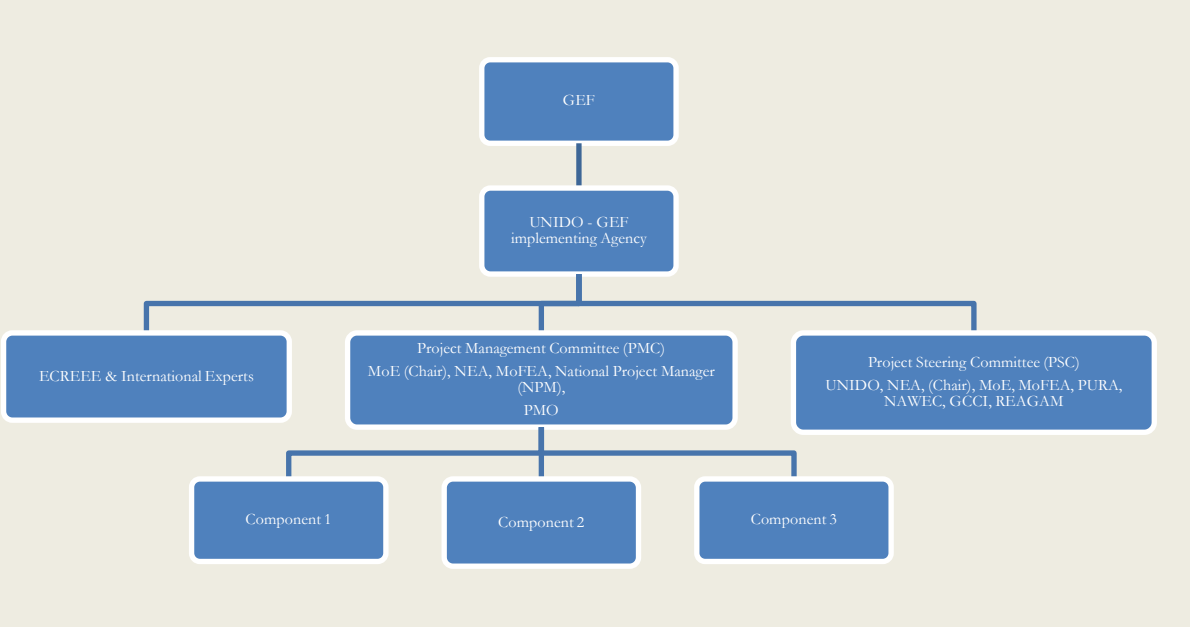

Fig. 6: Project implementation structure

Selection of the pilot projects was competitive, transparent and applied strict selection criteria based on clear Terms of Reference (ToR). The institutional framework was put in place and a co-financing modality also negotiated and agreed. Although measures to mitigate project barriers were identified and a dedicated budget for M&E estimated, an M&E plan was desired to assist the PMU detect and report on critical risks on time for remedial action.

However, projects are time bound and therefore require simple and clear structures devoid of conflicting roles. As per the structure, almost same members are represented in the governance structures of both PMC and PSC committees. Our consultations with stakeholders noted apparent overlaps, which seemed to have affected effectiveness in their service delivery as observed in the frequency of PSC meetings. From reports we received so far, the PSC held three (4) out of the proposed quarterly meetings supported by minutes, yet no minutes were shown for the planned monthly meetings of the PMC over the project duration. During the ET's meeting with the PMU, it was confirmed that while both committees' functions were indicative by design (ProDoc), the PSC's TOR was not fully developed up to the time of this evaluation. With only two staff at the PMU, the capacity was too limited to handle the management demands of the project, which affected their monitoring and supervision on regular basis. A review of the project management structure and arrangement to enhance good governance practices is desired. It is therefore imperative to consider a mixed approach upfront (Expert skills + national counterparts) if the alternative scenario to build national capacity will be effective and sustained in the long term.

Although relevant RE law (RE Act, 2013) was in place, this was insufficient to implement the Feed-in-Tariff (FIT) and the Grid codes without the second level regulations and strategies planned under GEF 5, which is still a gap. As per the reports seen, though training and skills development of target beneficiaries were successfully accomplished, there is yet the need to evaluate and ascertain the effectiveness of the trainings conducted based on the objectives and follow up actions determined.

3.2 Relevance

The project design took steps to align activities with the Government of The Gambia's priorities. Accordingly, the RE law was enacted in 2013 and set the legal, economic and institutional basis to promote the use of RE resources; the Programme for Accelerated growth and Employment (PAGE 2012 – 2015) and Gambia's National Energy policy (2015 – 2020) also identified the supply of adequate, affordable, reliable and environmentally friendly and sustainable energy services, as a key pillar to ending poverty in The Gambia and promoting investment for economic growth. The National Development Plan (NDP, 2018 – 2021), Vision 2020 incorporated, Second national communication of the Gambia to the United Nations Framework Convention on Climate Change (UNFCCC), National Electricity Act (2005) and other policies and strategies remain relevant to the RE ambitions. The RE objectives are consistent with and responsive to poverty reduction targets of the national development plans and related policy frameworks geared towards addressing the aspirations and human rights of Gambians across sections and sectors.

The project focus was also in alignment with UNIDO/GEF's policies and priorities of promoting industrial development for poverty reduction, inclusive globalization and environmental sustainability within partnership cooperation frameworks with member countries of the United Nations. Its mandate in relation to the SGDs/2030 Agenda is to promote and accelerate inclusive and sustainable industrial development and facilitate countries like the Gambia's transitioning phase. The table presents the project's linkages with the National Development Plan (NDP 2018 – 2021) and Sustainable Development Goals (SDGs, 2015 - 2030), some by proxy.

Table 3: Strategic linkage with NDP and SDGs

Project Priority Area	Outcome Indicator	NDP priority	SDG priority
Promote market based use and integration of small to medium scale RE systems in the productive sectors	Conducive regulatory environment for small to medium scale RE systems for the productive sectors established	1; 3; 9; 14	1; 16; 17
Demonstrate technical feasibility and promote investment in small to medium scale RE systems	Feasibility of small to medium scale RE systems demonstrated	5; 8; 12; 14	1; 7; 9; 11; 13; 17
	Women and youth invest in small to medium scale RE projects		
	Investment in small to medium scale RE systems promoted		
Renewable energy projects entrepreneurship skills development	Entrepreneurship skills of youth and women in small to medium scale RE projects increased	2; 3; 4; 7; 8; 10	4; 5; 10; 12; 17

3.3 Efficiency

Co-financing was a major part of this project. According to records, 14 agencies committed and pledged different amounts in cash and kind to co-finance the RE demos. However, only six fulfilled the conditions and proceeded to implementation level, which many blamed on the high cost of the co-fund. From records and interviews with participants, it was disclosed that the committed co-financing largely, did not materialize. And even the few that did and engaged in the pilots, experienced delays due to slow flow of co-funds and in some instances institutional bureaucracy. Despite the clarity in the ProDoc that UNIDO's contribution

would be between 20 to 30 percent of project cost, the project developers felt this was too low especially for pilot/ research initiatives. Almost all the projects combined both local and outside expertise especially for installation and also enterprise development trainings. Even though some developers got involved in the pilot demos, what seems unclear though is whether adequate sensitization was done in advance to create understanding especially about the co-financing and its modus operandum.

Project outcome 1: Develop strategy and regulation on integration of small to medium scale RE systems

The RE Act (2013) was developed through GEF 4 support creating the enabling environment for subsidiary regulations and strategies for the integration of small to medium scale RE systems in productive sectors. The dedicated budget under GEF 5 to develop the second level policy instruments was redirected through a decision of the PSC meeting of July 7th, 2017, for training of PSC members on the important technical issues of Renewable energy and energy efficiency. The PSC training was conducted and hopefully created awareness on issues and benefitted members. Hitherto, the relevant supporting regulations and standards are yet to be in place which hindered and may further delay integration of RE systems in productive sectors. These laws are critical and still relevant for achieving project targets.

Project outcome 2: Demonstrate technical feasibility and promote investment in small to medium scale RE systems

The six demo projects collectively installed approximately 1.3 MW of solar systems, (slightly above the target 1.2 MW) with corresponding reduction in anticipated emission reduction targets. The ET could not determine the actual budget reduction or variance as no expenditure performance reports were seen at the level of PMU for review. Project based enterprise training modules were developed and some training sessions conducted. Mainstreaming or integrating Small and Medium Scale (SMS) training into youth and women's organisations has been demonstrated with installation of RE solar systems for WYE development..

During an interview with Greentech personnel, the ET was informed that their initial budget of 350,000 euro, based on a researched European prototype was revised down to 100,000 euro for a low quality alternative, sourced from China. They claimed, UNIDO paid 15 – 20 percent below their requested 30% advance payment. These changes caused some delays in turn around as a result of restarting the process all over again and the equipment from South Africa arrived two years after contract award and UNIDO's first payment. COVID also contributed to the delays experienced according to the interview respondents. Due to these delays the contract was amended in June 2020… project size reduced from 60 KW to 40 KW and funding from US $50,000 down to US $25,000. The project took off in June/July 2015 and up to the time of our visit (June 2nd 2022) work was still on-going.

Although the UTG reported having completed installation and started reaping benefits (savings of D1.4 million in electricity payments since the RE system was commissioned), their co-financing posed initial challenges until they were rescued by the Ministries of Petroleum and Energy, and Finance and Economic Affairs, contributing US $ 50,000 and US $ 1.7 Million respectively. This was in addition to the contribution by the private partner/contractor who secured a loan from the Bank to pre-finance the demo. Although there were no reports of disbursement delays by the implementing Entity/funding agency, the project suffered 4-6 months delay after the departure of the first project focal person. At the time of the ET's visit, UTG reported having two outstanding payments from UNIDO, pending certification.

The GNPC established an internal management team to support and speed up implementation of their demo projects following teething problems. The team requested for an extension to end of June 2022, and after a prolonged negotiation, UNIDO granted them a no objection. Two extensions were granted earlier. They reported having received an amount of US $108,676.8 out of UNIDO's contribution of US $210,000 in May 2022 and have finally installed solar fields in all their planned fuel stations across the country, all of which now run exclusively on solar. This ensured continuous/uninterrupted service to their customers especially up country, where electricity supply is sporadic. The company took decision to remove the batteries component

as a cost effective and sustainability measure. Notwithstanding required procurement rules, GNPC single sourced their contract, which was potentially prone to abuse.

According to reports, the African Development Bank (AfDB) fully paid for GCCI's co-financing of US $800,000 through an existing cooperation agreement. The AfDB disbursement took a long time causing 2-3 amendment requests i.e. extensions on contract. The project started in 2015 and GCCI installation was completed and commissioned in 2019, with 20 kW for the office and 80 KW at the Trade Fair Grounds. Since 2019, GCCI made about D700, 000 in savings on electricity bills. There is potential for scale up, but most private sector members are informal and accessing loans from the banks daunting. The project suffered fund access challenges due to frustrating bureaucracy at the Ministry of Finance and Economic Affairs.

The MRC/G already had an on-going "greening campus initiative" to install 500 KW solar at the Head office in Bakau and Keneba field office. The UNIDO- GEF 5 was an additional financing scheme and supported the ongoing efforts. During the KII, the respondent reported that MRC/G spent £800.000 / year on fuel, mainly diesel, for generators and vehicles. He estimated savings of 25% but with the commissioning of the new energy intensive cooling system supplying the high energy user hubs, including the lab, data centre, he expects higher bills. There is a project management unit and board which meet monthly to assess progress, risks and timelines of project implementation.

The PURA received US $100,000 from UNIDO under a contract, as RE Fund for women and youth enterprise development. The Authority on the other hand signed a Memorandum of Understanding (MOU) with National Enterprise Development Initiative (NEDI) and delivered support to women's garden projects, community video club, poultry and training in bookkeeping, solar maintenance and training. Furthermore, the fund facilitated the installation of 9320 watts of PV solar for 8 different project entities benefitting individuals as well as community groups. Two impact case stories from these projects have been extracted from PURA's reports and represented in the boxes below:

Box 1: Case study 1 - Hasimu's Video club enterprise

Hasimiu Sidibeh lives in the remote Village of Changai in Sami District, Central River Region (CRR) without access to electricity. Following his training with Empretec-Gambia, he set up a small business, selling ice blocks, which he sourced from neighbouring Senegal, charging mobile phones and operating a video club using a small solar panel. Through partnership with PURA and GEF/UNIDO, Hasimu benefitted from 1620 Watts of solar and scaled up his business – bought a refrigerator, increased his charger capacity and also ran a video club in the village. He reported generating D15, 000 (US $310) from the business portfolio and intends to grow his business further.

Video club gadgets fixed in cinema hall

Solar Panels mounted on Hasimu's roof top

Box 2: Case study 2 - Kuntaur Fula Kunda women's vegetable garden project

A women's group (57 women & 40 youth) in Kuntaur Fula Kunda also sought and received support of 1000 Watts solar PV from the WYE fund to alleviate the water problems in their community vegetable garden. The size of the garden is 300m X 300m (9 hectare), which used over the years but abandoned due to challenges of water supply. The village rehabilitated it due to its importance to the community shortly before PURA's intervention. The community plans to expand the garden to cover 500m X 600m (30 hectare) potentially to enhance employment and improve food and nutrition security for the people.

The Abandoned garden before interventions

Meeting at the revived garden after PURA/GEF/UNIDO intervention

Participants of these projects also paid counterpart funds (cash/kind) as contributions to project cost to demonstrate commitment and buy-in. The RE funds were lodged with the Central Bank of the Gambia (CBG) and the bank's administration processes and bureaucracy often caused delays, which impacted timely delivery.

Connecting solar power to NAWEC Grid was a key motivation for the project developers especially the income generation dimension. Mbolo – Fandema empowered girls who dropped out of formal education stream through skills development training. Mbolo initiative developed other RE driven projects including skills (e.g. welding and fabrication, energy saving cook stoves) and income generation (sewing machines, washing/drying machines) for livelihoods. Without a PPA, Mbolo in 3-4 months uploaded 23, 000 kW into NAWEC Grid for future use in times of crisis. Mbolo enjoyed partnerships through visits of international agencies including United Nations women (UNWOMEN) based in Dakar, British Broadcasting Corporation (BBC) and Radio France International (RFI), which gave them coverage and publicity. Mbolo reported receiving their work completion certificate from the MoPE late, causing delay in accessing their final payments from UNIDO. They also linked with GTTI for more technical training of youth and women.

Power up Gambia (PUG/Gambia), with similar GEF 5 support, electrified the critical wards in the Bwiam General Hospital and installed solar at Bansang Hospital in Central River Region South (CRR-S), but missed the income generating potential due to lack of a PPA.

Project outcome 3: Renewable Energy projects entrepreneurship skills development

This RE Demo project is dependable having put in place a comprehensive plan integrating policy review; programme development and business promotion to spur economic growth.

Owing to the women and youth entrepreneurship Fund administered under the Gambia Renewable Energy Fund, PURA and partners trained women and youth in enterprise development and business sustainability. In addition to improving their entrepreneurship skills, the training as an empowering process sought to create

space for participants to engage in other national development efforts[19]. The ET could not determine performance at this stage of training input delivery and output, and therefore recommends a follow up training evaluation to assess for skills utilisation and value for money.

A review of some progress reports and minutes also indicated other entrepreneurship skills development trainings concluded, including Training of Trainers (ToT) sessions with 20 trainees (3 females) from higher education level and 16 trainees (3 females) from secondary technical education level; and relevant modules developed. In spite of these achievements, there are still outstanding but relevant activities for follow up. For instance, curriculum integration into: GTTI, UTG and systems of other learning institutions to encourage skills uptake, and promotion of RE businesses especially in agriculture.

3.4 Sustainability (likelihood)

> The alignment of project objectives with the NDP and SDGs, and the local installation capacity built are indicative sustainability measures. The realized savings on energy expenditures of a recorded 133,666kWh, equivalent to D1, 416,860 (~USD 27,247.31) since project inception encouraged the UTG to spend its internal resources on the project.
>
> *(Dr. Jain, Project coordinator UTG, KII, June 2022)*

Sustainability of project outcomes in future will be realised if the following indicative assumptions are fully tested and measures taken to avert further risks to RE drivers.

The Gambia's three pronged approach to RE options as alternatives to fossil fuel driven development agenda, is strategic and forward looking. The model is inclusive and the strategies if supported, will lead to mitigating risks related to social, economic and environmental vulnerabilities in the country. Addressing the policy gaps is key and will create the enabling environment, facilitate innovative/research practices, and preserve and enlarge the development results achieved. The RE Act, 2013 is the foundation and an opportunity to drive the elaboration of second level regulations and policies that will guide integration of RE in the productive sectors of the Gambian economy. Furthermore, an audit of the energy sector together with welfare, natural resources (including climate change) and economic sector policies needs to be undertaken to make them RE aware, ensure coherence and avoid sector policy conflicts. Hence, future policy-making processes must take into account green job creation, CO_2 emission reduction and attract investment.

Government/private sector collaboration in implementing the GEF 5 RE demonstration projects was significant, and the leadership role played by the latter as the engine of growth remains critical in nurturing the instructive value of the partnership and sharing of resources. The GoTG and the private sector must therefore mobilise efforts and direct financing towards sustaining the gains made so far in the innovative RE project pilots. This calls for support and close coordination with other sectors, local banks, insurance companies (a design initiative), and international partnerships to bridge the national funding gaps. Similar partnership with Estate developers/managers may be initiated to develop a model green village in the country. To this end, participatory and inclusive planning processes must be launched that would harness knowledge, set realistic but ambitious targets, create cost effective RE plans and attract requisite funding. Accelerating and concluding a net metering contract with the NAWEC utility grid will facilitate storage of excess energy, future utilisation and potential to generate income for project developers thereby encouraging investment[20] in the RE sector.

The GCCI and PUG established new partnerships during the pilot phase. According to GCCI, African Development Bank (AfDB) fully paid their co-financing bill, and similarly, PUG also benefitted from additional solar panels through Johnson and Johnson's philanthropic gesture. Strengthening these

[19] Training report, PURA: Entrepreneurship skills training for the women and youth, 17th -18th July 2019
[20] PUG/SJFGD (FGD, 13/06/2022) and partner project developers

relationships and reactivating the cooperation solicited with local banks and insurance companies at the beginning of the project will encourage more investments.

Promoting women and youth entrepreneurship skills development training for employment and income, attached to RE schemes initiated by Mbolo are good practices, which can sustain projects of this nature. Developing and integrating skills training curriculum in educational systems for schools and institutions of higher learning, e.g. GTTI and UTG will enhance life skills and facilitate early adoption of technologies.

Institutional capacity strengthening and engagement of sectors like Department of Community Development's (DCD) for outreach - sensitization and awareness creation; and the department's Appropriate Technology Unit (ATU) for technology development and diffusion, along with GTTI is crucial.

During the stakeholder consultations, governments high reliance on external/partnership funding was raised, which was found to be counterproductive and inimical to long-term sustainable development aspirations. Shifting focus inward to mobilise the required internal resources through prudent management of local funds and implementation of RE policies, will help government achieve its objectives of realising sustainable energy for citizens.

Advocacy - awareness and reorientation of NAWEC and associates to re-focus attention to "providing clean and renewable electricity" to support social sectors, especially those in off-grid locations to promote education and health care delivery for growth and economic development.

Using Biomass for Gasification and power generation is the only aspect remaining for this demonstration project. Although the developer claimed availability of biomass, it will be prudent to assess potential due to its multiple use and demand. As the traditional sources of biomass for briquettes, e.g. Groundnut shells are scarce due to drop in production and the fact that alternatives are also challenged by climate crisis, an assessment will be desired to establish coping capacity. However, Solar panels are built on array support frames, often close to the ground, and also on roof tops. Raising the platforms a bit higher and adapting and promoting flat roofs of housing infrastructure will minimise environmental risks of using massive land areas for solar outfits.

Strengthening Coordination for results, the UNIDO/GEF project is encouraged to work with on-going (and prospective) projects like the United Nations Secretary General's peace building initiative under UNDP (to minimise political risks) and ecosystems adaptation/restoration activities to reduce environmental risks.

3.5 Gender mainstreaming

The GoTG recognizes that sustainable economic and social development of the country requires full and equal participation of women, men, girls and boys[21]. By the same token, the government expressed strong commitment to increased participation of women and youth in RE and promote up scaling.

Accordingly, the project co-opted the Women's Bureau as a member of the UNIDO/GEF5 PSC to facilitate the identification and mainstreaming of gender sensitive issues in all stages of the RE Demo implementation cycle. Consequently, specific outputs under components 2 and 3 of the RE project plan were designed and budgeted to support businesses and employment opportunities for women, emphasizing skills development and women's increased decision making. A UNIDO/GEF funded grant facility for women and youth led enterprise (WYE) development projects was created and implemented within PURA/NEDI established partnership. Training sessions on maintenance of RE systems, financial management, communication and marketing were facilitated with support through the RE fund benefitting young women and men across the country. Regrettably, the target number of training sessions planned was under achieved and the proposed businesses for women remained undeveloped. The majority of these women failed to qualify for fund access,

[21] The Gambia National Gender policy 2010- 2020, (GoTG)

because they had no formal education and were unemployed; a significant number had no Tax Identification Number (TIN) and largely operated in the informal sector. Consultations with PURA staff revealed that follow-up to assess post training impact with participants was restricted because monitoring and evaluation of the project was for the duration (18 months) of the agreement with UNIDO, which had elapsed. The GoTG contributed Gambian Dalasi (GMD) 2 million, which according to PURA was not utilised at the time and important that this be addressed to spur scaling-up of the WYE initiative. Generally, the project design was clear on gender representation in project portfolios, which was also recognised in specific stakeholder interventions. For instance, the Mbolo center in Tujereng, trained young women in solar installation, who now install solar systems and earn income, including other RE based livelihood skills e.g. tailoring, cookery etc.

Much of the existing laws/policies are fairly gender aware/sensitive and create the enabling environment for RE to thrive. However, the institutional and human resources capacities remain weak and need strengthening and coordination (under the Ministry of Gender) to minimise overlaps and duplication of efforts.

4. Performance of Partners

4.1 UNIDO – implementing agency/ PMU

As GEF Implementing Agency, UNIDO had ultimate responsibility for the timely implementation of the project, the delivery of the planned outputs and monitoring of the achievements of the expected outcomes. The execution of the project on the ground was the responsibility of the Project Management Unit (PMU)[22], with direct reporting responsibility to UNIDO HQ (FGD with PMU, 20/06/2022). With its vast experience, UNIDO ensured that the project's alignment with GEF's climate change strategic objective (SO 3) was maintained during implementation. In collaboration with a Private Finance Advisory Network (PFAN), UNIDO facilitated recruitment of an investment facilitation expert who supported the MoPE in developing a business plan and investment readiness on selected projects.

Fig 7: Visiting Monitoring team with UTG VC and staff inspecting the installed

As outlined in the ProDoc, UNIDO's role and responsibilities as the implementing agency was to facilitate deployment of RE systems in the productive sectors, which support ongoing national efforts to increase access to electricity. According to our source, UNIDO was fully involved either directly through Vienna representation as evidenced by the PSC meeting minutes or the local (PMU) office in Banjul. The Agency also actively took part in project inception activities while guiding the processes through knowledge sharing. In close collaboration, UNIDO and the relevant national stakeholders such as GEF Operational Focal Point (NEA), MoPE, REAGAM, Private Sector representative (GCCI), PURA and ECREEE developed and selected the project developers in an efficient and transparent manner.

Oversight support of the UNIDO head office was considered accessible and forthcoming, which was helpful in expediting solutions on time. In July 2018, a monitoring mission from UNIDO, Vienna office visited the

[22] ProDoc, GEF 5 UNIDO CC – M Gambia 5609 (2014)

Gambia and held discussions with the UTG and other developers on progress of the RE projects. The two staff at the PMU, under the direct supervision of UNIDO, sent project progress reports directly to UNIDO and PSC through their statutory meetings in consonance with their Job briefs (TOR). A two and half year work plan (January 2016 to June 2018), including monitoring existed. The GEF 5 project however, remained active to December 2021 and budgeted for as provided in the TOR for this Terminal Evaluation, requiring monitoring of performance of indicators to project end.

A Basic Co-operation Agreement (BCA), a standard document was signed between UNIDO and GoTG on January 27th, 1994. Considering the timing its application as a legal instrument to the GEF 5 project could be tricky as some staff of the executing entity were not on board and not aware of the BCA. The ProDoc on the other hand is not sufficient, especially in addressing contractual disagreements. It may be prudent therefore to always consider reviewing the BCA and align with specific project portfolios to better guide relationships particularly between the implementing and executing entities.

Lessons from UNIDO/GEF4 should have been instructive for project developers' contribution requirements to address delays and contract extensions experienced in this project cycle. Although a demonstration for feasibility, the project is also a capacity building endeavour for empowering the country's institutions/systems, which UNIDO's procedures should promote.

4.2 National counterparts

4.2.1 Executing Entities

Ministry of Petroleum and Energy (MoPE/GREC), National Environment Agency (NEA) and ECOWAS Center for Renewable Energy and Efficiency (ECREEE) constituted the executing entity for the RE project. The MOPE is the government office responsible for establishing and implementing government policies and strategies on energy. It also sets national targets for the use of RE and in collaboration with other ministries develop technical standards and promote capacity building in the RE sector. The ministry in collaboration with a consultant from the ECOWAS Centre for Renewable Energy and Energy Efficiency (**ECREEE**) developed an investment prospectus to showcase promising renewable energy projects in the country. The investment prospectus identified five (5) pipeline project opportunities.

The ministry supported the setting up the PSC and participated in the many meetings undertaken by this body. The leadership role of the PSC was divided between the ministry and National Environment Agency (NEA) as counterpart heads. This arrangement may be good governance practice but could pose challenges to responsibility and decision making often creating an accountability vacuum as the ET noted during consultations with the two agencies. The ministry took part in project inspection exercises and counter-signed certificates of works completion by project developers. Some developers commented receiving their certificates late from the ministry, which delayed their payments for long periods. Its role as regulator was weak as many of the proposed regulations for integrating RE into the productive sectors remained under achieved. Also the Project Management Committee (PMC) advised under the ministry's management was not constituted and as mentioned before, this could be due to conflicts of roles with the PSC's mandate. **The Gambia Renewable Energy Center (GREC)** is the ministry's technical arm established in 1980 as government's innovative pacesetter for solar integration and promotion. The center was responsible for research and development; and promotion of RE market and capacity building. The objective of the center was stalled for lack of resources, manpower and infrastructure. However, while the ministry has now committed to resourcing the center, NAWEC reported to have funded training of personnel for their established RE unit.

4.2.2 The National Environment Agency (NEA)

The NEA is responsible for regulating environmental concerns and ensuring that electricity supply and expansion meet global environmental standards for sustainable social and economic development of the country. The NEA is the co-chair of the RE project's PSC and also the focal point for Global Environmental Facility (GEF). The office participated in the inspection of projects and co-signs certificates of works completion with the MOPE. The PSC meetings were irregular albeit the absence of schedules, and the long intervals and sporadic nature of these meetings did not allow for rapid response regimes to address issues especially matters of an emergency nature. Meetings were therefore accumulated crowding the agenda for any opportune meeting subsequently, thus making decision processes a daunting challenge for members.

4.2.3 ECOWAS Center for Renewable Energy & Energy Efficiency [ECREEE]

As the West Africa regional center for the promotion, adoption and implementation of RE and EE policies and incentives in member states, ECREEE facilitated the update of the RE Investment Prospectus (IP). This resulted in the development of portfolio investment of 15 RE projects for funding investment by public and private stakeholders. The updated IP of 15 projects assisted the selected 7 viable pipeline projects that received training from PFAN to elaborate their business plan and investment readiness. Through ECREEE's facilitation, six of the 7 projects, received on-line training and support from the PFAN investment facilitation expert. A follow up was desired in regard to whether elaboration of proposals was complete and if the proposals were submitted to banks and funding agencies towards securing financing.

However, despite the bankers' expressed interest to receive training on assessing RE proposals to enable them provide financing to address sustainability and growth of the RE subsector, post project funding and support, this did not materialise. This was a huge missed opportunity with regards to increasing sources of funding for more private sector investment as well as sustainability of RE projects in the long-term.

4.3 Donor

4.3.1 Global Environmental Facility (GEF)

As a multilateral trust, GEF provides grants and co-financing for projects and programs to address national and global environmental concerns[23]. In partnership with its implementing agency UNIDO, GEF 5 project cycle builds on UNIDO/GEF4 and expands from promoting the deployment of RE technologies to sustainable integration of RE systems in the productive sectors. As a key GEF strategy, the project also aimed to increase income generating activities whilst boosting rate of energy access with clean renewable energy**.** The demos and enterprise development projects received GEF subvention through UNIDO as agreed, albeit challenges of delays and extensions. The timely disbursement of project funds helped facilitate the achievement of planned targets although some suffered due to delays and extensions. The GEF appointed a focal point (NEA) and provided policy guidelines, and the role of NEA (chair of the PSC) also helped accelerate communication between GEF and the projects in collaboration with UNIDO.

4.3.2 Project Developers – Private sector partners

Apart from developing and piloting the RE demos, the project developers each contributed and financed about 70 to 80 percent of the cost of their individual projects implemented. The benefits of their contributions and lessons learned will not only benefit them but also the Gambia as a whole, the sub-region and beyond.

[23] www.thegef.org www.ecreee.org www.gefunido.gm

5. Factors facilitating or limiting the achievement of results

5.1 Monitoring & evaluation

Monitoring and evaluation (M&E) as a management tool was considered and very strongly in this project, having dedicated a whole component in the design frame. A project management framework was also put in place with PSC and PMC among other support systems to facilitate supervision and reporting on performance. Although there are only two staff at the project office, a Project Manager and a Project Assistant, since GEF4 to GEF5 and now GEF6, the project results are indeed formidable. This is an indication of efficiency, dedication and deligency without which these results would not have been achieved. The M&E functions are integrated into the tasks of PMO. Regular monitoring through field visits and reporting to UNIDO is done by PMO. These visits are tied to the milestone in the contracts signed by project developers.

However , strengthening stakeholders' capacity in M&E was essential to improve the important Human resources strength in managing the RE project to achieve results. Some project developers e.g. PUG/Bwiam, reported instituting daily monitoring of their projects to keep track and take measures as necessary.

5.2 Results-Based Management

A Results-Based Management (RBM) protocol has been fully developed, and integrated in the RE demo project's management strategy, via a responsive logical framework for assessing performance. The system also established baselines for each focal area, developed prudent achievable targets and clear performance indicators to be measured. Perhaps relating to these indicators and systematically assess performance across the critical pathway was a major challenge for project stakeholders and monitors. Furthermore, there seemed not to be a shared understanding of the very basic concepts of input, output, outcome indicators and impact and their connectivity with each other in the project. Having the right skills sets was also imperative for analysing information and making comparisons with actual achievements/targets.

The PSC training on technical RE issues, though important, could have been more appropriately tailored to improve skills in RBM that would address coordination and other process issues relevant for achieving results in line with the theory of change approach. Targeting capacity building of project stakeholders to ensure that the RBM framework provided in the project document was clearly understood and that its mode of operation marches the skills and ability of implementers to assess and verify results according to plans.

Regularly assessing the management risk matrix elaborated in the project document was also critical for achieving project target/results.

> *"…RBM is a broad management strategy aimed at improving management effectiveness and accountability by defining realistic expected results, monitoring progress toward their achievement, integrating lessons learned into management decisions and reporting…"*
>
> UNIDO, 2018

5.3 Other factors

The design of this project as mentioned before was comprehensive in its consultations with stakeholders, but the low consideration given to the role of RE in other socio-economic sectors like agriculture, education and health was also bemoaned. However, discussions with NAWEC highlighted government's plans to address these gaps by installing solar fields in locations off the main electricity grids as part of the World Bank/ GoTG RE project.

The lessons from the RE pilots showed potential for replication and scale up of this innovation however, the systematic integration of energy efficient solutions into policies and programmes of both productive and social sectors remained daunting. Although the private sector demonstrated capacity to lead market-driven RE interventions in the country, they lack the financial muscle to handle the high initial cost of solar, and the project's failure to win the support of commercial banks and insurance companies for lending contracts with businesses was disappointing and could impede further expansion efforts.

The Women and Youth Entrepreneurship Fund managed by PURA and Central Bank/Gambia (CBG) was a good starter, but accessing loans for private is not straight forward through the CBG and the excruciating interest rates by the commercial banks remain excessive.

In spite of the elaborate policy guidelines, the practice on the ground sometimes is at variance and exhibits apparent conflicts. This was observed for the project's established PSC and PMC with more or less same functions, and more importantly the provisions on the responsibilities of UNIDO and MoPE as implementing and executing entities respectively. This role un-clarity can affect country ownership, oversight and impact accountability at country level. More emphasis on national policies and rules as a capacity building process is very much desired and will facilitate the country to shift attention away from partnership resources to locally generated funds.

5.4 Overarching project assessment and rating table

Table 4: Overarching project assessment and rating

Index	Assessment criteria	Rating	Evaluators reason for rating
A	**Project's contribution to development results: Effectiveness and impact**		
1	Project achieved results	3: Highly satisfactory	The target of installing 1.2 MW was surpassed instead 1.3MW was installed less the Biomass Generator. RE law exists since GEF4. Entrepreneurship training sessions were conducted and reported. Monitoring visits undertaken by the PMU with trek reports.
2	Progress towards impact	4: Moderately satisfactory	The five RE pilot projects achieved the target solar installation; realised financial gains; contributed to CO_2 emissions reduction indicative of economic returns/benefits. Public/private partnership, capacity building. RE curriculum training module for Entrepreneurship for vocational, tertiary and higher education institution was developed

			and training conducted PURA conducted Entrepreneurship training for youth and women . The Biomass Generator has been installed and entered the testing phase in June 2022. |The project is still undergoing modifications and testing.
B	**Project quality and performance**		
3	Project design	5: Satisfactory	Highly consultative; delivery structure but fairly ambiguous; project results and risk management frameworks, Budgeted M&E (for achieving planned outputs and expected outcomes).
4	Relevance	5:Satisfactory	Sufficiently aligned with GoTG's priorities (NDPs) and UNIDO/GEF policies and priorities for industrial development; and SDGs
5	Efficiency	3: Moderately satisfactory	Limited co-financing led to changes for all developers but largely resolved. Most withdrew and the few remaining struggled, but received bailouts through other partnerships. UNIDO/GEF contribution considered too low and access demanding
6	Sustainability (likelihood)	4: Moderately satisfactory	Enabling regulations; private sector leadership in PPP; large membership; income generation; Financial returns assured and CO_2 Emission reduction potential
7	Gender mainstreaming	3. Moderately satisfactory	Women and youth entrepreneurship skills; income; gender aware policies; Special fund for women & men; However, RE regulations are urgent; ratio of women's representation was below target
C	**Performance of partners**		
8	UNIDO	5: Satisfactory	Supported RE deployment; M&E fully budgeted; missed MTR but TE undertaken; partnerships established for delivery; ProDoc and Basic co-operation agreement (legal) in place; undertook periodic monitoring visits

9	National counterparts	5: Satisfactory	MoPE leadership; RE law & plans for requisite regulations; Effective structures (PSC); GREC but functionality was desired; Environmental standards; ECREEE support
10	Donor	5: Satisfactory	Secure funding (grant); experienced implementing entity (UNIDO); guiding policies present; Developers /innovators contributions material
D	**Factors facilitating or limiting achievement of results**		
11	Monitoring and Evaluation (M&E)	4: Moderately satisfactory	M&E budget present; M&E plan/ system was required; No MTR but TE assigned
12	Results-based Management (RBM)	4: Moderately satisfactory	Logical framework for RBM existed; baseline and targets in place; Capacity on RBM was desired
E	**Overall assessment and rating**		
	Overall assessment	4: Moderately satisfactory	Overall performance can be described fair. Despite the progress, many of the targets remained substantially unachieved

Table 4: Overarching project assessment and rating

6 Conclusions, recommendations and lessons learned

6.1 Conclusions

The project met its target of installing 1.2MW of solar systems collectively by project's developers who also met technical requirements with requisite equipment in place to generate surplus energy and upload to NAWEC overhead grid. This potentially will achieve reduction targets of GHG emissions by generating clean energy or offsetting on-grid electricity demand while demonstrating the environmental benefits, viability and replicability of the RE systems to promote both public and private sector investments.

The project accomplished some capacity building and skills development training especially on women and youth entrepreneurship (WYE), enhancing the technical skills of these cohorts of the society. The RE Investment Prospectus was updated with 6 out of 15 selected for full project proposal elaboration to make them bankable. A training manual to mainstream RE in relevant curricula was developed and training sessions for trainers such as GTTI, NAWEC training center and Chamen training institute; and training of women and youths to increase their participation in the RE sub-sector was also developed.

With regards to meeting the indicated focal area outcomes in the project document, namely a favorable regulatory environment and increased investments in RE, the achievements were less successful. Consultations have revealed that although draft documents on FiT and Net Metering guidelines are available the finalization of the regulatory framework remains work in progress with no anticipated date to conclude and finalise.

Periodic site visits of demo-projects were conducted by the PMU staff throughout implementation to monitor progress and verify performance and this triggered disbursement of UNIDO/GEF grants for the next implementation stages. The monitoring site visits were undertaken based on the endorsed work plans of

the respective project developers. Whilst this system achieved results, an M&E framework/plan by the PMU would have been more realistic and a better independent approach.

6.2 Recommendations

Periodic field visits of PSC members and PMU to project sites during implementation phase encouraged interactions between the state promoting RE and the private developers showcasing the RE technologies. Increased frequency of these monitoring visits would have built more confidence, helped managed expectations and strengthen public-private partnerships in promoting the RE initiatives.

Regular coordination meetings between project beneficiaries/developers and others stakeholders should have been integral to PMU organized periodic sessions of project developers and management processes to share experiences and exchange ideas to enhance learning and sharing of best practices.

The structure of what is termed UNIDO/PMU and the specific responsibilities and reporting lines of staff need to be reviewed to improve accountability and ensure controls in project management. As per their Job frames, the PMU's role was daily management of the project and as the in-country coordination entity it was reasonable for this unit to be responsible to the executing entity, i.e. the Ministry of Petroleum and Energy for effective monitoring and supervision, and for timely problem solving.

The project developers lamented the high cost of co-financing, which led to long delays and high probability of failure, if some of them had not secured additional funding through new partnerships they forged. Resources for research and innovations/pilots need to be reasonably adequate as the results are expected to benefit beyond the developers. More work to involve the banks, insurance and other private businesses will help attract more innovators and spur scale up/replication.

6.3 Lessons learned

The ministry's request for the project to take into consideration the on-going projects in regard to policy development in our view was misconstrued, which perhaps resulted in the project not developing the requisite regulations on FIT and Grid codes. The PSC also decided to shift the budget to training without adequately discussing what was at stake and the communication on this was also limited.

The involvement of NAWEC in the project was limited to demonstration and its critical role as leader in RE and custodian of electricity generation and supply was largely sidelined and downplayed by the company itself according to the Deputy Managing Director.

The UNIDO/GEF 5 project consultation with heads of institution's to address institutional incoherence and secure political support and facilitate finalization of regulatory frameworks and RE systems integration was effective. However, coordination efforts to actualize the institutional commitments needed to be structured, supported and mainstreamed in project management interventions.

The few developers that participated in the trials demonstrated feasibility and potential leadership of private sector partners. Co-financing however, was a major barrier to projects development as well as the lack of PPA with NAWEC, and the high cost of solar became too critical for project success. The new partnerships some developers forged with international partners were rewarding and inspirational.

6.4 Good practices

The approach to integrate policy and programme including business development was a major step towards maintaining good project health. Setting up the Gambia Renewable Energy Center (GREC) since 1984 was real foresight and a demonstration of government's high commitment to RE. An effective stakeholder engagement was facilitated through an all-inclusive project design and implementation. Civil society is a critical player in development practice and the organisation has potential to promote the RE idea, but their participation in this project despite being mentioned in the ProDoc, was marginal. This was supported by a friendly and responsive results/ logical framework with unambiguous and measurable indicators/targets of performance. The project developed a management structure with personnel roles defined, committees established to provide oversight and controls. However, the apparent role overlaps could impact implementation and slow down decision making and project delivery.

The development of the RE law created the enabling environment and laid down the foundation for enacting subsidiary regulations towards the systematic integration of energy efficient solutions into policies and programmes of both productive and social sectors.

The participation of a section of stakeholders in identifying and selecting project developers ensured participation and transparency of the selection process. The project developed a risk management plan and identified mitigation measures which could avert delays and slow down progress in implementation.

Some of the developers uploaded their excess power unto the NAWEC grid for future use/benefits whilst others forged new partnerships to address funding challenges.