Meeting of the Board
12 – 14 October 2016
Songdo, Incheon, Republic of Korea
Provisional agenda item 11(f)

GCF/B.14/07/Add.10

27 September 2016

Consideration of funding proposals – Addendum X

Funding proposal package for FP027

Summary

This addendum contains the following three parts:

a) A funding proposal summary titled "Universal Green Energy Access Programme" submitted by Deutsche Bank AG;
b) No-objection letters issued by the national designated authorities or focal points; and
c) Environmental and social report(s) disclosure;

These documents are presented as submitted by the accredited entity and the national designated authority(ies) or focal point(s), respectively. Pursuant to the Comprehensive Information Disclosure Policy of the Fund, the funding proposal titled "Universal Green Energy Access Programme" submitted by Deutsche Bank AG is being circulated on a limited distribution basis only to Board Members and Alternate Board Members to ensure confidentiality of certain proprietary, legally privileged or commercially sensitive information of the entity.

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Funding Proposal

Version 1.0

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Contents

Note to accredited entities on the use of the funding proposal template
• Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document. • The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

fundingproposal@gcfund.org

A.1. Brief Project / Program Information	
A.1.1. Project / program title	Universal Green Energy Access Program (**"UGEAP"**)
A.1.2. Project or program	programme
A.1.3. Country (ies) / region	Sub-Saharan Africa with first projects located in Benin, Kenya, Namibia, Nigeria and Tanzania
A.1.4. National designated authority (ies)	**For Benin:** Directorate General of Climate Change Management Ministry of Environment in charge of Climate Change Management, Reforestration, and Protection of Natural and Forest Resources Mr. Ibila Djibril Director General Avenue Jean-Paul II, 01 BP 3621 Cotonou, Benin E-mail: idjibril@yahoo.fr **For Kenya** The National Treasury Mr. Kamau Thugge Principal Secretary, The National Treasury Treasury Building Harambee Avenue P.O. Box 30007-00100 Nairobi, Kenya ps@treasury.go.ke **For Namibia** Ministry of Environment and Tourism Mr. Petrus Muteyauli Deputy Director, Multilateral Environmental Agreements Department of Environmental Affairs pmuteyauli@met.na pmuteyauli@yahoo.co.uk **For Nigeria** Dr. Samuel Adeoye Adejuwon Director, Department of Climate Change Federal Ministry of Environment Plot 444, Aguiyi Ironsi Way Maitam, Abuja; Nigeria **For Tanzania:** The Office of Vice President Sazi Salula Permanent Secretary Luthuli Street, P.O. Box 5380 Dar Es Salaam, Tanzania E-mail: ps@vpo.go.tz E-mail: km@vpo.go.tz
A.1.5. Accredited entity	Deutsche Bank AG

A.1.5.a. Access modality		☐ Direct X International
A.1.6. Executing entity / beneficiary		Executing Entity: The Universal Green Energy Access Program S.A.SIC-SICAV to be managed by Deutsche Bank group entities in line with DB's accreditation status with the GCF. Beneficiary: SMEs and households located in Sub-Saharan Africa with an initial focus on Benin, Kenya, Namibia, Nigeria, and Tanzania
A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☐ Small (10<x≤50) ☐ Medium (50<x≤250) X Large (>250)
A.1.8. Mitigation / adaptation focus		X Mitigation ☐ Adaptation ☐ Cross-cutting
A.1.9. Date of submission		05.05.2016
A.1.10. Project contact details	Contact person, position	Michael Hoelter, Director, Sustainable Investments EMEA Susanne Kern, Vice President, Sustainable Investments EMEA
	Organization	Deutsche Bank AG
	Email address	michael.hoelter@db.com susanne.kern@db.com
	Telephone number	+49 69 910 30843 +49 69 910 60585
	Mailing address	Taunusanlage 12 D-60325 Frankfurt am Main Germany

A.1.11. Results areas *(mark all that apply)*	
Reduced emissions from:	
X	Energy access and power generation (E.g. on-grid, mini-grid or off-grid solar, wind, geothermal, etc.)
☐	Low emission transport (E.g. on-grid, mini-grid or off-grid solar, wind, geothermal, etc.)
☐	Buildings, cities and industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
☐	Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:	
☐	Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
☐	Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.)
☐	Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.)
☐	Ecosystem and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Program Executive Summary (max 300 words)

The Universal Green Energy Access Program

Objectives

The overall program development objective is to contribute to universal access to electricity in Sub-Saharan Africa by scaling up investments in renewable energy from local financial markets and the international private sector.

More specifically, the program targets are to:

- reduce the emission of CO2 through increased access to clean electrical energy for predominantly rural population in the Target Region of UGEAP (as defined below);
- reduce the emission of CO2 by replacing fossil fuel based energy production (on- or off-grid) with renewables, supplying clean energy for expanding energy demand and/or contributing to the stabilization of the national grid with additional capacity;
- work with and through local financial institutions in an innovative structure to enable local banks to provide long term loans in local currency or USD for businesses that provide clean electricity solutions;
- as a public-private partnership instrument multiply the amount of public capital through private investment by at least 2 times, thereby significantly increasing impact.

UGEAP is an investment fund that:

1. pursues investments in three types of transactions (the ***"Target Investments"***):
    1) **Category 1:** Off-grid renewable electrical energy
    2) **Category 2:** Mini-grid renewable electrical energy
    3) **Category 3:** Industrial renewable electrical energy and selected on-grid installations
2. targets households and industry in Sub-Sahara Africa (SSA) as beneficiaries of its investment activity (the ***"End Beneficiaries"***). All features of the program are applicable to any country in SSA (the ***"Target Region"***) while the investment activity will expand in phases;
3. plans to execute an expected 50 investments with a total target volume of USD500m over a 5 years investment horizon. Until the end maturity of UGEAP (15 years after closing), further investments are expected beyond the initial 50 through reinvestments; and
4. has a 2-tiered capital structure consisting 1/3 of B-Capital (to be invested in by GCF along other public sector investors/guarantors) to provide a risk buffer to enable 2/3 of A-Capital (to be invested in by private sector investors).

Development Benefits

Based on the analysis of a pipeline of transactions, through its investment activity - which will be governed by specific policies on social, environmental as well as gender aspects – UGEAP will achieve the following developmental benefits in line and beyond its contribution to the targets of the Green Climate Fund:

- Emission reduction through avoidance and reduction of CO2
- Increased low-emission energy access for the rural population, including women
- Creation of employment
- Contribution to poverty reduction
- Improvement of equal gender treatment
- Improvement in health conditions

Roll-Out Forecast

UGEAP will be rolled out in 2 phases that are different in terms of the regional investment activity:

Table 1: Phases of UGEAP roll-out

Phase	Regional Activity ("Host Countries")	Time	Total available capital	Investor Split
1	• Benin • Kenya • Namibia • Nigeria • Tanzania •	36 months	USD300m	• GCF: USD80m • Public Sector: USD20m[1] • Private Sector (incl. DB): USD200m • (to be invested in 2 closing rounds)
Once 75% of capital raised in Phase 1 is invested, Deutsche Bank will start an analysis to identify additional countries for Phase 2 and will approach GCF for additional capital.				
2	Sub-Saharan Africa	24 months	USD200m	• GCF: USD52m • Public Sector: USD13m[2] • Private Sector (incl. DB): USD135m
TOTAL		60 months	USD 500m	• GCF: USD 132m • Public Sector (incl. DB): USD33m • Private Sector: USD335m

Source: Deutsche Bank

It is envisaged that the GCF for the first phase commits to contributing up to USD80m of B-Capital while for the first closing USD40m would be drawn and the balance would be drawn as soon as USD100m have been invested or committed to investees.

A- and B-Capital will be structured as shares in a collective investment undertaking / investment fund being a closed-end SICAV-SIF based in Luxembourg where investors contribute capital in form of shares. (subject to detailed legal consultation).

As the program will be first rolled out in five countries ("Host Countries"), for the second phase it is envisaged that the GCF will be approached again to contribute another USD52m in B-Capital to bring the program to its full scale and leverage the private sector further. An increase of GCF's investment will be subject to:

- the commitment to investees of the 75% of the capital raised in Phase 1; and
- satisfactory performance and demonstration of demand and pipeline to expand beyond the initial priority countries.

The first five countries have been selected based on their market opportunities for green energy access solutions, an analysis of their financial sectors, the need and feedback from project developers on the likelihood that these regions produce sufficiently well developed businesses cases to invest as well as interest expressed by governments and NDAs. For the second phase, an analysis will be performed again on the countries UGEAP will focus on.

Swedish International Development Agency (SIDA) is expected to provide a partial credit guarantee covering the capital by Class B Capital investors at maturity to facilitate, inter-alia, a private sector co-investment along the GCF in the B-Capital (note that the GCF and DB are not expected to become a beneficiary). The guarantee is expected to have the following features:

[1] The public sector contribution can consist of paid in capital and/or guarantees
[2] The public sector contribution can consist of paid in capital and/or guarantees

a) issued by a public entity benefiting from a 'AAA' credit rating;
b) being available pro-rata to all Class B Capital private sector investors;
c) available to be drawn upon first demand and at maturity of each Class B Capital tranche;

The Maximum Guarantee Amount equals the initial issue price of Class B Capital purchased by private sector investor (with the exception of Deutsche Bank).

In return for the Partial Credit Guarantee, UGEAP will be obliged to pay a premium to SIDA to reflect the expected loss in the amount of capital to be guaranteed by SIDA.

In addition and as compensation for putting in place the Partial Credit Guarantee, UGEAP is expected to be obliged to pay a due diligence fee to SIDA.

Additional interest to invest in the B-Capital has been expressed by other public sector entities. DB is currently in discussions with USAID which is considering support via a potential partnership, since outcomes of UEGEAP are aligned with the Power Africa intiative and the Powering Agriculture energy grand challenge for development. DB also continues additional discussions with other potential entities, inter alia the German Government (through its International Climate Initiative), with regards to a potential participation in the program as investors or additional guarantors. Finally DB shall co-invest along the capital structure (up to USD5m for B-Capital and USD10m for A-Capital) while financial market regulation for Deutsche Bank limits the amount the bank is allowed to co-invest to 3% of total capital outstanding.

Structure of this Funding Proposal

This application presents:

a) the UGEAP as an investment concept (***the "Program Level"***) designed to match funding needs of the Target Investments described above with the requirement of private sector investors for a stable, low risk return;
b) project types the UGEAP will target to invest debt capital into three different project categories that are referred to as ***"Category 1 Projects "***, ***"Category 2 Projects"*** and ***"Category 3 Projects"***, respectively);
c) the climate mitigation and co-socio economic benefit targets of UGEAP. The analysis of three transactions, one out of each Category, that are in the pipeline for UGEAP was used as a basis for the expected outcomes and results. These sample transactions are referred to as ***"Project 1"***, ***"Project 2"*** and ***"Project 3"***, respectively.

Category 1 Projects: Solar Home Systems

- Solar Home Systems (SHS) are provided with an affordable payment plan via established payment means (ie. mobile phones), comprehensive customer service and innovative remote monitoring technology, including after sales services and maintenance.
- (D)ESCOs offer low- to medium-income customers in SSA, including in remote areas, a clean and affordable alternative to unhealthy, environmentally harmful, and expensive fossil fuels.
- Private sector offers contribute to the targets of improved electrification while in some countries of the Target Regions the market develops very quickly at this stage and capital is highly needed for expansion.

Category 2 Projects: Green Mini-Grids

- Companies that offer project 2 type transactions install, operate, and maintain photovoltaic (PV) based mini-grids to sell energy services in rural communities.
- Their technologies and processes enable companies to incrementally match generation capacity with increasing consumer demand - effectively "growing" supply with consumption - in commercially viable, efficient, and operationally scalable manner.

Category 3 Projects: Green industrial energy supply and selected on-grid projects

- Companies in project 3 categories typically provide modular, transportable, often rented photovoltaic farms for hybridization of diesel generators in frontier markets, deployed in containers or are small independent power producers with typical sizes of 1-10 MW either as a captive power plant for industrial use or installations feeding into the national electricity grid.
- Companies offer remote small and medium enterprises (SMEs) and communities competitively-priced scalable solar power, integrated intelligently with diesel generators, without up-front investment, on flexible rental contracts.

UGEAP will invest only in companies with a sufficiently long track record employing proven technology and having the necessary local presence and operations.

A.3. Project/Program Milestone

Expected approval from accredited entity's Board (if applicable)	For the execution of the program, standard new product development approvals apply.
Expected financial close (if applicable)	30/06/2017
Estimated implementation start and end date	Start: 30/06/2017 End: 30/09/2032
Project/program lifespan	__15____ years ___0___ months

B.1. Description of Financial Elements of the Project / Program

Please provide:
<an integrated financial model in Section I (Annexes) that includes a projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale; and a sensitivity analysis of critical elements of the project/program>
<a description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance>
<a breakdown of cost estimates analysed by sub-component in local and foreign currency and a currency hedging mechanism>

Financial Model Result Overview

The results of a financial model are provided in section F1 which also contains the sensitivity analysis. Further, the assumptions and scenario calibrations are provided in section F1. The following table summarizes results for 5 chosen scenarios to provide an overview of the functioning of UGEAP's financial structure.

Table 2: Overview model results

#	Description	IRR on Class A	IRR on Class B
1	Base Case	6.8%	6.6%
2	Stable Currency	7.4%	10.4%
3	Margin Upside – Stable Currency	8.2%	13.6%

4	Margin Downside – Currency BC	6.2%	3.4%
5	Margin Downside – Currency Downside	6.1%	1.8%

Source: Deutsche Bank

A- and B-Capital will be structured as shares in a collective investment undertaking / investment fund being a closed-end SICAV-SIF based in Luxembourg where investors contribute capital in form of shares (subject to detailed legal consultation).

Investment Activity

UGEAP is an investment vehicle which shall invest debt through or with local financial institutions in transactions that fall into one of the following categories:

Category 1: Off-grid green electrical energy supply for households:

- End Beneficiaries are households in rural areas that currently have no access to electrical energy;
- Households buy under a typically 3-5 years leasing contract an energy supply kit that consists of a clean energy production component, a battery and a control unit sized to supply a household's demand for energy;
- Payments are made on a pre-agreed payment schedule via mobile payment (micro-credit business model);
- The success of this business is based on so far very low default rates due to top tier customers reached so far; an expansion to customers with lower credit quality may follow and will have to be performed carefully.
- As example, a portfolio of 40.000 installations requires debt funding of around USD10m-15m p.a. in line with operational growth capacity.

Category 2: Green mini-grid electrical energy supply:

- End Beneficiaries are inhabitants of communities that have no national grid connection but are dense enough to allow for building a green mini-grid. Final off-takers are small and medium sized businesses, households or public sector buildings (schools, medical service points, street lightening, etc.).
- Project companies may, but not all of them do, receive grant funding for fixed installed equipment (meters, power lines, converters). Private sector capital covers energy producing units (exclusively renewable energy or a combination of renewable and highly efficient Diesel gen-sets);
- Connected households sign up to fixed off-take (take-or-pay model) arrangements for a pre-agreed load. Spare capacity is sold for spot prices to the community. Remote controlled smart meters ensure charges according to consumption and ensure grid stability;
- As example, an installation covering a community of up to 80.000 households requires CAPEX of around USD17m out of which private sector debt demand is in the range of USD9.5m (70% loan-to-value ratio).

Category 3: Green industrial electrical energy supply and selected on-grid projects:

- End Beneficiaries are companies requiring electrical energy in their production (i.e.: agro-processing, mining, cement, ports) or service (telecom) and that currently operate independent, diesel based power production capacity due to lack of grid capacity / availability;
- Solutions to be financed are to (partially) replace diesel based generation capacity with renewable energy components (predominantly photovoltaic). Experience from projects points to cost benefits that reduce operating expenses of a company on average by 20% while in certain cases 40% can be achieved;
- Investments can be set up as corporate or project finance structures with credit-worthy industrial off-takers under medium-term power purchase agreements (PPAs) covering the amortization horizon or alternatively the national grid operator;
- Target capacity size starts from 1MWp for PV capacity and hence private sector debt per project could start at USD1.5m while the average transaction size is expected to be [USD 15m].

As a public-private financial partnership and investment vehicle UGEAP bundles capital from the GCF with capital from:

- the project owner / sponsor in form of equity contribution (in kind as well as in cash);
- local banks / financial institutions that invest together with or in parallel to the UGEAP;
- international private sector investors.

Capital Structure for Investment Targets

UGEAP will serve transactions together with local financial institutions through two alternative investment strategies:

- A funding and risk participation structure;
- A syndicated loan structure.

These two options are further described below in Section C3.

The following table uses a single investment (defined as a ***"Project")*** as an example and provides a "look through" approach showing the origin, the type and the risk position of the capital that will be used to the benefit of the End Beneficiaries. The table shows the situation when UGEAP has reached its targeted scale of USD500m after completion of Phase 2. The table ranks the source of capital by the risk position (1 = being the highest risk position while two positions that have equal risk positions rank pari passu). An approximate share of the total capital needed is estimated using a "standard" project as an example. Each single transaction is expected to differ from this "standard" case while on average the approximate share is expected to be maintained for all projects UGEAP will invest into.

Table 3: Sample Capital Structure of a Project

Risk Position		Type of Capital	Source	Instrument	Currency	Share approximation
Funding and Risk Participation	Syndication					
1	1	Equity	Project developer / Project owner	Ownership of business	Local	33.3%
2	2	Debt	Local financial institution	Loan to business	Local / USD	6.7%
3	**2**	**Debt**	**Public Sector Investors incl. the Green Climate Fund**	**B-Capital of UGEAP**	**USD**	**20.0%**
4	3	Debt	International private sector investors	A-Capital of UGEAP	USD	40.0%

Source: Deutsche Bank

Funding Structure

DB expects that GCF shall initially contribute 40% of total capital of the UGEAP at the beginning of Phase 1 while its share will reduce to 26.7% at the end of Phase 1. DB envisages that due to the higher regional concentration, a smaller leverage of the public sector's capital in the first Phase can be achieved while the leverage will grow over time.

Table 4: Target Funding Structure

Phase	Time (yrs)	Total Available Capital	GCF Capital Sought	Other Public Sector Funding/Guarantee Contributions	Private Investor's Contribution
1	<=3	+ USD 300 MM	+ USD 80 MM	+ USD 20 MM	+ USD 200 MM
2	4-5	+ USD 200 MM	+ USD 52 MM	+ USD 13 MM	+ USD 135 MM
Total	1-5	=USD 500 MM	= USD 132 MM	=USD 33 MM	= USD 335 MM
3	6-15	Reinvestment Period: 2.1 BN of total invested capital throughout total lifetime of UGEAP			

Source: Deutsche Bank

For additional information on the closings please refer to Table 13: Overview of Closings in Section C.3 Project/ Programme Description

The contribution of equity as capital by the GCF will address the following barriers that exist in financing investments into clean energy production for production and consumption purposes in the least developed countries which the GCF is set to promote:

Table 5: Barriers and solutions

Barrier	Delivery of UGEAP to overcome the barrier
Amortization Expectation: Infrastructure investments like those to be pursued by the UGEAP require longer amortization periods compared to other businesses in emerging / developing economies.	**Long term capital supply:** UGEAP will collect its own capital from long term oriented investors (5 years and longer) as well as GCF with a longer tenor (15 years) so it can match the maturities of the Target Investments which fall into the 5-10 years timeframe.
Leverage to enable sponsorship by local project developer: internal rate of returns for projects with high impact are typically not attractive enough to be financed purely by equity or by the operating company. As such, debt is required to reduce the weighted average costs of capital (WACC). As economies expand with high growth rates, such adequately priced leverage is scarce.	**UGEAP shall provide debt capital:** Based on market research, UGEAP will offer long term debt capital with adequate return expectations given its risk position in the underlying transactions. Having analyzed the first transactions in the pipeline and the economic rational of the investment thesis of UGEAP, the offer by UGEAP is expected to lower WACC such that equity investors will pursue transactions that otherwise would not be realized.
Local banks face structural and capacity limitations: Capital and risk sharing is required to enable local financial institutions to provide the large amounts of capital the market needs to meet rising demand. Such financing requires long-term maturities which are not readily available in most financial markets in Africa due to structural constraints.	**UGEAP helps local financial institutions to meet demand:** The UGEAP invests in parallel or works with as well as through local financial institutions, hence not creating competition. As such, the capital from UGEAP will be additional to the already existing capacity while it shall provide the critical mass to the sector to increase the share or renewable energy generation above purely local capacity by providing long-term capital and building the capacity of local banks in project finance for renewable energy projects, including in remote rural areas.
Private sector investors currently do not invest outside their traditional scope: Albeit the investment and business climate on the African continent is constantly improving and is perceived to offer attractive opportunities, traditionally private sector investors are careful to invest in new markets (regionally as well as from a business perspective) due to high perceived risks. UGEAP's investment proposition is a new asset class for private sector investors.	**Enabling private sector investment through GCF subordination to lower private sector risk:** As loss risks from the underlying portfolio would be covered last by the private sector investor, their credit risk would be acceptable in principle, allowing them to invest in UGEAP at scale. Potential returns would provide an adequate compensation for the risks the private sector investors would take.
Large private sector capital focuses on large transactions: Institutional investors that are able (and willing) to provide substantial amounts of capital require significant funding amounts (i.e. typically no lower than USD50m just for their investment).	**Large capital allocation feasible:** While the single investment of the UGEAP will be in the range of USD2m – USD20m, UGEAP bundles the portfolio of investments such that large amounts of capital can be invested by the private sector investors, while benefiting smaller scale projects, including for rural households.

Source: Deutsche Bank

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing	**(a) = (b) + (c)**	500	million USD ($)		
(b) Requested GCF amount	(i) Senior Loans (ii) Subordinated Loans – Phase I (Phase II) (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants *	0 80 (+52 for Phase 2) 0 0	Options million USD ($) Options million USD ($) Options	15 years	6.6% IRR in a base case (see section F1)
	** Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/program's expected performance against the investment criteria indicated in section E.*				
	Total requested (i+ii+iii+iv+v+vi)	132	million USD ($)		

	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
(c) Co-financing	Equity	197 for Phase 1 (+133 for Phase 2)	million USD ($)	Private Sector investors	5-15 years	6.8% IRR	senior
	Equity	23 for Phase 1 (15 for Phase 2)	million USD ($)	DB, Public and Private Sector Investors	15 years	6.6% IRR in a base case	pari passu
	Guarantees	up to 50m	million USD ($)million USD ($)	AAA rated government	15 yrs	tbd	
	A- and B-Capital will be structured as shares. GCF's B-Capital investment will be classified as equity investment in their internal accounting. Lead financial institution: Deutsche Bank AG as placement agent Other public organizations have expressed interest to invest/ guarantee pari passu with the GCF funding contribution. See Section A.2. Program Executive Summary for further details.						
	** Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.*						

B.3. Fee Arrangement (if applicable)

<Please specify the fee arrangement between the Fund and the accredited entity, in case it is project/program specific.>

Deutsche Bank (DB) will have two main roles in the UGEAP (and can assume further functions subject to a match between the tasks to be covered and DB's offer / capabilities), notably:

- Investment manager of the UGEAP; and
- Placement agent.

- *Investment Manager*

As Investment manager, DB will provide investment origination, underwriting, structuring, execution, and administration services. As compensation for the services, DB will receive a market based investment management fee. The fee will equal the sum of (i) 1.5% p.a. on the outstanding balance of invested capital and (ii) 0.5% on committed capital, each at the end of each quarter.

Placement Agent

Placing capital with private sector investors will be compensated for by a market based placement fee borne by the investor. The placement fee is market driven and depends on the total amount placed, the amount placed with a single investor, the type of investor who has acquired and the type of capital that shall be placed. Private sector investors shall be offered Class A and Class B capital while GCF is foreseen to invest into Class B capital only.

The placement fee will equal 0.10% p.a. of the amount of subscribed capital for Class B to be acquired by the GCF while outstanding.

Further Services

Beyond the core functions mentioned above, DB may also provide ancillary services to UGEAP (administrative agent, cash management services, paying agent, trustee, etc.) Such services are typically tendered by DB and the respective other product units of DB may be asked to participate in the tender. Reference is made to the procurement standards of DB as detailed in the accreditation application.

B.4. Financial Market Overview (if applicable)

<How market price or expected commercial rate return was (non-concessional) determined?>

<Please provide an overview of the size of total banking assets, debt capital markets and equity capital markets.>

<Please provide an overview of market rates (i.e. 1-year T-Bill, 5-year government bond, 5-year corporate bond (specify credit rating) and 5-year syndicate loan.>

<Provide examples or information on comparable transactions.>

Program Level

UGEAP targets to mobilize private sector capital for investments as described above. For investors, the investment offer by UGEAP falls into the following investment bucket:

- Infrastructure assets;
- Debt product;
- Unrated / expected to be sub-investment grade quality;
- Long term;
- USD denominated;
- Variable return structure.

Investment Climate

At this time, DB could not identify any competing offer to financial investors that invests in the Target Investments located on the African continent, especially – amongst others – in the least developed countries. While interest to invest into African businesses has increased over time, the predominant share of capital targets direct investments rather than portfolio investments. In addition, existing portfolio investments, like direct investments, are equity focused rather than debt.

Table 6: Foreign investments (both direct and portfolio) now largest source of capital flows to Africa (USD)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 E*	2015 P*
FDIs	12.5	23.3	20.0	23.4	25.4	33.8	35.4	52.8	66.4	55.1	46.0	49.8	49.7	54.2	49.4	55.2
Portfolio investments	1.5	-3.6	-0.4	-0.7	6.9	6.3	22.5	14.4	-24.6	-0.3	21.5	6.8	25.7	21.5	13.5	18.4
Official development assistance	15.5	16.8	21.4	27.4	30.0	35.8	44.6	39.5	45.2	47.9	48.0	51.7	51.3	55.8	56.3	54.9
Remittances	10.9	12.1	12.8	15.4	19.5	33.3	37.3	44.0	48.0	45.2	51.9	55.7	61.2	60.6	61.8	64.6
%GDP	6.8	8.4	9.3	9.3	9.7	11.0	12.3	11.4	8.7	10.0	9.6	8.6	8,3	8.2	7.3	7.2
Total	40.4	48.7	53.8	65.5	81.9	109.2	139.7	150.6	135.0	147.9	167.3	164.0	187.9	192.0	181.1	191.5

Source: AfDB, OECD, UNDP

The chart below depicts the attractiveness of investments on the African continent on a global comparative basis which is mainly driven by operating businesses rather than financial investors. However, “real” economy money typically flows in advance of capital from pure financial investors. DB sees that financial investors closely follow the development path of Africa, while looking for solutions that help overcome high perceived risks, as international financial investors are not present on the ground and not actively engaged in the day-to-day business, which limits their understanding of local circumstances and risks.

Graph 1: Africa‘s relative attractiveness. Relative to the following markets, is Africa attractive as an investment destination?

Source: Ernst & Young 2015

Financial Sector

Given the partial dependency of UGEAP on the creditworthiness of local and regional financial institutions, the stability of the local financial sector and the common risk factors overall have been analyzed. While the selection of the appropriate partner banks of UGEAP as borrowing entities will be subject to its own due diligence, banks also need to be analyzed in the context of the local financial sector. For a more detailed analysis of the overall financial sector in the five countries in the target region please refer to Section J, B.4. Annex 1 – Financial Market Overview

Current Status

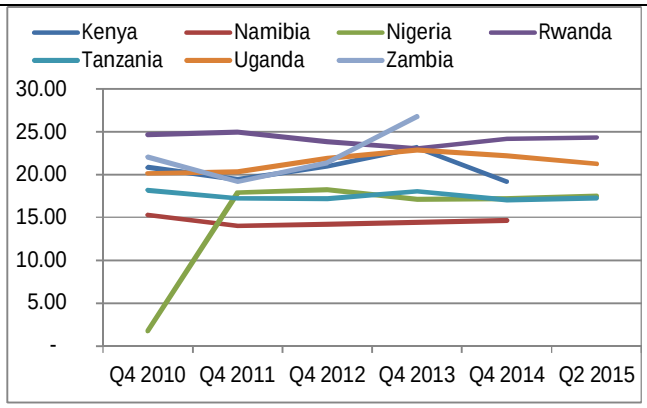
Across the SSA region, banks tend to be financially sound as indicated by five key ratios shown at the right. While aggregate data is sometimes unavailable for small countries with central banks / regulators having less ongoing oversight on bank's operations, overall the financial sector shows an adequate positioning within the macroeconomic realities of the single countries while there are countries to be avoided with longer term exposures given their instabilities.

While comparable and reliable data on Benin are not available, the other countries in UGEAP's Target Region have an acceptable level of data being available that can be used to analyse the market and track developments.

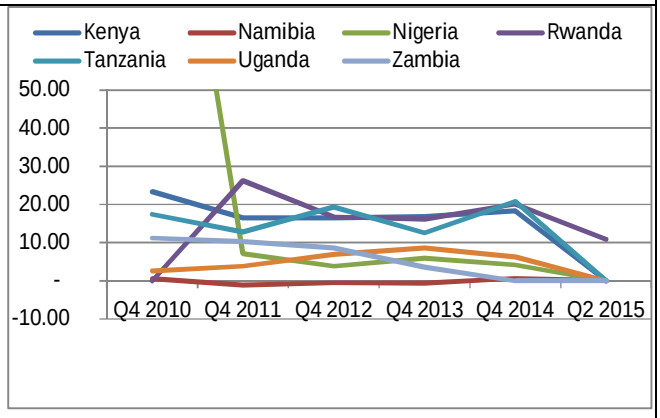
Ratio	2013
Capital to risk-weighted assets	18.5
NPL to total loans	7.2
Liquid assets to total assets	26.2
Bank returns on assets	2.7
Bank returns on equity	23.1

Source: IMF Financial Soundness Indicators database; simple average across 20 SSA countries with available data as of 2013 as well as IMF staff estimates

Graph 2: Regulatory Capital to RWA (%)

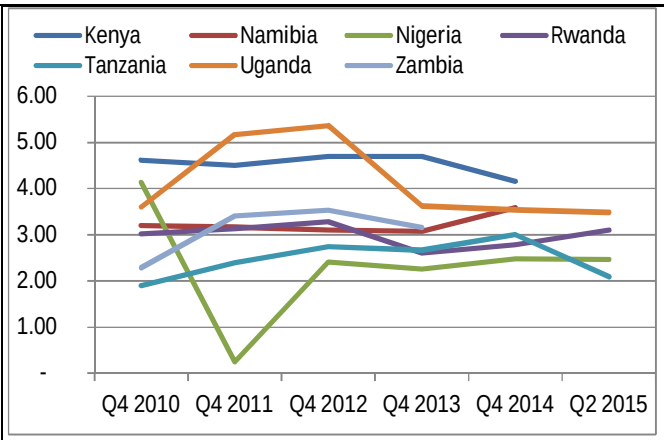


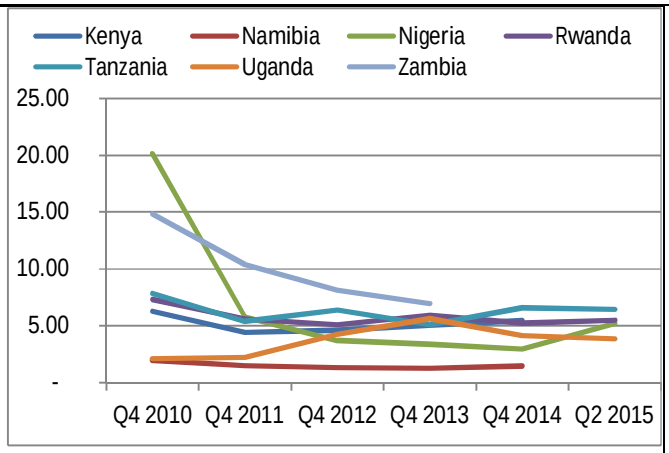
Graph 3: NPL Net of Provisions to Capital(%)



Graph 4: Return on Assets

Graph 5: Non-Performing Loans to Total Loans





Overall, banks manage to keep NPLs well within their risk taking capacity with NPL net of provisions to Capital fluctuating around the 5% range. Profitability is high with around 3% return on average assets translating into RoEs or generally above 20% while capitalisations fluctuate around 20% as well.

Note that NPLs are often driven by single credit exposures that have a high weight in bank's balance sheets. It will be the target of UGEAP to create portfolios with a higher, relative granularity in which a single credit event will not have such high effects.

Trends

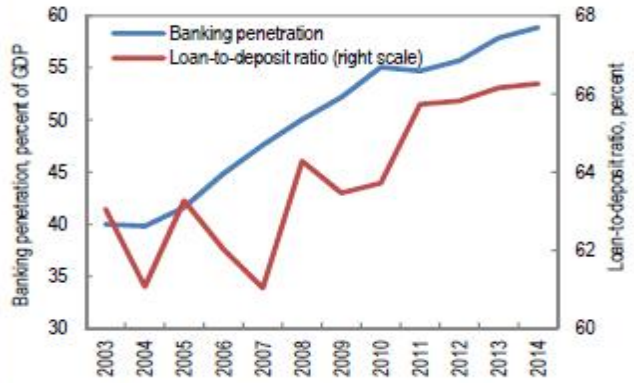
There are two major risks governing the sector at this stage:

1. the potential that banking sectors may overheat which would be based on a growth of lending activities above the sustainability of real economies;
2. a continued and sharper correction of raw materials linked to the cooling of Asian economies, and more specifically the Chinese economy.

Over the past century, real credit to the private sector has grown fivefold – an average annual progression of 16% over 10 years leading to a doubling of the credit-to-GDP ratio of the region as a whole. Progression was driven by the oil-exporting economies and "fragile" states – which do not fall into UGEAPs initial target with the exception of Nigeria.

However, some factors accompanying the rapid expansion in credit are in fact reassuring. The key point is that increased banking intermediation has been underpinned by a growing deposit base driven by rising per capita incomes and an increase of the share of urbanized population. Further, the credit growth to private sector for SSA as a whole compared to other low-income countries globally has been much smaller reaching 15% end of 2014 while other low income regions went up to above 30% on average. This suggests still some more headroom for credit growth.

Nevertheless, seven countries stand out where information suggests a credit growth beyond capacity (>20% of GDP p.a.) which are Angola, DR Congo, Guinea, Guinea-Bissau, Ghana, Lesotho and the Republic of Congo – none of the countries falling into the initial scope of UGEAP.



Source: IMF, International Financial Statistics.
Note: Excludes South Africa. Banking penetration data excludes Ethiopia, Guinea, Liberia, Rwanda, and Zimbabwe due to data availability. Data on credit-to-deposit ratio additionally exclude Madagascar and Malawi.

Table 7: Past and Ongoing Credit Booms:

Past Credit Booms	Start	End	Ongoing Credit Booms	Start
Angola	2006	2009	Chad	2008
Central African Republic	2010	2013	Comoros	2009
DR Congo	2006	2009	Republic of Congo	2008
Gabon	2012	2013	Equatorial Guinea	2013
Ghana	2005	2008	Guinea	2013
Lesotho	2005	2012	Guinea-Bissau	2005
Liberia	2008	2011	Mozambique	2008
Malawi	2008	2012	South-Sudan	2011
Niger	2006	2012	Togo	2011
Nigeria	2007	2008		
Rwanda	2008	2008		
Sao Tomé and Principe	2009	2010		
Seychelles	2010	2010		
Sierra Leone	2007	2009		
Zambia	2012	2012		
Source: IMF				

Please fill out applicable sub-sections and provide additional information if necessary, as these requirements may vary depending on the nature of the project / program.

C.1. Strategic Context

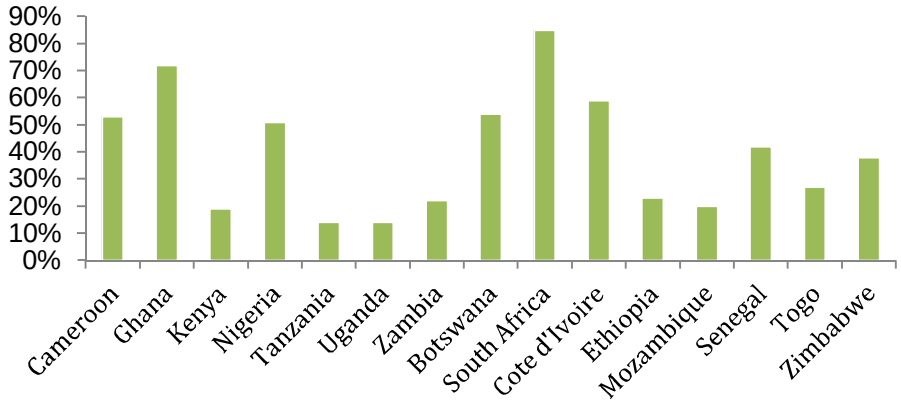
<Please describe relevant national, sub-national, regional, global, political, and/or economic factors that help to contextualize the proposal, including existing national and sector policies and strategies.>

Program Level

African Energy Access and Demand with focus on Sub-Saharan Africa (SSA)

An estimated 621 million people in Sub-Saharan Africa lack access to electricity; power shortages reduce the region's growth by 2-4% per year. Africa's poorest households spend USD 10/kWh on lighting which is 20 times more than households in developed countries (produced using fossil or nuclear sources)[3]. African population is expected to double by 2050 to over USD 2 bn. Most will still have no access to electricity and clean cooking fuels if energy access trends continue unchanged.[4] Energy access estimates commissioned by PIDA, the Program for Infrastructure Development in Africa, indicate that only 37% of the eastern African and 25% of the southern African population had access to electricity in 2010[5]. According to the World Bank, electrification rates in Namibia are a relatively high 47.3%.[6]

Graph 6: Electrification Levels for Selected African States

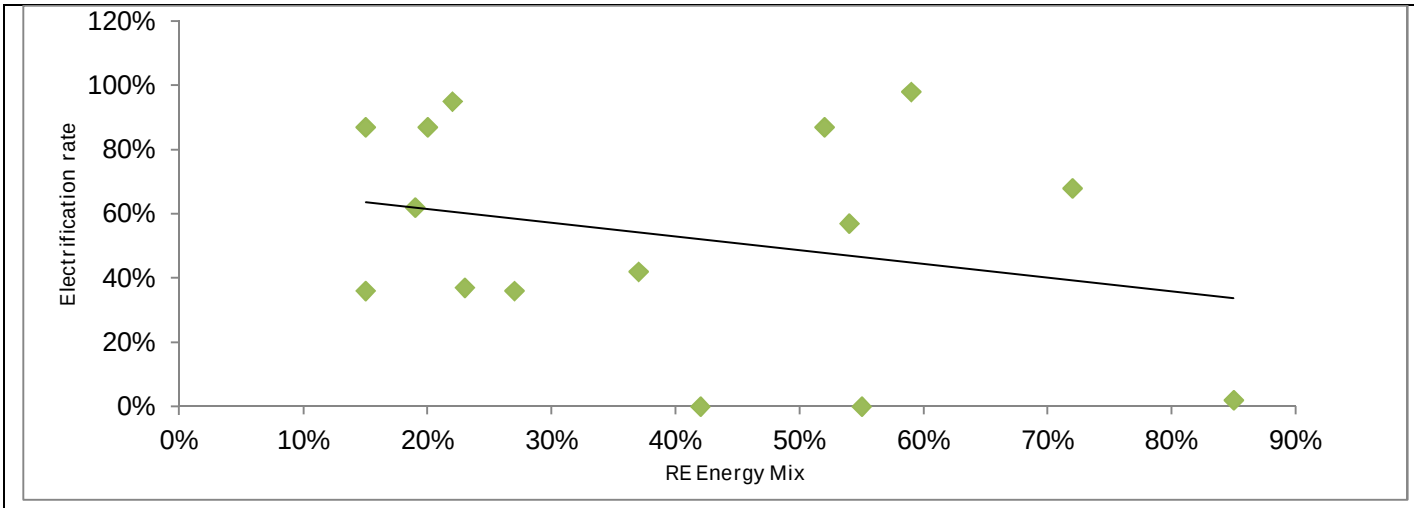


Source: REN21 2014

In addition, a negative correlation between a high electrification rate and the share of renewable energy mix producing electrical energy to the grid exists.

Graph 7: Correlation of Electrification Rate with Renewable Energy Share in the Energy Mix

[3] Africa Progress Panel 2015
[4] IRENA, 2013a
[5] SOFRECO, *et al.*, (2011)
[6] World Bank, Sustainable Energy for All (SE4ALL) database from World Bank, Global Electrification database



Source: REN21 2014

This suggests that with investments in projects that give access to electrical energy for the first time, there is a high probability that electrical energy is produced using renewable energy technologies. It further allows for a sensitive approach towards energy consumption versus energy availability which treats energy as a valuable resource – a view in contradiction to the typical behavior for businesses that have access to electrical grids and see energy to be available in affluence.

Industry (led by mining and refining) accounted for 50% of electricity consumption in Sub-Saharan Africa while much of this is concentrated in South Africa, Nigeria, Ghana and Mozambique. Accurately quantifying the installed grid based power generation is not possible as either data is not available, outdated or unreliable. However, estimates quantify the available generation capacity to be in the region somewhere between 125 to 160 GW with a renewable energy share of just about 1%. Total generation is estimated at around 600 TWh while overall energy demand is estimated to increase to 3,100 TWh in 2040.[7] An additional 683 GW of capacity would be required to increase the share of population with access to electricity to increase to about two-thirds by 2040, as shown in the table below:[8]

Table 8: Capacity of electricity demand by 2040 in Africa

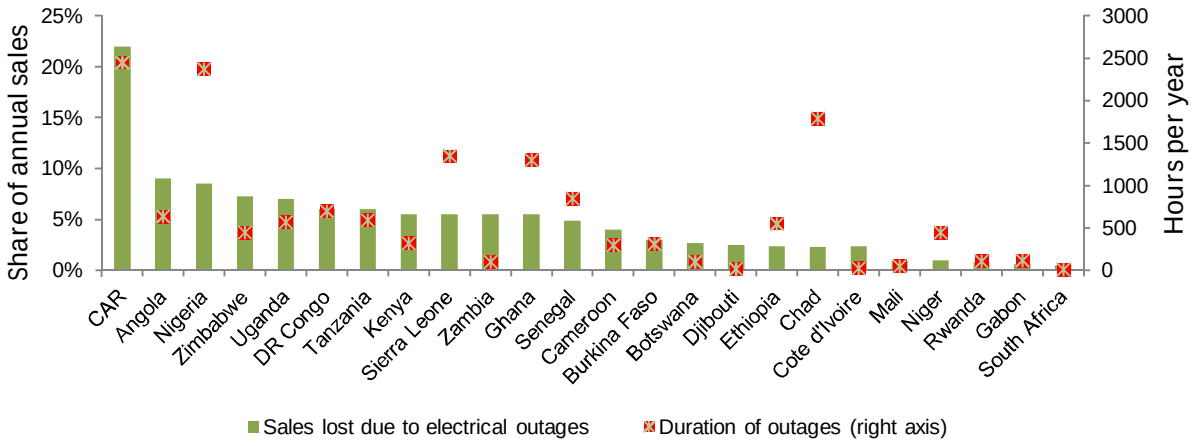
Region	Average annual growth in GWh consumption (%)	Access (share of population) (%)		Additional capacity required
		2010	2040	MW
West African Power Pool	8.9	45	67	90 000
Central African Power Pool	7.3	21	63	26 000
Eastern Africa Power Pool	6.5	37	68	140 000
Maghreb Committee on Electricity	6.0	>95	>99	298 000
Southern Africa Power Pool	4.4	25	64	129 000
Total	**5.7**			**683 000**

[7] IRENA 2015
[8] IRENA 2015

Source: Sofreco, et al. (2011)

Economic prospects are negatively impacted by the lack of reliable and efficient supply of electrical energy given that sales opportunities are lost due to electrical outages. This does not even include households and businesses that are in demand of electrical energy and that are not connected to a grid at all, and further already takes into account that most businesses operate diesel based backup generation sets to maintain operations.

Graph 8: Sales loss due to outages (%)



Source: World Bank (2014b); IEA analysis

The amount of existing, predominantly diesel based backup generator capacity is estimated to range between 120-150 GW (excluding South Africa)[9], with the majority (>=80%) going to services and industry; The actual amount of electricity being produced is likely to be higher during economic prosperous times if and when businesses can absorb the energy costs. Assuming a demand of 16 TWh – an estimate of the actual production of electricity through Diesel backups - an estimated 90,000 barrels a day of oil is used for generators producing expenses of around USD5bn annually.[10] Given these high costs, energy demand and the economic benefit of cheaper and reliable supply more than evident.

There are numerous national, regional and Pan-African initiatives to address the issue that the lack of electrical energy supply hinders the economic and social development of the continent. In most cases, grid based electrical energy supply remains the most efficient and cheapest form to provide energy to consumers. In sub-Sahara Africa with its scattered rural population, there are economic limitations to this paradigm shift as financially viable grids need a specific minimum population density. This is for instance part of the explanation for the success of mobile telecommunication in sub-Sahara Africa whereas landlines could not keep pace with demand. Expanding existing grids is either financially not viable or takes significantly more time, and risks to constantly lag behind actual demand. The following two initiatives document this trend by purely relying on grid connected solutions:

- PIDA, the Program for Infrastructure Development in Africa has been adopted by several African governments in 2012 and shall address the African deficit in infrastructure by co-ordination the development of regional and inter-regional development, large-scale energy, water, transport and information and communication technology projects. PIDA energy projects include the North-South electricity transmission corridor, which extends from Egypt through countries in eastern and southern Africa to South Africa.
- The International Renewable Energy Agency (IRENA), whose mandate is to promote the accelerated adoption and sustainable use of all forms of renewable energy, has launched a complementary initiative to that of PIDA:

[9] Millenium Resource Strategies, Vivek Mittal 2015
[10] IEA 2014 while if current prices would sustain low, costs would also come down.

Africa Clean Energy Corridor (ACEC). ACEC seeks to promote a regional approach to developing a greater share of clean, indigenous, cost-effective renewable power in the energy mix.[11] This would support African economic development

PIDA, as an example, is based on present and projected electricity demand statistics that assume a 6% average annual economic growth rate for Africa for 2010-40. It is estimated that this translates into electricity energy consumption growth of 5.7% per year. Over the period to 2040, 950 million people are projected to gain access to electricity in sub-Saharan Africa (SSA). Urban populations gain access via connections to the grid; in rural areas, mini-grid and off-grid solutions, increasingly powered by renewable energies, will play a much larger role. Against a backdrop of strong population growth, cumulative investment of more than USD200 bn is expected to lower the population without access to energy by just 15% which still leaves 530 million people in the region, primarily in rural communities, without electricity in 2040.[12]

DB estimates that around USD 20 bn was invested in renewable energy in the region between 2006 and 2014 (corresponding to roughly 1,800 MW of renewable energy installed capacity). Development finance institutions (DFIs), contributed more than a quarter of the total investment (USD 5 bn). Analysts expect the private sector needs to build up to a crucial role in the near future, growing the market significantly, up to USD 7 bn a year by 2016.[13]

Positioning of UGEAP within the social and economic context

Against this current situation, the UGEAP offers an instrument that aims to:

- Enable access to electrical energy; and
- Increase the share of renewable energy production in the national energy mix to meet the existing and growing energy demand.

Research unanimously confirms that the capital expenditure required to meet the forecasted energy demand and the ambition to give access to electrical energy cannot be met with national funding sources by most of the SSA countries. Further, it becomes clear that the priority is to produce energy – which includes only a minor focus on shifting of the energy mix towards renewable energy.

Conclusion for UGEAP targeting the SSA region

Based on our research, UGEAP fits well into the regional and national strategies, given its focus on the replacement of fossil fuels as energy carrier as well as targeting energy access programs while focusing on Sub-Saharan Africa.

In order to increase the likelihood for success, UGEAP will focus first on a selected number of countries within SSA (Phase 1). After having executed the first investments in these countries, the regional focus of UGEAP to invest will be expanded to countries selected based on:

- demand;
- regulatory feasibility; and
- technical and business feasibility.

Regional Focus Phase 1

To underpin the choice of countries for Phase 1 beyond the actual pipeline and active demand by projects for debt funding, an analysis of all countries in Sub-Sahara Africa (excluding South Africa and countries recommended to be banned by OFAC) and their key economic as well as energy and climate related indicators has been performed. For this, the ratio of people without electricity access has been put into correlation to the ease of doing business ranking by the World Bank. A high ease of doing business ranking (1=best ranking) means the regulatory environment is more conducive to the starting and operation of a local firm. Countries with a good investment case for UGEAP can be found

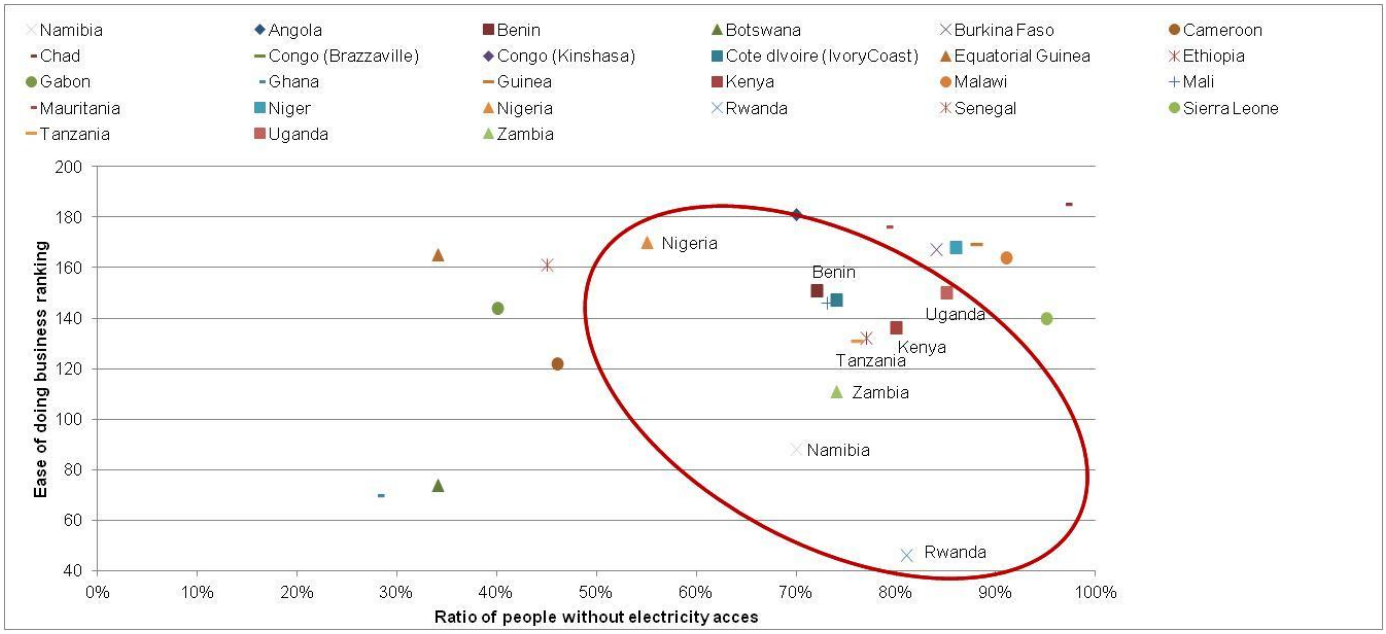
[11] IRENA 2015
[12] IEA 2014
[13] "H2 2014 Sub-Saharan Africa Market Outlook". Bloomberg New Energy Finance, London. July 2014.

on the left towards the bottom, as these countries show a high ratio of people without electricity access and a relatively good ranking of ease of doing business. The countries that have been identified are mainly clustered in East Africa in order for UGEAP to benefit from relative geographical closeness and synergy effects on the investment side:

- Benin
- Kenya
- Namibia
- Nigeria
- Tanzania
-

In addition, demand for electricity provided by renewable solutions under the 3 project types outlined below has already been expressed either by governments or energy service providers.

Graph 9: Regional Feasibility Cluster Phase 1



Source: DB based on World Bank data

Regional Focus Phase 2

After the first Phase, UGEAP will start Phase 2 of the program by widening its geographical scope to new countries. To identify new countries a new analysis will be performed. Based on lessons learn from Phase 1 and an operating track record of the proposed technology solutions, it is likely that UGEAP will be able to broaden its activity successfully into other markets that will be chosen and analyzed carefully.

Project Information

The following paragraphs provide an overview on how the project categories (based on the sample projects) will contribute to the replacement of fossil fuels and to increased renewable energy access in Sub-Sahara Africa.

Category 1 Projects – Solar Home Systems

Off-grid solar home systems support the proposal in the following way:

Which economic sector do the projects serve?

- Off-grid solar electrification of households: creates electricity access for households, micro-enterprises, and their communities, and thus enables socio-economic development and growth, substituting or complementing other energy sources for low-income Sub-Saharan African households (like for instance charcoal for cooking stoves).

Will be such projects part of a nationally organized strategy / policy?

- Such type of projects will be fully private sector projects that will contribute towards reaching the Target Regions's electricity access target.

Who are the end-beneficiaries of the projects' outcome?

- Current focus: Sub-Saharan Africa rural households with relatively high energy expenses and no access to grid electricity or other reliable and affordable electricity supply sources;
- Off-grid population in Sub-Saharan Africa forecasted to grow from 600 million people in 2011 to 698 million in 2030[14];
- The majority of UGEAP's phase 1 Target Region households are off-grid as by today;
- First projects has started so far to electrify households but only on a small-scale compared to the potential market sizes;
- To ensure market acceptance different solar home system sizes are available to satisfy demand from different household types:
  1. small size Solar Home Systems (SHSs) (eg 80Wp) to fulfill the basic energy needs of those living close to the poverty line;
  2. medium size SHSs (eg 120 Wp) for the "middle" income segment of the poor population wanting to power some basic additional appliances, like charging mobile phones or using a TV set;
  3. large size SHSs (eg 200 Wp) for the population in the "higher" income segment of the lowest quintile of the population, wishing to power heavier appliances such as a refridgerator;
- Larger SHSs also have the ability to power micro and small business enterprises (MSME), enabling households to strengthen their business activities or even to become entrepreneurs;
- SHSs can grow with demand, upgrading from a smaller to a larger SHS, following social, economic and environmental development.

What are the needs of final beneficiaries that are getting served?

- Electricity for lighting;
- Electricity for phone charging;
- Electricity for smaller appliances, including TVs and fans;
- Electricity for larger appliances, like refrigerators or MSME machines;
- Estimated electricity consumption of a typical rural household in Africa: far below 1 kWh per day as a baseline but expected to grow over time.

What are the alternatives for final beneficiaries if such projects would either not exist or would not be preferred by them?

- Households would otherwise use kerosene or candles for lighting, or pay a local entrepreneur to charge their phone via a lead acid battery;
- These costs can conservatively already range from USD 6-10/month without the possibility of using TVs, fans, or other small home appliances;
- Grid extension is expensive: estimates for Kenya indicate costs of USD 2,000/household[15] and unlikely to be implemented area-wide due to its economic limitations, i.e. it will not pay off;
- Compared to these alternatives, even large size SHSs are cheaper with about USD 1,700 (including

[14] AT Kearney/GOGLA: "Investment and Finance Study for Off-Grid Lighting", June 2014

[15] Information provided by Kenyan and Rwandan Ministries of Infrastructure. With growing grid access, these costs per household are tending to grow because, first, 'low-hanging fruits' are given access before reaching a wider area.

appliances) per household.
- Sub-Saharan African Governments are working on several electrification projects in rural areas to increase generation capacities, still supplying to only a minority of the national demand, mainly in urban areas.

Category 2 Projects – Green Mini Grids

Green mini grid solutions support the proposal in the following way:

Which economic sector do the projects serve?
- Such type of projects serve rural electrification of remote off-grid villages in sub-Sahara Africa;
- It implements off-grid solar power infrastructure in the form of mini-grids for households, micro-enterprises, and their communities, and thus enables socio-economic development and growth, substituting or complementing other energy sources for low-income sub-Saharan African households (like for instance charcoal for cooking stoves).

Will be such projects part of a nationally organized strategy / policy?
- Such type of projects will be fully private sector projects that will contribute towards reaching the Target Regions' electricity access target;
- Serving rural areas with alternative energy sources is in line with the Target Region's policy strategies.

Who are the end-beneficiaries of the projects' outcome?
- Off-grid households (especially rural) with relatively high energy expenses and no expected access to grid electricity or no other existing reliable and affordable electricity supply source;
- Basically, similar beneficiaries as off-grid solar home supply companies while mini-grid suppliers have a stronger emphasis on the "Base of the Pyramid" (BoP) households with a daily income below USD 2[16];
- Off-grid, rural micro-enterprises such as village kiosks and agro-processors that are currently dependent on diesel generation sets for electricity supply.

What are the needs of final beneficiaries that are getting served?
- Electricity for lighting;
- Electricity for phone charging;
- Electricity for small appliances including TVs and fans;
- Electricity for micro-enterprise appliances, such as small fridges, sewing machines, and agro-processing;
- Estimated electricity consumption of a typical rural household in Africa: far below 1 kWh per day as a baseline but expected to grow over time.

What are the alternatives for final beneficiaries if such projects would either not exist or would not be preferred by them?
- As regards households: see Category 1 Projects ;
- Micro-enterprises would otherwise use a diesel generator to provide electricity to power small appliances. This is costly for operators, a nuisance (as diesel generators must be stored indoors at night for security but run outdoors during the day), and noisy for the community. Diesel is not always available and there is high price volatility. Fuel and maintenance costs can conservatively range from USD 30-40/month.

Category 3 Projects – Green Industrial Energy Supply/ Selected On-Grid Projects

Green industrial energy supply can be provided e.g. through rental solar power solutions that support the proposal in the following way:

Which economic sector do the projects serve?

[16] People in the Bottom of the Pyramid live on less than 2 USD per day (as defined by Prahalad/Hart in 1998), i.e. more than 50% of the world's population.

- Rental solar power solutions to decentralized / rural business in remote locations;
- Multipurpose solar-diesel hybrid farms, standalone high-output solar PV systems;
- Providing cost-effective, convenient and clean rental solar farms to reduce fuel consumption of on-site diesel generators;
- Focusing on fast-growing, developing economies;
- Target market: decentralized / rural businesses

Will be such projects part of a nationally organized strategy / policy?

- Such type of projects will be fully private sector projects;
- However, serving rural areas with alternative energy sources is in line with the Target Region's policy strategies;
- Providing reliable electricity supply to industries contributes towards achieving strong and competitive economies

Who are the end-beneficiaries of the projects' outcome?

- Off-grid SME industry operators in agro-processing, mining, wood processing and other sectors; even suitable for on-grid businesses due to unreliable grid supply; lowering the cost of electricity generation frees up resources that could be allocated towards increasing employment
- Off-grid communities and their households as well as micro-enterprises that lack any form of electricity supply or depend on a privately run diesel generator;
- SHS providers redeploy-ability mitigates off-taker default risk as solar farms can be redeployed in case of end of use or non-payment.

What are the needs of final beneficiaries that are getting served?

- In remote community customer segment: Such projects improve energy access by renting solar farms (with generators and/or battery systems) to local partners who in turn provide first-time energy access to off-grid communities, through hybrid mini-grids;
- Reduce power costs and emissions for cost leaders;
- Reduced price volatility and more robust/redundant energy supply chain will be also greatly valued benefits;
- Partly replace unreliable, expensive and unhealthy fossil fuel-based power;
- Rental solar farms hybridize existing diesel generators: reducing the diesel fuel consumption of the generators - for every MWh of diesel power replaced, rental solar farms add to the reduction of carbon emissions;
- Avoid up-front capital investment or long-term off-take obligations.

What are the alternatives for final beneficiaries if such type of projects would either not exist or would not be preferred by them?

- Basically, SMEs face a poor electricity supply structure: The Target Region cannot keep up with growing demand in power supply, a large base of non-environmentally friendly installed diesel generators are being used as day-today or emergency solutions instead;
- None of the existing power supply options are satisfactory: The Target Region's electricity grids experience frequent outages, alternative diesel power is expensive (although oil prices went down);
- Solar: more cost effective than 100% diesel power or grid+diesel-backup "blended" power;
- Rental solar farms: offer a kWh-cost below current costs while the solar farms integrate with existing diesel generators to provide hybrid power, generating significant cost savings and CO2 mitigation;
- Rental solar farms: well suited for deployment in developing countries due to their operational flexibility;
- Redeploy-able rental solar farms: allow powering rural SMEs and residential users at attractive price levels, with privately-financed, scalable business models, generating maximum CO2 mitigation.

C.2. Project / Program Objective against Baseline

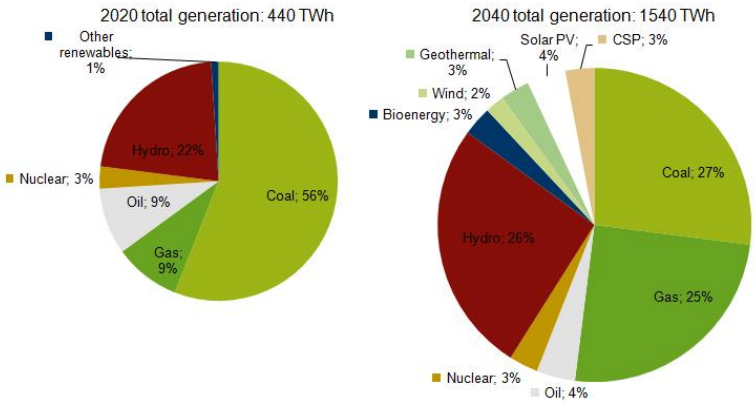
<Describe the baseline scenario (i.e. emissions baseline, climate vulnerability baseline, key barriers, challenges and/or policies) and the outcomes and the impact that the project/program will aim to achieve in improving the baseline scenario.>

Program Level

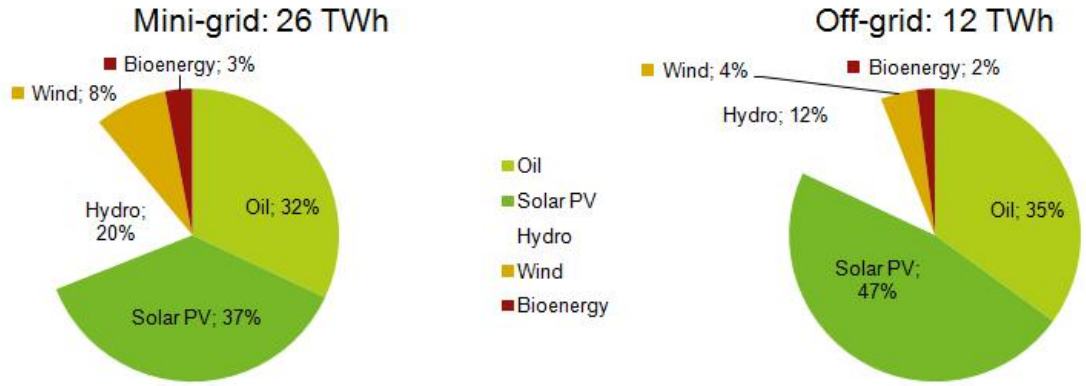
Sub-Sahara Africa accounts for relatively small portion of CO2 emissions globally (0.6 gigatons (Gt)) which is expected by the IEA to grow to 1.2Gt in 2040. This represents a share of 2-3% of global emissions. At the same time, the impact of climate change on Africa is expected to be pronounced. Increase in temperatures is estimated to be higher for Africa compared to other regions globally.[17] The continent is already subject to weather extremes that will increase in weight and frequency. Amongst those are droughts in some areas and extreme precipitation in others. In a scenario where sea levels would actually rise, the coastal areas, that host large parts of population and where the majority of economic activity is located, would be highly affected.

The expansion of electrical energy production heavily depends on hydroelectric installations apart from fossil fuel based energy carriers. The investments of UGEAP target mainly off-grid solutions that are either exclusively based on renewable energy sources (Category 1) or hybridize existing Diesel based generation capacity (Category 2 and 3).

Graph 10: Energy Mix Development: Grid Supply



Graph 11: Off-grid power system



[17] James and Washington, 2013

Source. IEA 2014

UGEAP targets a huge and largely untapped market of industrial off-grid diesel systems and areas that have no electrical energy supply. UGEAP will serve the demand with long term debt capital that is required to match the amortization horizons of the underlying assets.

The target of UGEAP is to mitigate lifetime CO2e emissions by more than 50m tCO2e (see below in section E for further details) over the lifetime of the program by investing in renewable energy generation capacity and measured by CO2e emissions saved and delivering towards the target to increase the share of renewable energies in the energy mix of African economies.

Category 1 Projects – Solar Home Systems

Projects' baselines are outlined as follows:

- Significant urban-rural gap: only a fraction of the total electrification reaches rural areas, while the vast majority of the total population lives in these regions;
- Based on market information households consume 0.2 liters of kerosene per day, yielding annual CO2e emissions of 0.2t CO2e per household;
- In the Target Regions rural households spend approx. 10-25% of income (USD 15/month) on energy – excluding costs for mobile phone charging and travel expenses spent to buy fossil fuel; in comparison, off-grid solar home system (SHS) users pay an average of USD 9-12/Wp equivalent to USD 21 per month, while after 3 years the SHS is paid off[18];
- Rural households which depend on agriculture are highly affected by climate change;
- Moreover: lack of electricity hinders children to study after dark, having negative impact on their education and consequently their living standards;
- Key barrier to overcome the barrier: lack of technical understanding of and experience in last mile electricity distribution on the level of various stakeholders, e.g. policy makers;
- Major barrier is access to funding.

Projects outcome/impact:

- SHS providers equip rural households that have different needs and willingness-to-pay (WTP) with suitable SHSs, providing different sizes;
- Many of them (up to 40%)[19] utilize the SHS for income generation;
- In doing this, SHS providers mitigate CO2e emission from kerosene lamps from every household it equips with ensuring benefits for the end-users' health;
- SHS providers' approach includes electrification of MSMEs;
- SHS providers' objective is to contribute to the paradigm shift to low-carbon technologies;
- SHS providers' major aim: provide reliable, sustainable and affordable solar energy technology to rural households with funding from UGEAP;

A SHS provider's offering has to be enabled by the following innovations:

- A comprehensive technological package, including the photovoltaic panel, the battery, the meter, the standardized box kit to charge phones or connect electric appliances, the DC electric appliances themselves;
- A comprehensive customer service with affordable monthly installments and a reasonable warranty after sales service which can optionally be extended.

Category 2 Projects – Green Mini Grids

[18] Based on market information
[19] Market research

Mini grid solution (MGS) providers' baseline is outlined as follows:

- Off-grid households consume 0.2 liters of kerosene per day, yielding annual CO2e emissions of 0.2T CO2e per household;
- Micro-enterprises consume 2 liters of diesel per day, yielding annual CO2e emissions of 1.44T CO2e per micro-enterprise;
- Main barrier: no readily available, accessible, and affordable low carbon energy alternatives to traditional fuels;

Projects' outcome/impact:

- The projects displaces the use of fossil fuels through the provision of PV-based electricity services;
- MGS providers' approach includes electrification of MSMEs;
- In doing this, MSG providers' mitigate CO2e emission from fossil fuel from every household and MSME it connect to its mini-grids;
- Climate vulnerability is greatly reduced as access to electricity increases. Access to modern electricity services improves incomes, access to information that can increase climate resilience (such as weather reports and improved agricultural practices), and communications.

MSG providers' offering requires the following innovations:

- A sophisticated though adjusted network design, tailor made to rural Sub-Saharan African conditions with remote monitoring and metering,;
- A comprehensive customer service at affordable rates and a contract lifetime service.

Category 3 Projects - Green Industrial Energy Supply/ Selected On-Grid Projects

Rental solar power solution (RSPS) providers' baselines are outlined as follows:

- A RSPS provider's baseline is either off-grid production of electricity on-site with diesel generator; e.g. communities or industry sites (e.g. mines, timber saw mills, quarries and other companies in the extractive or raw materials industry), or on-grid but with power shortages; production of electricity on-site with diesel generator as back-up-system during power shortages (e.g. communities or industry sites);
- Three barriers impeded fast scaling up of solar power in the African SME segment:
  - Solar up-front costs are too high for local SME to shoulder themselves;
  - Pre-financed "energy-sales" offers, based on power-purchase-agreements, require long, 20+-year off-take agreements with investment-grade entities. SME's, by definition, do not qualify investment-grade entities and almost never have a 20-year decision horizon, and
  - while solar can scale down to <1MW technically, small projects are difficult to be profitable due to large project-level costs (permitting, engineering, financing) involved.

A RSPS providers' project outcome/impact:

- RSPS provider's approach overcoming these barriers: offering SMEs a standard, modular, and re-deployable solar farm on a flexible, pre-financed rental basis, hence enabling customers, solid, but non-investment-grade businesses, to benefit from solar cost savings without upfront investment and without the need for long-term off-take agreements.

Table 9: Overview of Barriers and Solutions for Category 3

Baseline barriers which impede the application of solar opportunities	A RSPS provider's solution to overcome the barriers and to support the objectives of the project
Up-front costs for buying a solar farm too high	Lack of up front investments allows RSPS provider to reach smaller, capital constrained SMEs and/or frees up customer capital to invest in their growth.
Too few users with required credit quality / user cannot	Business model integrates the technical solution AND the

apply for loans, funds, etc.	financial model, mitigating off-taker risk, so that rural SMEs can also be served using scalable, market-based sources of finance.
Too few users with 20+ year power demand which limits the installation of a solar farm on a 20+ yr contract (to avoid up-front costs)	Rental duration is matching with user's power needs, because, through redeployment, solar farms can be used at changing customer sites if needed.
Cost per kWh of solar plus batteries (to manage solar intermittency)too high	Storage-free solar-diesel hybrid solution does not require power storage, and is therefore the lowest cost power source for remote areas.
Solar based option does not save costs	• RSPS provider has to offers customers immediate cost savings due to innovative technical, risk-mitigation and financing model, which is suited to renting equipment to frontier market SME's. • "Clean & Green" business model with financial and environmental win-win. • No subsidies needed.
Need for stable "on-site" grid	• Equipment need to include simple and easy software for grid management. • Innovative developments such as skycams for cloud detection together with professional software ensures a stable on-site grid.
No complex grid management	
24-7 availability	Full-service installation and operation.
No trained staff for installation, operation and maintenance available	Training concept for local technicians has to be in place.
Source: Market information	

An RSPS provider example offer should include:

- Customer benefit by obtaining a lower cost, more reliable, convenient power service, at zero up-front cost, when and where they want it
- The climate benefits from significantly reducing CO2e and other harmful emissions
- RSPS providers offer investors a risk-mitigated, sustainable way to invest in frontier markets' economic growth at attractive market-based rates
- Rural communities benefit from enhance local employment and wealth creation, because unavailable, expensive and/or unreliable power is the primary constraint on economic growth.

RSPS providers' objectives are:

- To be sustainable by reducing CO2e and other emissions;
- To be enabling: enables communities with no electricity supply to install their first grid which then is green from the start;
- To be cost-effective: Immediate cost savings and independence from subsidies;
- To be Clean & Green by creating environmental and financial win-win plus customer satisfaction;
- To reduce vulnerability of communities in remote areas or on islands towards climate change by unfolding a low-carbon development path.

C.3. Project / Program Description

<Describe the main activities and the planned measures of the project/program according to each of its components.>

Program Level

UGEAP's objective is to contribute to universal access to electricity in Sub-Saharan Africa by scaling up investments in renewable energy from local financial markets and the international private sector.

For this purpose, UGEAP mobilizes capital for local financial institutions to the benefit of End Beneficiaries in the Target Region. This is achieved by providing debt capital to the Target Investments. As End Beneficiaries of each Category have different financial ability and need profiles, DB has developed two instruments UGEAP can use in parallel to serve the different sectors with a instruments that matches demand:

- A Funding and Risk Participation Agreement structure (FRPA); and
- Syndicated Loans (SL).

The structure is based on the following two financial elements local financial institutions require in order to serve the sector on a larger scale than current status quo allows:

- Long term debt
- Risk taking capacity

Target Investments within the three project Categories, however, require different approaches how the long term debt and the risk taking capacity actually is made available to the End Beneficiaries. This is as both "assets" need to come in the right form to match how local financial institutions serve the businesses that serve the End Beneficiaries. The differences are shown in the next table, while UGEAP will pursue two solutions: FRPA and the SL structures.

Table 10: Solutions of UGEAP to reach the Target Investments

Investment Category 1&2 (i.e. Project 1 and Project 2)	Investment Category 3 (i.e. Project 3)
Solve capital supply: long term capital to be provided to local FIs.	Strengthen the access for local FIs outside their own balance sheet by providing capital along with local FI.
Risk take-over to support local financial institutions to serve regions, businesses and sectors it so far does not cover.	Risk participation in parallel with local FI.
➔ **Funding and Risk Participation Agreement Structure**	➔ **Syndication Structure**
Source: Deutsche Bank	

The need for two the different approaches are caused by the nature of the underlying businesses that are described further in the following two sections.

Ad 1) Funding and Risk Participation Structure:

This instrument has been developed to deliver toward the End Beneficiaries of Category 1 and 2 investments and to serve the following business concepts:

- End beneficiaries are local households as well as micro, small and medium sized businesses (MSME) that are in need for light, heat (cooking), cooling (fridges) as well as electrical energy for mobile phones, IT equipment or other equipment (i.e. sewing machines).
- Households either

(i) Purchase energy kits (i.e. solar home systems with a typical capacity of 80 – 200MWp) that deliver electrical energy under purchase contracts that require regular (weekly, monthly) installments or pre-payments over a lifetime of up to 3-5 years after which the energy kit is legally owned by the household; or

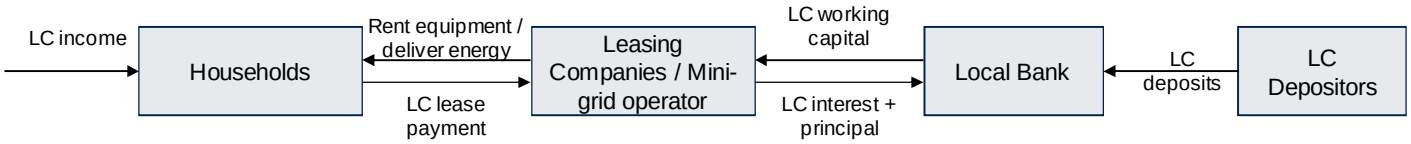
(ii) are connected to mini-grids against a connection fee and a remuneration linked to the amount of energy being consumed (which may have a minimum off-take requirement or pre-payments);

In both cases, End Beneficiaries replace current energy carriers (kerosene, petroleum, diesel, bio-fuels) with electrical energy that is produced through their own kit or with energy generators attached to the local mini-grid which can be a hybrid solution of renewable energy and fossil fuel based generation capacity.

- Households and MSMEs generate their income in local currency. A share of the income is used to settle lease payments or pay for electrical energy consumed.
- As a result of the business described, leasing companies create highly granular portfolios of local currency denominated claims that require debt funding; mini-grid operators create the same as a function of the amount of households attached to the grid.
- As international investors cannot source local currency (LC) funding, a local financial institution has to be used to extend local currency denominated financing. Local banks generally have both, local currency deposits as well as USD based business (i.e. international trade finance transactions). Hence, local banks can play the traditional role of a financial intermediary transforming the USD capital investors in UGEAP can provide into local currency denominated capital for the (Decentralized) Energy Service Companies (D)ESCOs), leasing companies and/or mini grid operators.

The following chart depicts again the cash flows of the business and how a local bank can be added to provide funding.

Graph 12: Cash Flow Structure Local Currency



Source: Deutsche Bank

In order to allow local banks to extend debt financing to the ESCOs, leasing companies and mini grid operators to refinance their investments in the renewable energy generation capacity, UGEAP will offer a Funding and Risk Participation Agreement that will deliver:

- long term USD denominated funding to the local bank;
- a partial risk transfer of the credit risk local banks will generate out of the portfolio of eligible loans towards Category 1 and 2 investments.

Part of the structure is that the local bank takes the FX risk and uses its balance sheet as a natural hedge between the USD denominated funding from UGEAP and the local currency denominated lending it grants to local borrowers. This is following its standard function as financial intermediary.

The following gives a description of the functioning using a simplified form of the structure while the exact arrangement will be tailored towards each country and the risk taking capacity of (a) the local bank and (b) UGEAP. The FRPA will have two legs combined in one agreement:

- Funding Leg
- Risk Participation Leg

Funding Leg

Under the Funding Leg, the local bank will receive a loan that can have the following exemplary features while the exact terms will be calibrated towards the risk taking capacity of the local bank along with the amount of risks that is to be transferred to the UGEAP:

- Loan Amount: 25m

- Currency: USD
- Tenor: 10 years
- Interest rate: 3m USD LIBOR + Margin (which will vary according to the risk profile of the bank)
- Repayment: Bullet or amortizing subject to the risk of the financial institution and its funding profile.
- Repayment Amount: Loan Amount reduced by the Risk Participation Amount

The Risk Participation Leg

The Risk Participation Leg details under which conditions the Loan Amount repayable by the local bank might be reduced along the following principles:

- The local bank is required to build up within the ramp-up period of [2] years ("the Ramp-Up Period") a portfolio of loans towards Target Investments. Every quarter the local bank can report to UGEAP the loan it wishes to add to the "Reference Portfolio" in which those loans are tracked on which UGEAP will bear partially the credit risk on (2nd loss position) and that meet certain pre-defined eligibility criteria (the "Eligible Loans").
- If, after the Ramp-Up Period, the Reference Portfolio has reached a balance equal to the Loan Amount, the data trustee of UGEAP will start to track the USD equivalent amount of write-offs that are booked against the Reference Portfolio in a Loss Ledger Account. The USD equivalent of write offs will be the lower of (a) the USD equivalent of the reference loan amount at the end of the Ramp-Up Period and (b) the USD equivalent of the write off at the end of the quarter the write off has been booked. Extraordinary revenues that are received after write off are debited to the Loss Ledger Account.
- At the maturity of the loan, the Risk Participation Amount will equal the higher of (I) 0 and (II) the sum of (a) the debit balance of the Loss Ledger Account minus (b) the product of (i) First Loss Ratio ([15%)] times (ii) the Loan Amount.
- Note that the applicable FX rate to the losses to be recorded in the Loss Ledger Account will be capped at the FX rate at the time of disbursement. This is to exclude the situation where the potential loss in USD terms would increase over time.
- Note that the first loss retention will be quantified subject to the risk taking capacity of the local bank and the expected profitability of the arrangement for UGEAP (as the first loss share is linked with the participation on the revenues of the underlying loan portfolio). The intention is to size the first loss piece such that the bank will see a negative effect on its P&L while at the same time the first loss piece shall not exceed its risk taking capacity.
- This mechanism will ultimately achieve that the local bank will have to repay only a portion of the Loan Amount in case that the USD equivalent of write offs exceed a first loss retention amount which will be calibrated towards each individual bank taking into account its financial strength and risk taking capacity.

Principal Loss Exposure of UGEAP

The following tables show the principal cash flows at maturity in 3 scenarios:

Graph 13: Principal cash flow in 3 scenarios

Item	No defaults	Loss of 0.75m	Loss of 4.5m
Loss Ledger	Credit / Debit Write offs 0 — Extraordinary Income 0 Balance 0	Credit / Debit Write offs 1 — Extraordinary Income 0.25 Balance 0.75	Credit / Debit Write offs 5 — Extraordinary Income 0.5 Balance 4.5
Repayment Amount	25m = 25m – max(0; 0-3.75m)	25m = 25m – max(0; 0.75m-3.75m)	23m = 25m – max(0; 4.5m - 3.75m)
Loss local	0	0.75m	3.75m

bank			
UGEAP loss	0	0	0.75m

Source: Deutsche Bank

Quantification of First Loss Coverage

The amount of first loss retention that will be requested by UGEAP will be tailored towards:

- the local market;
- the operational financial capacity of the bank;
- the risk assessment by DB on the underlying transactions;
- the key origination channels and selection criteria;
- the regulatory framework the bank is working within;
- the requirement that the local bank will have significant and sufficient risk retention to align interest of UGEAP with those of the local bank.

While the above examples make use of 15% first loss borne by the local bank to illustrate the functioning, UGEAP expects to work with different risk participation levels by local banks along the principles laid out below. It should be noted that UGEAP shall act as enabling investor. Hence the balance between prudent risk acceptance and mission orientated target achievements is assessed on a case-by-case basis and after careful analysis of the credit risks embedded in the portfolio expected to become part of the risk sharing mechanism.

The assessment of the appropriate first loss retention by the local partner bank will be conducted by DB as investment manager based on its in-depth knowledge of and track record of working with local banks in Africa through the following channels:

- As part of its investment management mandate for the existing public-private partnership funds DB manages in Africa, including the Africa Agriculture and Trade Investment Fund[20] and the Global Climate Partnership Fund[21], DB has invested in local banks in Africa;
- DB entertains trade finance operations with over 250 banks in 31 African countries through its Trade Finance Financial Institutions (TFFI) team which has long standing relationships with all major banks throughout Africa and offers to their correspondent banks trade finance solutions such as Letters of Credit, trade-related guarantees, emanating from banks as well as financing products. This in-depth banking sector knowledge of the DB platform will be leveraged for UGEAP as well;
- DB's Africa banking teams cover the African financial markets including African banks through teams based in Egypt, Lagos, Johannesburg, Mauritius and Dubai; the UGEAP investment management team has a track record of collaborating closely with these teams, thus having first hand access to their knowledge;
- DB's investment management team for UGEAP is led by a director with long-standing experience in analyzing and rating banks and microfinance institutions, including in Africa. The team has conducted in-depth discussions with initial partner banks for UGEAP which have already been identified and continues the analysis for additional partner banks.

To avoid any 'free riding' by local banks and ensure that they apply prudent credit and lending practices, UGEAP will set the first loss share based on the following principles cumulatively:

1) The amount of regulatory capital the bank has to maintain against the loans to be extended shall not reduce as a result of entering on into the FRPA structure. This generally will lead to a first loss piece to be as high as the current equity capitalization of the local FI. Generally, banking regulation requires for first loss positions that are retained by a regulated financial institution a 1:1 coverage of the first loss retention with regulatory capital. That means, if a

[20] www.aatif.lu

[21] GCPF was managed by DB until September 2014

bank had to hold against a portfolio of loans a given amount of capital, after entering into the risk sharing with UGEAP the amount of equity to be maintained shall not reduce.

2) If the portfolio of underlying assets will be granular, historical data may be used to assess the potential credit quality of the portfolio in the future while stresses would be applied to historical delinquency, default as well as losses to model the lifetime credit risk of the portfolio in a downturn scenario. Stresses will depend on the expected volatility of the economy and the underlying business.
3) If the portfolio is of low granularity (i.e. portfolios of up to 10 assets), the first loss will be calibrated based on the credit quality of the single transactions that shall become part of the reference portfolio.

Based on the above principles, if UGEAP were to serve average banks in its target markets, the first loss piece would be different if banks are served for example in Namibia, where current regulatory capital of banks stands at 15%, compared to Zambia where the capitalization exceeds 25%.

In addition, general credit analysis will be performed on the risk management practice of the bank. Generally, the investment manager expects that the bank provisions 100% of the expected loss of its impaired loans while at the same time the investment manager expects that the bank has remained profitable. This requirement in combination with the link to regulatory equity generally provides a significant buffer of first loss compared to the expected losses of the underlying loans UGEAP shall share the credit risk with. In a market average standard case, the first loss buffer would generally provide protection against an increase of 5 times of expected losses before UGEAP's risk position would be reached. It should be noted, however, that risk assessments are orientated towards future developments and hence are subject to uncertainty.

Revenues for UGEAP

UGEAP will have the following sources of revenues:

- 3m USD LIBOR + Margin on the Loan Amount as compensation for providing funding to the local bank;
- The local bank will be required to transfer the USD equivalent of a certain fraction of the interest collections of all loans that are part of the Reference Portfolio after having deducted a loan administration fee while the fraction will be calibrated towards the risk amount that UGEAP will take and the profitability of the underlying loans;

The amount of UGEAP's participation on the interest income of the underlying portfolio will depend on the amount of the first loss the local bank will retain. The higher the percentage of first loss the local bank takes, the lower the return participation will be by UGEAP. While the first loss risk portion will be calibrated towards the risk taking capacity of the local bank and the country's peculiarities, the most important element for determining the interest transfer is the risk acceptance by UGEAP. Note that UGEAP will have to approve each single exposure on which UGEAP will participate in the risk which will also be based on an assessment on the profitability of the underlying loans.

Under this structure, UGEAP will have revenues that are entirely based on the price for USD capital in the market and interest income that is subject to fluctuations of the local currency versus USD.

Ad 2) Syndicated Loans

The major difference between businesses that will benefit from the FRPA structure is that businesses typically falling into the 3rd project Category typically require:

- Larger amounts of long term debt capital which single investors generally are not able to provide;
- Can and would want to take USD denominated debt on board rather than local currency as their products are oftentimes traded in international markets and hence the business has USD / hard currency income.

Businesses in this sector are oftentimes active in food processing, tourism, telecommunication, construction or raw material sourcing and export, the latter being the largest industry segment African economies rely on to generate foreign currency income through international trade. These companies are receptive towards energy-supply concepts. At this stage, businesses are either grid-connected and operate their own Diesel based backup facilities to bridge the

grid outages, or companies have no grid connection and generate all their electrical energy required by themselves. Energy production is, however, not the core expertise of these businesses and companies would appreciate to divest the energy producing elements for the following reasons:

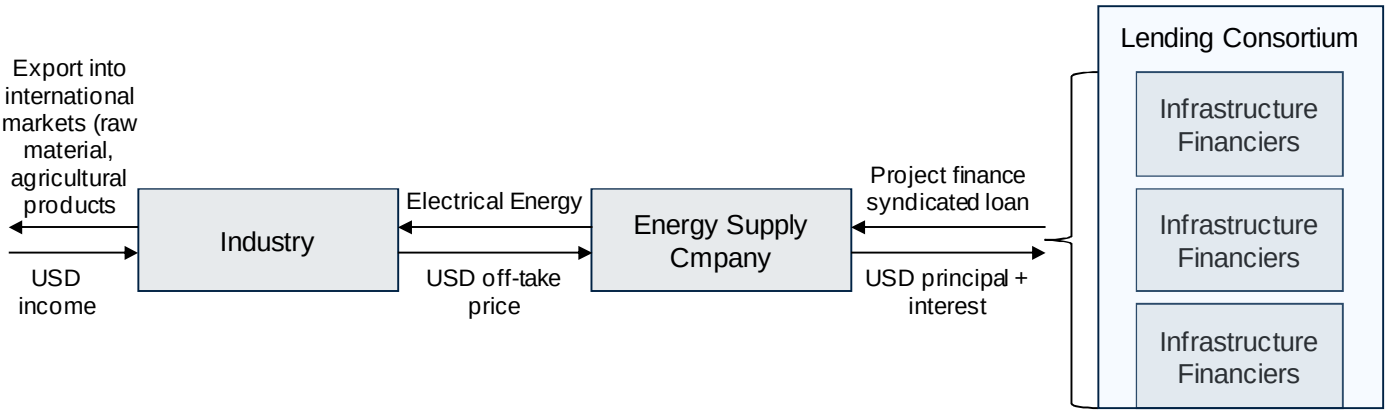
- Off-load the respective assets from their balance sheet and pay a consumption fee rather than having to finance the assets with scarce equity that could be used to expand the core business activity more effectively;
- New technologies are not the businesses' core expertise and support teams would need to be maintained to apply best practice;
- Investments in energy producing element have different amortization horizons compared to their existing businesses; hence receiving budgets to upgrade / expand is taking time and effort that could be spent more efficiently;

Regional and international development banks that serve the private sector can provide debt to businesses described above. Being the larger energy consumers, industry needs larger capacity. This exceeds the funding capacity of local institutions while international development banks are oftentimes able to finance the whole debt portion alone but cannot satisfy demand alone. To enable local banks to build up competence and expand into the sector, UGEAP will lend along them under a syndicated loan structure. This means that the syndicate partners all rank equal in terms of risk and return.

Local and regional development banks such as PTA Bank are the target partner for this structure. These banks do not have deposit taking businesses and therefore rely on debt funding from local or international markets as well – which can be a more expensive funding source than deposits. This hinders local and regional development banks to take on larger projects in the energy sector which in turn limits the market development. Through the syndication option, which has been developed in response to requests from local and regional development banks such as PTA, the UGEAP will provide the additional capacity and give access to larger amounts of funding compared to what is currently available locally. This will enable loans to clean energy projects and companies to be made available which could not have been financed by local and regional development banks on their own. The syndicate can be led either by Deutsche Bank or the local bank, with local leadership as the preferred option to develop the syndication capacity of local and regional banks.

The following chart depicts the structure:

Graph 14: Cash Flow Structure USD Funding



Source: Deutsche Bank

Demand from Local Financial Sector

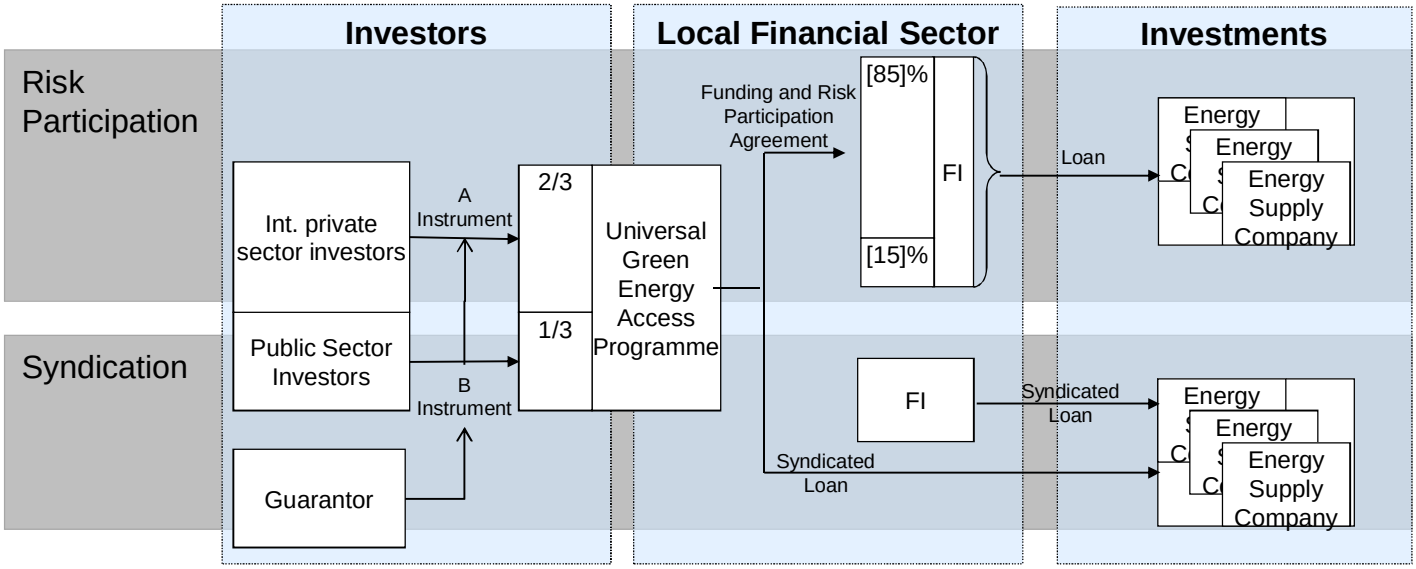
Feedback from local financial institutions on both proposals has been positive. DB has already signed two Memorandum of Understanding with financial institutions in the Host Countries and is actively working on developing additional partnerships to reduce the risk of execution.

Structure of the UGEAP

The following structural diagram details the overall functioning of the UGEAP while the key pillars are:

- UGEAP will collect funding commitments from investors in two tranches: A and B capital. It is targeted that A capital will equal around 2/3 of total capital and B capital around 1/3. B capital is subordinated in its return and principal structure to A capital as the available collections of cash will be distributed in accordance with a priority of payments;
- Deutsche Bank as investment manager will originate, structure and decide on behalf of UGEAP the investments along the instruments described above.

Graph 15: Structure of UGEAP



Source: Deutsche Bank

The overall investment process of the UGEAP and the investment by public sector contributors will be conducted in accordance with the following structure:

- The GCF will be expected to invest into the B-Capital of the UGEAP, with an initial capital contribution of USD 80 MM for Phase 1 and an additional capital contribution of USD 52 MM for Phase 2.
- Deutsche Bank, in its function as placement agent will lever the public sector contribution with private sector investors (A-Capital investment).
- Deutsche Bank, in its function as investment manager, will originate, structure and close loans to and along local / regional banks through a loan and risk sharing mechanism or syndication.
- Local banks will extend loans to local “(Decentralized) Energy Service Companies” (D)ESCOs as borrowers on long terms and in local or international currencies.
- The (D)ESCOs themselves will use the funding from the local banks and the UGEAP to provide energy supply services to the final beneficiaries: households, communities, businesses or local grid operators / utility companies.

Guarantee

It is foreseen that private sector investors in B- Capital may benefit from a partial credit guarantee to be issued by a AAA rated sovereign entity. The guarantee shall cover principal and no returns.

Capital Tranches

The objectives of the capital structure of the UGEAP are:

- To prioritize A Capital investors over B Capital investors for receiving a target return on their investment and principal payments at maturity which translates into a 1st loss position for the GCF and other B-Capital investors/guarantors on a UGEAP level with the 2nd loss being borne by the private sector investors;
- In an expected case scenario, treat the balance between A and B Capital investors such that B Capital investors will have the upside potential in case UGEAP has revenues higher than required to meet the target returns after having paid the claims of creditors. This compensates them for their subordinated position.

The first objective is achieved by an application of the priorities of payments that govern the distribution of payments in combination with minimum subordination requirements. The second is achieved by distributing the revenues that exceed the target returns based on the amount of the "Complimentary Revenue Share" of each investor. Class A Capital investors receive a smaller amount in contrast to Class B Capital investors. The relationship is 3:4 for Class B Capital to 1:4 for Class A Capital.

The senior Class A Capital, which may be issued in successive tranches, bear, pro rata to their respective net asset value ("NAV"), unrealized/realized capital losses of the Fund only if the NAV Class B Capital has been reduced to zero. The Class A Capital return entitlements rank senior to the entitlements of the Class B Capital, but rank junior to the claims of creditors of the Fund which includes the service providers and potentially lenders.

Table 11: The characteristics of the Class A Capital

Reference Currency:	USD
Minimum Subscription	1,000,000
Complimentary Revenue Share	1:4
Target Dividend	Investor specific target dividend (initial guidance: 3-m USD LIBOR + [5.00]%)
Complimentary Dividend	If, after having paid the target return on A- and B-Capital, there is still a surplus of income that is not used to fill a cash reserve, the surplus will be distributed to A- and B-Capital investors subject to the amount of shares of each investor.
Commitment Period	1 year
Maturity	between 5 and 15 years
Redemption	a) upon maturity of a tranche of shares; b) upon liquidation of the Fund; c) upon execution of an early redemption / prepayment right of the Fund; d) dissent by the respective shareholder to amendments to issue document proposed by the Board; or e) other compulsory redemption caused by statutory rulings.
Subordination	Fully subordinated to the creditors of the UGEAP.

Source: Deutsche Bank

Table 12: The characteristics of the Class B Capital

Reference Currency:	USD
Minimum Subscription	1,000,000

Complimentary Revenue Share	3:4
Target Dividend	Investor specific target dividend (initial guidance: 3-m USD LIBOR + [4.00]%)
Complimentary Dividend	If, after having paid the target return on A- and B-Capital, there is still a surplus of income that is not used to fill a cash reserve, the surplus will be distributed to A- and B-Capital investors subject to the amount of shares of each investor.
Commitment Period	5 years
Maturity	15 years
Redemption	a) upon maturity of a tranche of shares; b) upon liquidation of the Fund; c) upon execution of an early redemption / prepayment right of the Fund; d) dissent by the respective shareholder to amendments to this issue document proposed by the Board; or e) other compulsory redemption caused by statutory rulings.
Subordination	Fully subordinated to the creditors of the UGEAP and the Class A capitals.

Source: Deutsche Bank

Capital Raising Steps

UGEAP will issue capital in three rounds (Closings) each time accepting additional investors to the structure. The following displays the envisaged number of closings:

Table 13: Overview of Target Amounts for Expected Closings

1st Closing – March 2017 (Phase 1)

Tranche	GCF	Additional Public Investors	Private Sector	Deutsche Bank	Total	Available Subordination
A	0	0	47	2	49	51.0%
B	40	10	0	1	51	0%
Total	**40**	**10**	**47**	**3**	**100**	

2nd closing – prior to but no later than September 2018 (Phase 1)

Tranche	GCF	Additional Public Investors	Private Sector	Deutsche Bank	Total	Available Sub-ordination
A	0	0	144	4	148	26%
B	40	10	0	2	52	0%
Total	**40**	**10**	**144**	**6**	**200**	

Total Fund level after 2nd close

Tranche	GCF	Additional Public Investors	Private Sector	Deutsche Bank	Total	Available Sub-ordination
A	0	0	191	6	197	34.3%
B	80	20	0	3	103	0%

Total	**80**	**20**	**191**	**9**	**300**	

3rd closing – March 2020 (Phase 2)

Tranche	GCF	Additional Public Investors	Private Sector	Deutsche Bank	Total	Available Sub-ordination
A	0	0	129	4	133	33.5%
B	52	13	0	2	67	0%
Total	**52**	**13**	**129**	**6**	**200**	

Total Fund level after 3rd close

Tranche	GCF	Additional Public Investors	Private Sector	Deutsche Bank	Total	Available Sub-ordination
A	0	0	320	10	330	34.0%
B	132	33	0	5	170	0%
Total	**132**	**33**	**320**	**15**	**500**	

Legal Arrangement with Deutsche Bank AG as investment manager

DB will be obliged to deliver the following services for the benefit of UGEAP:

- Develop and manage UGEAP to full professional standards, as a sustainable program;
- Develop and implement policies and procedures in line with this funding proposal;
- Establish and develop the UGEAP's visibility and activity;
- Identify, evaluate, negotiate and structure investment opportunities that match with the Target Investments;
- Follow its internal investment decision making procedures in selecting the Target Investments to be made by UGEAP;
- Ensure that UGEAP's activities obey the gender policy developed by DB to apply to Deutsche Bank programmes funded by the Green Climate Fund and outlined below;
- Operate in line with dedicated Social & Environmental Guidelines and maintain proper capacity to conduct social and environmental review and monitoring of UGEAP's investment activities;
- Ensure proper documentation of the Target Investments in line with its internal standards;
- Execute loan agreements, promissory notes, and other such documents describing the rights and obligations of investees under the investment, to be entered into by UGEAP;
- Agree on adjustments to the loan agreements and promissory notes entered into by UGEAP in line with DB's internal processes and procedures and where necessary;
- Reduce risk by appropriate selection and diversification of investments;
- Review, monitor and supervise all outstanding investments;
- Ensure an appropriate asset-liability management;
- Manage all aspects of the UGEAP's relationships with investees, as well as the day-to-day management of the investments, including follow-up of events of default of investees;
- Undertake best efforts at protecting the UGEAP's assets;
- Coordinate with the other service-providers (custodian, trustee, cash manager, legal counsel, auditors), as well as with the relevant regulatory authorities;
- Prepare and present to investors quarterly reports on UGEAPs investment portfolio and its current financial position;
- Manage UGEAP's public relations and external communications; and ensure to the extent possible GCF's visibility;

- Set up and operate a framework and monitoring system to validate and monitor energy savings and CO2e emission reductions resulting from each investment; this may include energy audits and impact analysis as necessary;
- Ensure that all investments adhere to the technical, environmental and economic eligibility criteria, especially with respect to energy savings and CO2e emission reductions as well as environmental and social impact assessments when relevant;
- Provide and manage key personnel and such other personnel and officers as required to enable the investment manager to provide the management services as provided for herein;
- Manage the flow of funds; and
- Provide transaction management services;

In its activities, the DB as investment manager is bound by the following policies and guidelines:

- Private Placement Memorandum/Issue document of UGEAP
- Investment policy and guidelines;
- Asset-liability management guidelines;
- Gender Policy applicable to Deutsche Bank Programmes funded by the Green Climate Fund;
- Social & Environmental Guidelines;
- Operating guidelines.

All guidelines and policies governing UGEAP will comply with Deutsche Bank's internal policies and procedures as well as with GCF policies and procedures as outlined in B.07/02 – Annex III

Project Level

Target investees of UGEAP are expected to have performed the following steps developing the projects while in detail due diligence of the results are to be done by the investment manager of UGEAP:

Table 14: Expected Operational Capacity

	Market Research & Demand Assessment	Marketing and Sales	After Sales & Warranty Service
Task	• Market research on economic activities in the target region • Source on-the-ground data through interviews, phone surveys, focus group assessments • Identify needs of customers and ability / willingness to pay • Collaborate with districts and ward offices as multipliers; • Identification of appropriate logistics and required infrastructure;	• Identify the appropriate sales strategy through agents and the support required to agents by staff from the company; • Identify supporting sales tools (marketing through word-of-mouth, referral schemes, "ambassadors", etc., media); • Design the infrastructure for the sales and goods delivery; • Set up appropriate underwriting processes; • Provide for standardized and appropriately detailed documentation with the customers;	• Collection / payment systems; • Design service infrastructure and warranty contracts; • Design, build and maintain an appropriate information transmission and processing infrastructure;

		• Include community engagement plans;	
Deliverable	Market assessment as part of the business plan	Sales and marketing strategy as part of the business plan	Warranty and after sales infrastructure detail as part of the business plan
Source: DB			

Beyond the Business Plan components, a detailed technical assessment is required to design the technical solution that will fit to the customer's needs.

C.4. Background Information on Project / Program Sponsor

<Describe project/program sponsor's operating experience in the host country or other developing countries.>

Program Level

There are three relevant areas where the capabilities of DB are crucial to the success of the UGEAP:

- Investment Fund structuring and administration;
- Investor origination and placement of capital with investors;
- Investment origination and execution.

Ad 1) Investment Fund Structuring and Administration:

Setting up the UGEAP as investment fund requires experience in choosing the right structure in order to ensure that steps 2 and 3 can be delivered successfully and are not held up by an inadequate structure and unworkable procedures. Otherwise the best investment concept may fail with private sector investors in case formal requirements of investors are not met of the product cannot be distributed due to regulatory issues. With total of EUR149bn of "alternative" assets under management, into which UGEAP would fall, including in public-private investment structures similar to UGEAP, DB has the relevant experience needed to deliver this target.

Ad 2) Investor Origination

UGEAP will multiply the GCF's and other public sector capital by attracting private investors to its A Class capital. Deutsche Bank will place this capital on behalf of UGEAP with institutional investors, private investors as well as development banks. These investors are sourced through one of the available sales channels of Deutsche Bank.

Deutsche Bank continuously raises assets for its open ended funds, as well as for new funds/products it launches. It raises debt and equity in all forms, through these main sales channels below:

- Global Client Group (GCG);
- Regional Wealth Management advisors (WM);
- Structured Credit Trading Desk (SCTD).

Each has its own merits for UGEAP. GCG serves as a single point of access dedicated to advising larger institutional investors (pension funds, insurance funds, banks, large corporates, investment companies and larger family funds) on their investments. These institutional investors will undertake their own detailed due diligence around potential investment opportunities; single investment size is typically between USD10m and USD100m. GCG employs over 600 advisors located in a large number of financial centres around the world. WM targets smaller investors like high net worth clients, family offices, foundations/endowments and similar investor groups. DB will only use this sales channel from the second phase onwards as it takes more time to set-up due to more intense regulations. Primary market will be investors from Germany. Other European jurisdictions may be considered. Within WM there is a special desk, Key Client Partners (KCP) for the larger family offices/UHNW and foundations/charities set-up and investing as institutional investors. These clients tend to invest larger amounts. KCP is closely co-operating with GCG and can be a prime

source of potential investors for UGEAP.

SCTD, is a banking sales channel that sells off-the-shelf products to institutional clients. The bank acts as counterparty in a trade and not in an advisory or brokering role. SCTD can buy notes from funds like UGEAP and sell these onwards to investors. SCTD is mostly used for highly standardized investment grade credit products, either rated or unrated. The SCTD is capable of placing larger amounts in a relative short period (from days to weeks). This channel is only available if UGEAP will introduce a notes-like security.

Within 2015, DB placed EUR 5.03bn through its various sales channels that are linked to renewable energy related investments in a total capacity of 3,496 MW. Per end of 2015, Deutsche Asset Management had, in addition, more than EUR 7.6bn of assets under management that are selected in accordance with environmental and social criteria.

For UGEAP, DB plans asset raising as laid out in the table below.

Table 15:Overview of private sector asset raising by sales channel

Closings	Asset origin	Time	Amount to be raised	Sales Channel
1	• 100% Europe	6-9 months	USD 47m	• GCG: USD 47 million • WM: USD 0 million • SCTD USD 0 million
2	• 70% Europe • 10% Asia • 20% US	18 months	USD 144m	• GCG: USD 120 million • WM: USD 24 million • SCTD USD 0 million
3	• 70% Europe • 10% Asia • 20% US	18 months	USD 129m	• GCG: USD 100 million • WM: USD 29 million • SCTD USD 0 million
TOTAL		42 months	USD 320m	• GCG: USD 267 million • WM: USD 53 million • SCTD USD 0m

The next table gives a more detailed overview of the potential investors that DB will be approaching through GCG to invest in UGEAP. Country priorities may be adjusted based on applicable regulations (and its impact on potential investors and UGEAP structure) at the time of asset raising.

Table 16: Overview of target investors by origin and type for the GCG channel

Origin	Investor Type	Nr of selected target investors	Possible Ticket size
US	• Family Funds/UNHW • Foundations • Insurances • Pension funds	• 10 • 10 • 5 • 5	• USD 1-20 million • USD 5-50 million • USD 5-50 million • USD 10-100 million
Germany	• Family Funds/UHNW • Insurances • Pension funds	• 5 • 50 • 5	• USD 2-10 million • USD 1-20 million • USD 2-10 million
United Kingdom	• Foundations • Pension Funds • Family Funds/UNHW	• 10 • 10 • 5	• USD 1-20 million • USD 5-50 million • USD 1-50 million

Switzerland	• Family Funds/UNHW • Insurances	• 5 • 4	• USD 5-25 million • USD 10-100
Sweden	• Foundations • Family Funds/UNHW • Pension Funds	• 2 • 5 • 4	• USD 1-20 million • USD 2-25 million • USD 10-50 million
Norway	• Pension Funds	• 2	• USD 50-100 million
Denmark	• Pension Funds • Family Funds/UNHW	• 5 • 5	• USD 20-100 million • USD 1-20 million
Netherlands	• Pension Funds • Insurances	• 8 • 2	• USD 20-100 million • USD 10-100 million
Belgium	• Insurances	• 4	• USD 5-50 million
Singapore	• Pension Funds	• 2	• USD 20-100 million
Korea	• Insurances	• 3	• USD 10-100 million
United Arab Emirates	• Pension Funds	• 4	• USD 20-100 million
China/Hong Kong	• Family Funds/UNHW	• 5	• USD 5-50 million
Taiwan	• Insurances	• 3	• USD 5-50 million

Ad 3) Investment Origination and Execution

Investments will be sourced through the following pillars:

- Technology owning companies and equity investors that frequently have their roots in Europe; North America or Asia;
- Relationships with businesses in Sub-Saharan Africa stemming from DB's existing asset management mandates;
- Co-operation with other financial investors that are investing in the same sector – while being focused on equity rather than debt.
- DB's Africa network of African banks, governments and corporates developed through its platform consisting of local offices and teams working on Africa (see details below)

In terms of technology providers, DB has developed active relationships with over 40 partner companies who are already active in the areas UGEAP will invest in and plan to expand their activities in Africa, illustrating strong demand for the debt financing UGEAP plans to provide. Working with technology providers also enable a broad outreach for DB, as most providers have or plan operations in multiple African countries.

Dedicated Africa experience

Regarding local presence, DB employs more than 500 people directly located in Africa or with a dedicated coverage of African clients or transactions. The bank is currently active in 19 countries across Africa including Algeria, Angola, Cameroon, Chad, Egypt, Ethiopia, Gabon, Ghana, Ivory Coast, Kenya, Liberia, Morocco, Mozambique, Nigeria, South Africa, Tanzania, Togo, Tunisia and Uganda. Except for countries included on sanctions lists, there are no restrictions on DB's geographical reach in Africa.

The main hub for DB's African investment banking activities is the office in South Africa employing approx. 180 people, thereof 130 people providing services including i.a. capital markets (e.g. foreign exchange), trade & export finance and corporate finance. DB's Mauritius office mainly covers securities services, cash management and fund administration and employs approx. 290 people. The representative offices in Lagos and Cairo employ 6 and 12 people, respectively. Other locations with employees covering Africa include London and New York (approx. 10), Dubai (17 people), Madrid (3 people) and Frankfurt (more than 20 people in asset management active in sustainable investments and equities).

Within Deutsche Asset Management, Deutsche Bank has a dedicated Sustainable Investments team of 28 people based in Amsterdam, Frankfurt, Hong Kong, London, Luxembourg and New York with Assets under Management (AuMs) of approx. USD 1.8bn. A team of 5 investment managers located in Frankfurt – while working closely with DB's Africa teams – locally acts as investment advisor to Africa Agriculture and Trade Investment Fund (AATIF), a Luxembourg-based investment company funded by public and private investors (including Deutsche Bank) providing debt financing to the agriculture sector in Africa through local banks and direct investments. AATIF has committed capital of approx. USD 172m. AATIF successfully sources its investments through the contacts of the investment team, the DB platform as well as a number of financial, E&S and industry partners with local presence in Africa.

Furthermore, a fund investing in African equities (Deutsche Invest I Africa) is managed out of Frankfurt with AuMs of EUR 120m (approx. USD 132m).

DB has an award-winning track record in African bonds and between 2013-2015 issued 33 bonds in Africa for governments, corporate and banks, ranking number 1 in league tables and raising over USD8 bn in total. This provides DB with strong relationships with Ministries of Finance, African corporate and banks which can be leveraged for UGEAP as well.

Through its corporate and project finance track record in Africa, DB entertains close contacts with African corporate in the mining, infrastructure and manufacturing sectors. These contacts will be leveraged to identify investments for Category 3.

Finally, DB's trade & export finance teams (i) handle documentary credits issued by nearly 250 banks across 31 African countries and (ii) are able to issue guarantees and letters of credits into most African countries (currently 24). The UGEAP investment team can leverage this banking network together with the portfolio banks of the existing Africa funds to source partner banks for UGEAP.

DB's track-record in the off-grid space

DB's Sustainable Investment's team based in New York has managed global microfinance funds including investments in microfinance institutions in Africa since the mid 1990s. SI covers all activities related to social investments, and it is known for its innovative financings in the field, particularly in microfinance and financing social businesses.

Within the latter the team has built up substantial track-record in the very early stage of the off-grid market by providing a loan to d.light design, the world's leading manufacturer of solar lighting solutions for off-grid households (through its Consortium I Fund). SI's experience in the off-grid market also includes a 2010 partnership with the Shell Foundation to establish the Carbon Initiative for Community Impact (CI)², a revolving credit facility that pre-financed carbon revenues to small/medium-sized emission reduction projects that benefit vulnerable communities in developing countries. SI also manages a $4 million revolving fund which was initiated jointly with the Global Alliance for Clean Cookstoves that will deploy working capital loans and loan guarantees to enterprises along the clean cookstove and clean fuels value chain. Furthermore, SI has directly lent to solar home light distributors servicing the BoP such as d.Light, Greenlight Planet and Orb Energy.

SI's most recent fund in the off-grid space is the Essential Capital Consortium (ECC) Fund that focuses on Social Businesses established with the intent of benefitting poor communities and directly impacting on the poor through the production of goods and/or the provision of services in three sectors: Base of the Pyramid ("BoP") financial services, energy, and health. ECC's current portfolio includes off-grid companies such as Mobisol, Off-grid-Electric, Sunfunder, Green Light Plant, SolarNow, most of which are potential borrowers under UGEAP.

The Frankfurt-based Sustainable Investment Team has gained experience in the off-grid space mainly through its investment mandates covered by SI where the team financed the first captive photovoltaic power plant for a mining operation in South Africa that is not based on any form of public financial support. Additionally one of the investment funds covered by SI has supported a mini-grid project development led by Jumeme and Inensus through its technical assistance facility.

UGEAP's dedicated investment management team will make use of all the channels listed above for the sourcing and

monitoring of investments, while also bringing its own network of relevant contacts. DB foresees that about 6 investment specialists would be allocated to UGEAP full time while staff will be chosen that has the relevant knowledge and experience. DB further envisages local presence to be of importance and hence would probably add staff located in one of the hubs of DB to the investment management team,

For a more detailed process description on the origination and execution of investment (opportunities), please refer to C.3 Annex 1 – Investment Process.

Project Level

Part of the selection of appropriate investments by the investment manager will be a satisfactory review of the existing operational capacity of the investee / the relevant service providers. The following indicators suggest a positive result of this assessment while concrete cases may differ:

- Several years of already existing activity;
- Existing operations in the country to ensure that customer satisfaction is maintained high level;
- Trial phase in the target regions successfully passed as part of the market testing approach;
- Pilot projects running with sufficient run-times to ensure technical feasibility;
- Management team and staff with the relevant experience to handle the projects / targeted customers;
- Network or local, qualified service providers;
- Up-to-date IT infrastructure allowing a 24/7 monitoring of the operations of the installations;

<Describe financial status and how the project/program sponsor will support the project/program in terms of equity, management, operations, production and marketing.>

Program Level

In order to align interests of Deutsche Bank acting as investment manager with the interests of investors, the bank shall co-invests into the UGEAP. Deutsche Bank envisages investing an amount of up to 3% of the total amount of capital to be raised by UGEAP (up to USD500m while DB's commitment shall reach USD15m in total) for which it has received internal approvals. Please note that US regulation limits the amount an investment manager of an investment fund is entitled to invest into (Volcker regulation). The DB co-investment is expected to be equal to 1/3 in Class B and 2/3 in Class A Capital.

C.5. Market Overview (if applicable)

<Describe the market for the product(s) or services including the historical data and forecasts.>

Program Level

As investment vehicle, UGEAP has two markets that are relevant to it:

- On the asset side, the investments are loans to projects in the categories mentioned above. The relevant market is that of long term debt capital for businesses located in the Target Region with the following characteristics:
  1) Amount: USD 5m – USD 30m debt portion;
  2) Tenor: 5-10 years;
  3) Currency: Local currency or USD;
  4) Target interest rates: 6-10% in USD equivalent;
  5) Collateral: Assets that are financed by the loan;
  6) Small sized businesses in a new industry expanding to oftentimes unbanked customers (Category 1 and 2) or companies that are pure project finance companies (Category 3).

- On the liabilities side, the market is that of capital invested into funds that invest in infrastructure assets located

on the African continent. UGEAP will issue shares that will bear the following characteristics:

1) Amount: USD 25m – USD 100m per investor;
2) Tenor: 7 - 15 years;
3) Currency: USD;
4) Target return: [5-7]% in USD equivalent;
5) Collateral: Assets that are financed by UGEAP;

<Provide the key competitors with market shares and customer base (if applicable).>

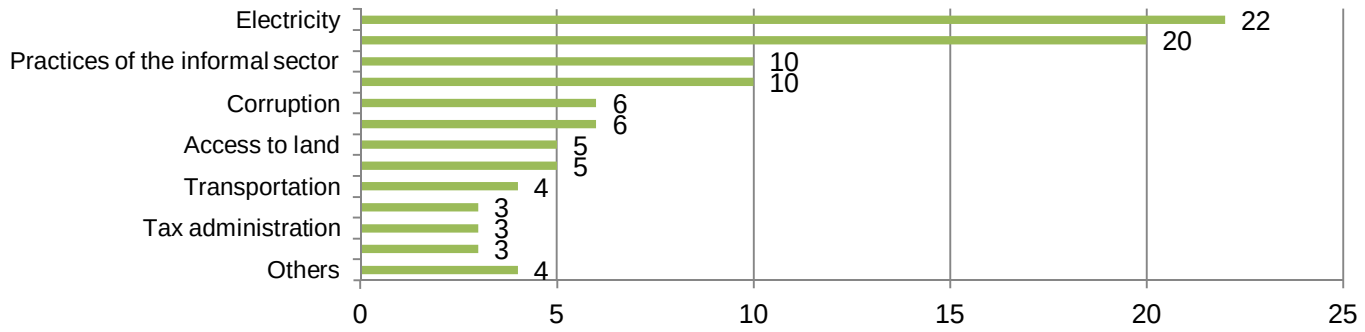
- *Assets*

Loans that bear the characteristics above are hardly available from local financial institutions outside South Africa. Debt capital from international private sector investors is almost non-existing. The largest capital providers are development banks or infrastructure funds that are backed by governmental institutions and / or development banks.[22] Competition for good and viable projects does exist amongst lenders while:

- The transactions sought by competitors to UGEAP either seek volumes above those targeted by UGEAP; or
- The funds typically offer USD funding and no local currency debt; and
- Oftentimes, governmental agreements need to be in place to allow for transactions to tap into existing DFI programs.
- To DB's knowledge, none of the competitors' offering includes risk sharing mechanisms with local banks
- A number of competitors provide larger-scale debt finance for on-grid electricity projects only (see Table 17).

The market demand for capital from the private sector is substantial and is underserved with the amount of capital that is made available by the local financial institutions. Access to finance in combination with access to electricity were the dominating barriers a survey on behalf of the AfDB identified for local businesses the effect of which is higher for small businesses while larger corporates typically manage to cope:

Graph 16:: Barriers for Local Businesses



Source: African Development Bank 2012

UGEAP rather targets a market in which there is relatively little competition from private sector while the significant competition stems from development initiatives and banks. Key competitors DB has identified are:

Table 17: Key Competitors

	Project Type		Funding Type

[22] Backer McKenzie 2013

Capital Provider/ Fund	Initiator/ Investors	On-Grid	Off-Grid/ Mini-Grid/	Private Equity	Project Devel-opment	Construction Equity	Debt
Acumen	Acumen		X	x			x
AECF	SIDA, UK Aid		X				x
Africa50	AfDB	x		x	x	x	x
CleanStart	UNCDF		X	x			x
Emerging Africa Infrastructure Fund (EAIF)	PIDG	x					x
GET-FIT	Uganda government, UKAid, DECC, WB, KfW	x	X				x
Green Africa Power (GAP)	DECC, DFID, EISER Infrastructure Partners LLP, Camco International	x	X			x	x
Responsability Energy Access Fund	IFC / Shell Foundation/ Responsability	x	X				x
Cleantech Innovation Facility	IFC / IFC-GEF Earth Fund		X		x	x	x

Source: Deutsche Bank

- *Liabilities*

The market for investment opportunities for private sector investors along the characteristics described above is tiny. While there are numerous governmental and multilateral initiatives, most funds that also target to involve the private sector investors focus on equity stakes rather than providing long term debt given the better return structures an equity stake provides. At the same time, there is an affluence of liquidity in international markets given the extremely low interest rates for USD and EUR funding looking for fixed-income-like products with adequate returns. UGEAP falls into this bucket and also benefits from the growing interest by institutional investors with an impact focus to increase their investments in Africa and the energy sector[23].

<Provide pricing structures, price controls, subsidies available and government involvement (if any).>

- *Assets*
  - In the Target Regions, DB is unaware of price controls (i.e. the total costs of capital UGEAP expects to charge to investees) that would limit the investment activity of UGEAP. Working along and through nationally regulated financial institutions shall ensure also adherence of local banking regulation.
  - UGEAP foresees no specific governmental involvement (apart from normal licensing processes) as it is a purely private sector oriented initiative. There may be transactions that feed in electricity into the national grid, off-takers may be parastatal companies (grid operators) and transactions may benefit from feed-in tariffs local governments have set up. However, the investment concept of UGEAP targets household PV systems

[23] JPMorgan GIIN Impact Investor Survey (2015)

(Category 1), mini-grids (Category 2) or diesel based energy generation (Category 3) to be replaced with technology that is cheaper compared to existing generation.

- *Liabilities*

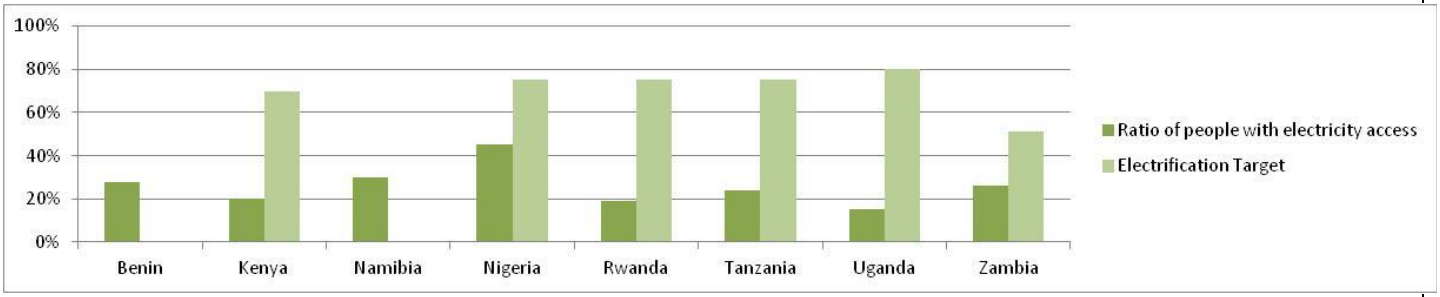
UGEAP envisages a variable return for its investors. Investment funds are generally not subject to price controls with regards to the returns they produce. Governmental involvement is limited to the supervision of the investment vehicles in accordance with national legislation.

Target Region

Phase 1 has chosen Benin, Kenya, Namibia, Nigeria, and Tanzania, as first countries to become active in as a result of considerations detailed in section C.1 (investment ability and demand).

All five countries show a high proportion of population without access to electrical energy:

Graph 17: Electrification as of 2013 and target values



Targets: Kenya by 2020, Rwanda by 2020, Tanzania by 2035, Uganda by 2040, Zambia 2030 Source: REN21

In most of the countries, off-grid energy access is no new instrument but is – based on the already installed systems – still in its infancy and the growth is also hindered by the lack of appropriate financial solutions that target the end beneficiaries. This lays the ground for growth of the businesses identified already by UGEAP and the concept these businesses are based on:

Table 18: Experience with mini-grid and off-grid photovoltaic in Phase 1 countries

	Technology/ System	Total capacity 2014	Additional information
Benin	Solar PV (pico)	100 units	Implemented under the EnDev Programme
	Solar lamps	2,825 units	Implemented under the SNV-funded Off-grid Solar Market Development Programme
	Solar powerpack	50 kWp	- 250 people electrified - Installed by ARE members
	Hybrid mini-grid	30 kWp (2013)	Implemented in North Benin under an Energias Sin Fronteras (EsF) project
	Biogas digesters	107 units	Implemented by SNV with government funding
	Improved cookstoves	214,600 units	Implemented under the EnDev Programme
Kenya	Solar PV (pico)	56,800 units	Implemented under the EnDev Programme
	Solar PV (pico)	695 units (2012)	Implemented under an SNV-funded project
	Solar PV (pico)	1,574,078 units	Implemented under a joint GOGLA and World Bank project3

	Solar kits	150 units	Implemented by Oolux under a REPIC co-funded project
	Solar kits	100 units	Implemented by Oolux under a SYMPHASIS co-funded project
	Solar lanterns	7,155 units	Implemented under an SNV-funded project
	Solar powerpack	430 kWp	1,290 residents electrified Istalled by ARE members
	Solar home systems	100 units	Implemented by Mobisol under a REPIC co-funded project
	Hybrid mini-grid	19 MW	18 systems installed Consolidated at country level
	Mini-grid (solar)	113 kWp	A mini-grid (45 kW), 25 compact mini-grids (58 kW), and 4 con kW) Installed by ARE members
Namibia	Solar PV	200 kWp	Public buildings and 100 homes Hybrid system including 3 MW battery and 3 diesel Generators implemented by juwi and Alternative Energy Systems
	Off-grid solar power plant	200 KW	24-hour electricity for Gam village (1.630 inhabitants) Implemented by HopSol
	Solar PV	2x20 kWp	Solar system for desalination plant implemented by juwi
Nigeria	Solar PV (pico)	147,396 units	Implemented under a joint GOGLA and World Bank project
	Solar outdoor microstation	23 kWp	6,900 residents electrified Installed by ARE members
	Solar streetlights	5.4 kWp	40 solar streetlights installed Consolidated at country level
Tanzania	Isolated home systems	5 units	Consolidated at country level
	Hybrid mini-grid	6 units	Consolidated at country level
	Mini-grid (hydro)	4 kWp	150 residents electrified Installed by ARE members
	Mini-grid (solar)	16 kWp	12 compact mini-grids Installed by ARE members
	Solar outdoor microstation	66 kWp	1,800 people electrified Installed by ARE members
	Solar PV (pico)	1,800 units	Implemented under the EnDev Programme2
	Solar PV (pico)	787,488 units	Implemented under a joint GOGLA and World Bank project
	Solar lamps Renewable Energy Services Programme	1,050 units	Implemented under the SNV-funded International
	Solar home systems	900 kWp	7,500 residents electrified Installed by ARE members
	Solar home systems	1,000 kWp	10,000 systems installed by Mobisol 56,000 people electrified in 2014
	Isolated home systems		4,000–8,000 units installed Consolidated at country level
	Mini-grid (solar)	6 kWp	Two compact mini-grids, Installed by ARE network

Source: REN 21

Countries chosen for Phase 1 show different profiles in terms of the viability of the business concepts as a certain

density is needed to allow for a cost efficient service and distribution infrastructure for Category 1 and 2 while Namibia has only selected areas that show a sufficiently dense population.

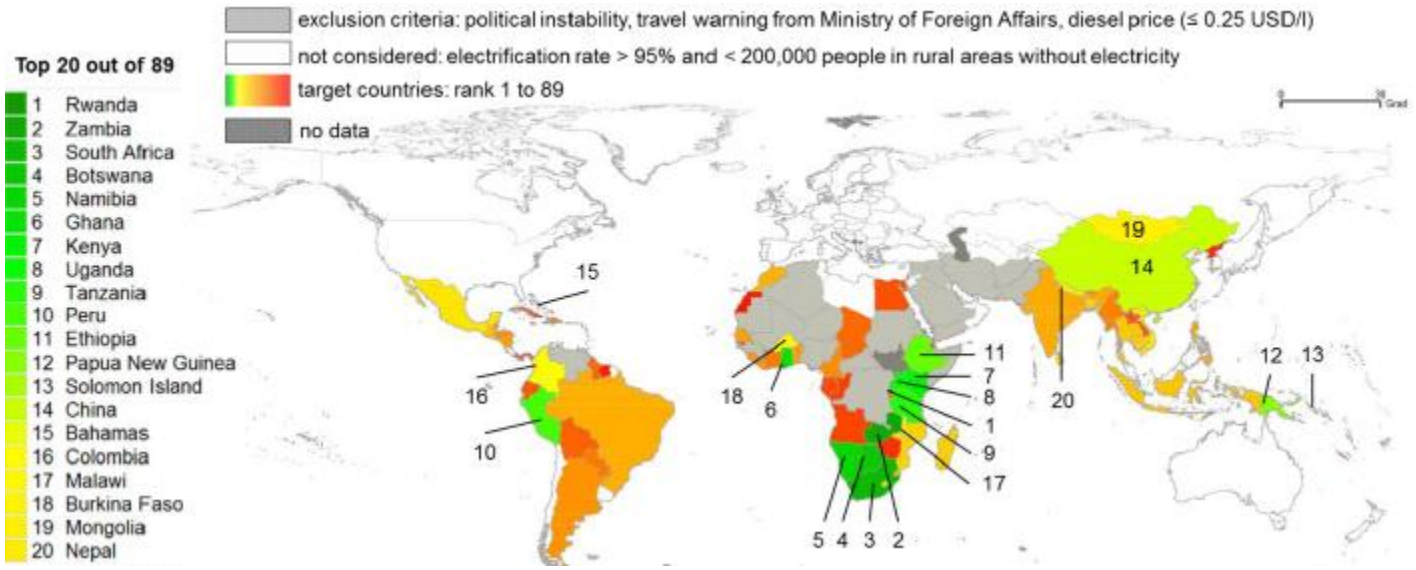
Table 19: Population density

Country	People per sq km
Benin	94
Kenya	80.0
Namibia	2.9
Nigeria	195
Tanzania	57.3

Source: WorldBank

The outcome of DB's selection process was confirmed by the findings from the Reiner Lemoine Institut gGmbH, a research institute with a focus on PV solutions. Using a similar approach chosen by DB, the institute identified 3 out of the 5 chosen countries to rank in the top 10 list of all countries globally that would have the best potential for sustainable businesses concepts delivering clean energy to energy consumers[24]:

Graph 18: Overview on market potential for off-grid energy supply business opportunities



Based on the existing pipeline of projects which has been pursued along the concept development of UGEAP and DB's ongoing investment activities in the region, DB currently sees a realistic investment potential for UGEAP for Phase 1 as follows, subject to the assumption that UGEAP would on average provide funding of up to 2/3 of total capital expenditure. Note that the pipeline refers to current potential only and is expected to grow further following the successful execution of the first transactions und UGEAP.

[24] Source: Gerlach, Gaudchau, Cader, Wasgindt and Breyer 2013

Table 20: Expected Investment Volumes Phase 1

Country (USDm)	Category 1	Category 2	Category 3
Benin	3	3	5
Kenya	15	10	80
Namibia	5	2	25
Nigeria	25	20	40
Tanzania	22	15	30
Sum	70	50	180
Distribution for Phase 1	**23%**	**17%**	**60%**
Source: Deutsche Bank			

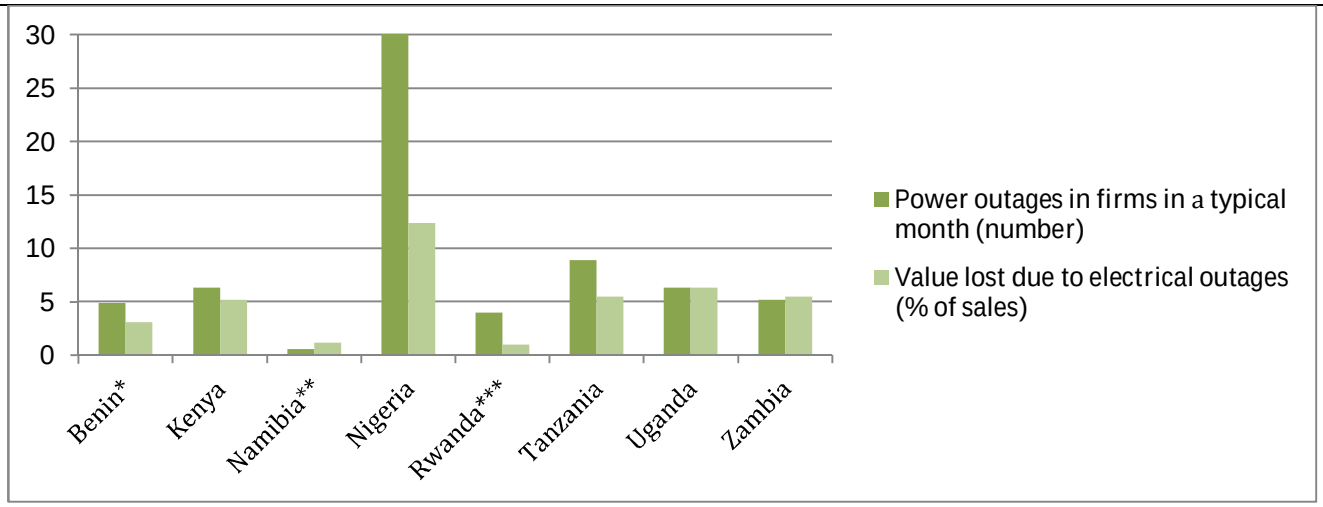
The above estimates are based on an assessment of funding demands by businesses that operate within the three market segments.

Additional companies include:

- existing companies that sell and rent electrical generation equipment mainly through their own distribution channels and that are expanding into the renewable energy sector (3 in the pipeline for Kenya, 1 Namibia);
- local rental and leasing operations for industrial equipment (6 companies that are active in all countries – while to varying degrees);
- specialized energy service companies (numerous while most are relatively small and with only very limited track record) or (smaller) IPPs.

Initially, DB expects a higher share of SHS systems for Phase 1 as mini-grids require a longer preparation phase and initial investments. However, DB believes that once UGEAP can actively offer the missing funding for these installations, mini-grids will further develop and Category 2 projects will take over a larger share than Category 1 type of transactions during Phase 2.

Graph 19: Power outages and negative impact



*as of 2009, **as of 2014 ***as of 2011; Source: WorldBank

Losses from businesses due to instable energy supply, targeted by category 3 investments, are highest in Nigeria and Tanzania while Namibia shows the smallest negative effect on national statistical levels. Information from project developers, though, show significant demand for the replacement of Diesel generation capacity simply as a result of its price across all countries. At the same time, reducing the import of Diesel will have a highly beneficial effect on trade balances of local economies as net energy imports did rank as high as 79%:

Table 21: Energy imports and diesel prices in Phase 1 countries

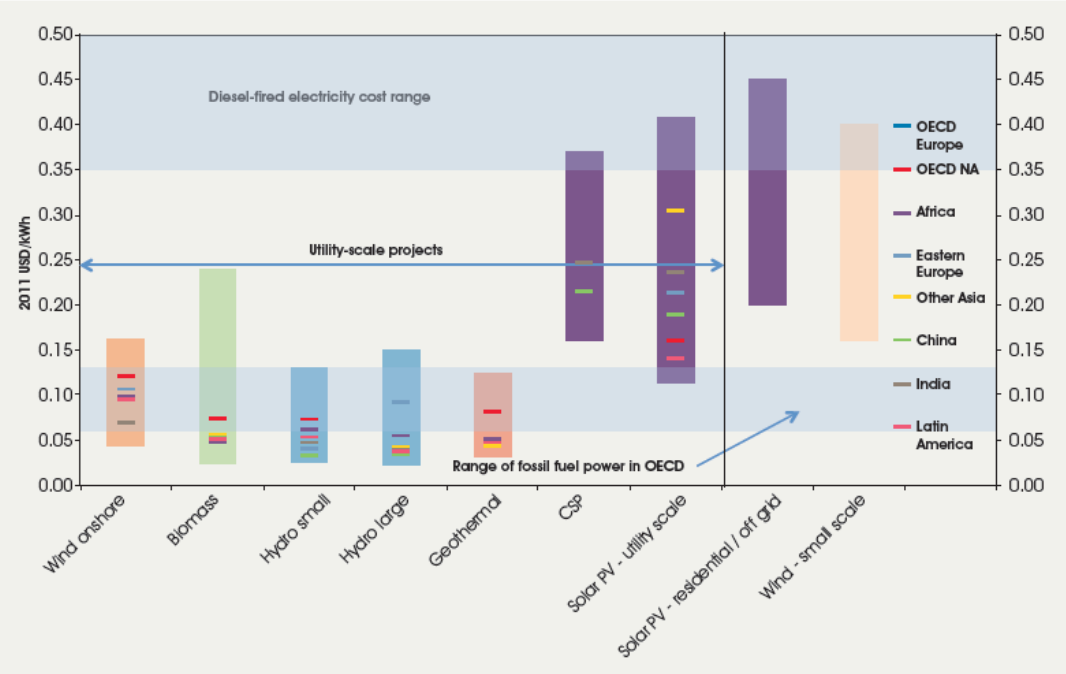
	Energy imports, net (% of energy use) - 2012	Pump price for diesel fuel (USD per liter) - 2014
Benin	45%	1.10
Kenya	18%	1.07
Namibia	79%	1.11
Nigeria	-103%	0.84
Tanzania	10%	1.20

Source: Worldbank; *estimates for electrical energy from national sources **Nigeria is estimated to be a net energy exporters. However, the electricity grid does not reach out to consumers.

Graph 20 shows the general economic viability of solar PV off-grid installations comparing its levelized costs of electricity (LCOE) with LCOE of diesel-fueled electricity generation. While it generally shows the cost-effectiveness of today's photovoltaic technology, the cost ranges are wide and very site-specific due to additional technological needs of batteries and/ or hybridization but also cost of capital.

Graph 20: Levelized cost of electricity and weighted averages by region for renewable power generation technology (2012)[25]

[25] All LCOE data assume a 10% cost of capital. The large coloured bars represent the typical LCOE range by technology and the coloured horizontal lines the weighted average by country/ region if enough individual projects were available.



Source: IRENA

Independent from the site-peculiarities, it is very clear that renewable technologies have become an economic viable solution for off-grid installations or also centralized grid supply in locations with good solar resources as exist across Sub-Saharan Africa.

Review of Country Potential

Benin

Benin has significant solar energy potential with solar radiation of about 5.65 kWh/m2/day.[26] Currently, 448 kW of PV installations are operational, primarily for villages, health centres, and telecommunications, funded by the government or the Islamic Development Bank.

Benin's energy is produced by CEB (Communauté Electrique du Benin), a state – owned binational company owned by Benin and Togo and is in charge of production, distribution and the import of electricity in both countries. The revision of the Benin-Togo Electricity Code in August 2006 ended the CEB monopoly over electricity production, thereby opening the electricity production and distribution segments to private operators. However, with respect to commercial electric power, CEB remains the sole buyer of electricity production to date.[27]

Renewable energy is viewed as an option for increasing energy independence and reducing the reliance on expensive energy imports in the country. Consequently, the national objective is to increase the electricity production and to promote a significant contribution of renewable energy to the overall energy supply of Benin. The stated objective of government policy is to cover the whole territory within the next two decades.

In order to enable consistent resources to finance rural electrification, the government has created a rural electrification fund (ERF). This fund is drawn from a combination of resources such as state grants, donor funding, grants and

[26] PVGIS online – Country information Benin
[27] Reegle – Country information Benin

bequests and taxes on electricity production. Furthermore, the Solar Electric Light Fund (SELF) has promoted "solar market gardens" in the country. The SELF project couples solar PV units (1.5–3 kW) with drip irrigation systems. In sum, Benin added 100 units of solar PV (pico) and set up 50 kWp solar powerpacks in 2014 that resulted in the electrification of 250 people.[28]

Kenya

The potential for photovoltaic energy for Kenya is good with an irradiation of 6.32kW/m2/day[29]. Currently, PV installations are mainly used for telecommunication, cathodic protection of pipelines, lighting and water pumping.[30] There is an abundance of solar power potential given sufficient non-cultivated land available.

The regulatory framework for renewable energy production has become more attractive. The Ministry of Energy is actively promoting the use of solar energy for off-grid electrification. In particular, it has funded the Solar for Schools Program and is targeting to extend this to off-grid clinics and dispensaries. Through the Sessional Paper No. 4 of 2004, the Energy Act of 2006 and the Feed-in-Tariff (FiT) policy, the Government is committed to promoting electricity generation from Renewable Energy Sources (RES).[31] Additionally, according to the Draft Energy Bill 2015, the government has proposed a net metering system agreement for renewable power generation of 1MW or below. Finally tax-based policy offers an exemption from value added tax (VAT) for supplies bought or imported for the construction of power-generating plants.

The electricity sector in Kenya is relatively modern with independent power producers (IPPs) providing around 27% of the generated energy. However, the main problem in the sector is that existing capacity is barely able to meet peak demand, thus small-scale renewables have a role to play.[32] According to "Kenya Vision 2030" it is intended that renewable energy will play an increasingly important role in mini-grids also. The development of hybrid mini-grids is one of the Kenya's important projects within the Scaling-Up Renewable Energy Program (SREP).

Kenya remains the primary target for impact investors. There are about 4 million households in rural Kenya alone which present a vast potential for this virtually untapped technology. The off grid market is estimated to be over 40MW.

Namibia

Namibia has one of the best solar regimes in the world with an average solar irradiation of 6.33 kWh/m2/day[33]. There is sufficient non-cultivated land available, so potential competition against arable land is very unlikely and should be assessed prior to any investment within the Environmental and Social Impact Assessment.

The Namibian national government supports (renewable) rural energy production primarily by means of feed-in tariffs, capital subsidies, and reduction in taxes, mainly through the Ministry of Mines and Energy supported by the Renewable Energy and Energy Efficiency Institute and mandated by the Energy White Paper of 1998. In addition the country has launched an Off-Grid Energisation Master Plan (OGEMP) to support the roll-out of renewable energy systems to provide access to appropriate energy technologies to communities living in off-grid areas, through solar electrification of public institutions, establishment of Energy Shops and credit financing for solar technologies.

Despite numerous efforts, the experience to date of RE powered mini grids in Namibia is limited to government and donor initiated pilot projects. Regional electricity distributors appear to be unwilling to take ownership of mini-grids citing lack of viability.[34]

[28] REN 21 – Global report
[29] PVGIS online – Country information Kenya
[30] Scaling-up Renewable Energy Program (SREP). Investment plan for Kenya, 2011
[31] Bloomberg New Energy Finance, 2015
[32] Technical and Economical Study for the Development of Small Scale Grid Connected Renewable Energy in Kenya, 2012
[33] PVGIS online – Country information Namibia

Although the current energy market is strongly dominated by the national energy supplier NamPower, the government's energy policy clearly seeks to stimulate the involvement of independent power producers (IPPs) in the Namibian electricity market to help overcome the forecast short-/mid-term deficit. Namibia's Vision 2030 policy document states that the government's objective is that by 2030 Namibia will be "largely self sufficient with reliable and competitively priced energy, meeting industry demands, plus some export of energy". Namibia's Electricity Act provides for private participation in the sector.

NamPower has engaged in negotiations for Power Purchase Agreements and Transmission Connection Agreements with Diaz Power (wind power generation) and GreeNam (solar PV). Moreover, the Ministry of Mines and Energy has implemented the Renewable Energy Procurement Mechanism that requires tendering for all renewable energy projects larger than 5MW in size.[35]

Nigeria

Nigeria has an enormous solar energy potential with solar radiation of about 5410 kWh/m2/day[36]. The government is in charge of the electricity distribution and generation in the nation under the umbrella of Power Holding Company of Nigeria PHCN, which was formerly called National Electric Power Authority. During 2012/2013 Nigeria has been privatizing the state-owned Power Holding Company of Nigeria (PHCN) with the intention to increase investments and increase the total generation capacity.

While the development of renewable energy technologies in Nigeria has been slow to date, liberalization has led to private sector participation in the electricity generation sector in general, and a number of operational IPPs in the country today. Establishment of off-grid generation is encouraged by the government through a moratorium on import duties for renewable energy technologies, tax credits, capital incentives and preferential loan opportunities for renewable energy projects, feed-in tariffs for solar energy, wind power and small-hydro. There are several on-grid photovoltaic projects in the pipeline which are expected to be constructed over the next years.

Tanzania

Tanzania has high levels of solar irradiation of 6.43kWh/m2/day[37]. Solar resources are especially good in the central region of the country, and are being developed both for off-grid and grid-connected solutions. There is sufficient non-cultivated land available, so potential competition against arable land is very unlikely and should be assessed prior to any investment within the Environmental and Social Impact Assessment.

The Tanzanian national government supports (renewable) rural energy production, primarily by means of feed-in tariffs, capital subsidies, and reduction in taxes, mainly through the Ministry of Energy and Minerals, mandated by Rural Energy Act (2005) and the Electricity Act (2008). These mandates aim to increase energy access through the Renewable Energy Board, Fund and Agency, exemplified by the procurement of a USD 250m loan to fund roads and rural electrification.

The contribution of the private sector is significant and encouraged. Only 59% of total capacity is supplied by TANESCO, while IPPs and Emergency Power Producers (EPPs) provide 26% and 13% respectively, which they sell wholesale to TANESCO.

Since 2009, Tanzania has been implementing the so-called Small Power Projects (SPP) program geared towards the promotion of private sector participation in the power sector, but also for renewable energy scale-up and accelerated electricity access to the Tanzanian population. The SPP program allows small renewable and co-generation facilities of

[34] Economic Consulting Associates: Namibia Case Study – Gap Analysis and National Action Plan; January 2014
[35] GIIN The landscape for impact investing in East Africa Tanzania, August 2015
[36] PVGIS online – Country information Nigeria

[37] PVGIS online – Country information Tanzania

up to 10 MW of capacity to be connected to the national grid or to one of the isolated mini-grids at fixed feed-in-tariffs (FIT). The FIT is not calculated on a cost of production basis but on the cost the utility would incur to produce the same amount of electricity using conventional (fossil) sources.

Tanzania is considered a country ranking high on the attention of impact investors after Kenya and Uganda. Up to date, the impact investments disbursed by DFIs are USD 846m (65 deals) and by Non-DFI are USD 227m (109 deals). Impact investors mainly invest in agriculture, energy and financial services.

Further Project specific information regarding the relevant market

<Describe the market for the product(s) or services including the historical data and forecasts.>

While the following table gives an overview of the relevant indicators of the renewable energy market as well as the current baselines in the Target Region a more specific exemplary analysis has been performed for Kenya, Namibia and Tanzania thereafter

Table 22: Local Energy Market Overview

	Total Installed Capacity									Per capita CO2 emissions from energy consumption
	Total Electricity	Renewable Electricity		Hydroelectricity		Non-Hydro Renewable Electricity		Fossil Fuels Electricity		
	(Mn Kilowatts)	(Mn Kilowatts)	as% of total	(Mn Kilowatts)	as% of total	(Mn Kilowatts)	as% of total	(Mn Kilowatts)	as% of total	(metric tons)
Benin	0.20	-	-	-	-	-	-	0.20	100%	0.60
Kenya	1.85	1.07	58%	0.81	44%	0.26	24%	0.78	42%	0.30
Namibia	0.51	0.34	67%	0.34	67%	(s)	0%	0.17	33%	1.50
Nigeria	6.10	1.90	31%	2.00	33%	(s)	-	4.00	66%	0.50
Tanzania	0.85	0.56	67%	0.56	67%	0.00	0%	0.28	33%	0.20

Kenya

Current Baseline:

- At the national level, wood fuel and other biomass accounted for about 68% of the total primary energy consumption, followed by petroleum at 22% and electricity at 9%
- Biomass provides for more than 90% of rural household energy needs. The main sources of biomass for Kenya include charcoal, wood-fuel and agricultural waste.
- Estimated national electricity demand is 1,191 MW. Effective installed capacity under normal hydrology is 1,429 MW, leading to a reserve margin of 238 MW, below the recommended reserve margin of 30%. The climatic conditions of 1998 – 2000 and 2008 - 2009 curtailed hydropower generation and led to severe energy shortages which culminated into power rationing
- Generation capacities from hydro, geothermal, cogeneration (bagasse) and wind are 52.1%, 13.2%, 1.8% and 0.4% respectively while fossil based thermal contributes 32.5%.
- While geothermal and hydro also dominated new investments into Kenyan renewable energy assets until 2010, wind is the largest recipient of renewable energy investments since with new investments summing up to more than 1bn USD (namely Lake Turkana).

- Government is undertaking efforts to provide lighting and water pumping PV installations to public institutions in Arid and Semi-Arid Lands where there is no access to the grid. These institutions are mainly primary and secondary schools, Dispensaries, Health Centres, Administration units and public water wells. According to the National Energy Plan targets for solar energy are 100MW by 2017, 200MW by 2022 and 500MW by 2030.
- The national electrification rate is only about 23%, in rural areas lower.
- Over 80% of households in the rural areas rely on firewood for cooking compared to 10% of urban households. Charcoal is the second most popular type of cooking fuel used by 13.3 % of households.
- Kerosene-based lamps are the leading source of lighting for Kenyan households[2]. Over 79% of households use paraffin lamps. Electricity is the second most common source of lighting about 14% while paraffin is the most predominant in rural areas (87% of rural households).

Market Potential

- Population density of 80 persons living per km² makes it economically unviable to build a national grid that reaches out to 100% of the population;
- Isolated grids or decentralized production facilities will have to be an inherent component of the Kenyan energy supply system and actually include the opportunity to "by-pass" the Northern design of electricity supply through a distribution network all over the country, similar to the mobile telecommunication networks;
- The national electrification target of the Government of Kenya as set out in the Vision 2030 is to achieve 100% connectivity by 2030 with an interim target of 65% by 2020. Currently, only 30% of the households are connected to electricity.[38]
- At this stage, mini-grids are only playing a relatively minor role in supplying electricity to Kenyan households. Currently 21 mini-grid stations are in operation, another 10 are under construction. These mini-grids are mainly supplied through diesel-based generation and are operated by Kenya Power and Lighting Company (KPLC), the electricity distribution company also responsible for managing the national grid. That means that electricity consumption in the existing mini-grid systems is heavily subsidized through the tariff structure (cross subsidies). The Kenyan Ministry of Energy and Petroleum (MoEP) plans to convert the existing mini-grids from diesel-based generation to hybrid generation (based on Solar PV and/or wind) to improve the cost efficiency of operations and to reduce carbon emissions. Government seeks to actively integrate the private sector to achieve this goal.
- The UGEAP offers the chance to challenge this forecast and contribute to further increasing the share of renewable energies in the Kenyan energy mix by addressing the following market segments:
- Retail segment (B2C):
- Less than 20% of the rural population have access to electricity and are not connected to the national grid. In the off-grid areas, mainly in the north and east of Kenya, KPLC and KenGen provide power by means of diesel power plants which supply a small isolated distribution network. However, the off-grid power plants listed in Table 7 only generate energy for 0.8% of the total electricity sales in the country. This leaves a significant market potential for investments of Category 1 and 2 Project types with a peak demand of 9,040kW in off-grid areas which is expected to increase to over 15,000kW by 2020.

Table 23: Off-Grid Power Plants Kenya[39]

[38] Government of Kenya, " Vision 2030", 2007

[39] The Kenya Power & Lighting Company Limited, "Kenya Distribution Master Plan Vol. I", April 2013

County	Location	Status	Capacity (kW)	Annual generated energy - 2010/2011 (MWh)	Peak demand (kW)	Load factor
Turkana	Lodwar	Existing		3,556	650	62%
Marsabit	Marsabit	Existing	2,489	2,799	600	53%
Marsabit	Moyale	Existing	1,341	1,969	540	42%
Marsabit	North Horr	Under construction				
Marsabit	Laisamis	Under construction				
Samburu	Baragoi	Existing		153	41	43%
Mandera	Mandera	Existing	1,600	4,167	858	55%
Mandera	El Wak	Existing	360	416	95	50%
Mandera	Takaba	Under construction	184			
Mandera	Rhamu	Under construction	184			
Wajir	Wajir	Existing	1,700	5,234	1,020	59%
Wajir	Habaswein	Existing	360	603	108	64%
Wajir	El Das	Under construction				
Isiolo	Merti	Existing	138	170	44	44%
Garissa	Garissa	Existing	6,100	17,129	3,435	57%
Tana River	Hola	Existing	800	1,494	369	46%
Lamu	Lamu	Existing	2,378	4,871	942	59%
Lamu	Mpeketoni	Existing		1,109	312	41%
Homa Bay	Mfangano	Existing		90	26	40%
Total			17,634	43,760	9,040	55%

- Commercial segment (B2B)

- As outlined in the table below, diesel oil, which is mainly used for backup generators, still plays a decisive role in the industrial energy mix (on average 12%) in Kenya. Therefore there is a large demand for Project No. 3 which will play a key role in reducing the use of diesel oil and therewith contribute to lower energy costs and less carbon emissions.

Namibia

- *Current Baseline:*[40]
  - Estimated national energy demand is 1,713 mtoe;
  - Biomass fuels (i.e. wood and charcoal) account for over 18% of primary energy supply, oil products 64%, hydro 7% and electricity 7%;
  - Total grid installed capacity 393 MW and the interconnector capacity stands at 900 MW
  - Of the total production and grid capacity, 63% hydropower and 37% thermal (coal, diesel & gas); share of renewable energy other than hydro is negligible;
  - Fuel and mining imports account for 19% of total imports of Namibia which makes RE transaction highly beneficial from a macroeconomic standpoint;
  - 40% of population without access to electricity, in rural areas 75%;
  - 90 % of rural households use firewood for cooking, 34 % LPG, 9 % paraffin, 8% electricity;
  - Diesel generators or solar photovoltaic home systems are alternatives not readily available for at least 95% of the rural population due to high upfront costs and supply chain challenges;
  - Overall expected growth in power demand lies at 4% per annum reaching a 430MW power deficit by 2015
  - The share of renewable energy seems particularly high with 71 % of the total primary energy supply (TPES) in 2009 and 98 % of the electricity generated in the country. However traditional biomass accounts for 64 % of the TPES.
  - Draft net metering rules are prepared allowing to feed in electricity into the grid (with capacity below 500kW) which may contribute to the stabilization of the grid as well as support the decentralized expansion of capacity.
- *Market Potential*
  - Population density of 2.8 persons living per km² makes it economically unviable to build a national grid that

[40] Sustainable Energy for All, “Rapid Assessment and Gap Analysis for Namibia”, June 2012

reaches out to 100% of the population;[41]

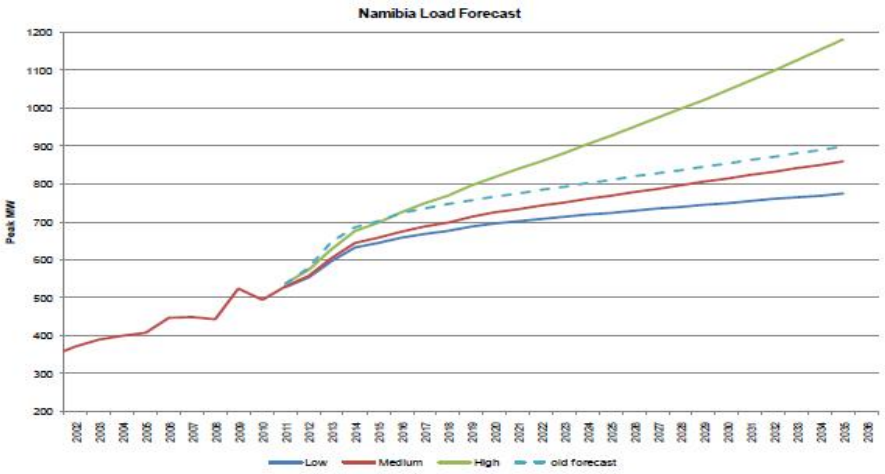
- Isolated grids or decentralized production facilities will have to be an inherent component of the Namibian energy supply system and actually include the opportunity to "by-pass" the Northern design of electricity supply through a distribution network all over the country, similar to the mobile telecommunication networks;
- The UGEAP offers the chance to challenge this forecast and contribute to further increasing the share of renewable energies in the Namibian energy mix by addressing the following market segments:
- Retail segment (B2C):
- approximately 80,000 households which need stand-alone solutions, like solar home systems – this is the potential market for Category 1 Projects;
- approximately 20,000 households suitable for mini-grids – this is the market potential for Category 2 Projects.

Table 24: Grid Coverage Namibia[42]

Regions	Off-Grid	Pre-Grid	Informal Settlements	Sub-Total
	Households	Households	Households	Households
Caprivi	3,055	960	2,458	6,473
Erongo	1,828	176	1,682	3,686
Hardap	1,106	214	2000	3,320
Karas	694	194	1,864	2,752
Kavango	6,385	3,004	4,238	13,672
Khomas	75	65	22,467	22,607
Kunene	4,010	456	1,600	6,066
Ohangwena	6,015	4,798	300	11,113
Omaheke	3,767	351	1000	5,118
Omusati	4,376	4,628	295	9,299
Oshana	1,511	2,261	3,600	7,372
Oshikotot	5,344	2,899	250	8,493
Otjozondjupa	2,378	520	3,730	6,628
National Total	40,554	20,526	45,484	106,554

Graph 21: Load Forecast Namibia

[41] Trading Economics, "Population Density in Namibia", 2013
[42] Consulting Services Africa, „Off-Grid Energisation Master Plan Namibia: Final Report", January 2007



Source: World Bank & Electricity Control Board (2012), National Integrated Resource Plan

According to forecasts, 2015 is expected to see a shortfall of 300MW without imports while government appears to pursue a large hydro-electric power plan (Baynes, 660MW) as well as a gas to power installation (Kudu, 800MW).

Tanzania

- *Baseline:*
  - In 2009, the official figures according to the Ministry of Energy and Minerals of Tanzania[43] were:
    - Estimated national energy consumption: 22 million tons oil equivalent;
    - Biomass fuels (i.e. wood and charcoal) account for over 90% of primary energy supply, petroleum 8%, and electricity 1,2%;
    - Total grid installed capacity 1.051 MWp;
    - Of the total production and grid capacity, 53% hydropower and 47% thermal (coal, diesel & gas); share of renewable energy other than hydro is negligible;
  - Fuel imports account for 32% of total imports of Tanzania which makes renewable energy transaction highly beneficial from a macroeconomic standpoint;
  - Off-grid installed capacity 143.1 MW, thereof 69% coal, diesel and gas, 1% hydro, the rest is biomass-based (especially based on bagasse from public and/or private sugar plantations)
  - No photovoltaic nor wind production capacity in 2009;
  - Most off-grid commercial capacity based on fossil fuels (unless biomass resources available on site)
  - 86% of population without access to electricity, in rural areas 98%;
  - In rural areas, 92% of the population uses kerosene or candles as a primary source of lighting, chosen for their availability and affordability;
  - Diesel generators or solar photovoltaic home systems are alternatives not readily available for at least 95% of the rural population due to high upfront costs and supply chain challenges;
  - Overall expected growth in power demand 10-15% per annum;
- *Baseline - Update 2014[44]:*
  - Demand: Current annual per capita consumption below 100 kWh (as reference point, in the US per capital consumption is 12,954 khW/capita, source: Gapminder/The World Bank Data);

[43] Ministry of Energy and Minerals (2011): "Tanzania Energy Sector", presentation given during JICA conference in July 2011 in Tokyo

[44] Based on African Development Bank (2015): "Renewable Energy in Africa – Tanzania Country Profile", Abidjan

- Supply: Total installed grid capacity increased to 1,438 MWp, thereof 0% solar;
- Off-grid capacity shrunk to 125.9 MWp, thereof 6 MWp solar;
- Incumbent energy utility TANESCO operates 20 diesel-based mini-grids;
- Currently, renewable energy (excluding large hydro) accounts for only about 2-4,9% of generation capacity;
- Population without access to electricity approximately decreased slightly to 76% (rural areas 11%[45])
- Under the Tanzanian program to promote small power producers (SPPs), 3 SPPs are selling power to the national TANESCO grid, one selling to an isolated TANESCO mini-grid;

Table 25: Current Grid-Connected Energy Mix Tanzania

Source	TANESCO	IPP	EPP	SPP	Total	Percent
Hydropower	553.0	-	-	-	553.0	35
Small hydro (<10 MW)	8.8	-	-	4.0	12.0	0.8
Oil (Jet-A1 and diesel	88.3	163.0	205.3	-	456.3	29
Gas	252.0	249.0	-	-	501.0	32
Biomass	-	-	-	27.0	27.0	1.7
Imports	14.0	-	-	-	14.0	0.9
Total	916	412	205	31	1564.1	100
Percent	59	26	13	2	100	

Note: IPP=Independent Power Producer, EPP=Emergence Power Producer, SPP=Small Power Producer
Source: TANESCO 2013

- In addition, private, diesel-based captive generation is estimated at 300 MWp nationally, with costs exceeding USD 0.35 per kWh.
- Long-term (2035) forecast according to Tanzanian Power System Master Plan[46]:
  - Additional 9 GWp of production capacity required;
  - Planned power mix targets at 41% coal, 35% large hydro, 21% oil & gas;
  - Only 3% expected to be covered with renewable energies, e.g. 120 MWp of on-grid solar or 50-100 MWp of photovoltaic from private investors (both on-grid and isolated)[47];
  - Production is projected to increase ten-fold, from 4,175 GWh in 2010 to 47,723 GWh in 2035;
  - Electricity is planned to reach 75% of Tanzanians by 2035, adding 250,000 households per year:

Graph 22: Changes in Grid Connected Electricity Production Sources

[45] African Development Bank (2015): "Renewable Energy in Africa – Tanzania Country Profile", Abidjan; other sources suggest a lower national electrification rate but all vary around 20%
[46] African Development Bank (2015): "Renewable Energy in Africa – Tanzania Country Profile", Abidjan
[47] African Development Bank (2015): "Renewable Energy in Africa – Tanzania Country Profile", Abidjan, page 35

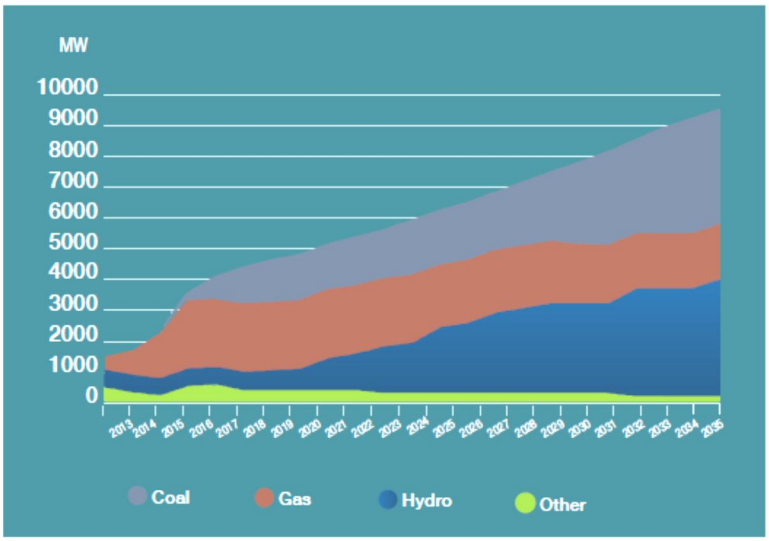


Figure 8. Changes in grid connected electricity production sources (Elaboration on PSMP 2012).

- Population density of 47 persons living per km²[48] makes it economically unviable to build a national grid that reaches out to 100% of the population;
- Isolated grids or decentralized production facilities will have to be an inherent component of the Tanzanian energy supply system[49] and actually include the opportunity to "by-pass" the Northern design of electricity supply through a distribution network all over the country, similar to the mobile telecommunication networks;
- Low projected share of renewable energies can be explained "due to insufficient resource information needed for investment decisions and inadequate planning and project development"[50];
- The UGEAP offers the chance to challenge this forecast and contribute to significantly increasing the share of renewable energies in the Tanzanian energy mix by addressing the following market segments:
- Retail segment (B2C):
  - approximately 14 million people which need stand-alone solutions, like solar home systems – this is the potential market for Category 1 Projects;
  - approximately 9 million people living in 1,8 million households suitable for mini-grids (at a population density of >125 inhabitants/km²) – this is the market potential for Category 2 Projects:

Table 26: Grid Coverage in Tanzania

Characteristic	Population,2012 (thousands)	Percent	Estimated number of households, 2012 (thousands)
TANESCO grid extension			
Up to 2 km from electrified settlement	10,217	23	2,085
Close to grid, low density	4,330	10	884
Close to grid, high density	6,050	14	1,235
Grid-connected subtotal	20,597	46	4,204

[48] UN Population Division 2010
[49] Initial results of the Rural Electrification Investment Prospectus show that only about 46% of rural residents live somewhat close to the grid
[50] African Development Bank (2015): "Renewable Energy in Africa – Tanzania Country Profile", Abidjan

Mini grid			
Far from grid, medium density (125-250 residents/km)	4,737	11	967
Far from grid, high density (250-1000 residents/km)	3,848	9	785
Very far from grid, very high density	522	1	107
Mini-grid subtotal	9,106	20	1,859
Stand-alone			
Far from grid, low density (<125 residents/km)	14,902	33	3,041
Stand-alone subtotal	14,902	33	3,041
Total	44,607	100	9,104

Note: Assumptions are that population growth rates remain at 2.9 percent per year, population distribution remains unchanged, and the average household size is 4.9 persons. Estimates are preliminary as the study is ongoing.

- Source: IED, Preliminary GEO-SIM mapping for the REA Rural Electrification investment Prospectus, January 2013
- Commercial segment (B2B): the addressable current market potential for Category 3 Projects in Tanzania is equivalent to private, diesel-based captive generation capacity of 300 MWp[51] which is expected to increase in parallel to the growth of the agricultural and mining sector.

<Provide the key competitors with market shares and customer base (if applicable).>
<Provide pricing structures, price controls, subsidies available and government involvement (if any).>

Category 1 Projects

- The off-grid energy market in Sub-Saharan Africa is comparably young, the amount of successful players is still limited in numbers – but growing at fast pace;
- Estimated number of pay-as-you-go off-grid solar companies active in developing countries: more than 25
- There is a low concentration of competitors on a large market: aggregate market penetration below 5% in Sub-Saharan Africa, while increasing;
- There are no signs of price competition as demand is significant and every business concept has its specific features;
- Three different segments for relevant market players: solar lanterns, pico systems (2-8 Watt), and larger, productive Solar Home Systems (compare market segmentation above);
- Competitors in the pico range (up to 10W): limited performance during rainy season, but considered to be market complementary.
- Category 1 Projects introduce an affordable up-front payment (like a “connection fee”), combined with pay-as-you-go rent-to-own installment schedule.
- There are two relevant cost elements for customers: a) price per Watt peak installed, and b) payment modality;
- A typical payment profile is outlined in the table below:

Table 27: Typical Payment Profile

[51] Ministry of Energy and Minerals, “Final Report on Joint Energy Sector Review for 2010/11,” September 2011

System Size	Monthly Instalment (36 months) in USD	Down Payment in USD	Total Price in USD for 36 months
80W	~20	~80	~800
120W	~28	~110	~1,100
200W	~45	~150	~1,800

Source: Project reviews by Deutsche Bank

Category 2 Projects

- The main competitor to Category 2 Projects is the use of traditional fuels and "appliances". This includes the use of kerosene wick candles and paraffin, as well as battery- and diesel-based electricity for phone charging, radio, TV, fridges, and lighting services. Households receive lower quality energy services despite higher per unit energy costs.
- Growing sources of competition are new PV-based products and other social enterprises in off-grid electricity;
- There is competition among suppliers in the price range of USD 10-500 range per system;
- Other portable appliance providers provide products in the USD 10-100 range using similar pay-as-you-go systems;
- Category 1 Projects are also an alternative to mini-grids;
- Category 2 Projects apply a similar fee structure as Category 1 Projects;
- Category 2 Projects price systems shall consist of elements similar to Project 1:
  1) A connection fee;
  2) Plus energy fees;
  3) The sales can be either metered in a traditional pay-per-use approach, or in bundles. A bundle is a package of energy with an expiration date attached. A bundle may also include an appliance on lease, for instance a TV or a stereo; in such cases, the appliance ownership is transferred to the customer after a certain number of bundle payments, with repayment in 6 to 9 months.

Category 3 Projects

- Category 3 Projects include providers of rented photovoltaic farms which is an innovative business model;
- The business cases are built on robust to very low oil prices which enables further scaling;
- Investees are active in the segment “Off-grid commercial market (B2B)”, although solution can also be useful for on-grid businesses which need to run a back-up generator;
- The success is driven by 1) cost leadership and redeployability, 2) proprietary advanced hybrid systems controls technology, and 3) a large rental solar farm fleet generating economies of scale;
- The offer combines the benefits of the generator rental model (fast deployment, no up-front investment, flexible duration, asset-backed finance), but with the benefits of solar power (lower price, no carbon emissions);
- The business concept is a similar approach to make expensive equipment more affordable on the industrial SME scale, offering financing solutions along technical ones.
- Customers pay a fixed monthly equipment rental fee, calculated based on envisaged energy consumption;
- To the commercial customer, photovoltaic power is still cheaper than diesel (provided USD/bbl price is higher than ~USD 20);
- Business model is not based on subsidies and hence, governments are typically not involved, apart from business permits.

Companies active in the Target Region

Based on DB’s research, all countries provide already a very good basis for a functioning renewable energy industry

with suppliers delivering solutions that work in the respective country and also providing ongoing maintenance to the existing installations. All companies – in our experience – require debt capital to expand their activities and presence. UGEAP will invest exclusively in companies that meet its standards, including technical standards and requirements regarding S&E as well as gender considerations.

Table 28: Competitive Landscape Overview – Companies active in UGEAP's Investment Categories

Category 1.	Category 2	Category 3
• Azuri • Fosera • Boma Safi Limited • Chloride Exide • M.Kopa • Mobisol • One Degree Solar • Scode • Sollatek Electronics • Suntransfer • Pfoofy Power and Light AESP Greenpower • Ensol • Mobisol • Shamba Technologies • Juwi Solar/ Alternative Energy Systems	• Energia sin fronteras (Esf) • off-grid Factory • PowerGen renewable energy • Sollatek Electronics • Juwi Solar/ Alternative Energy Systems • AESP Greenpower • Devergy; • Ensol • Inensus; • Jamii Power; • Lung'ali Natural Resources Company • L's Solution Limited • Shamba Technologies	• First Solar • Generalia • off-grid Factory • PowerGen renewable energy • Schneider Electric • Sollatek Electronics • Atlantic Solar Namibia • First Solar; • Hopsol AG • Juwi Solar/ Alternative Energy Systems • Ensol • Redavia; • Shamba Technologies

Source: Deutsche Bank

C.6. Regulation, Taxation and Insurance (if applicable)

<Provide details of government licenses or permits required for implementing and operating the project/program, the issuing authority, and the date of issue or expected date of issue.>

Program Level

Assets

- *Licenses, Approvals, other regulation*

Granting debt to regulated financial institutions in the Target Region does typically not require a special license. Restrictions and regulation, however, sometimes apply to the import and export of international currencies like USD. The UGEAP will obey the respective regulation and DB does not see obstacles in the existing rules towards the investments the UGEAP targets. In addition, DB has experience with such regulation in its existing Africa funds.

Under the syndication option, UGEAP will participate in the loan to the project company directly. Typically, this is achieved through the acquisition of claims arising under the loan agreements from the syndicate lead, which can either be the local financial institution UGEAP will work with or also Deutsche Bank AG.

All countries have regulation in place that governs international currency transfers latest for national statistical purposes and banking oversight. None of the 8 target countries though restrict international currency flow to the point that would threaten our investment targets as of today.

Tax

Typically, withholding tax applies to the interest rate payments that are to be paid from the project company to UGEAP

under the loan facility. Such taxes are different amongst countries of the Target Region and also depend on the final jurisdiction under which UGEAP will be incorporated. Investees need to pay withholding tax to local tax authorities subject to applicable regulation including double-tax-treaties in case existing. As part of the normal routine, DB requests annual confirmations that applicable withholding tax had been paid to local tax authorities.

Insurances

No insurance will be sought on the loans UGEAP shall extend.

Liabilities

Licenses & Approvals

For an investment vehicle based in Luxembourg, the local financial markets supervisor has to approve the private placement memorandum/ issue document which governs the rights of investors in the fund. Approval is given once the prospectus is presented to the CSSF (Commission de Surveillance du Sectors Financier). Structuring the Fund in accordance with Luxembourg regulation will be ensured by a local and experienced law company to be hired by Deutsche Bank AG.

For investment funds that fall under the Alternative Investment Fund Markets Directive (AIFMD), the fund manager may require to be licensed within the European Union to fulfill its role as investment manager. Deutsche Bank entities hold the required licenses which would also apply to UGEAP.

Tax:

Deutsche Bank is not entitled to provide tax advice. To understand its tax position, investors should seek their own tax advice which can vary from the general situation described below.

Withholding tax on Interest Payments from the Issuer under its obligations

Payments of interest are made free of tax while resident individuals of Luxembourg can opt for either a 10% withholding or declare interest revenues; the 10% tax is final if residents act in the context of private wealth;

Since 1 January 2015, Luxembourg officially started to provide information to other tax authorities on interest and similar income which replaces a 35% withholding tax applicable before. The Luxembourg Paying Agent is responsible for obeying Luxembourg tax regulation.

VAT

Luxembourg VAT may be payable in respect of fees invoiced for services rendered to the Issuer. The payment of interest or principal on debt instruments issues are typically not subject to Luxembourg VAT.

Investor Level

Holders who derive income from shares to be issued by UGEAP or who realize gains on the disposal / redemption, are not subject to Luxembourg taxation unless:

- the holders is or is deemed to be resident in Luxembourg for Luxembourg tax purposes;
- such income or gain is attributable to an enterprise or part thereof which is carried on through a permanent establishment in Luxembourg.

In addition, national taxation for each investor applies.

Insurances

It is foreseen that a partial credit guarantee will be part of the structure to the benefit of private sector investors (see above in section C.3.)

C.7. Institutional / Implementation Arrangements

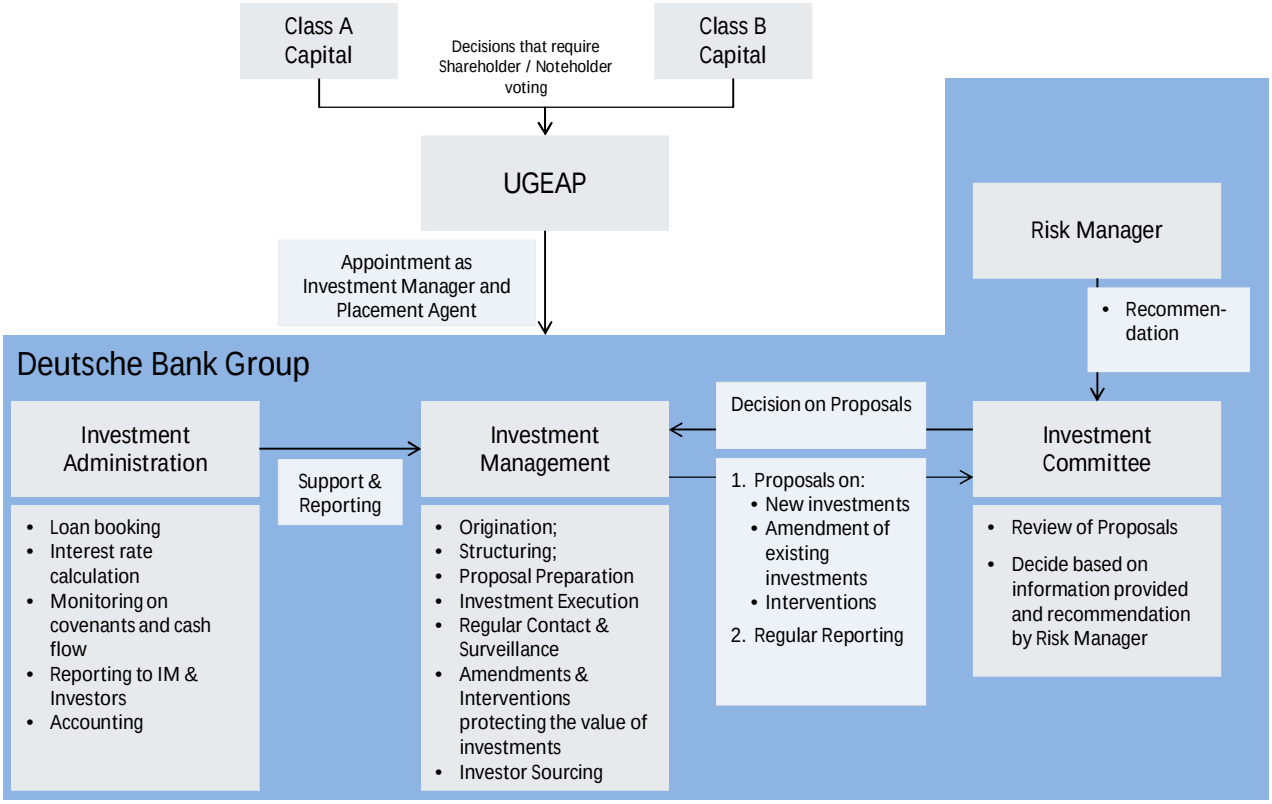
<Please describe in detail the governance structure of the project/program, including but not limited to the organization structure, roles and responsibilities of the project/program management unit, steering committee, executing entities and so on.>

Program Level

Structural Setting

In accordance with a standard investment fund concept, UGEAP will have a dedicated governance structure that makes use of DB's existing infrastructure processes. The following diagram gives an overview on the structure and the main processes that would be important to the success of UGEAP as investment vehicle.

Graph 23: Structural Diagram UGEAP



Source: Deutsche Bank

Structuring

UGEAP will be an investment vehicle set up and structure by Deutsche Bank in accordance with its internal policies and processes that govern the set-up of investment vehicles that will be marketed with targeted investors (which includes the GCF but to a larger degree the private sector investors). Part of setting up the UGEAP as investment vehicle is to ensure that the fund will have appropriate policies and procedures in place to comply with national regulation as well as international financial markets practice. This includes:

- the policies to be developed (as discussed below)
- oversight of activity by Investment Committee and Board of the UGEAP

Once launched, the UGEAP falls under DB processes of fund administration which includes the ongoing monitoring of the portfolio, the approval processes required, the financial accounting as well as disbursement and loan administration

procedures.

Key Contractual Relationships

Table 29: Key Contracts/ Fund-related Documentation

Contract	Parties (amongst others)	Purpose
Subscription Agreements	GCF / Investors UGEAP -	Investor commits to purchase shares to be issued by UGEAP within a commitment period and subject to certain conditions.
Private Placement Memorandum/ Issue Document		Document that states the objectives, risks and terms of the investment in UGEAP (for investors only) and will be approved by the Commission de Surveillance du Secteur Financier (CSSF), the supervisory authority in Luxembourg.
Articles of Association		Articles of Incorporation/ Statutes of the legal entity UGEAP which will be registered with Commission de Surveillance du Secteur Financier (CSSF), the supervisory authority in Luxembourg.
Investment Advisory Agreement	UGEAP - Entity of Deutsche Bank group	DB providing, inter alia, the services listed below
Investment Agreements (Syndicated loan, Funding and Risk Participation Agreements)	UGEAP - Investees	Provides the capital from UGEAP to investees subject to certain conditions. Documents respective liabilities
Account Agreement	UGEAP service provider to be selected	Documents the financial structure in detail along information shared and disclosed to investors in the placement memorandum or prospectus, as applicable
Depository Agreement	UGEAP service provider to be selected	Documents the financial structure in detail along information shared and disclosed to investors in the placement memorandum or prospectus, as applicable
Trust Agreement	UGEAP service provider to be selected	Documents the financial structure in detail along information shared and disclosed to investors in the placement memorandum or prospectus, as applicable

Source: Deutsche Bank

Board of UGEAP

As an investment fund, UGEAP will have a Board of Directors that will be proposed by Deutsche Bank to shareholders investing in the Fund. The Board of Directors will oversee the activity of the investment manager and other service providers. Board members do not represent interests of a single shareholder. This is to protect minority shareholders and their interests. It is not foreseen that representatives of the GCF will receive a board seat. The fund documentation will include the rule that board members will need to include members proposed by DB. In accordance with Luxembourg legislation, board members represent no single shareholder but are responsible to all shareholders simultaneously.

Investment Management

UGEAP as investment vehicle will appoint Deutsche Bank as Investment Manager (either Deutsche Alternative Asset Management (Global) Limited (United Kingdom), Reef Spezial Invest GmbH (Germany) or another legal entity being part of Deutsche Bank group). A sample list of tasks is provided in section C3 above. Under the investment advisory agreement, UGEAP assigns full authority to the investment manager to execute investments on its behalf and administer the portfolio of investments.

Certain decisions will require a positive voting from the investors in UGEAP. In line with local legislation (Luxembourg) this includes mainly changes to the prospectus, which governs the relationship between UGEAP and investors, and that will be proposed by the investment manager with a recommendation.

The investment management team will be led by a fund manager who will have the overall responsibility of the mandate. The Fund Manager will oversee a team of investment managers that have the task to support delivery towards the mandate. The investment management team will have the task to prepare new investments as well as monitor the existing portfolio of investments, a function which is supported by Investment Administration. Decisions on:

- applicable guidelines and policies,
- new investments, and
- amendments and interventions on existing investments that have an economic impact to the performance of the investment

require the approval of the “Investment Committee” (IC) which is staffed by about 3 investment specialists with knowledge and experience regarding the underlying type of investments. The IC will receive a recommendation from the Risk Manager who will perform an independent review of the proposal submitted by the investment management team. Decisions from the IC are binding for the Fund Manager who represents the investment management team in the IC.

The role of the risk manager is to review the proposal from the investment management team and provide his recommendation to the IC independently. The risk manager will participate in IC meetings.

Guidelines and Policies

As mentioned in section C3, the Investment Manager’s actions will be governed, amongst others, further by the following internally developed and maintained policies and guidelines:

- Investment policy;
- Asset-liability management policy;
- Gender policy applicable to Deutsche Bank Programmes funded by the Green Climate Fund;
- Social & Environmental Guidelines;
- Operating Guidelines.

All Guidelines and Policies governing UGEAP comply with Deutsche Bank’s internal policies and procedures as well as with GCF policies and procedures as outlined in B.07/02 – Annex III.

Investment Policy

The investment policy contains a range of rulings and is prepared by the investment management team:

- Investment thesis and targets;
- Relevant parties of mandate which include the staffing of the investment management team and the IC;
- Detailing the investment decision making process described above;
- Definition of eligible investments (including definition of eligible investees) in line with the definition on the Target Investments;
- Ensure that investees will fall within the capacity of DB as accredited entity of the GCF in accordance with the respective fiduciary principles and standards;
- Target region of investment activity (subject to limits);
- Definition of eligible investment instruments;
- Definition of terms and conditions investment instruments may contain;
- Limits on maturities and guidance on pricing structure (which is reviewed routinely);
- A range of portfolio composition restrictions and limits to be obeyed during the lifetime of the investment activities;
- Monitoring and reporting process, routines and content of reports to be produced to the benefit of the IC as well as investors.

The investment policy sets a number of limits that are designed to protect investors against a lack of granularity within the investment portfolio. Certain limits are also documented in the draft Term Sheet that would apply to the GCF investment. Additionally, limits apply to the following layers:

- *Country Level Limits*

Single country concentration increases the risks UGEAP is exposed to through its investment activity. Country specific risk factors are events where sovereigns impose transfer and convertibility restrictions on foreign currency exchange (measured by T&C risk ratings) as well as systemic risks that affect the whole economy, which includes political and legal risks (measured by the credit rating of a country).

The investment policy of UGEAP will foresee to limit the exposure of disbursed and committed capital to a single country as a percentage of the cumulative amount of all investments (disbursed and committed) of UGEAP. The limit is binding 36 months after the first investments have been executed to allow the portfolio to build up while it is subject to non-objection statements having been provided by the National Designated Authorities (NDAs) of the five Host Countries. Limits will apply subject to the internal grading category a country falls into. While the grade is denoted using the rating scale of international rating agencies, the internal grade would apply:

Table 30: Concentration Limits

Credit Grading Category	Investment Grade
Investment Grade	30%
BBi	20%
Bi and CCCi	15%
Unratedi	5%

Single Financial Institution Limit

UGEAP is exposed to the credit risk of banks UGEAP lends to under the FRPA structure. A limit will be set to in relation to the invested capital into a single financial institution in relation to the total investment portfolio of UGEAP.

Investment Instrument Limits

UGEAP offers two investment instruments that bear different risk profiles. A relative limit to the total investment portfolio applicable 36 months after the first investments having being executed will be set.

Single-/Sub-Borrower Limits

Finally, UGEAP is exposed to the credit risk from single borrowers that are either part of the Reference Portfolio or UGEAP lends to directly through the syndicated loan structure. A relative limit to the total investment portfolio applicable 36 months after the first investments having being executed will be set on the exposure to single borrowers (either as being part of the Reference Portfolio or via the syndicated loan structure).

Selection of Financial Institutions

The investment policy will further detail the selection criteria for the single transactions the UGEAP will take a risk position on as well as the local financial institutions UGEAP will either finance (FRP structure) or work jointly with (Syndication Option).

Bank's are chosen after a careful risk analysis that spans over the following areas:

- Financial position and strength
- Governance and ownership structure
- Quality of management
- Risk controls and procedures
- Regulatory status and quality of local regulator
- S&E Management Systems

- *Financial Analysis*

Deutsche Bank will employ a detailed financial risk analysis that covers the following areas:

- growth of the bank;
- loan book quality / customer type / NPL, provisions, collateral / related party exposure
- granularity of the loan book / industry concentrations / regional concentration
- liquidity position of the bank
- profitability split by types of income (interest, fee, other)
- cost base and development
- funding base including costs of funding and maturity structure
- recourse to "lenders of last resort" or other connections with long term capital providers like DFIs
- equity (ideally Basel III standards)

Banks have to show the financial capability to serve the debt capital UGEAP would invest through and with the bank.

- *Governance & Ownership Structure*
  - Banks are screened against the international standards on AML & ATF;
  - Further, banks are expected to have a transparent and shareholder value orientated governance structure. Related party exposures have to stay below a given minimum;
  - Banks with a strong ownership structure are preferred in order to allow for growth of the bank beyond the inherent profitability;
- *Quality of Management*
  - Management capabilities will be screened across the hierarchy to assess the technical capabilities and the required experience to manage the bank on the back of its market position and size;
  - Board members are screened in line with international AML & ATF standards;
- *Risk Controls and Procedures*
  - On-site due diligence is performed to analyze the routines and procedures that are in place;

- Processes have to be adequate for the size and the complexity the bank is active in.

- *Regulatory Status*
  - Banks are expected to be regulated by local banking supervising authorities;
  - quality and effectiveness of the supervision is analyzed as part of the due diligence process;
  - Banks are expected to be in compliance with prudential ratios in accordance with local banking regulation.

S&E Management Systems

- All banks UGEAP will work with are expected to have an appropriate Social and Environmental Management System to be in place;
- In case of deviations between UGEAP's standards and the bank's processes, remedial actions may be agreed in the loan documentation;

Documentation

The agreements between the UGEAP and (i) banks under the Funding and Risk Participation Agreement as well as (ii) borrowers under the syndicated loans will include, based on templates that will have been developed by a reputable, internationally active legal counsel, a clear documentation of the following points::

- financial rights and liabilities;
- maturities and time lines;
- reporting requirements
- warranties and covenants which includes adherence to S&E standards, financial covenants as well as adherence to national law and international best practice;
- conditions precedent to the first disbursement (which includes the requirement for all licenses and permits to be valid as well as an social and environmental impact assessment in case standards of UGEAP require this);
- conditions subsequent for follow up disbursements;
- rights for investigation and inspection by the investment manager;
- event of defaults and mandatory prepayment clauses;
- a list of exclusions on both, the bank wide level as well as the portfolio of loans that are granted using the funding facilitated by UGEAP which will match the one UGEAP will be bound to;
- eligibility criteria that will be matched with those of the UGEAP on the selection of projects that deliver to the targets on:
  - CO2e emission reductions within the limits that would apply to the UGEAP;
  - gender specific targets and requirements;
  - additional socio-economic benefits UGEAP targets

Essentially loan documentation is a mirror of the setting of the UGEAP in terms of targets and limitations with regards to the businesses it expects to finance and the S&E as well as gender specific aspects to be obeyed.

In case due diligence on banks identifies weaknesses, like a still acceptable deviation from UGEAP's expectations on a working and acceptable S&E management system with the bank, the agreement may include covenants on pre-defined action to be taken.

Non-adherence may lead to a mandatory prepayment event or an event of default.

Asset-Liability Management Policy

UGEAP is a closed end investment vehicle with a changing asset and liability profile. The yield for investors will depend on the interest income actually received from the invested assets and expenses to various service providers of the UGEAP. It is the task of the Fund Manager to maximize the available interest income. Certain risks can be hedged and are subject to management and discretion of the Fund Manager hedging them or not while other risks are to be mitigated structurally through decisions on capital demand and supply.

Assets and liabilities of the UGEAP are expected to have different financial and credit terms. Hence, investors are exposed to the following risks that can negatively impact their return as well as potentially the capital repayments UGEAP would be able to make:

- **Maturity Mismatch:** Mismatch in the timing of payments UGEAP is entitled to receive and the timing of payments UGEAP is expected or required to make.
- **Currency Risks:** The currency in which assets are denominated may be different to that of the shares.
- **Interest Rate Risk:** interest income on the assets may be different to expected coupon payments on the shares.

Assets: UGEAP holds assets mainly in the forms of cash equivalents and debt towards financial institutions and / or companies in the Target Region. Loans may be priced at either a variable or fixed rate of interest. Loans may be denominated in USD exclusively.

Liabilities: UGEAP will issue capital in form of shares. Shares will have a fixed redemption date at which UGEAP owes full capital repayment. The ability to pay will rely on the performance of the investments to generate liquidity upon maturity. The return on the capital issued by UGEAP will be variable and will equal to the amount available for distribution in accordance with a Priority of Payments, after having covered senior operating expenses of the UGEAP.

A more detailed description on the management of ALM risks can be found in C.7 – Annex 1 - ALM Risk Management

Gender Policy

Please refer to Annex F.3 – Annex 1 –Gender Policy applicable to Deutsche Bank Programmes funded by the Green Climate Fund for a draft of the gender policy to apply.

Social & Environmental Policy

Please refer to section F3 of this Funding Proposal on a description on the applicable S&E policy.

Operating Guideline

The operating guideline documents in detail the routines and processes as well as the departments in charge of the tasks allocated under these routines. This is an internal requirement to ensure that procedures are clear to relevant staff and enable replacements to take over tasks as backups in case of need.

Risk Management & Workout Processes

The risk management framework of DB as investment manager of UGEAP follows a three step approach to deal with non-performing assets:

- *Identification*

Mitigation

Workout

In the following sections these steps will be explained in more detail.

- *Identification*

As part of quarterly reporting, all projects are required to report on their covenants. These covenants are typically designed to cover the different aspects of both financial risk (such as capital structure, liquidity risk etc) as well as non-financial risks (S&E criteria, operating progress, reporting obligations etc). In addition, regular interaction with the borrowers and occasional onsite supervision in the field also help identify warning signs and potential credit quality issues early on.

Whenever covenants breach pre-defined thresholds, whether financial or non-financial covenants, this will lead to a re-classification of the underlying asset as non-performing and provisions will be made accordingly. Another reason for a re-classification is a payment delay of more than 90 days following Basel II default definitions. This re-classification and provisioning will also be communicated to the Fund during the consecutive regular quarterly reporting.

Mitigation

Following the identification of a non-performing asset DB aims to assess the overall financial and operating strength and the social and environmental implications of the project. For that a more detailed analysis of the latest financial statements, financial projects and the current operating and financial strategy are performed. Based on that analysis DB's investment management team typically recommends one of the following options to the Investment Committee:

- (Temporarily) Waive the covenant breach, in particular if the breach is expected to be healed in the foreseeable future and no significantly adverse effects are expected.
- Adjust the covenants, if particular if the current thresholds are not considered realistic and/or achievable any more, but no further adverse effects are expected for the project. This can typically be observed in merger & acquisition cases which tend to have a significant impact on key financial covenants.
- Propose remedial action by the management of the project to avoid further deterioration of the financial strength. These proposals are highly idiosyncratic, but range from complete strategic reviews and adjustments of the underlying business plan, possibly including management changes, to ensure the going concern of the company to tactical adjustments to ensure the availability of sufficient capital and liquidity for example. Part of the proposal could be a request for injection of additional capital if the business case justifies this measure. Such remedial actions are monitored closely in regular interaction with the borrower.
- Demand complete or partial capital repayment, if remedial actions are considered insufficient or impossible. Before any repayment can be effected an assessment of the potential social and environmental implications must be conducted.

Workout

If UGEAP demands a complete or partial repayment of capital, the likelihood of complete repayment must be assessed based on the analysis in 2. Mitigation. If a complete repayment is unlikely, workout teams will be created. These teams can access dedicated experts from legal and risk departments in DB. In particular, DB's RMA (Risk Management Advisory) team has a successful track record in workouts and can support the investment management team on workout cases.

In a workout scenario, the team re-negotiates the contracts, assesses the collateral values available and starts their liquidation if necessary. Given the relatively weak legal enforceability in some countries under consideration liquidation of collateral will most likely result in relatively low recovery value and/or only with a significant time delay. Furthermore liquidation of collateral against our contract partner (i.e. financial institutions) could impact the ultimate beneficiaries of the projects and stress vulnerable groups. Against this background DB considers a workout process to be the ultimo ratio only.

Benefiting from DB's global network and significant in-house Africa expertise, DB's investment management teams have a track record of finding solutions for critical exposures that ensure their going concern and avoid workouts.

Work-Out Scenarios under the Funding and Risk Participation Structure:

Once UGEAP has given consent for an exposure to become part of the Reference Portfolio, the credit risk arising from the underlying exposure is partially borne by UGEAP while the servicing of the loan remains with the local bank. Quarterly, the bank will be obliged the report risk indicators on the underlying transactions to UGEAP that will become part of the ongoing credit surveillance process. Local banks will be obliged to manage exposures in line with their

standard practice – while UGEAP's mission is to expand the bank's practice into sectors that can be new to the bank.

Loss Allocation

In case the bank (partially-) writes off claims for principal payments it has against the underlying borrowers, the following conditions need to be fulfilled for UGEAP to bear partially the losses:

- the write off is determined in line with international accounting practice;
- the write offs are limited to claims for principal repayments;
- UGEAP shall have the right to verify the amount of the write-off which in practice would be performed by a local auditing company mandated by UGEAP.

Work-Out Actions

In case of a default or bankruptcy, local banks are generally best positioned to deal with the situation under local law while UGEAP shall receive a right to intervene with decisions by the local bank that, subject to a materiality clause, will require the approval by UGEAP. Such decisions shall include, inter alia:

- give consent to the replacement of management or other action by management of the creditor requiring approval by the lender;
- agree to the appointment of a liquidator required under local law;
- agree to the restructuring of the cash flow profile of the loan;
- initiate the redirection of cash;
- initiate and effect the foreclosure of security and
- agree to the sale of the exposure to an enforcement agent / non-performing assets specialised company.

In principle, any action by the local bank to give up its rights, release security or dispose of the assets will require the consent by UGEAP. Failure of the bank to receive the pre-consent will cause the exposure to retroactively become ineligible to be part of the Reference Portfolio and UGEAP shall contractually have no risk exposure any more to the loan.

Operationally, three elements will be employed to reduce the probability of incurring non-performing assets:

a) Selection of the right local bank as a partner institution of UGEAP based on DB's comprehensive experience with partner banks in Africa and the SI Europe team's analytical background in banking analysis (with the fund manager having rating agency experience for financial institutions); and

b) Acceptance of exposures to be added to the Reference Portfolio to include ideally only simple funding structures;

c) A close and ongoing interaction with the lending department of the local bank as part of supervision.

Projects

<Please describe in detail the governance structure of the project, including but not limited to the organization structure, roles and responsibilities of the project management unit, steering committee, executing entities and so on.>

<Describe construction and supervision methodology with key contractual agreements.>

<Describe operational arrangements with key contractual agreements following the completion of construction. If applicable, provide the credit analysis of key counterparties of key contractual agreements and/or structural mitigants to cover the counterparty risks.>

Details on the project level can be found in Annex C.7

C.8. Timetable of Project/Program Implementation

Please provide a project/program implementation timetable in section I (Annexes). The table below is for illustrative purposes. If the table format below is used, please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed. Kindly note that investing capital to be raised within the time frames linked to the two Phases can expand beyond the last day at which capital can be raised. Hence the Activity 1.1. differs from the timelines linked to Phase 1 and Phase 2 as the latter focus on raising capital, not investing it.

TASK (IN CHRONOLOGICAL INSTEAD OF FRAMEWORK ORDER)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
Activity 2.1. Identify and close co-operations with local financial institutions	x	x																						
Activity 2.2. Invest along local financial institutions in syndicated structures			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Activity 1.1. Phase 1 Originate investment opportunities in the focus countries for Phase 1	USD 100M				USD 100M				REPLACEMENT INVESTMENTS				REPLACEMENT INVESTMENTS				REPLACEMENT INVESTMENTS							
Activity 1.1. Phase 2 Originate investment opportunities in additional focus countries for Phase 2									USD 100M				USD 100M				USD 100M							
Output 1. Category 1 Projects: Number of solar home systems installed							30,000		30,000				30,000				30,000				30,000			

Output 2. Category 2 Projects: Number of mini-grids installed							700	700	700	700	700
Output 3. Category 3 Projects: Number of renewable energy systems installed							60	60	60	60	60
Output 4. Category 1 Projects: Total volume of capacity installed							3.4 MWp	3.4 MWp	3.4 MWp	3.4 MWp	3.4 MWp
Output 5. Category 2 Projects: Total volume of capacity installed							2.2 MWp	2.2 MWp	2.2 MWp	2.2 MWp	2.2 MWp
Output 6. Category 3 Projects: Total volume of capacity installed							63.6 MWp	63.6 MWp	63.6 MWp	63.6 MWp	63.6 MWp

D.1. Value Added for GCF Involvement

<Please specify why the GCF involvement is critical for the project/program.>

The GCF involvement in UGEAP is critical for the following reasons:

- Facilitating the transition of the private sector into a new asset class
- Overcoming structural limitations of local financial markets and international investors
- Triggering private investment at scale through the appropriate risk-return profile
- No alternative source of public sector funding at scale is available
- Local banks require training and capability building measures to deal with renewable energy related businesses

- *Facilitating the transition of the private sector into a new asset class:*

Financing access to electricity in Africa has traditionally been a public sector mandate. In remote areas, the approach to electricity access was typically grid-based and thus not economic, requiring investment grants from the public sector to enable private management and additional private investment in operations and maintenance. Technological progress and associated cost reduction in off-grid renewable energy solutions have now created the opportunity for Africa to leapfrog to 100% private sector based off-grid access solutions. Nevertheless, these technology solutions are new, with a short operational track record, currently limited in scale and operating in an untested regulatory environment. The private sector, i.e. local financial institutions and international institutional investors, therefore will not provide 100% of the required debt financing from the beginning, especially not for category 1 and 2 projects, while technology risks also remain for category 3 projects. A public-private partnership with the support from the GCF is therefore required to provide private sector debt providers with support and comfort to enter into financing this new asset class.

Overcoming structural limitations of local financial markets and international investors:

UGEAP will provide local currency debt finance to (D)ESCOS through local financial institutions (FIs) with a 5-10 year maturity, depending on project requirements. The majority of local financial markets are not yet developed enough to provide a similar offer to local businesses. Further, the capacity of local markets to offer the:

- maturity
- pricing and
- volumes

are well below the needs to bring clean energy access projects to fruition at the scale intended.

- In terms of maturity, the loan maturities provided by local banks average around 5 years and therefore typically cannot meet the loan maturity requirements of 7-10 years of the proposed investments. This is largely due to the fact that the largest funding source for local banks are short-term liabilities, the majority of which are demand deposits, while even term deposits typically do not exceed maturities of 1-2 years. GCF through UGEAP will therefore provide much-needed long-term funding for local banks, allowing them to extend loans to energy supply companies with the required 7-10 year maturity.
- Consistent data on the asset-liability mismatch of local banks is not available as banks differ in their positions. However, two examples represent the situation well:
  -
- In both countries, the weighted average life of liabilities fluctuate between 2-3 years – which is in significant contrast to the required terms of 5-10 years for the businesses UGEAP anticipates to invest into.
- In terms of pricing, even in case loans are available with the required maturities, local currency loans provided by local financial institutions typically carry interest rates which jeopardize the financial viability of the projects in question. GCF's involvement in UGEAP will allow local banks to extend loans with interest rates of 8-10% (USD equivalent) which are affordable vis-à-vis the expected return of the proposed investments.

- In terms of volume, lending by local banks to infrastructure sectors in general and electricity projects in particular to date is limited as a result of the limited size of local banks' balance sheet as well their lack of capacity in analyzing, structuring and assessing the credit risk of these projects. GCF as anchor investor in UGEAP will trigger access to additional financing volumes for clean energy projects, while tailoring the slice local banks are able to take on their balance sheet through the risk sharing and syndication mechanism.

The following table gives an overview on the key parameters of financial markets in Africa while there are certain points to be borne in mind:

- average lending rates show the whole spectrum from lending to sovereign or parastatal companies up to retail and SME customers (that are offered only significantly higher rates). In case of Tanzania, as an example, the average lending rate stood at 15% (and has not changed much) while companies in the pipeline were typically offered 25% and above.;
- loans to energy and water infrastructure providers are dominated by loans to the public service companies;

Table 31: Key Parameters of Financial Markets

Country	Max. tenor of government bonds (yrs)	Longest loan maturities available (yrs)	Average lending rate (%)	Longest tenor time deposit (yrs)	Infrastructure loans as % of total bank loans
Benin	5	10+	No information available	1	12
Kenya	15	10+	14	1+	9
Namibia	20	20	11	-	4
Nigeria	28	5	16.5	1	12
Tanzania	10	5+	15	2	8

Source: World Bank

Given that the proposed investments are a new asset class for international investors and in light of their regulatory investment restrictions, international investors alone cannot be counted on to invest with maturities above 3-5 years to ensure that UGEAP can extend long-term debt finance to local FIs. A long-term tranche from GCF with the proposed 15-year maturity is therefore required to provide sufficient comfort to local FIs that UGEAP can provide debt-finance with long-term maturities to meet the financing demand of local energy access projects.

Triggering private investment at scale through the appropriate risk-return profile:

The objective of UGEAP is to multiply the funding provided by the GCF by a factor of 2-3 through large scale debt investment from international private sector investors. This requires an appropriate risk-return profile, including risk mitigation for private investors as well as stable returns.

- In terms of risk profile, the actual and perceived risks of the proposed investments are very high from a private investor perspective, including lack of familiarity with the risk profile of local African FIs and energy supply companies, technology risks, macroeconomic and regulatory risks, market risks, operating risks and financial risks. These risks are too high to allow for a straight exposure to the underlying portfolio which does not meet private investor's acceptance at this stage. Private sector investment in UGEAP will therefore not be available without risk mitigation provided by the GCF. This risk mitigation consists of GCF's investment in UGEAP's subordinated B-tranche to take a higher risk position compared to private sector investors and provide private investors with a risk buffer. This will allow private sector investors to become comfortable with the risk profile and its default probabilities.

- In terms of return expectations, debt investors require stable returns being paid on their capital that should also be linked to floating rate returns in order to stabilize the present value of their investment while yield-curves change. UGEAP proposes to private sector investors to have access to the total amount of interest income from the investments in the following way:
  1) fixed target return: 5% - ranking senior (after having paid for senior operating expenses);
  2) a 1:4 share in the returns that are left after the target returns on the Class B capital has been paid.

The volatility in African economies is deemed to be outstandingly high and single defaults may occur without creditors having the option and chance to influence them. Investors would typically respond to such a situation by expecting "equity like" returns above 20% which the projects UGEAP targets cannot provide for debt investors.

GCFs involvement as risk cushion investor is therefore needed to stabilize the return profile of the A-tranche by removing the risk that the default of a single investment will destroy the return expectations of the private sector investors and lower the probability of write-offs for private investors which would negatively impact UGEAP's ability to raise additional private investment. As long as single defaults do not directly impact the private sector investor, acceptance for portfolio investments are realistic and DB believes that a significant portion of the capital refinancing the underlying transactions can come from the private sector based on its experience with similar structures.

No alternative source of public sector funding at scale is available:

Given the large investment needs and opportunities estimated in total at USD 500m, a sizeable amount is required as investment into the subordinated B-tranche which currently only the GCF is able to provide within the given timeframe. This is because no other DFI has ever considered a structure proposed by UGEAP and could encounter challenges in adequately programming the proposed structure which is a hybrid of local FI risk and direct project risk; no single DFI has similar financing capacity; and DFI programming requires a longer time horizon.

In addition, UGEAP establishes GCF as leading innovator in climate finance as no other program to date has managed to combine the elements of developing local financial markets and tapping into large scale international debt investment for the benefit of energy access in Africa. GCF's investment in the B-tranche of UGEAP triggers this innovation.

Capability of local banks to underwrite renewable energy base businesses:

The transactions UGEAP targets are not in the focus of financial institutions yet which has various reasons. Most banks have raised the concern that their in-house experience to deal with (a) consumer based lending in rural areas and (b) long term project finance structures is limited and would require external support from knowledgeable and experienced consultants. Further DB sees the need to build capacity across the sector by connecting financial institutions amongst each other. This will not only strengthen the capacity of banks but also produce competition which would improve the availability of funding for businesses UGEAP targets to promote.

D.2. Exit Strategy

<Please explain how the project/program sustainability will be ensured in the long run, after the project/program is implemented with support from the GCF and other sources, taking into consideration the long-term financial viability demonstrated in E.6.3.>

The GCF investment will be repaid at maturity (15 years after closing). The capital invested by GCF will become due and payable by the UGEAP at maturity. The repayment of the maturing capital will be made out of principal repayments from investments by UGEAP and the ability of UGEAP meeting the repayment obligation is a function of the Asset-Liability Management described above.

Once the business case has been proven, sustainability for UEGAP could be achieved by private sector investors

investing in the A-tranche with longer maturities and also in the higher yielding B-tranche, so that UGEAP would continue operations without the need for a public sector risk taker. It would be an expectation that investors would include African pension funds, insurance companies and other local institutional investors at that point in time.

Alternatively, as the investment proposition, associated investments requirements and electricity access situation can be expected to have changed significantly after 15 years, sustainability could be achieved through alternative development pathways:

- local financial institutions would have developed sufficient capabilities, investment expertise and long-term funding sources to finance the energy supply businesses by themselves without the need for a financial contribution by UGEAP;
- other international capital market investors start investing into the sector UGEAP covers;
- local financial markets would have developed in terms of depth and the capital available which translates into an environment that the need for external funding in the form of UGEAP is no longer required;
- businesses under category 3 investments would be in a position to finance their clean energy access from their own cash flow and no longer require an investment from UGEAP;
- the wealth of End Beneficiaries has increased such that they can afford investments in clean energy sources from their own cash flows without the need to make use of the energy supply companies UGEAP will invest into, which may be more unlikely for Category 1 and 2 transactions, though.

In addition, the business case for UGEAP will need to be re-assessed after 15 years in light of the then applicable national electrification strategy.

<In this section, the accredited entity is expected to provide a brief description of the expected performance of the proposed project/program against each of the Fund's six investment criteria. Activity-specific sub-criteria and indicative assessment factors, which can be found in the Fund's Investment Framework, should be addressed where relevant and applicable. This section should tie into any request for concessionality made in section B.2.>

E.1. Impact Potential

Potential of the project/program to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

<Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's investment framework.>

<When applicable, specify the degree to which the project/programme avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.>

The impact potential and the targets of UGEAP with regards to CO2e savings have been determined following three steps:

1) Step 1: Quantification of the CO2e savings of the three benchmark investments (Projects 1 to 3);
2) Step 2: The results of Step 1 are set into relation to the funding amount required by the three transactions;
3) Step 3: The resulting "costs per impact" are scaled up using the expected portfolio distribution of the UGEAP to achieve a UGEAP-wide estimate of the potential CO2e savings UGEAP can achieve through its investment activity. Hence the overall impact depends on the total amount of capital invested;

Step 1 Quantification of CO2e savings from Benchmark Investments:

The following table summarizes the CO2e savings of 3 concrete projects that have been analyzed, one for each project category while the detailed calculation is provided in section E.1.2

Table 32: Mitigation Impact Overview of the three Benchmark Investments

Indicators[52]	Program	Project 1	Project 2	Project 3
Expected tCO2e p.a. savings (5 year investment period)	see below as well as section E.1.2	19,090	5,183	148,665
Expected tCO2e lifetime savings (5 year investment period)	see below as well as section E.1.2	85,905	103,660	2,973,300
Expected number of MWp of low-emission energy capacity installed, generated and/or rehabilitated (5 year investment period)	see below as well as section E.1.2	4.7 MWp	1.1 MWp	53 MWp
Expected increase in the number of households with access to low emission energy (5 year investment period)	see below as well as section E.1.2	41,500	84,380	4,000

Source: Deutsche Bank

The CO2e emissions reductions of Project 3 have been quantified based on the replacement of Diesel generators

[52] For the methodology of calculating the indicators, please refer to section E.1.2.

that provide 24h/7days electrical energy supply. A grid connected installation will produce different results based on the CO2e factor of the grid the installation will be attached to. In the following calculations, it is assumed that 50% of Category 3 type projects will relate to grid-connected and 50% to Diesel generator/off-grid only installations.

Step 2: Set results from Step 1 into relation with the required funding

The determined CO2e emission reductions from the analyzed transactions are set into relation with the expected funding participation of UGEAP in these transactions which takes into account the need and type of funding as well as related costs. As a result, the tCO2e reduction per USD invested by UGEAP in each of the three Categories is calculated (Step 3 in the table below).

Step 3: Scaling up to UGEAP's total investment targets

As detailed above, UGEAP targets to invest a minimum of USD500m over its two Phases within 5 years. Using the funding per tCO2e savings ratio, the expected result (measured in lifetime tCO2e savings) of UGEAP having fully invested the USD500m in available capital would reach slightly more than 12m tCO2e.

Table 33: Target CO2e Savings Calculation Phase 2

Expected tCO2e saving based on transactions reviewed					
Item	Exp. lifetime tCO2e savings based on exemplary transactions	Funding share of UGEAP	tCO2 / US$m	Invested capital per category (Phase 2)	lifetime tCO2 reduction in emission (Phase 2)
Column	1	2	3	4	5
Calculation			=1/2		=3 x 4
Cat. 1 Projects	85,905	27,5	3,124	100	312,382
Cat. 2 Projects	103,660	9,5	10,912	100	1,091,158
Cat. 3 Projects - PV Diesel replacement	2,973,300	50	59,466	150	8,919,900
Cat. 3 Projects - PV Grid connection replacement	571,923	50	11,438	150	1,715,769
Total	3,734,788	137		500	12,039,209

Source: Deutsche Bank

Upside exists subject to the concrete composition of the portfolio as well as the amount of repayments that UGEAP will receive and that will be re-invested, creating a financing volume above the USD500m in total capital the UGEAP targets to raise. As shown in section C and E.6.5, if UGEAP re-invests the repayments from the underlying transactions that amortize, another scenario can be built in which an assumed USD2.1 BN are invested leading to significantly higher savings expectations with slightly more than 50m tCO2e lifetime savings.

Table 34: Target CO2e Savings Calculation at End of UGEAP

Expected tCO2e saving based on transactions reviewed					
Item	Exp. lifetime tCO2e savings based on exemplary transactions	Funding share of UGEAP	tCO2 / US$m	Invested capital per category (Year 15)	lifetime tCO2 reduction in emission (Year 15)
Column	1	2	3	4	5
Calculation			=1/2		=3 x 4
Cat. 1 Projects	85,905	28	3,124	420	1,312,004
Cat. 2 Projects	103,660	9.5	10,912	420	4,582,863
Cat. 3 Projects - PV Diesel replacement	2,973,300	50	59,466	630	37,463,580
Cat. 3 Projects - PV Grid connection replacement	571,923	50	11,438	630	7,206,230
Total	3,734,788	137		2100	50,564,677

Source: Deutsche Bank

<Degree to which activity avoids lock-in of long-lived, high-emission infrastructure>

Details and background of the impact potential of UGEAP's investment activity

Energy access is key to the development of Sub-Saharan Africa. UGEAP avoids the lock-in of high-emission infrastructure in the African electricity supply for households and communities (Categories 1 and 2 Projects) as well as for industrial and commercial customers (Category 3 Projects) in their development pathway of granting people access to a reliable energy supply and to allow for economic growth by serving local industrial and commercial customers with on-site energy generation.

Given that the energy mix in the target region already heavily depends on fossil-fuel based electricity and/or the target region does not provide for reliable grid infrastructure, further adding high-emission diesel generators to power decentralized communities and businesses is not an option from a climate perspective.

Both, low-carbon energy production and the expansion of rural energy services can be achieved by scaling up the use of renewable energy sources, particularly photovoltaic in combination with small battery kits and hybrid systems which is the focus of UGEAP.

The first two project categories focus electrifying local communities and homes (Category 1 and 2 Projects) and Category 3 Projects are providing renewable energy for businesses. The additional benefits, beyond CO2 emission reduction, include:

- The provision of clean, safe and sustainable electricity sources providing ability for communities to have homes which are lit with more hours of electricity supply per day compared to fuel and wood-fired solutions;
- Access to charging units creates multiple benefits for households, such as availability of several hours of electricity for productive activities with associated benefits of employment creation; availability of lighting for studying purposes; reduced health impacts from dirty cooking fuels etc.;
- At the community level, increased resilience, safety, empowerment and sustainability as a result of access to lighting in public spaces, including in schools with associated education benefits, in clinics with benefits of improved health care services and in community centers with a positive impact on community empowerment and decision-making

- Renewable power increases access to telecommunication resulting in a reduced travel demand, thereby reducing fossil fuel consumption and also connects people better to markets, therefore improving their livelihoods and income;
- If any of the power generated by these projects is used to run refrigeration equipment this will help the local community store medication safely and appropriately. This will improve treatment against infectious diseases including Malaria and other vector borne diseases.
- Given economic growth rates and increased need to electricity for the economy, hybrid systems for industries will play a crucial role in reducing CO2 emissions generated by different productive sectors of the African economies.

<Degree to which the programme/project supports the scaling up of low-emission energy in the affected region by addressing key barriers>

Table 35: Overview on how barriers are overcome

Key Barriers	Explanation	Way to address barrier by Program
Economic and financial barrier	• Access to capital is scarce, in particular in local currency • High upfront costs	• Program facilities involvement of different sources of capital on all levels (local and international project developers, local banks, institutional and other private sector investors) • Business models allowing for implementation of renewable with no upfront costs for end-customers
Lack/Unreliability of grid connection	• Energy access/supply in Africa is limited due to limited coverage by electricity grids, driving the use of high-emission on diesel generation sets	• Technical concepts for photovoltaic/battery kits as well as highly-efficient PV-hybrid systems which are offered in a viable business model bypass the need of a grid infrastructure
Familiarity and trust in renewable technology	• Lack of technical and commercial skills which is necessary for the role out. • Limited knowledge about installation and operation of renewable energy installations	• Program supports trust-building by rolling out viable concepts with a proven technology • Capacity building of local staff as well as customers
High transaction costs	• Small –scale of installations increases financing costs as well as installation costs	• Program benefits from economies of scale in all Projects • Due to aggregation of different projects into one investment programme funding from private sector is facilitated • Involvement of local bank transaction costs can be reduced

Source: Deutsche Bank

Three Benchmark Investments

Category 1 Benchmark Investment

- Projects of this category provide off-grid SHS to rural, remote and vulnerable communities in one country, thereby contributing to both sustainable and low-emission development pathways for climate change mitigation and adaptation

Regarding climate change mitigation:

- Projects provide access to sustainable energy sources and lighting for households that previously relied on conventional high-emission energy supplies such as diesel generator sets (as a shared energy source) or kerosene lamps (for individual housing)
- Within 2016, the sample project analyzed has the capacity to electrify at least 41,500 households that previously depended on fossil fuel for lighting, resulting in a total of 4,7 MWp installed renewable energy capacity;

Regarding climate change adaptation:

- Research shows that about 1/3 of customers use SHS to generate additional income; 1/3 of a total of 41,500 SHS systems results in 12,500 households less vulnerable to climate change by diversifying their business activities and income sources;
- Larger-scale SHS kits for productive activities can also offer an alternative to local income generating activities from agriculture, making them more resilient to future climate change impacts such as droughts.

Category 2 Benchmark Investment

- This project provides mini-grid PV solutions to villages, thus contributing to both sustainable and low-emission development pathways for climate change mitigation and adaptation

Regarding climate change mitigation:

- The sample project analyzed is estimated to electrify around 84,380households; contributing to an additional capacity of 1.1 MWs clean electrification capacity and avoiding approximately 5,183 tCO2 within the first five years;
- This avoids the lock-in high emission infrastructure such as mini-grids fed by electricity produced from diesel-generators; solar mini-grids also replace kerosene lamps as high-emission infrastructure
- Social benefits generated include health benefits from reduced cooking fuels and availability of appliances such as refrigerators; increased leisure time due to reduced time to organize everyday live tasks (e.g. mobile phone charging, fuel wood collection); increased educational level due to longer study hours possible through increased access to light

Regarding climate change adaptation:

- solar-powered mini-grids also improve access to reliable electricity for increased productive activities through connectivity for e.g. small scale machines of SME companies, resulting in increased householder income and resilience
- Technology progress allows for a full service package including household connection, metering, pay-per-use charges, and local after sales maintenance services, increasing the reliability and availability of electricity service, while keeping the operations cost and capital expenditures low;

Category 3 Benchmark Investment

- Projects in this category replace CO2 intensive energy production from diesel generators with a low-emission photovoltaic solution and integrating it into a hybrid system for local industries with ensuing climate change mitigation benefits:

- Hybrid systems replace high-emission infrastructure in the energy supply of companies and businesses in sectors such as agriculture, mining, and food processing, all of which today still depend primarily on fossil-fuel based electricity generation for their captive power supply.
- Significant potential for a growing share for renewable energy for industries exists:
  - As example, until 2035 only 3% of Tanzanian energy consumption is expected to be covered from renewable energies while coal and diesel will account for more than 50%;
  - In Namibia, hydropower accounts for 67% of internal power generation capacity on-grid, the balance being provided by coal and diesel; solar off-grid solutions are in high demand from industries such as agriculture and tourism and only provided by three major suppliers;
- Total capacity is then planned to comprise 53MWp, abating approx.148,665 tCO2 per year. Over a physical life-time of 20 years, this corresponds to approximately 2.97m tCO2 assuming all installations replace diesel generators.

E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	*Expected tonnes of carbon dioxide equivalent (tCO_2eq) to be reduced or avoided (Mitigation only)*	*Annual (after 5 yrs)*	Cat. 1 Projects: 69,418 tCO2e / year[53] Cat. 2 Projects: 54,558 tCO2e / year[54] Cat. 3 Projects: 531,783 tCO2eq / year[55] Entire UGEAP program: 655,759.53 tCO2e / year based on the three analyzed sample transactions
		Lifetime (after 5 yrs)	Cat. 1 Projects: 312,382 tCO2e[56] Cat. 2 Projects: 1,091,158 tCO2eq[57] Cat. 3 Projects: 10,635,669 tCO2e[58] Entire UGEAP program: 12,039,209 tCO2e
		Annual (after 15 yrs)	Cat. 1 Projects: 291,556 tCO2e / year[59] Cat. 2 Projects: 229,143 tCO2e / year[60] Cat. 3 Projects: 2,233,490 tCO2eq / year[61] Entire UGEAP program: 2,754,190 tCO2e / year based on the three analyzed sample transactions
		Lifetime (after 15 yrs)	Cat. 1 Projects: 1,312,004 tCO2e[62] Cat. 2 Projects: 4,582,863 tCO2eq[63] Cat. 3 Projects: 44,669,810 tCO2e[64] Entire UGEAP program: 50,564,677tCO2e

[53] Calculated based on a technical lifespan of 4.5 years due to battery lifetime;
[54] Calculated for 20 years as batteries will be replaced every 5 years by mini-grid operator
[55] Assuming a lifespan of 20 years;
[56] expected annual savings from transactions into which USD100m will have been invested in full
[57] expected annual savings from transactions into which USD100m will have been invested in full
[58] expected annual savings from transactions into which USD300m will have been invested in full
[59] Calculated based on a technical lifespan of 4.5 years due to battery lifetime;
[60] Calculated for 20 years as batteries will be replaced every 5 years by mini-grid operator
[61] Assuming a lifespan of 20 years;
[62] expected annual savings from transactions into which USD420m will have been invested in full
[63] expected annual savings from transactions into which USD420m will have been invested in full
[64] expected annual savings from transactions into which USD1,260m will have been invested in full

Other relevant indicators	*Expected increase in the number of households with access to low-emission energy* • Cat. 1 Projects: 150,000 of SHS sold and installed • Cat. 2 Projects : 3,500 mini grids • Cat. 3 Projects : 300 SME systems *Expected increase in the number of small, medium and large low-emission power suppliers, and installed effective capacity* • Cat. 1 Projects: 150,000 solar home systems as each household then counts as power supplier • Cat. 2 Projects: 3,500 mini-grids installed counting each as power supplier • Cat. 3 Projects : 300 SME systems each of which counting as power supplier

<Describe the detailed methodology used for calculating the indicators above.>

Energy and carbon savings have been calculated for each project analyzed in accordance with the following principles:

- **Methodology**: Where actual production data is not available (Project 1 and Project 2), the project appropriate standardized baseline calculation framework has been followed as referenced in the CDM Methodology Booklet[6566].
- Deutsche Bank has followed the CDM standardized baseline methodologies to facilitate calculation of emission reduction for proposed project activities as frameworks include parameters specific to the electrification of rural communities. Using CDM methodology enhances transparency, objectivity and predictability of each project's energy and carbon savings whilst adopting a simplified measuring, reporting and verification approach.
- Both, Project 1 and 2, align with chosen CDM[67] technology/measure criteria as stated below:
  - Electricity generation and supply will be through the installation of new, renewable electricity generation systems[68] including solar photovoltaic systems that displace fossil fuel use, such as fuel-based lighting systems and stand-alone power generators.
  - Generated electricity use includes interior lighting, street lighting[69], refrigeration, or agricultural water pumps while additional energy consuming equipment is also served (mobile charger, fan, TV sets).
  - At least 75% of the end use facilities connected to the project renewable electricity generation system(s) through Project 1 and 2 will be households.
  - Project equipment shall comply with international standards or comparable national, regional or local guidelines will be a fixed system where each system will not exceed 15MW.

[65] Clean Development Mechanism (CDM), 2014a. CDM Methodology Booklet. Information undated as of EB 79. Sixth edition. Available from: https://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf#AMS_III_AR. Accessed on 26/08/15.

[66] Table VI-1 (pg 9-10) provides Methodology Categorization in the Energy Sector. Both Project 1 and 2 are small scale projects, with focus on energy for households and buildings. Relevant methodologies are focused on the AMS categorisation.

[67] Clean Development Mechanism (CDM), 2014b. Small-scale Methodology: Electrification of rural communities using renewable energy. AMS-I.L. Version 03.0. Sectoral scope(s): 01. Available from:https://cdm.unfccc.int/filestorage/I/O/F/IOFY140VMZSBUGPQ6JCAK8XD7ETNR2/EB81_repan21_AMS-I%20L_ver03.0.pdf?t=VzI8bnRwN21sfDALhy2MAzIaYFxlX__g-5Gg. Accessed on 26/08/2015.

[68] Facilities and consumers supplied electricity through an isolated mini-grid are also included. For the purpose of this methodology, a mini-grid is defined as a small-scale power system with a total capacity not exceeding 15 MW (i.e. the sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW) which is not connected to a national or a regional grid.

[69] Lighting equipment should only be high efficient lighting such as Light Emitting Diode (LED) lamps.

- To calculate baseline emissions the amount of renewable electricity consumed by the facilities served by the project renewable electricity generation systems and the number of facilities (e.g. households) supplied with renewable electricity by the project activity are known.
- **Static data for project 1 and 2**: The following are the baseline emission factors for each tranche of annual amount of renewable electricity consumed per end-use facility[70].
  - For the first 55 kWh of renewable electricity consumed by each facility the baseline emission factor is 6.8 (tCO2/MWh);
  - For the facility consumption greater than 55 kWh but equal to or less than 250 kWh, the baseline emission factor is 1.3 (t CO2/MWh) for the tranche between 55 and 250 kWh;
  - For the facility consumption beyond 250 kWh, the baseline emission factor is 1.0 (t CO2/MWh) for the tranche beyond 250 kWh.
- **Static data equation** for project 1 and 2: Baseline emissions for the entire project activity are then calculated as:

  $BE_y = BE_{55,y} + BE_{250,y} + BE_{250\ plus,y}$[71]

  Where:

  BE_y Baseline emissions in year *y* (t CO2)

  $BE_{55,y}$ Aggregate baseline emissions for facilities that consumed equal to or less than 55 kWh of renewable electricity from project renewable electricity systems in year *y* (t CO2)

  $BE_{250,y}$ Aggregate baseline emissions for facilities that consumed more than 55 kWh but equal to or less than 250 kWh of renewable electricity from project renewable electricity systems in year *y* (t CO2)

  $BE_{250\ plus,y}$ Aggregate baseline emissions for facilities that consumed greater than 250 kWh of renewable electricity from project renewable electricity systems in year *y* (t CO2)
- Energy savings calculation equation for project 1 and project 2:

  Energy Generation: Potency * Hours * Availability

  Where:

  Potency Installed capacity

  Hours 8760 (365 days * 24 hours)

  Availability 12% - UNFCCC assumes12% availability for solar photovoltaic electricity systems. According to UNFCCC/CDM this availability can only be assumed for installed capacities of each project renewable electricity generation system being less or equal to 1.0 kW. (DB assumes the availability ratio (12%) accounts for daily solar radiation, solar panel efficiency of conversion and performance ratio of solar panel).
- **Key document reference:** Clean Development Mechanism (CDM), 2014b. Detailed in footnote[52].

Category 1 Projects: CO2 savings measurement

- Summary: Project 1 analyzed targets to sell 41,500 SHS[72] = 19,090 tCO2 / year[73] and 85,905 tCO2 for technical lifespan of project using the funding from UGEAP[74]
- These savings have been calculated following CDM (2014b) methodologies
- The project is for small domestic PV, which replace a mix of off-grid fuel sources including diesel generators, kerosene lamps and batteries.
- The project is to power a variety of electrical appliances which may include lighting and refrigeration.

[70] These factors are sourced from CDM (2014b) pg (6).
[71] Additional baseline emission calculations can be referenced within CDM (2014b).
[72] Of average installed capacity 113 Wp (calculation detailed in Table 1).
[73] Using Emission Factor 0.46 tCO2 / devise derived using CDM (2014b) methodology.
[74] Technical lifespan is at 4.5 years which is the battery lifespan.

- A number of different panels with various installed capacities are possible: 80 Wp, 100 Wp, 120 Wp and 200 Wp. A weighted average calculation for installed capacity is calculated in Table 1. The average installed capacity is 113 Wp.
- Using CDM (2014b) energy generation equation: Potency * Hours * Availability equates to 113 Wp * 8760 * 12% = 0.12 MWh / year / device.
- Emission conversion factors are taken from CDM (2014b).
- Following the detailed framework and emission thresholds of 6.8 tCO2/MWh for the first 55 kWh per SHS and 1.3 tCO2/MWh for a capacity between 55 kWh and 250 kWh per SHS, the following factors are derived:
  - For 80 Wp 80 * 8760 * 0.12 = 0.08 MWh / yr / device. Baseline emissions: ((0.08 – 0.055) * 1.3) + (0.055 * 6.8) = 0.41 tCO2 / year / device.
  - For 100 Wp 100 * 8760 * 0.12 = 0.11 MWh / yr / device. Baseline emissions: ((0.11 – 0.055) * 1.3) + (0.055 * 6.8) = 0.44 tCO2 / year / device.
  - For 120 Wp 120 * 8760 * 0.12 = 0.13 MWh / yr / device. Baseline emissions ((0.13 – 0.055) * 1.3) + (0.055 * 6.8) = 0.47 tCO2 / year / device.
  - For 200 Wp 200 * 8760 * 0.12 = 0.21 MWh / yr / device. Baseline emissions ((0.21 – 0.055) * 1.3) + (0.055 * 6.8) = 0.58 tCO2 / year / device.
- Following this methodology, a weighted average tCO2 conversion factor was created which equates to 113 Wp installed capacity (see Table 1).
- Based on the data above, the annual savings for 41,500 SHS of varied installed capacity (average 113 Wp) to be installed equals 19,090 tCO2 / year (=41,500 * 0.46);
- Lifetime savings are estimated linked to the lifetime of the batteries that are built into the SHS: 19.090 tCO2e * 4.5 (battery lifespan) = 85,905 tCO2.

Table 36: Weighted panel capacity and weighted emission factor calculation

	Panel Capacity (W) (A)	Installed to date (Pcs) (B)	In % (C)	tCO2 conversion rates p.a. (D)
Source			=Installed pcs (B) / total installed pcs (1-4)	Following CDM methodology
1	80	8952	42	0.41
2	100	4442	21	0.44
3	120	4106	19	0.47
4	200	3644	17	0.58
	Total	21144		
	Average		113	0.46 This factor is used to calculate overall project emission savings.
	113	= (C1 * A1) + (C2 * A2) + (C3 * A3) + (C4 * A4)		
	0.46	= (D1 * C1) + (D2 * C2) + (D3 * C3) + (D4 * C4)		

Source: Energy supply company

- Research and triangulated data show: ~33% of customers use SHS to generate extra income
- Extrapolating 1/3 to 41,500 systems: resulting in the number of households less vulnerable to climate change by diversifying their income sources adds up to 12,500

<Describe how the indicator values compare to the appropriate benchmarks established in a comparable context.>

- As shown above, the weighted panel mix amounts to an emissions reduction factor of 0.46 tCO2e per year per device;
- These indicator values compare conservatively with those commonly used in off-grid energy projects:

- One energy supplier gives for its devices (8 Wp) a emissions reduction factor of 0.057 tCO2e per year per device – adjusted to the size of an average solar panel under the project the factor would be 0.81; ~335,000 devices would need to be sold compared to the 41,500 SHS under the project to achieve the same savings
- Another energy supplier gives for its 10 Wp devices a factor of 0.071 tCO2e per year per device – adjusted to the size of an average solar panel this would be equivalent to 0.80; ~270,000 devices would need to be sold compared to the 41,500 SHS under the project to achieve the same savings.

- Competitors mostly provide so called "pico-systems" which are very small systems of less than 10 Wp; Pico-systems can considered as solar-entry level systems and as a substitute for kerosene lights, but lack the upgrading possibility, i.e. cannot run a TV or larger appliances, use during rainy season is limited;

Table 37: Benchmark Overview

	Operations in	System Size [Wp]	Average cost per Wp [USD]	GSM
Energy supplier 1	Kenya, Uganda	4 - 5	47	Yes
Energy supplier 2	Kenya, Tanzania	3	25	No
Energy supplier 3	Tanzania, Ghana	10	20	No
Project	Tanzania, Rwanda	30 - 200	8.9 – 12.9	Yes

Source: Deutsche Bank

Category 2 Projects: CO2 savings measurement

- Summary: Project 2 targets to install 12,054 panels * 0.43 (emission factor / devise) = 5,183 tCO2 / year and 103,660 tCO2 for technical lifespan of project using the funding from UGEAP[75].
- CO2 savings are calculated using data provided by the project managers and CDM (2014b) methodologies.
- The project is for small domestic use which replaces a mix of off-grid fuel sources including diesel generators, kerosene lamps and batteries.
- The project is to power a variety of electrical appliances including LED lighting and battery re-charging.
- The project is to fund 12,054 panels which each have an installed capacity of 90 Wp.
- The number of panels equates to 84,380 households being connected to devices by the end of 2020 (end of UGEAP investment phase). The assumption of one device equating to one panel and one device reaching 7 households is used.
- Using CDM energy generation equation: Potency * Hours * Availability equates to 90 Wp * 8,760 * 12% = 0.09 MWh / year / device.
- Emission conversion factors are taken from CDM (2014b).
- Following the detailed framework and emission thresholds of 6.8 tCO2/MWh for the first 55 kWh per devise and 1.3t CO2/MWh for a capacity between 55 kWh and 250 kWh per devise, the following factors are derived:
- For 90 Wp 90 * 8760 * 0.12 = 0.09 MWh / yr / device. Baseline emissions: ((0.09 – 0.055) * 1.3 + (0.055 * 6.8) = 0.43 tCO2 / year.
- For 12,054 90 Wp panels annual carbon emissions equate to 5,183 tCO2 / year.
- Technical lifespan of each project has been calculated at 20 years, a conservative estimate for solar panels.

[75] Of installed capacity 90Wp, using emission factor of 0.43 tCO2 / devise derived using CDM (2014b) methodology. Technical lifespan (20 years) is conservative lifetime for a solar panel.

Therefore 5,183 tCO2e / year * 20 = 103,660 tCO2.

Added value

- 12,054 panels are estimated to reach 84,380 homes (7 households per panel system). Assuming 5 people per household, this investment could enhance the lives of over 421,900 people.

<Describe how the indicator values compare to the appropriate benchmarks established in a comparable context.>

- Mini-grid indicator values under Project 2 are close to those under Project 1 while CO2e lifetimes savings are higher as the battery is owned and maintained (replaced). This allows to model lifetime savings over 20 years rather than capping the results at the expected lifetime of a battery which would need to be replaced in Project 1 by the owner of the solar home system. This allows the mini-grid supplier to produce 1.2 times higher lifetime savings with 3.4 times less panels being installed;
- Mini-grid systems connect various panels and batteries and therefore are able to better cope with load volatility in the grid;

Category 3 Projects: CO2 savings measurement

- Project 3 produces annually 236 MWh (101 MWh + 135 MWh) in its existing installations. 236 MWh * 1.7 tCO2 = 401 tCO2 / year. Technical lifespan for solar panel is 20 years = 8,024 tCO2 for technical lifespan.
- Projected energy and carbon savings are based upon actual data collated from other solar panels which are currently installed and electricity generation metered.
- It is assumed that solar panels are replacing previous electrical generation from diesel generators.
- With reference to the standardized baseline value from UNDP (2014)[76] for rural off-grid electrification in Sub-Saharan Africa, when diesel generators are replaced by renewable energy (including solar) the emission factor of 1.7 tCO2/MWh is to be applied.
- Two reference projects had the following electricity production for 2014 which was metered on site i.e. the data points below are actual:
  - A mining project: 1,600 kWh/kWp/yr * 63 kWp = 101 MWh/y
  - A forestry & timber project: 1,550 kWh/kWp/yr * 87 kWp = 135 MWh/yr
- To ensure that carbon calculations are conservative and take into account actual rural locations, these measured values have been taken forward.
- Carbon savings from these two projects: 101 MWh + 135 MWh = 236 MWh. 236 MWh * 1.7 tCO2 = 401 tCO2 / year.
- A conservative technical lifespan for a solar panel is 20 years.
- Therefore 401 tCO2 * 20 years = 8,024 tCO2 for project technical lifespan of the two installed projects.

Future estimations

- 50 similar SME customers are assumed, reaching an installed capacity of 53 MWp with funding from UGEAP i.e. the average capacity of each installation will be 1.06 MWp.
- 1,650 hours of operation * 53 MWp = 87,450 MWh.
- 87,450 * 1.7 emissions factor = 148,665 tCO2 from 2020 onwards.
- Technical lifespan for a solar panel is 20 years. 148,665 * 20 = 2.97m tCO2 for a lifespan of 20 years.

[76] United Nations Development Programme, 2014. Standardized baseline assessment for rural off-grid-electrification in Sub-Saharan Africa.

- Almost 4,000 households could be served through 13 mini-grid off-takers from 2020 onwards, based on the assumption that 230 households will be served with 87 kWp containers deployed in the (mini-)grids segment, and that out of the 50 SME customers 13 will be mini-grid operators.

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/program investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

<Describe expected contributions to global low-carbon and/or climate-resilient development pathways through a theory of change for scaling up and replication (e.g. in terms of multiples of initial impact of the proposed project/programme).>

Program Level

UGEAP will leverage GCF resources by a factor of 1:3.3 as part of the proposed program, creating the first program for public-private climate finance in Africa at scale, with a target volume of USD 500 million. In addition, successful investments by UGEAP will further multiply its impact inside and outside of the program as new markets have been created which will move towards sustainability and continue beyond UGEAP.

UGEAP contributes to the paradigm shift towards low-emission and climate-resilient development pathways through the following paradigm shift:

- ***Mobilizing private climate finance in partnership and at scale for climate-smart electricity access investments:*** *Private sector capital can be invested alongside existing local capacity from project developers as well as local banks to the benefit of climate-smart electricity access projects.*

  Private sector investors at this stage have currently no opportunity to invest into climate-relevant mitigation projects (like those UGEAP targets) on the African continent and therefore do not cover the region with the necessary attention and capital. On the other hand the current demand for debt of businesses in the targeted categories is not met by local financial institutions.

  Paradigm shift: UGEAP provides the first integrated platform to link private sector investors, local financial institutions and local and international project developers/climate businesses for the benefit of scaling up universal electricity access in Africa. UGEAP - on the active side - will indirectly add profitable assets to the balance sheets of local banks and enable them to serve larger transactions that are not reachable with their own capital sources and – on the passive side – shall provide institutional and other private sector investors with the opportunity to tap the climate mitigation market in Africa with higher certainty. Successful investments through UGEAP will allow for further transactions to follow from 3 sources: first, from local financial institutions who will allocate further (own) capital once they built up a successful track-record in lending to these projects; from international investors who will feel more comfortable to invest at scale after early successes and from equity/project sponsors who will invest more in projects with a proven market and technology.

Innovation through local and international financial market development: *At the local level, UGEAP will provide local banks with long-term funding for cash-flow based lending. At the international level, UGEAP provides the first structure to allow international investors to finance green electricity access in Africa. Both are new markets.*

Local banks in Africa face an asset-liability mismatch: in many African economies, financial markets are still predominantly short-term, in some cases even without a long-term financing benchmark (such as long-term government bonds) and in most cases lacking long-term deposits which banks could intermediate into long-term lending to projects which require a longer time horizon.

In addition, local banks' lending practices are not conducive to financing new technologies. In mature renewable energy markets financial institutions finance renewable energy projects of all sizes in cash-flow based (project) finance structures. However, the financial sector in the Target Region is used to grant loans for business operations mostly against hard collateral (the value of which is often higher than the loan amount) but is not yet open to granting loans for which the repayment relies on the cash that is produced by companies' operations. In addition, interest rates from local financial institutions are calibrated towards cash rich business.

In an emerging economy, a Debt to EBITDA multiple of 1-2 times the earnings minus net operational costs (i.e. before interest, tax and depreciation (EBITDA)), is typical. Businesses with high turnover (trade, agriculture, retail, manufacturing) and in low capital intensive businesses (machinery is already amortized / not expensive) comfortably fall into this target range.

This is in contrast to climate businesses that are producing less cash (and are less profitable) and can offer less hard collateral or proven market fundamentals in Africa. To enable these transactions to produce adequate returns, 8-10 times EBITDA is a typical requirement for the amount of required debt at interest rates that are typically offered to corporates with established operations. This Local financial institutions currently do not provide such financing due to:

- Lack of knowledge on how to structure debt / underwrite;
- Not foreseen in the credit procedures of the local financial institutions;
- Long term execution horizons while other business (such as real estate) allows to earn higher interest rates with shorter maturities;
- Perception of high risk – low return combination;
- Interest rate and other subsidies by international development banks can make it unattractive to start lending to these businesses.

On the side of international investors, they currently do not invest in green electricity access projects in Africa directly as the associated actual and perceived risks are too high, including political, market, technology and operating risks and the expected returns to compensate for such risks cannot be provided by the projects.

Paradigm Shift: UGEAP creates both new markets for local banks as well as investors by overcoming the barriers outlined above through:

- Providing long-term debt finance to local financial institutions which they can intermediate into long-term loans with the maturities required by green electricity access projects
- Partnering with local banks in project analysis and credit assessments, thereby building their capacity in cash-flow based lending to these projects
- Providing an adequate risk-return profile for international investors to start investing at scale in renewable energy access projects in Africa

Building up both these local and international financial markets and creating a growing capital flow through them will drive prices for capital (interest rates) down given that the available capital will over time compete for these projects.

Innovation to the traditional "on-lending scheme": *Providing long term debt to local financial institutions in an existing and proven concept to enable banks to provide long term capital into specifically targeted sectors. While this leaves banks with the full risk, a risk participation provides an even stronger incentive to serve industries and clients that have not yet been covered by the local banks*

In order to mobilise funding for local businesses in the targeted categories of the UGEAP, banks are expected to provide loans to sectors that are currently outside of their target and comfort zone. Local economies are evolving very quickly which is also reflected in lending standards. Banks tend to show high growth rates and

growth requires equity and profitability. Profitability in the markets is high as banks are able to charge relatively high fees and interest from underpenetrated businesses segments. The target businesses need, however, interest rates that are not at the top of the offer range from local banks and hence become less attractive to expand into – although their business models come with significant growth prospects from the local banks.

In addition, lending standards of local banks generally are not adapted to the business types UGEAP targets to support – while these businesses are vital for an economy that is fuelled by green energy from a granular number of small energy companies. In order to expand the lending practices, local risk procedures need to adjust to the risk characteristics of these companies. As local banks would be accompanied in the risk take-over by UGEAP, the offer provides sufficient incentive to initiate the transition.

Paradigm Shift: UGEAP allows local banks to expand their scope of services and customer outreach, supports the financial inclusion of currently unbanked customers and transforms the lending / credit acceptance criteria of local banks towards the businesses that are typical for an economy backed by many de-centralized green energy providers.

UGEAP delivers long term capital through debt: *While international investors focus on equity investments in the Target Region, UGEAP offers long term debt which supports local entrepreneurs and stabilizes national account balances.*

Typically, investments by international investors (tracked by the "foreign direct investments" statistics) come in with a relatively short term orientation and the ability to divest in case macroeconomic conditions turn negative. Further, local businesses that have oftentimes borne development costs have to bring on board further equity investors in order to fund the capital expenditures required to grow the businesses in line with the market potential. This reduces the amount of up-side and returns local entrepreneurs can retain. Debt is also used to reduce the total funding costs of a company and therefore makes businesses feasible that otherwise would not succeed.

In addition, on a national level, equity investments leaving the economy in case of a downturn lead to a further de-stabilization of the situation. In contrast, debt has a maturity schedule and therefore would flow "only" on expected terms.

Paradigm Shift: Provide long term, stable and foreseeable capital contributions to the expanding economic activity of economies in the Target Region rather than short term orientated capital flows.

Sustainability and Scalability: *Renewable energy is a competitive, scalable technology:*

Businesses and households are still skeptical toward renewable energy, particularly toward photovoltaics, in Sub-Sahara Africa which is perceived to be:

- Expensive;
- Unreliable;
- Unproven;
- High maintenance;

compared to the traditional Diesel based alternative which they are familiar with.

Paradigm Shift: UGEAP will scale up successful renewable energy access models in off-grid, mini-grid and industry solutions. UGEAP will act based on private sector, market-based principles and only finance transactions that are economically and financially viable on their own. UGEAP shall have an initial investment horizon of five years which will allow not only investing in the first of its kind of projects under commercial terms, but also supply capital to the market followers. This will create multiple benefits, including:

- Fiscal space for governments as no subsidies for the green electricity access projects financed by UGEAP are required

- Competition amongst project developers which will drive technology and financing costs down;
- Broaden the technical service base available in the regions due to higher demand and respectively build a perspective for well-educated staff;
- Give a competitive advantage to businesses that decide to use the new technology at an early stage
- Ultimately further decrease costs of implementation for photovoltaic and hybrid systems and roll out a viable climate-smart business concept that will be one component for increasing photovoltaic usage in Africa's electricity mix beyond EIA's scenario of only 4% in 2040.[77]

Project Level

- *Combining sustainable economic growth and climate change mitigation:* rising economic growth rates further increase power needs - small business entrepreneurs in remote areas can be served especially well by PV based electricity supply linking small businesses and the country's general economic growth to renewable energy sources;
- *Innovation / technology transfer:* All installations make use of state-of-the-art technology while proven and hence support building up an industry around clean energy generation and supply.
- *Sustainability and Scalability:* All installations are highly standardized and are delivered in very short time; ie. Installations UGEAP looks at typically take only one week to set up a village mini-grid after approval by the village council. Business models are all scalable due to the simple technology and the very good applicability in the national context.
- *Financial service:* All investees of the UGEAP provide indirectly financial services to end-users which removes the need for high up-front investments while local banks are reluctance to finance on long terms.

E.2.2. Potential for knowledge and learning

<Describe how the project/programme contributes to the creation or strengthening of knowledge, collective learning processes, or institutions.>

Program Level

UGEAP is creating a unique public-private partnership consisting of multiple stakeholders who will work together in a collective learning process. For example, part of this process is that local financial institutions, DB and international investor work together to jointly underwrite transactions that originate new climate-smart businesses for the benefit of increased green electricity access in Africa. In this context, the following learning and know-how transfers and benefits will be achieved: :

- *Project Developers:*
  - Understand how debt capital can be built into their clean energy business;
  - Receive guidance on how to structure climate business to make it bankable (either project finance structures or Leasing business models);
  - Benefit from network and international relationships through UGEAP, including regional banks, GCF, DB as investment manager, other technology providers et al.

Local Financial Institutions & DB:

[77] EIA, Africa Energy Outlook, 2014, p. 82

- Receive support from DB as investment manager of UGEAP underwriting transactions for UGEAP how to structure and analyze climate mitigation business proposals;
- Get exposure to new clean technologies and applications and exchange experience on it amongst the financing consortium;
- Systematic approach to energy access projects and business models;
- Develop internal risk underwriting around the new business concepts (local FI);
- Gain experience in geographies not yet covered systematically.

International Investors:

- Understand and participate in risk-return structures which allow to enter investment opportunities in unknown markets
- Understand the features of a sustainable business opportunity in renewable electricity access in Africa;
- Gain exposure to and overcome undue perceived risks related to Africa by frequently being updated on developments, including the underlying portfolio of investments through UGEAP.
- Develop knowledge and skills that can be transferred to potential similar investments in other geographies

End Beneficiaries:

- Gain comfort in the RE technologies employed;
- Improve local technical skills through support and maintenance requirements that are coming together with the businesses financed.
- Dedicate the time gained through electrification to other learning opportunities, such as education and improved health care

Local governments:

- Learn about climate-friendly models to reach national electrification targets
- Learn about lower-cost models for electrification in remote rural areas
- Understand the benefits of private-sector led green electrification models
- As a result, possibly review national electrification strategies to increase the focus on renewable energy sources and low-cost alternatives to grid extensions

GCF:

- Understand how GCF can multiply its resources through leveraging in the local and international private sector
- Develop an understanding of a program structure that can be scaled up and replicated in other geographies
- Act as and deepen its skills as natural convener for a multi-party approach to developing and financing sustainable climate mitigation and adaptation projects

DB:

- Connecting its renewable energy finance expertise with knowledge on local context in Africa, further deepening its skills in climate finance in Africa
- During implementation, learn about the opportunities and challenges of the UGEAP program structure for potential replication in other regions and knowledge sharing with other stakeholders
- Transfer transaction structuring and credit approval knowledge to local banks and knowledge about climate-smart electricity access opportunities in Africa to international investors

Project Level

Each business UGEAP will facilitate with its capital, delivers to the target in different ways, while the following points are common:

- Individuals are trained towards technicians, sales staff or entrepreneurs as sub-contractors of the companies;
- Businesses provide knowledge to effectively service customers and represent the sustainable energy industry;
- Local SMEs are trained towards using the PV based electricity to expand / improve their economic activities (expand offers and opening times);
- Community representatives and regulatory bodies are educated towards the peculiarities of the industry / its needs.

E.2.3. Contribution to the creation of an enabling environment

<Describe how proposed measures will create conditions that are conducive to effective and sustained participation of private and public sector actors in low-carbon and/or resilient development.>

Program Level

- **Technological sustainability**: UGEAP offers long term capital only to businesses that mitigate greenhouse gas emissions. Promoting the respective technologies and scaling them up as the basis for economic development supports the end-beneficiaries in building a low-carbon environment as part of sustainable development. . In addition, after amortization of initial investments, renewable energy is almost free for the end-user and endlessly available during the lifetime of the equipment. This creates a competitive advantages for its users and empowerment at the local level due to self-sustainability.
- **Accelerated local development path**: Investments in all Categories deliver climate-smart infrastructure assets to end-beneficiaries without grid extensions to satisfy energy demand using fossil based energy carriers. Current projections suggest that local electrical energy grids are too far away to supply electricity within the same time frame, even if renewable sources would have a majority share in the energy generation mix. The UGEAP therefore accelerates the expected development path for local economies and will allow policy makers to include renewable off- and mini-grid solutions in national electrification strategies.
- **Environmental and social sustainability**: All investments of UGEAP have to be in line with strict social, environmental and governance standards. Hence climate-smart businesses can be showcases for local regulators which activities are worth receiving supportive regulation. Successful precedents can therefore facilitate supportive local regulation for clean energy infrastructure solutions.
- **Building local capacity**: UGEAP supports local solutions to local needs. All businesses to be invested into have local maintenance and operations (with global sourcing of technology and components) thereby mainstreaming and disseminating knowledge and capacity on photovoltaic technology into African energy supply.
- **Building local financial markets for climate finance**: By partnering with local banks, UGEAP builds the capacity of local banks to assess and lend to climate-smart projects. Once local banks understand this business model, they are expected to continue providing finance to these businesses even without UGEAP participation.

Project Level

Project Category 1 and 2

Target investees that offer solar-home-systems as well as mini-grids support conditions that are conducive to effective and sustained participation of mainly low-income populations towards low-carbon development by:

- Fostering participative community-life by educating and enabling rural households, which opens doors for further socio-economic development;
- Raising awareness for environmentally friendly and sustainable business practices through customer education and village presentations;
- Their business model for customer ownership of solar home systems which is empowering people, especially women, accelerating local democratization processes and contributing to low-income rural populations;
- Engaging local population/self-employed entrepreneurs in workshops and training courses for local technicians and marketing agents, likewise acting as multipliers for the use of modern solar technology as a reliable power source.
- Adding to technical and engineering capacity in rural areas through the development of a strong pipeline of engagement opportunities for local SMEs. This will have a follow-on effect of stimulating greater interest in rural electrification as a vocational field to be pursued in rural employment centers or at local universities.
- Enabling new business opportunities: craftsmen can expand working hours during the evening, shops can extend their opening hours without using candles or kerosene lamps, and new businesses emerge which could not exist without electricity;

Category 3 Projects

Energy supply for industrial used mainly delivers towards the target to improve the operational conditions for companies while two sectors can serve as examples:

- *Agri-business sector:*
  - Farming operations as well as third party suppliers to SME agro-processors, like private farmers, including out-growers and small-holder farmers, prefer to have their produce processed on an environmental friendly site and thus contribute to public awareness building;
  - Due to thin margins for processed agricultural products, cost awareness and the need for cost efficient solutions is high, and PV provides a cost-efficient solution;
  - All parties involved in the supply chain will benefit from cost-efficient and environmental friendly produce;
- *Mining sector*
  - Mine operators are increasingly aware of their ecological footprint and of their image which suffered from recent incidents and the media;
  - It is an observation that many mine operators across sub-Saharan Africa are revising their Corporate Social Responsibility (CSR) strategies, including environmental concerns:
    - The improvement of health conditions improvement for their workers is a major ambition within this context; mining companies in SS usually have their own or tailor-made medical aid and employee wellness schemes – the reduction of CO2 emissions can reduce the prevalence of respiratory diseases;
    - The reduction of their carbon footprint through hybridized power production equipment fits very well into this strategy;
    - Due to declining prices on global mineral markets, mine operators also need to be more cost effective than during the previous decade; PV project developers enhances this development and offer viable solutions;
  - UGEAP will very carefully and diligently chose which mine would be served based on would only consider energy solutions for mining companies which the GCF's Environmental and Social Safeguards that will be reflected in UGEAPs own standards;
  - Mines that will be served are those that exploit non-carbon raw material and are exploiting raw material for industrial use mainly; a strong preference exists to serve mining operations that are embedded in a national

value chain and where the raw material gets refined / used locally rather than purely exported;

<Describe how the proposal contributes to innovation, market development and transformation. Examples include:
Introducing and demonstrating a new market or a new technology in a country or a region
Using innovative funding scheme such as initial public offerings and/or bond markets for projects/programme>

Program Level

UGEAP introduces the following innovation to the respective markets:

Technology innovation:

- UGEAP will be the first program to roll out renewable energy solutions in off-grid, mini-grid and industry settings at scale and across African countries. Building on the pilot investments, new technologies will consolidate their successful track record which will serve as reference for rolling them out to meet pent-up demand in other African countries.

Financial innovation:

- For private sector investors, the first opportunity to invest in renewable African energy access projects, unlocking access to a new large-scale financing source through appropriate terms regarding investment size and risk-return profiles;
- Using limited public funds for climate-smart electricity access solutions and multiplying them through additional private finance, thereby creating fiscal space for local governments to invest in other sectors relevant to sustainable development;
- Working with local banks to build capacity and scale up local currency finance to climate change mitigation projects, thereby creating a new market in financial intermediation
- Invest capital jointly with local financial institutions, international investors and the Green Climate Fund, hence creating network and know-how transfer effects through the investment activity;
- Filling the gap of much needed long-term debt capital for the targeted investments, while equity solutions already exist.

Project Level

All target investees will be assessed to contribute to innovation, market development and transformation. Examples from the pipeline transactions include:

- One (D)ESCO has the first-of-its-kind technical solution for solar home systems including an IT backend where the technical solution and its software is embedded in a viable business model.
- Offering a range of business kits and appliances/products developed to support entrepreneurs in establishing small business i.e. cooling drinks, charging mobile phones, powering an office laptop, etc.;
- Research from customers confirms that energy generated is used by customers to offer services to their community, therefore enhancing community development through new small businesses;
- Transformative change towards a low-carbon energy supply is supported by increasing the interest in and roll-out of solar power and solar power solutions, which are leading to greater social and economic benefits;
- Many local entrepreneurial activities started as a result of a PV system are managed by women, contributing to women empowerment in local communities;
- Connections to a local mini-grid, single houses do not depend on their own photovoltaic panel; electricity supply is ensured from the grid; smart meters ensure correct charges;
- Mini-grid operator comprise all of the three pillars of a typical utility company, including management of

installed assets, operations and maintenance and services, all through a computerized system from anywhere in the world plus international management and local customer service;
- Village schools embrace the model and create a new learning environment with a library and computers or tablets;
- Pupils can study after dark and improve their knowledge skills and productivity;
- Village health posts can operate 24/7 and provide improved services, like pharmacies with extended opening hours, basic laboratory services or even basic surgery services;
- Traditional electrical energy producing installations typically require high up-front investment in equipment (i.e. purchasing of equipment);
- PV installations for industrial use will be designed to inject more photovoltaic power into the hybrid system compared to having Diesel generators running on low load, creating further cost savings and emissions reductions;

E.2.4. Contribution to regulatory framework and policies

Describe how the project/programme strengthens the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities, promote development of additional low-emission policies, and/or improve climate-responsive planning and development.

Program Level

UGEAP will strengthen the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities by applying the following measures:

- Invests directly into small-scale renewable energy projects that are viable under existing regulation;
- Invests only in transactions that are economically sustainable and therefore does not require subsidies;
- Where relevant, will work with local regulators (and other donors as applicable) to create simplified regulatory frameworks for off-grid and mini-grid renewable energy solutions
- Will contribute to increasing the share renewables have in the respective national energy mix and national electrification targets;
- Upon their demand, will work with government planning authorities / economic development agencies (and other donors as applicable) to promote scaling up renewable energy solutions as basis for industrial and other economic development initiatives Works under commercial terms and does not crowd out local financial institutions or other investors into the projects;
- Promotes competition amongst project developers for the best technology along its S&E standards;
- Reduces through its investments the requirement to import / produce fossil fuel carriers and therefore reduces existing trade deficits that are caused by the import of refined oil products;
- Invests in local businesses that create revenue and jobs – and as a result increased household income as well as tax revenues; and
- Works strictly in line with national legislation and international best practice, e.g. regarding licensing, taxation/import duties or social and environmental standards, and therefore strengthens national frameworks.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

<Describe environmental, social and economic co-benefits listed above, including the gender-sensitive development impact.>

UGEAP will create substantial environmental, social and economic co-benefits. While impacts are diverse and touch upon different aspects within the four categories environmental, social, economic and gender-related benefits DB has identified certain sub-criteria for each categories and outline the type of impact the three projects will have:

Economic Co-Benefits

UGEAP and its three project categories generates the following wider economic co-benefits:

- *Total number of jobs created: these include*
  - the number of direct permanent and temporary employment created by the program, including a growing share of female employment, as laid out in section H.
  - additional employment created through entrepreneurial activities and/or increased productivity created as a result of access to electricity through UGEAP; for example, records show that more than one-third of customers in Project 1 in off-grid regions started a business by selling their excess energy produced each day
  - indirect employment created in the suppliers to UGEAP's investment projects and through the increased spending power from the GDP contribution of UGEAP's investments.

Amount of foreign currency savings:

Most Sub-Saharan economies rely on the import of Diesel as there are no national refining capacities. This drives the trade deficits up, imports inflation subject to the volatility of the oil prices and further weighs on the need to produce foreign currency inflows into the country to finance the trade deficit.

Based on a conversion factor of 1l Diesel to kWh of 10.63, the expected 94MWh production stemming from the three analyzed transactions alone could save 8.8m litres of Diesel. At an assumed price of 0.50USD per litre, the contribution from the three existing businesses would amount to USD4.4m in savings annually.

Scaling up the calculation with UGEAPs target to finance the MWp capacity as detailed in section E and H, an annual amount of produced electricity of 556,133MWh could be achieved. Using the assumptions above, annually 52,317m litres of Diesel could be saved if all installations were to replace Diesel generators. This would reduce the annual import requirement by USD26m annually. Over a lifetime expectation of 20 years, this would reduce total import funding requirements by USD532m – more than the amount UGEAP targets to invest in the economies.

Poverty reduction:

As a result of growing employment and household income, it is expected that UGEAP contributes to decreasing poverty, especially extreme poverty, in the local communities and regions where its investments take place.

Social Co-Benefits

Numerous studies show a positive correlation between rural electrification and improvement of living conditions and promotion of development. The range of positive social benefits of rural electrification and a reliable electricity supply to SMEs and corporate to local communities includes

- Poverty reduction by providing a long term income through new jobs and increased productivity
- New opportunities for leisure (through time savings, TV and lighting);

- Improvements in education (children living in electrified households can study longer and have higher educational attainment);
- Improvements in health, hygiene and safety through improved indoor and outdoor air quality from changes in lighting and cooking fuel and cleaner electricity generation;
- Other benefits, such as increased security and increased community empowerment, including for women.

Studies confirm the positive effects on health improvements as electrical power producing light through LEDs replace kerosene and candles that emit harmful particulates and the reduction reduces the sick time as well as avoids death of population:

Table 38: Health Effects of Lightning Replacing Kerosene

Lightning technology used	# of families served (size of sample) in million	Annual sick time avoided (days in millions)	Annual deaths avoided
Mini-grids	29	3	9,625
Integrated SHS	86	9	28,543

Source: IFC 2012

Environmental Co-Benefits

Key environmental co-benefits include:

- Significant CO2e emission reduction as per Section H.
- Improved air quality due to replacement of kerosene lanterns and wood-fired cooking stoves as well as diesel gen-sets
- Improved sustainability of local forests/biodiversity due to reduced collection of fuel wood for cooking purposes

Table 39: Example of Benefits in the three Benchmark Investments

Wider benefit indicator	***Project 1***	***Project 2***	***Project 3***
• Economic co-benefits			
- *Contribution to GDP* - *Volume of tax payments* - *Total number of direct jobs created (of which female)*	USD 15m USD 2.7m 200	USD 9.5m USD 0.3m 1,000	USD 8.9m USD 2.8m 1,035
• Social co-benefits			
- *Number of schools reached*	500	450	163
- *Number of health facilities reached*	500	450	163
• Environmental co-benefits			
- *Environmental friendly MWh p.a. produced*	5,460 MWh	1,100 MWh	87,450 MWh
• Gender-sensitive development impact			
- *Proportion of women benefitting from*	50%	50%	50%

improved access to basic energy infrastructure (which can lead to greater economic impact			
- *Access of women to technical training*	=>50%	=>50%	*N.A.*
• Technology transfer co-benefits			
- *Number of local technicians trained*	70	64	109
- *Annual days of routine maintenance*	622.5[78]	1,750[79]	741
- *Value of technical equipment imported (cumulated, USD)*	USD 16.6m	USD 17.5m[80]	USD 81.9m
- *% of installed capacity still operational three years after installation*	100%	99%	100%

Source: Project Companies

Scaling up of the above data leads to the targets set in section H.

Gender-Sensitive Development Impact

Renewable energy projects have gender-specific aspects to be considered in the design and implementation. Sustainability and success of a renewable energy project or climate-smart business model depends on taking into account cultural and social values connected to gender aspects. The design of the 3 Projects promotes gender equality by providing equal access to energy but also to the jobs and training created through the new projects. Corresponding indicators are included in the Results Monitoring and Reporting Framework (see Section H.)

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

Describe the scale and intensity of vulnerability of the country and beneficiary groups, and elaborate how the project/programme addresses the issue (e.g. the level of exposure to climate risks for beneficiary country and groups).

Not applicable

E.4.2. Financial, economic, social and institutional needs

<Describe how the project/programme addresses the following needs:

Economic and social development level of the country and the affected population

Absence of alternative sources of financing (e.g. fiscal or balance of payment gap that prevents from addressing the needs of the country; and lack of depth and history in the local capital market)

Need for strengthening institutions and implementation capacity.>

[78] Based on 41,500 systems installed: ~3% of all systems need maintenance, each maintenance case requiring 0.5 days (4 hours), aggregating to 0.015 days of maintenance required per system per year.
[79] Based on 5 days per grid and 350 grids
[80] Based on CAPEX 2016-2020 figures less grid installation costs and growth salaries

Program Level

Economic and Social Development

UGEAP addresses the following needs for social and economic development:

- Access to electrical energy (Category 1 and 2 projects) of population and businesses that have no access to electricity and are also unlikely to be connected to the national electricity grid in the near future; UGEAP hence contribute to delivering national electrification targets to increase the share for population with access to electrical energy; this is expected to also increase household income through new entrepreneurial activity with positive benefits for poverty reduction.
- For Category 3 projects: improve electrical energy supply, increase productivity and reduce costs, improve local health conditions by reducing CO2 emissions from mainly Diesel based gen-sets through hybrid electricity generation or diesel replacement with renewable energy technology.

All projects reduce further the dependency of the population towards Diesel. Hence, the projects also have the benefit of reducing:

- Trade deficits of affected countries and generating foreign currency savings;
- Avoid negative ecological effects from transport related accidents;

The above effects have numerous co-benefits as laid out in section E.3. above and also portrayed in the three sample transactions chosen and described below.

Absence of Alternative Sources of Financing

Local currency debt funding with the required tenors and interest rates is scarce to non-existent for the businesses identified, even though their investments are economically and financially profitable. UGEAP works through and with local banks, lending in parallel or taking over risks which allow the local financial institutions to unlock access to the required debt capital for the sector.

Need for Strengthening Institutions and Implementation Capacity

Local financial institutions are strengthened and increase capacity by working along with UGEAP on transactions that fall into the respective Categories. Strengthening is further achieved by supplying long term capital to the local banks that stabilize their funding base and balance sheets – which is a pre-condition for long term lending. As a further benefit, the risk transfer to UGEAP allows for a more efficient use of the available equity of the local financial institutions, which also generates higher taxable returns of the local banks.

In addition, by scaling up renewable energy solutions for households and industry, UGEAP contributes towards the capacity of local governments and regulators to understand the benefits of off-grid and mini-grid solar power solutions as well as diesel replacement from renewable energy sources and to improve the enabling framework for such transactions implemented by the private sector.

Category 1 and 2 Projects

These projects contribute to the economic and social development level of the country and the affected population, especially as these relate to:

- The need for electrification: Serving rural households with electricity, otherwise being off-grid/relying on high-

emission power sources, increase employment, poverty reduction and health benefits, including especially for women and children;
- The need for development of local businesses: projects enable local entrepreneurs in rural areas by providing necessary tools and knowledge for the productive use of a SHS;
- Economic development in remote off-grid areas: projects with innovative system of affordable but effective and efficient PV mini-grids.

In respect to strengthening financing institutions and growing implementation capacity:
- Pre-financed solar home systems allow for micro-credits for the local rural population to finance SHS (otherwise impossible) with 36 months finance rates, plus customer affordability score assessment to avoid private customer debts;
- Solid growth needs to be supported by loans through local financial institutions or directly from UGEAP as the "usual" means of financing growth after the start-up phase;
- With the UGEAP platform and funding, local financial institutions will be incentivized to provide financing to the development of aggregators who pool financing needs of villages and communities as well as multiple customer relationship.

In respect to improving knowledge of local governments and regulators:
- Where appropriate, work with local regulators to set / meet technical standards applicable to off-grid and mini-grid solutions
- Report on the impact of these projects and their contribution towards meeting the national (renewable) electrification target

Category 3 Project

These projects contribute to the economic and social development level of the country and the affected population, especially as these relate to:
- Innovative system of easy deployable and removable PV systems,driving economic development in remote off-grid areas, reducing dependence on Diesel and improving health conditions.

In respect to strengthening financing institutions and growing implementation capacity:
- With the UGEAP platform and funding, local financial institutions will be incentivized to provide financing to community grids;
- Strengthening of the understanding of the value added of renewable energy based power supply on the side of commercial customers;
- Training of local service providers for installation, operations and maintenance strengthens the local implementation capacity for similar projects.

Through all of the above, investments in Categories 1, 2 and 3 will not just contribute to socio-economic development, but also to Millennium Development Goals 7a (as regards the reduction in carbon dioxide emissions) and 8F (as regards benefits of new technologies), respectively Goal 7 "Ensure access to affordable, reliable, sustainable and modern energy for all" and Goal 13 "Take urgent action to combat climate change and its impact" of the new 2030 Sustainable Development Goals, adopted by world leaders in September 2015.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

<Please describe how the project/programme contributes to country's identified priorities for low-emission and climate-resilient development, and the degree to which the activity is supported by a country's enabling policy and institutional framework, or includes policy or institutional changes.>

Program Level

Each country in the Target Region has adopted national visions and development plans which center around access to reliable infrastructure as the basis for inclusive growth and poverty reduction. Reliable electricity supply and rural electrification through renewable sources of energy are core themes in these documents. As outlined in Section C, Graph 17 out of the 8 countries for Phase 1, six have electrification targets established. All countries have the promotion of renewable energy sources high on their political agenda, also in the context of climate change mitigation which is a recurring theme in national strategies.

More specifically, the UGEAP's proposed investments are in line with national policies, action plans and regulation in the Target Region as follows:

Table 40: Overview of National Targets

Country	National Targets	Basis for Execution
Benin	• Promotion of 40 MW newly installed photovoltaic capacity • Electrification of 1000 communities	• Intended Nationally Determined Contribution (INDC)[81]
Kenya	• Universal electricity access by 2020 • Reduction of GHG emissions by 30% by 2030[82] • Increase in new sources of energy such as renewable	• National Energy and Petroleum Policy[83] • Intended Nationally Determined Contribution (INDC)[84] • Kenya Vision 2030[85]
Namibia	• Increase share of renewable energy in electricity production from 33% in 2010 to about 70% in 2030	• Off-Grid Energisation Master Plan (OGEMP) • Intended Nationally Determined Contribution (INDC)[86]
Nigeria	• Work towards off-grid solar PV of 13 GW • Increase electrification to 75% by 2020	• Intended Nationally Determined Contribution (INDC)[87] • Renewable Energy Master Plan (REMP)[88] • Roadmap for Power Sector Reform (2010)
Tanzania	• 75% electrification by 2035 • Reduction of GHG emissions by 10-20% by	• Power System Master Plan Update[90] • Intended Nationally Determined

[81] Source: Republic of Benin (2015), published by UNFCC
[82] Relative to the business-as-usual scenario of 143mn tones of Co2e.
[83] Source: Republic of Kenya, Ministry of Energy and Petroleum (2015)
[84] Source: Republic of Kenya (2015), published by UNFCC
[85] Source: Republic of Kenya (2007)
[86] Source: Republic of Namibia (2015), published by UNFCC
[87] Republic of Nigeria (2015), published by UNFCC
[88] Source: Republic of Nigeria (2006)

2030[89]	Contribution (INDC)[91]

Source: Deutsche Bank

Benin

Benin submitted its Intended Nationally Determined Contribution (INDC) on 7 August 2015, committing to lower emissions in its production, energy consumption, transport, and agriculture and forestry sectors. The country signed up to adapt its national development agenda in order to reduce its CO2 emissions substantially and to undertake the necessary mitigation measures. Therewith, the country offers to cut 5 Mt from the energy sector and 115 Mt from the land use and forestry sector between the years 2020-2030. This shall be achieved within the framework of the national targets that preview the promotion of 40MW newly installed photovoltaic capacity which will ultimately lead to the electrification of 1000 communities. [92]

Benin commits to improve its energy efficiency by using renewable energy sources in all sectors especially in the fields of agriculture and transport and is working on a program to valorize renewable energies at large scale. The recently created national agency for the development of renewable energies (ANADER) plans to create 105 solar mini-grids for villages not connected to the national grid. Renewable energy development measures foresee among others the implementation of 1 million solar lamps in Beninese households in rural and peri – urban areas until 2030 ("Lights for All" Program). Ultimately, solar energy is planned to be used for the extraction of salt in order to restore the country´s fragile ecosystems such as mangroves.

Namibia

The goal of Namibia's Vision 2030 is a "prosperous and industrialized Namibia, developed by her human resources, enjoying peace, harmony and political stability". The National Development Plan which serves as the implementation framework for Vision 2030 identified 5 "Basic Enablers" which are critical to achieve this vision, including reducing extreme poverty and infrastructure. Within infrastructure, Namibia seeks to have in place adequate base load energy to support industry development through the construction of energy infrastructure and the production capacity from 400 to more than 750 mega watts by 2017. Furthermore, Namibia seeks to increase access to energy from 60% in 2012 to 65% in 2017. To achieve this goal the government will "promote the use of economically viable renewable technologies, as a complement to grid electrification, to improve energy provision to rural areas." As women represent over 50% of the population, Vision 2030 seeks to ensure that minimum standards ensure equitable access for both men and women.[93]

Namibia has set itself am Off-Grid Energisation Master Plan (OGEMP) and the Ministry of Environment and Tourism and have recently issued the Nationally Appropriate Mitigation Action (NAMA): Rural Development in Namibia through electrification with renewable energies, namely to provide access to appropriate energy technologies to everyone living or working in off-grid areas.[94]

In its INDC, Namibia undertakes to Namibia aims at a reduction of about 89% of its GHG emissions at the 2030 time

[90] Source: Republic of Tanzania (2012)
[89] Relative to the business-as- usual scenario of 138-153 mn tones of Co2e.
[91] Source: Republic of Tanzania (2015), published by UNFCC

[92] The Road to Paris.org (2015)
[93] Source: 1) Republic of Namibia (2013): Namibia's Fourth National Development Plan. 2) Republic of Namibia (2004): Namibia Vision 2030.
[94] http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/nama-on-rural-development-in-namibia-through-electrification-wit.html

horizon resulting in a projected GCG emission reduction of 20 00o Gt. As part of the required measures, Namibia plan to to increase the share of renewables in electricity production from 33% to 70%.

Nigeria

Nigeria's Vision20:2020 aims to launch Nigeria on a path towards becoming a strong, diversified, sustainable and competitive economy among the top 20 economies in the world. Access to reliable electricity for households and industries is a cornerstone to achieve this vision and meet the needs of Nigeria's 140 million inhabitants. Vision 20:2020 also undertakes to promote the use of 'green technology' to ensure sustainable production in the electricity and agricultural sectors.

Nigeria offers in its INDC a pledge to reduce its emissions by 20% from business as usual levels in 2030, rising to a possible 45% contingent upon adequate international support. The country commits to work towards off-grid solar photovoltaic systems of 13GW that shall result in an electrification increase to 75% by 2020.

Nigeria, which became the largest economy in sub-Sahara Africa in 2014, chose to adopt these renewable energy measures in its national development agenda in order to prevent incurring costs that would result from exacerbated climate change. With regard to this, renewable energy measures would lead to a potential 31m tones reduction of GHG per year in 2030.

Nigeria is host to a number of Clean Development Mechanism projects, as well as projects financed by the Adaptation Fund. With regard to this, the Federal Executive Council approved the Nigeria Climate Change Policy Response and Strategy in September 2012 thus underlining the efforts that the country is undertaking in the field of renewable energy.[95]

Tanzania

According to its national development plan, Vision 2025, Tanzania seeks to "graduate from a least developed country to a middle income country by 2025 with a high level of human development". Scaling up investments in energy and transport infrastructure is one of the five strategic pillars of Vision 2025 with the objective to unleash the country's resource potential to fast-track the provision of the basic conditions for broad-based and pro-poor growth, with a targeted GDP growth rate of 8% p.a. Energy has been identified as an essential service whose availability and quality determines success or failure of development. The main source of energy in Tanzania is biomass (fuel-wood and charcoal) which accounts for about 85.5% of total energy consumption. More than 80% of energy derived from biomass is consumed in rural areas. Electricity accounts for 6% of total energy consumption. So far very few alternative renewable energy resources, such as mini-hydro, wind, coal, solar and geothermal, have been commercially exploited, despite their potential availability in the country. The national grid supplies only about 12% of urban and 2.5% of rural households. The National Five Year Development Plan therefore seeks to work on new sources of energy production across the country. The proposed interventions target the development of alternative sources of cleaner and renewable energy sources, including natural gas, solar, and wind. The Plan also calls for additional emphasis on scaling-up rural electrification for district headquarters, townships, villages, and commercial centers as the basis for improved growth, economic development, and enhanced living standards.

Crosscutting goals of the Five Year Development Plan are climate change mitigation and adaptation and gender considerations, as both play a crucial role in achieving the goals of Vision 2025. Preservation of the rich ecological base of Tanzania and mitigating and adapting to the impact of climate change are of prime importance in ensuring sustainable growth. The costs from draught is expected to as high as 2% of GDP by 2030 and owing to rising sea level a loss of 274 km2 of land is forecast. Therefore, environmental concerns will be mainstreamed in all future policy measures and henceforth they will be given utmost priority along with climate-wise economic development policies.

[95] Republic of Nigeria (2015), published by UNFCC

Tanzania has put a comprehensive framework in place to develop transparent sector regulation, promote rural electrification and increase private sector participation in renewable energy projects:

- Key policies and legislation for electricity supply in Tanzania are the Energy and Water Utilities Authority Act, 2001 and 2006; National Energy Policy, 2003; Rural Energy Act, 2005; Electricity Act, 2008; and Public Private Partnership Act. No. 18, 2010;
- The Rural Energy Agency (REA) is processing additional grant-co-funding to prepare 60 stand-alone solar projects and mini-grid projects to benefit more consumers, also preparing a Rural Electrification Investment Prospectus that is for the first time integrating grid-based electricity access planning with renewable energy-based mini-grid and stand-alone electrification options;
- The Ministry of Energy and Minerals (MEM) and the Rural Energy Agency (REA) have policies and procedures in place to ensure compliance with social and environmental safeguards;
- The National Electrification Program Prospectus estimates that about half of the rural population might be more cost-effectively served by mini grids and off-grid options, 20% could benefit from renewable energy mini grids and 32% from stand-alone and mini-grid PV. The prospectus will define a least-cost investment plan for 2013–22, aimed at electrifying 1,200 development centers (about 6,000 localities) with the highest potential. The prospectus will define the least cost path for grid electrification and will identify those districts and communities that cannot be cost-effectively reached by grid and should be targeted for private sector–driven, off-grid electrification investments. The prospectus guides the SREP-Tanzania off-grid electrification investments96;
- The three top priority choices that emerged to support national development priorities were geothermal power development, renewable energy for rural electrification (RERE), and alternative biomass supply options. The Government of Tanzania decided to focus on the first two priorities, with the understanding that additional SREP resources, if they become available, would be used to implement the strategy to emerge from the Biomass Energy Strategy Tanzania (BEST) initiative now under development[97];
- The National Climate Change Strategy will integrate the climate change dimension into national policies and programs.

Kenya

Kenya Vision 2030 aims to transform Kenya into a newly industrializing, “middle-income country providing a high quality life to all its citizens by the year 2030”. A focus on energy; science, technology and innovation underpins the Vision as strategic pillar. The National Energy and Petroleum Policy clearly states that the range of development projects identified under Vision 2030 will require Kenya to generate more energy at a lower cost and increase efficiency in energy consumption. With electricity being the most sought after energy service and crucial to the socio-economic development of the country, Kenya has developed a roadmap “5,000+ MW by 2016 – Power to Transform Kenya” to raise the generation capacity by at least 5,000MW from 1,664MW as at October, 2013 to slightly over 6,700 MW by 2016. Through this roadmap the generation cost is projected to reduce from US¢ 11.30 to 7.41, while the indicative end-user tariffs are projected to reduce from US¢ 14.14 to 9.00 for commercial/industrial customers and from US¢ 19.78 to 10.45 for domestic customers. In achieving this goal, renewable energies will play a critical role as in addition to having the potential to enhance energy security. Kenya acknowledges the potential of renewable energies to mitigate climate change, generate income, create employment and generate foreign exchange savings. The percentage of renewable energy harnessed is insignificant relative to its potential. Kenya offers one of the largest and most dynamic markets for solar energy in Africa. The Kenya Renewable Energy Association (KEREA) estimates that approximately 300,000 rural households in the country have solar home systems installed, and between 10,000 and 20,000 PV systems are currently being sold annually. The

[96] SREP Tanzania, 2013,p. 15
[97] Ibid, p. 16

Energy Regulatory Commission (ERC) is responsible for the economic and technical regulations and their enforcement in the renewable energy sector.

To further combat climate change, the Ministry of Energy and the Kenya Association of Manufacturers signed a Memorandum of Agreement to establish a Centre for Energy Efficiency and Conservation (CEEC) with the goal to avoid cumulative emissions of CO2 to the tune of 7.0 million tonnes by the end of year 2016, equivalent to more than 20,000GWh in energy savings. As the lack of access to affordable energy services disproportionately affects women and girls due to their traditional roles, household responsibilities, and low socio-political status, the government will target to mainstream gender, youth and persons with special needs issues in energy and petroleum policy formulation, planning, production, distribution and use.[98]

In its INDC, Kenya seeks to abate its GHG emissions by 30% by 2030. Kenya's planned mitigation activities include the expansion of wind, hydro, solar and other renewable and clean energy options.

Category 1 & 2 Projects

- Home solar system activities deliver towards a country's target to increase the number of population that has access to clean energy, thereby contributing to emission reduction targets, while it is a purely private sector initiative and is not based on public sector support in terms of funding;
- The companies obeys all applicable regulation with regards to consumer protection and electrical supply;
- The activity of the companies do not officially qualify as energy supply as components are household appliances; however, the company carefully considers consumer protection and waste management;
- The mini-grid provider's roadmap is fully in line with the Scaling-Up Renewable Energy Program in Low Income Countries (SREP), funded by the World Bank through the Climate Investment Fund;
- The program also is coherent with countries" Vision 2030 which in most Phase I countries aims to ensure availability of affordable and reliable energy supplies as the basis for economic growth and to attract private sector participation in the development of the power sector.
- The program corresponds to the mitigation strategies of all countries included in their INDCs which focus on increasing the share of renewable energy in total electricity production as well as a programmatic focus on renewable off-grid and mini-grid solutions in most countries, including solar technologies.

Category 3 Projects

- The project developer contributes to meeting future energy demand and improved productivity as a basis for socio-economic development;
- The project developer contributes to filling the supply gap in off-grid regions;
- Helps to attract substantial private sector participation in the development of the power sector;
- The project developer's roadmap is also fully in line with the Scaling-Up Renewable Energy Program in Low Income Countries (SREP), funded by the World Bank through the Climate Investment Fund;
- The project developer further drives the development of the legal and regulatory framework as well as it also engages further in the dialogue with relevant government authorities, thus strengthening their capacity as off-grid solutions are on their agenda.
- The project developer contributes to national emission reduction targets and strategies as laid out in the INDCs.

E.5.2. Capacity of accredited entities and executing entities to deliver

[98] Sources: 1) Government of the Republic of Kenya (2007).*Kenya Vision 2030: the popular version.*
2) Ministry of Energy and Petroleum (2015). *Draft National Energy and Petroleum Policy.*

<Please describe experience and track record of the accredited entity and executing entities with respect to the activities that they are expected to undertake in the proposed project/programme.>

Program Level

There are four crucial aspects for the success of UGEAP with respect to Deutsche Bank as executing agent for the program:

1. Ability to set up investment vehicles that can execute the Target Investments working through and with local financial institutions;
2. Attract and place capital with private sector investors for UGEAP.
3. Ability to structure the refinancing arrangement with local financial institutions;
4. Ability to originate, structure and underwrite the Target Investments with a first focus on Benin, Tanzania, , Kenya, Nigeria andNamibia

Ad 1) Deutsche Bank has a proven track record to set up investment vehicles in various jurisdictions, including Luxembourg, that meet investors demand, including public-private investment vehicles such as UGEAP. Ad 2) DB continuously raises funds for its open ended funds and as well as for new funds/products it launches. It raises debt and equity in all forms, through multiple sales channels, each with its own merits. The three primary sales channels for funds like UGEAP are:

- Global Client Group (GCG) for large-scale institutional investors like pension funds and insurance companies;
- Structured Credit Trading Desk (SCTD) for all types of investors;
- Regional Wealth Management advisors (WM) for medium-scale investors such as foundations, churches or family offices.

The cumulative amount of capital raised by these sales units reaches several billions per year through all three sales channels while DB expects that UGEAP will be placed predominantly with investors covered by GCG and SCTD. Together, these units place around EUR 130-150bn of capital with investors. For its Alternatives division, which manages funds similar to UGEAP, Deutsche Asset Management has raised over EUR 23 billion since 2015 (as of March 2016)."

Ad 3) DB has already identified partner institutions that are willing and keen to deliver towards the success of UGEAP. DB attaches the memorandum of understandings with two institutions that represent each one of the two options UGEAP shall offer:

- Syndication;
- Funding and risk participation.

Ad 4) DB has the required expertise structuring the Target Investments relying on its infrastructure, corporate finance and trade finance business units which includes the Sustainable Investments team that is in charge to manage concepts like UGEAP. The team includes investment professionals that focus on Africa (and already manage investments in Africa through existing funds). In total the Sustainable Investments team already covers sustainable assets under management of USD 1.8bn as of today.

Project Level

Each investee will need to fulfill the following requirements:

- The company has an established track record of activity over the time of its existence
- The company has a track record in working on the technology offered
- The company is active in the local market for a satisfactorily long period of time already

- The company has successfully performed a pilot phase or implemented projects
- The company has local presence in the respective country and follows national employment laws

E.5.3. Engagement with civil society organizations and other relevant stakeholders

<Please specify the multi-stakeholder engagement plan and the consultations that were conducted when this proposal was developed.>

Program Level

In the current development state of the UGEAP Program, consultations at the Program level continue to take place with the NDAs of countries in the Target Region, international private investors for the A Capital and public investors for the B Capital, local financial institutions as well as renewable energy technology providers.

Regarding the NDAs, final draft versions of this funding proposal containing all material information have been shared with NDAs and discussed with representatives of the NDAs. The following countries have provided non-objection letters for UGEAP:

- Benin
- Kenya
- Namibia
- Nigeria
- Tanzania

The concept and this proposal has been presented and discussed in more detail to and with selected NDAs at the Green Climate Fund 2015 Africa – Middle East Regional Workshop hosted in Alexandria which took place from 6-8 September 2015.

Beyond an exchange with the NDAs, Deutsche Bank has began to organize stakeholder workshops to introduce the UGEAP as a concept to local project developers as well as local and regional financial institutions and further strengthen government awareness and understanding. Workshops target:

- to establish a broader knowledge of the concept of UGEAP;
- connect to local companies active in certain regions or sectors only with a view to adequately involve the local/regional private sector;
- understand any local peculiarities to be taken into account for the detailed offering of the UGEAP based on national regulation, priorities and realities; and
- engage with local associations to establish a working-relationship and active information exchange.

Stakeholder workshops and events have already been held in the following target countries:

Tanzania

A first workshop has been held in Dar-Es-Salaam 16 February 2016 co-operation with the Tanzanian Private Sector Foundation (TPSF), while the Renewable Energy Association is a member of the TPSF. About 50 participants included representatives from local project companies already active or planning to become active in the sector, local banks, international companies and local advisers, most of them members of the TPSF. The workshop confirmed the strong demand for UGEAP both from the local private sector and local banks. The overall feedback received from workshop participants mirrors the market assessment outlined in this funding proposal that local markets do not provide sufficient debt capital in general and to companies active in the clean energy access space in particular, including the limited availability of local currency financing for local businesses.

Benin

Similarly, in-depth stakeholder engagement took place in Benin in February 2016 through meetings with local banks, the Renewable Energy Association, project developers, corporates active in the sector and relevant government stakeholders. The meetings also confirmed demand for longer term debt finance for UGEAP's investment categories from the private sector and from local banks to increase their clean energy finance capabilities.

Kenya and Nigeria

On May 31 and July 2 DB held events in Nairobi and Lagos hosting around 40-50 participants ranging from (mini-grid) project developers and decentralized energy service companies and industry associations to local banks, consultants, technical assistance provider as well as multilaterals and donor agencies. While attendance from all types of energy access businesses was very positive; local banks attendance – as to be expected – was more restrained with around 4 -6 banks per event. The workshop sessions and following discussion confirmed our investment thesis that we need to work with local banks to finance energy access locally by bringing bankable transactions to the local banks rather than awaiting them proactively approaching the sector.

DB will continue the discussion with NDAs in the remaining to obtain the non-objection statements respectively. Further, DB targets to engage with countries during the first roll-out phase of the UGEAP that are prospective potentials for phase II.

Regarding international private investors, the UGEAP concept was discussed with select institutional investors in Germany, the Netherlands, the UK and the US and met with strong interest, as investors perceive the renewable energy sector in Africa, including off-grid solutions, as a growing and attractive investment opportunity.

In terms of local financial institutions, the concept was shared and discussed with several local and regional banks in Africa and met with positive feedback. Memorandum of Understanding with a regional partner bank as well as a Kenyan bank for phase I have been finalized and additional discussions with potential partner banks are ongoing.

Regarding energy technology providers, a comprehensive consultation took place with several providers who are already active in the Target Region and are interested to expand their activities. DB entertains a dialogue with over 40 technology providers who have the potential to become partner companies of UGEAP.

Once approved, UGEAP will continue its consultations in each of its country of operations with all relevant stakeholders, including stakeholders from national and local government, local and national agencies including regulatory agencies, business associations/representatives, civil society organizations as well as academic and research institutes. These stakeholders will also be consulted for the Program's mid-term review and its final impact evaluation. UGEAP will organize meetings or workshops to discuss best practices and challenges, identify opportunities for further facilitation e.g. through regulatory measures, and integrate lessons learned into the Program's further development.

At the level of the initial investment projects, a multi-stakeholder engagement process has been conducted.

For each of Project 1-3 different stakeholders on local and national level have been heard and integrated through dialogues, meetings, need assessment studies based on interviews on household as well as community level in the project concept development. Especially for Project 1 and 2 this approach proved valuable already in the project concept development phase in order to create trust between the actors (project developers and communities/ households) and to come to solutions that provide mutual benefits and a greater sense of ownership. For all Projects, multi-stakeholder engagement is an integral part of the Social and Environmental Management System (SEMS) that establishes a process of stakeholder engagement and disclosure as outlined in F.3. Environmental, Social Assessment, including Gender Considerations, and will be considered and integrated in the entire Project cycle from concept phase, preparation, implementation to the operational phase as well as ongoing monitoring and evaluation.

Project 1

For multi-stakeholder engagement, the home solar system provider of Project 1 builds the following aspects and consultations into their business model:

- A close contact to all stakeholder groups such as local population, customers, employees and staff;
- Before entering new markets/regions, the home solar system provider engages with ward executive officers, regional governments and village communities and their respective leaders;
- The home solar system provider uses feed-back channels by conducting surveys, gathering feedback through its hotline, interacting with potential and existing customer on the ground via contractors and staff (mainly Installation Technicians, Sales Agent, Market Hub Operators and Loan Field Officers);
- Feed-back is used for further improvement of services, products, target areas, etc.

Project 2

For multi-stakeholder engagement, mini-grid providers of Project 2 build-in the following aspects and consultations into the development of their projects:

- The mini-grid provider maintains close contact with relevant national authorities;
- Community outreach and engagement is ensured through capturing local approval for installed projects from village committees, and through the implementation of community level dialogues around project introduction;
- The mini-grid provider has established a process for effective and participatory community engagement prior to the building of new mini-grids;
- The mini-grid provider partners with local SMEs, NGOs, universities and CSOs to implement its corporate operations as well as innovation projects;
- The mini-grid provider remains connected to the broader Sustainable Energy for all (SE4ALL) community via conferences and networking events in order to learn from best practice examples and follow current developments.

Project 3

As a basis for their interacting with their stakeholders, the project developer of Project 3 has created a stakeholder map, based on interest of stakeholders and influence of stakeholders:

- Key stakeholders are those with a high interest as well as a high influence on a project's success, like customers, suppliers, and investors.
- The project developer also pays special attention to stakeholders with a lower initial interest but with a high influence, especially city councils or other (higher) authorities;
- The project developer interacts with nearby city councils, i.e. use local customer contacts to set up meeting with relevant council members and/or key administrators, give a presentation on the project and its socio-economic impact, highlights benefits of solar hybridization to local economy and SMEs, discusses, clears and alleviates any concerns that are raised;
- As regards the regulatory authority in Namibia, the project developer and its customers aim to obtain any necessary permits quickly, while ensuring compliance with local and national legislation, regulations, as well as local and global technical standards.

This stakeholder mapping serves as the basis for the project developer's ongoing local engagement.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

<Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers; providing the least concessionality; and without crowding out private and other public investment.>

Barriers

As described in section B and D.1 there is a strong need to mobilise debt capital to the benefit of low-emission electricity supply to End Beneficiaries. Public sector funding through developmental institutions will not suffice to serve the capital by investments that are needed and viable in order reach a transformative scale towards low-emission electricity supply in the Target Region. Private sector capital is required to be mobilised but is held back by:

- the high risk perception of private sector investors;
- the relatively small investment amounts the added-value investments require;

A local barrier is the high capital intensity of the investments and the lending practices local banks follow that oftentimes focus on collateral based lending for lower margin business or acceptance of a lack of "acceptable" collateral against a higher risk charge (retail business).

Additionality

Close Co-Operation with Local Financial Institutions

UGEAP provides two solutions to local financial institutions to overcome the local barriers. In cases where local banks are able and willing to serve the sector with local currency funding, UGEAP will not compete with local banks but crowd-in local sources of financing through local banks and support them with:

- long term debt capital;
- risk sharing to free up regulatory / economic equity.

This offers a tailored solution to local banks while details will be tailored to the capacity of local financial institutions.

UGEAP is not crowding out, but crowding in local financial institutions. Co-operations with local banks will not be on an exclusive basis. In fact, UGEAP has an interest to sign up as many local partner banks as possible in a single market. UGEAP will not exclude financial institutions for reasons other than its international credit and quality expectations against the screening criteria which UGEAP will use.

In case energy supply businesses require USD funding, UGEAP will offer an opportunity to local financial institutions to make use of UGEAP as a source of funding together with local bank funding.

Private Sector Orientation

Investments are private sector oriented, while public sector elements are not excluded (for example: PPA's with national grid operators as an income basis for private independent power producers). There is no competition with public sector initiatives or crowding out public sector services. Rather, Target Investments deliver infrastructure where public bodies are unable to provide it.

UGEAP involves private sector investors on its own funding side, while GCF's contribution would allow to trigger access to such private investment by providing a risk buffer and stabilise the returns. An adequate risk-return profile, including a risk buffer against first losses and stable returns and low provision rates are pre-requisites to tap into the large debt market that has a vast amount of funding available for deployment in transactions that produce predictable and stable revenues.

Concessionality

The concessionality GCF is supposed to provide is minimal and consists of tolerance for variable returns. In the base case, GCF's returns are commensurate with those of the private sector. In addition, GCF is asked to accept the down-side first loss risk for the subordinate B tranche which can lower the base case return. In an upside scenario, GCF will be compensated partly for the high downside risk by receiving a larger share of additional returns beyond the target returns for A and B tranche investors. From a risk-return and contribution perspective, this is the least concessionality that was identified in the value stream of capital mobilisation for End Beneficiaries.

<Please describe the efficiency and effectiveness, taking into account the total project financing and the mitigation/ adaptation impact that the project/program aims to achieve, and explain how this compares to an appropriate benchmark. For mitigation, please make a reference to E.6.5 (core indicator for the cost per tCO2eq).>

The efficiency of UGEAP is measured based on two indicators:

- The amount of projects that are financed with the support from and capital by UGEAP.
- The amount of tCO2e emissions being mitigated in absolute numbers.

Investments / Capital Mobilised

As described in section E.6.2 in combination with section B.3, the capital contribution by GCF and other public investors providing about 1/3 of capital of UGEAP's total volume and around 20% of total capital expenditures of the Target Investments. Forecasts under an expected scenario suggest that GCF's and other public capital could mobilise 24 times its own contribution given that the repayments from existing investments would not be used to repay capital but rather would be re-invested. The multiple would reduce in case investments cannot be effected with the anticipated volumes or at the expected speed, however, the ratio could even go up in case investments amortise faster than an assumed 8 years on average.

In addition, UGEAP is expected to raise 2/3 of private investment from international investors on top of the planned 1/3 of public investment.

Finally, local financial institutions are expected to contribute their own capital to the projects financed by UGEAP either through the risk sharing mechanism or through straight co-financing in a syndication structure.

CO2 Savings

DB as investment manager of UGEAP will track the amount of tCO2e emissions being mitigated by the investments financed. DB already operates a proprietary carbon accounting system which has been used in other public-private partnership funds. Based on the quantification of emission reductions from the 3 transactions that represent the Target Investments, the "value for money" is shown in section E.6.5.

Each investment will be subject to a pre-assessment that will determine the expected lifetime CO2e savings based on the measurement framework applied by the investment manager. Minimum thresholds will apply subject to the technology being used:

Table 41: CO2 Funding Limits

Category	Applicable Limit
1	USD400
2	USD150
3 – off-grid	USD25

3 – on-grid	USD100

Source: Deutsche Bank
The limit is applicable to the total amount of funding provided by UGEAP divided by the tCO2e lifetime savings the pre-assessment estimates. Limits will be subject to review by the investment manager and can be changed in order to accommodate technical improvements and hence higher efficiencies that can be achieved.

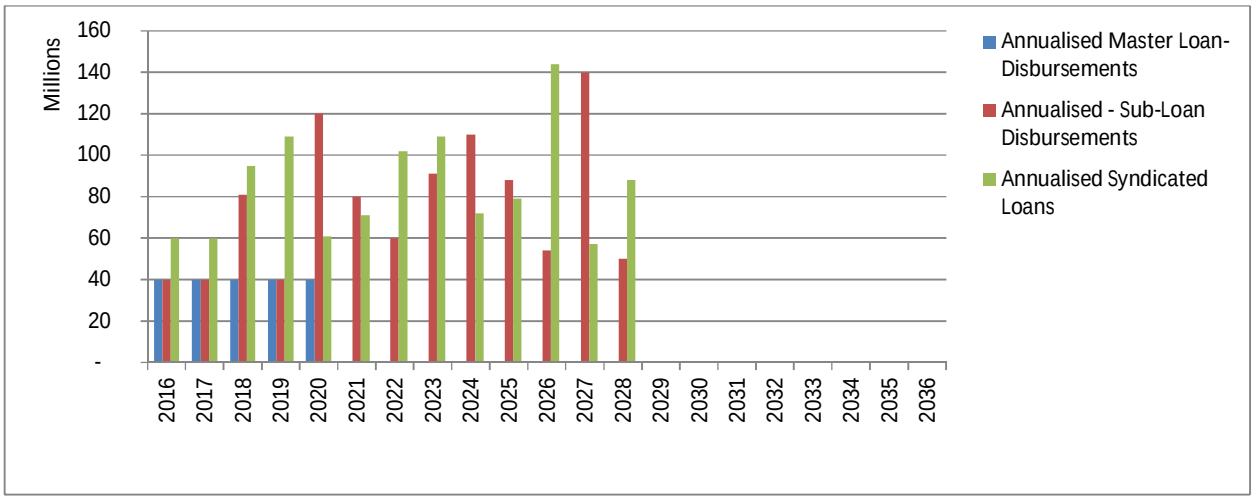
E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

<Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme)and/or the potential to catalyze indirect/long-term low emission investment.>
<Please make a reference to E.6.5 (core indicator for the expected volume of finance to be leveraged).>

Scaling Up Capital Mobilization

Using financial model projections (while the model is provided together with this funding proposal), under a base case scenario, every year UGEAP could fund on average investments in an amount equal to USD 184m, while in the first 3 years, investments will be smaller given the high work-load required to allow for building up the co-operations with local financial institutions.

Graph 24: Investment Model Assumptions UGEAP



Source: Deutsche Bank

In this scenario, stopping the origination after year 2028, the total amount of investments UGEAP would have funded reaches about USD2.1bn while capital from GCF and other public investors would equal USD165m and private sector contribution would have reached USD335m. In relative terms, GCF and other public capital would therefore have mobilised around 13 times its own capital in form of debt to Target Investments. As UGEAP has a debt funding share of around 60% in total CAPEX (see section B.3 for an estimate of the allocation), GCF and other public investors would have allowed for a total investment of about USD3.5bn over 15 years (multiple for GCF and other public investment: 21 times its own capital contribution).

E.6.3. Financial viability

<Please specify the expected economic and financial rate of return with and without the Fund's support, based on the analysis conducted in F.1.>

UGEAP depends on the participation of the GCF as B-Capital investor without which it would not come into realization. The financial returns in a base case scenario are as follows:

Total IRR (Base Case)	6.7%
Class A IRR (Base Case)	6.8%
Class B IRR (Base Case)	6.6%

UGEAP is designed to distribute the available return (expressed by the total IRR) to set the right incentive structure for the private sector investors and the investment manager and allow for the upside to the GCF.

A further analysis on the financial returns is presented in section F1.

<Please describe financial viability in the long run beyond the Fund intervention.>

UGEAP is a closed end fund concept that shall invest the capital investors have committed to provide within 5 years after the first closing of UGEAP, with a second and third tranche of capital to be raised over the first 42 months. In case UGEAPs investment activity meets expectations, it is very likely that a follow up product will be structured. It will depend on the economic circumstances at that point in time if support capital either from GCF or similar entities will be required to mobilize private sector investors again or if the investment climate has improved such that private sector investors would feel comfortable to finance 100% of the new investment vehicle. In a scenario with an even longer time horizon, local financial markets in Africa could have developed to such an extent that local banks can fully satisfy demand for renewable energy project finance at the local level.

<Please describe the GCF's financial exit strategy in case of private sector operations (e.g. IPOs, trade sales, etc.).>

GCF's capital invested into UGEAP would have a maturity of 15 years. At maturity, UGEAP is entitled to receive the full principal it has invested initially in line with the priority of payments of the share classes of UGEAP. The payment will be made using principal that has been collected by UGEAP prior to the maturity date. It is not the intention to replace UGEAP with another investor at this stage to prolong the investment activity of UGEAP. This would typically be done by raising capital for a follow up product (i.e. UGEAP 2) after the investment period of the second UGEAP tranche had been reached assuming that the performance of the product is in line with expectations.

The asset-liability management policy of UGEAP will ensure that principal collections should be sufficient to repay GCF's capital at maturity. However, in a worst case scenario, unpredictable events like substantial defaults may cause funds being insufficient to repay GCF. In this case, GCF's claim for repayment would be served only partially and in line with the priority of payments of UGEAP. However, the probability of such a worst case scenario is assessed to be extremely low.

E.6.4. Application of best practices

<Please explain how best available technologies and practices are considered and applied. If applicable, specify the innovations/modifications/adjustments that are made based on industry best practices.>

Program Level

- At the level of renewable energy technology, the application of best practice will be ensured through constant interaction with key research centers, other project developers, financiers, energy initiatives such as Sustainable Energy for All (SE4ALL) in order to ensure that best available technologies and sustainable business models are applied in all project categories. While the design and implementation of rural electrification and captive photovoltaic power plants varies from project to project due to the need to adapt to local conditions certain general features for each project category that were taken into account. Best practice features on the technological side

have been integrated into the technical solution already in the business development. Given technological development but also changes in behavior of end clients' applied technologies have to be adapted on an ongoing basis.

- Best practices in UGEAP's financial arrangements are being adhered to by (i) providing local currency loans to projects which generate local currency revenues, (ii) providing USD long-term funding to local banks with USD business, so that they can manage the foreign exchange risk on their balance sheet, (iii) ensuring that local banks' lending practices correspond to international standards and (iv) transparent and frequent reporting to all public and private investors on a regular basis.
- Best practices in terms of social, environmental and gender-aspects will be covered through the Social and Environmental Policy of UGEAP and the Gender Policy applicable to Deutsche Bank Programmes funded by the Green Climate Fund as well as UGEAP's Results Monitoring Framework (see Section H.).

Project 1

Amongst solar home systems and rural electrification concepts, the solar home system technology is considered among the best available technology that combines all components necessary to run a technical reliable electricity supply. The technology provides sufficient capacity for small-scale productive activities, thereby providing opportunities for diversification of household income. The solar home systems provider has also implemented a software database to monitor and control the system performance of each SHS, follow up customer payments, and supervise company operations across the globe. In addition, the provider is training local people in installation and maintenance of the solar home systems, thereby creating sustainable local employment.

Project 2

The mini-grid provider uses best available practices in terms of its technology and commercial operations in three major ways:

- First, all solar PV systems are sized appropriately for anticipated loads, localized irradiation, and annual seasonality. Best practices in terms of system design, installation, and maintenance are ensured through rigorous quality testing and trainings for both employees and customers.;
- Second, community outreach and engagement is ensured through capturing local approval for installed projects from village committees, and through the implementation of community level dialogues around project introduction. These steps are well established in rural development and are critical for the sustainability of newly introduced technologies into rural contexts;
- Third, the provider works with local PV enterprises to deliver its solution in remote areas. This collaboration with local businesses increases the speed and efficiency at which the provider can deploy electricity connections, while leveraging local knowledge, networks, and trust to preclude feelings of ill-well from established enterprises in target communities.

Project 3

The project developer provides best practice in different aspects:

- A robust and easy to handle technology which is reliable, tried-and-tested and technically up to date;
- Hybrid operation, avoiding expensive and operationally difficult storage devices (adding batteries would render the solar power system more expensive than diesel-only power, and would need regular maintenance, contain toxic substances that should be recycled);
- In many cases, communities and industries already have diesel generators in operation; The project developer's PV plants integrate existing equipment into an environmental much more friendly and more cost-effective hybrid

system;

- The project developer conducts state-of-the-art training of local technicians for Operations and Maintenance; in many cases, trained local people with entrepreneurial spirit became contractors and experts in PV systems. They can be seen as nucleus for the development of local PV industry which will create further employment and the shift to a greener economy with small and medium low-emission power suppliers or O&M-service providers;
- The project developer's system enables its customers to apply a long-term, abundant, sustainable source of renewable electricity generation[99]).

E.6.5. Key efficiency and effectiveness indicators

GCF core indicators

Estimated cost per t CO^2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)

Given that the success of UGEAP depends on a range of variables, which includes risk and investment climate considerations, the table below calculates the estimated costs per tCO2e mitigated in 3 scenarios. Scenarios represent the total amount of capital UGEAP provides to the benefit of Target Investments while the CO2e savings used follow the methodology described above in Section E.1:

- Scenario 1: Base Case: UGEAP funding will be re-used over its total lifetime of 15 years multiple times and at amounts shown in E.6.2. (i.e. USD 2,100m)
- Scenario 2: UGEAP's funding would only be used once (i.e, USD 500m)
- Scenario 3: UGEAP's funding would be used only partially (ie. USD 100m)

Table 42: Scenario Analysis on CO2 savings potential

#	Scenario	1	2	3
(a)	Total project financing (USDm)	2,100	500	100
(b)	GCF amount (USDm)	132	132	40
(c)	Lifetime savings (tCO2e)	50,564,677	12,039,209	2,407,842
(d)	Estimated funding per tCO2e (a/c) – USD	41.53	41.53	41.53
(e)	Estimated GCF funding per tCO2e (b/c) – USD	2.61	10.96	16.61

Source: Deutsche Bank

<Describe the detailed methodology used for calculating the indicators (d) and (e) above.>

1. Scaling CO2 Emission Reductions

From the existing three projects, DB has determined the CO2 savings that could be produced by delivering the capital UGEAP targets to mobilise to the Target Investments. In a first step, the USD per tCO2e savings from these three transactions, that represent the different categories of Target Investments, are calculated as shown in the table below:

Table 43: Lifetime Savings per invested USD

[99] Amy Galland, Clean & Green - Best practice in photovoltaics, 2012; the authors also state that PV solutions are reducing water use and reusing water on their own initiatives, and are participating in voluntary international programs related to worker safety

Project	(A) Debt capital requirement to be facilitated through UGEAP USDm	(B) Annual savings tCO2e	(C) Lifetime Savings tCO2e	USD / tCO2e annual = A / B	USD / tCO2e lifetime = A / C	lifetime tCO2 / invested USD = C / A
1	27.5	19,090	85,905	1,440.5	320.1	0.00312
2	9.5	5,183	103,660	1,832.9	91.7	0.01091
3 – off-grid	50.0	148,665	2,973,300	336.3	16.8	0.05947
3 – on-grid	50.0	28,596	571,923	1,748.5	87.4	0.01143

Source: Deutsche Bank

UGEAP targets to invest 20% of its capital each in Category 1 and 2 transactions with an allocation of 60% to Category 3. Applying the weighting factor to the respective debt funding portion to be facilitated by UGEAP, give the following results in the three scenarios described above:

Table 44: Assumed Distributed of Invested Capital

Project	Weight	USDm share of total volume Scenario 1: 2.100m	USDm share of total volume Scenario 2: 500m	USDm share of total volume Scenario 3: 100m
1	20%	420	100	20
2	20%	420	100	20
3 – off grid	30%	630	150	30
3 – on grid	30%	630	150	30

Source: Deutsche Bank

Multiplying the amount of UGEAP funding in the different scenarios with the tCO2 per invested USD determined, produces the expected savings in the three scenarios that is used as input to the calculation above.

Table 45: Lifetime tCO2e Savings per Scenario

Project	Lifetime tCO2e savings Scenario 1	Lifetime tCO2e savings Scenario 2	Lifetime tCO2e savings Scenario 3
1	1,312,004	312,381.8	62,476.4
2	4,582,863	1,091,157.9	218,231.6
3 – off grid	37,463,580	8,919,900.0	1,783,980.0

3 – on grid	7,206,230	1,715,769.0	343,153.8
Total	50,564,677	12,039,208.7	2,407,841.8

Source: Deutsche Bank

Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)

<Describe the detailed methodology used for calculating the indicators above.>

The degree by which GCF's contribution will be leveraged depends on 3 variables:

- debt leverage of the underlying projects (assumed to be 2/3 maximum)
- amount of private sector capital to come into UGEAP (assumed to be 2/3 maximum); and
- amount of repayments from maturing investments being re-invested within the 15 years lifetime of UGEAP.

Given these variables can change also over time, the leverage is presented in the three scenarios used to also show the relative value of GCF funding to the tCO2e mitigated through the Target Investments. Projections focus on results at the end of Phase 2.

Table 46: GCF Funding Share per Scenario

Scenario	1	2	3
Total Target Investments in USDm	2,100	500	100
GCF Funding in USDm	132	132	40
GCF share in total CAPEX funded	6%	26%	40%

Source: Deutsche Bank

The success of the UGEAP is dependent on the amount of investments that can be executed and the speed of execution of the same. Any cumulative investment above the target size of UGEAP (USD500m) would lower the share of GCF to total investments being funded and increase the leverage GCFs contribution would have.

Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)	

**** The information can be drawn from the project/program appraisal document.***

F.1. Economic and Financial Analysis

<Please provide the narrative and rationale for the detailed economic and financial analysis (including the financial model, taking into consideration the information provided in section E.6.3).>

The financial analysis of the UGEAP is based on a simulation of the cash flows (using a financial model), UGEAP as investment vehicle could expect to:

- return from its investments (in form of interest);
- pay to its investors in accordance with the structure describe in section C.3 above (in form of coupone payments).

The financial model replicates UGEAP as structured investment vehicle distributing the available income and allocating losses that arose to investors and other stakeholders of the UGEAP. The results of the forecast are dependent on the assumptions made with regards to the investments of UGEAP. Main assumptions include:

- timing when- and volumes at which capital can be invested either through local financial institutions under the FRPA- or the syndication structure;
- returns that can be generated on these investments (interest rate, maturity, repayment profiles);
- amortization of the capital invested (bullet, amortizing, grace periods for construction);
- external variables that influence the cash flow behavior (currency and interest rate fluctuation);
- expectation on the ability of investees to pay interest and principal to the local financial institution / UGEAP as lender over the lifetime of the loan granted to it; and
- value of collateral at the time the borrower is unable to serve its credit.

Risk factors are typically positively correlated with each other. Ie., a rising probability of a borrower to default in times of an economic downturn generally also comes with the value of available collateral to shrink, which increases the potential loss in case the borrower actually defaults and the available collateral is put on sale to recover some of the unpaid loan balance. The peculiarity of UGEAP's investments through the FRP structure has a positive distinction as two risk factors have a partially off-setting effect with respect to the risks that arise for UGEAP

- fluctuation of local currency;
- loss rate.

In terms of foreign exchange (FX) risks the FX rate used for the 1st loss calculation would be the lower of (a) the FX rate used at the time a loan was given to a local/regional financial institution and (b) the FX rate used at the time the same loan was given to the (D)ESCOs or project developers.

In an economic downturn, typically the local currency looses in value while businesses and households face challenges with their available sales shrinking which increases the likelihood that businesses and households may be unable to serve their debt payments. If a default occurs, however, the FRP structure uses the current conversion rate of USD to local currency to determine the balance that is to be counted against the first loss position of the local bank in the credit portfolio as well as – in case the first loss is already exhausted – the balance that reduces the repayment obligation of the local bank towards UGEAP under the FRP agreement. While the USD equivalent of loans reduces along the reduction in the value of local currency to USD, the potentially rising number of default that occur in the loan portfolio produce smaller amounts that would impact UGEAP as lender to the local bank. This effect cannot be used endlessly as high losses start to impact the local bank. In an extreme scenario, local banks may find themselves in insolvency which then is a high impact risk for UGEAP.

Table 47: Sensitivity Overview

Variable	Change	Tendency of the return profile of UGEAP	Tendency of the risk profile of UGEAP
Interest rate of loan to local financial institution in USD	↑	↑	→
	↓	↓	↓
Interest rate of loans to Target Investments in USD or local currency	↑	↑	→
	↓	↓	↓
Value of local currency to USD	↑	↑	→
	↓	↓	→
Probability of losses to occur in the underlying portfolio of loans through either FRP or syndication structure	↑	↓	↓
	↓	↑	↑
Volumes of new investments either made through FRP or syndicated loans	↑	↑	↑
	↓	↓	↓

Source: Deutsche Bank

The model assumes no default of a local financial institution in order to allow for a look-through approach and analyse the behaviour of returns linked to the underlying Target Investments.

The following table gives a high level overview of the results of the model in 7 different scenarios. The overview of assumptions used in the scenarios can be found in F.1 Annex 1 – Financial Model Scenario Overview.

Table 48: Overview of the results of model in the different scenarios

#	Description	IRR on Class A	IRR on Class B	Loss Class A (%)	Loss Class B (%)
1	Base Case	6.8%	6.6%	0	0
2	Stable Currency	7.4%	10.4%	0	0
3	Margin Upside – Stable Currency	7.7%	12.6%	0	0
4	Margin Downside – Currency BC	6.2%	3.4	0	0
5	Margin Downside – Currency Downside	6.1%	1.8%	0	0
6	Losses Break Even GCF – Margin Downside – Currency Downside	6.0%	0.0%	0%	38.6%
7	Extreme Loss Scenario – Margin Downside – Currency Downside	0.1%	n.a	66.6%	100%

Source: Deutsche Bank

<Based on the above analysis, please provide economic and financial justification (both qualitative and quantitative) for the concessionality that GCF provides, with a reference to the financial structure proposed in section B.2.>

The concessionality of GCF's funding comes from investing capital at returns that private sector investors may deem to be insufficient for the risks to be borne. Please see section D1 for a description of this aspect. The position of GCF as investor into the UGEAP would, however, align with the interests of the party that would take the higher amount of risks with the expectation to also benefit from the up-side of the opportunities. This is reflected in the returns for Class B capital being higher in the up-side scenarios compared to Class A capital.

F.2. Technical Evaluation

<Please provide an assessment from the technical perspective. If a particular technological solution has been chosen, describe why it is the most appropriate for this project/program.>

UGEAP will only finance proven, bankable technology and sustainable business concepts. All used technologies and hardware components are sourced from well-known and reputable companies within the photovoltaic and battery industry and have been adapted to the local needs for off-grid installations. Supply contracts will foresee industry standard warranties that will either (1) remain with the project developer (Project 1 and 2) and will be integrated into an end beneficiary warranty concept to be provided from the project developer to the end beneficiary (Project 1) be transferred to the project (Project 3).

Part of the due diligence of the local banks together with DB as investment manager will be a screening of the technologies applied; credit officers will therefore be trained. Additionally UGEAP will work with internationally recognized technical advisors that will ensure proper installation and give a final acceptance to a pre-defined number of installations.

Operational concepts follow best practice industry standards. O&M services are done either by the respective project developers that apply international standards (Project 1 and 2) or external O&M contractors (Project 3) that are well-known and have a track-record in the PV energy market.

Category 1 & 2 Projects

Technology

- Solar Home Systems are typically made up of panel, battery, smart controller, light sets and further appliances, can be easily installed and need no connection to other devices, e.g. no mini-grid. Core element is the proprietary software to monitor and control solar systems, company operations and payments.
- SHS makes use of mobile communication in 3 ways: (a) inclusion of mobile banking technology to allow for microcredit, (b) a SHS embedded monitoring system to remotely track usage and payment patterns, battery and panel data etc. to facilitate maintenance, increase the system durability and provide input for design improvements, and (c) a PV panel embedded switch to control its power output via mobile network, allowing the system to be turned off remotely in case of non-payment.
- An embedded GSM in SHS's controller allowing for worldwide fast and reliable data access as well as permitting for an outstanding payment to be registered.
- Solar photovoltaic-based mini-grids consist of controllers, distribution connections, and individual smart meters for both households and micro-enterprise clients. Other components are photovoltaic panels, batteries, and control units that are installed strategically throughout a target village. Distribution cables then connect the production elements its new customers.
- Direct Current (DC)-based mini-grids are highly cost effective solution for an easily and efficiently scalable solution for energy access. However, larger communities will require AC for generation and distribution which increases the capital expenditure and the technical requirements.

- DC based mini grids often serve very basic needs such as lighting, phone charging, entertainment (radios, stereos, TVs, cinema-enabling beamers) and productive use (hair cutters, sewing machines, refrigerators for cold drinks, corn/rice shellers and grinders).
- Alternating Current (AC) based grids have a higher range of use but also come with significantly higher requirements for permitting and planning. Hence the roll-out is less effective and likely on a large scale.

Quality management; quality control system; supply chain

Processes have to be in place to control both service and product quality which typically spans from a quality assurance division monitoring the quality of supplied components while local customer care and assembly staff does the quality testing on a daily basis on the ground.

- Design of product: The envisaged technological concept shall be as basic as possible with a focus on an easy customer friendly plug-in installation. While the design the initial engineering of the technical solution is expected to have been performed already prior to the delivery, companies typically partner with local solar SMEs to quickly and cost-efficiently install mini-grids.
- Training of technicians and sales staff: Frequently self-employed entrepreneurs who are planning to work as sales representatives or solar technicians are generally trained intensively followed by an accreditation assessment. Necessary training to partner company technicians is provided in order to perform all the tasks required for deployment of the mini-grids also subject to grids working on low voltage (DC only). For AC grids, certified technicians are required to perform the installation and the ongoing maintenance work.
- Suppliers: Suppliers are screened by the investment manager also for quality purposes while generally companies perform also onsite inspections of factories. ISO9001 certification is desired to apply. Technology and hardware components are sourced from well-known and reputable companies. Components (panels, batteries, smart controllers, light sets) are standardized and mass produced with all the advantages regarding cost reduction, high quality level, etc.. Framework contracts with suppliers are standard. These contracts usually oblige the suppliers to be able to deliver a certain quantity of goods in a given time frame if ordered. In case of components or products with long lead times, purchase orders are made a bigger quantity in due time. An ongoing communication with suppliers about capacity is important to maintain the operations of the company. Supply contracts generally include warranties over the lifetime of the financing by UGEAP.
- Distributors: Training provided by companies to distributors and agents is reviewed by the investment manager to assess their satisfaction. Additionally, distributors shall be monitored on a regular basis with regards to their compliance to the existing rules that are part of the distributor's contracts.
- Maintenance: Technical failures are generally dealt with by a local network of maintenance technicians that can fix smaller issues and replace broken components, as well as central locations, where these broken components are fixed and brought back into the spare part stock.
- Monitoring of product: Generally, data regarding system performance and payment status is transmitted from the SHS's controller via the mobile network and stored in data warehouse systems of the company.

Category 3 Projects

The main focus of these projects is the combination of solar and diesel to a hybrid solution.

Technology

- Solar diesel hybrid power generation which integrates a solar farm (to be installed on-site) into existing diesel generator based on-site / add to existing grid connection.
- Solar PV alone is not load-following, meaning that users need either a power storage device (battery) and/or

a generator "in between" the PV or the load, in order to match power supply with power demand. Currently, storage solutions are too expensive vs. diesel generators, despite major cost reductions in storage tech (e.g. recent Tesla powers battery is available at 350 USD/kWh);

- PV modules are standardized and pre-assembled with a mass-production / lean manufacturing mindset which improve quality and installation time. Usually, solar farms are built in a “project-by-project” approach, where each project is technically different and site-specific. To reduce costs, container based solutions are also available;
- Deployments in remote area, meaning getting trained labor in and out is very expensive, create a preference for containerized, preassembled solutions that are much more robust and lower cost and costs also much easier to estimate in advance;

Quality management; quality control system; supply chain

Quality management and supply chain elements are the same as for Category 1 and 2 projects.

F.3. Environmental, Social Assessment, including Gender Considerations

<Describe the main outcome of the environment and social impact assessment. Specify the Environmental and Social Management Plan, and how the project/program will avoid or mitigate negative impacts at each stage (e.g. preparation, implementation and operation), in accordance with the Fund’s Environmental and Social Safeguard (ESS) standard. Also describe how the gender aspect is considered in accordance with the Fund’s Gender Policy and Action Plan.>

Program Level

UGEAP will implement a Social and Environemntal Management System (SEMS) on the level of UGEAP as well as at the level of each Investment. The SEMS will be based on GCF’s Social and Environmental Safeguards and strictly follow IFC’s Performance Standards.

Operational Procedures

Deutsche Bank will classify each project that UGEAP shall invest into according to the categories as set out below:

- ***Category A*:** A proposed investment is classified as Category A if it is likely to have significant adverse social and environmental impacts that are sensitive,[100] diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to the investment.
- ***Category B***: A proposed investment is classified as Category B if its potential adverse social and environmental impacts on human populations or environmentally important areas including wetlands, forests, grasslands, and other natural habitats are less adverse than those of Category A investments. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be put in place more readily than for Category A investments.
- ***Category C*:** A proposed investment is classified as Category C if it is likely to have minimal or no adverse social and environmental impacts.

UGEAP does not expect to consider Category A projects, while through the syndicated loan structure, UGEAP may

[100] A potential impact is considered "sensitive" if it may be irreversible (e.g., lead to loss of a major natural habitat) or raise issues related to, Natural Habitats; Indigenous Peoples; Physical Cultural Resources or Involuntary Resettlement.

have exposure to larger installations that could potentially be categorised A. Projects 1 and 2 are categorized C due to the small size of the single sub-projects. Some sub-projects in Project 3 could potentially lead to Category B due to a certain project size which will be reached.

As most projects replace diesel-fueled power generation, this will undo the negative effects on air quality associated with diesel generator emissions and will aid in cleaner energy production for the community or site.

All projects will either have an external and independent Environmental Impact Assessment Study, or alternatively in case single projects are below a threshold of 10 MWp installed capacity an assessment according to the following 8 IFC Performance Standards will be performed and impacts in each performance standard will be highlighted and managed throughout the project's lifetime:

- **Performance Standard 1**: Assessment and Management of Environmental and Social Risks and Impacts
- **Performance Standard 2:** Labor and Working Conditions
- **Performance Standard 3:** Resource Efficiency and Pollution Prevention
- **Performance Standard 4:** Community Health, Safety, and Security
- **Performance Standard 5:** Land Acquisition and Involuntary Resettlement
- **Performance Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources
- **Performance Standard 7:** Indigenous Peoples
- **Performance Standard 8:** Cultural Heritage

Gender is considered a cross-cutting topic and will be addressed across multiple Performance Standards. A separate Gender Policy has been drafted for all of DB's programs with the GCF to which UGEAP will need to company (the "DB-GCF Gender Policy"). The policy is attached as annex F.3 Annex 1 – DB-GCF Gender Policy. Within its appraisal of the Performance Standards the external study and/or Deutsche Bank as executing agency will develop a mitigation and action plan to manage impacts of the sub-projects.

Deutsche Bank will also produce annual reports of the Program's compliance and incidents throughout the investment cycle. The reports will be based on site visits and information received from the project developers and. The social and environmental report will be produced annually by Deutsche Bank.

Additionally Deutsche Bank will assess and report on wider impacts as outlined in section E. 1. Impact Potential.

Exemplary S&E Summary

As part of their project development, projects commission either an external Environmental & Social Impact Assessment or the investment manager reviews the adherence to the S&E standards of the UGEAP. Below are the summaries of the findings from three sample transactions in each Category:

Project 1 Benchmark Investments

The company of Project 1 has not prepared an Environmental and Social Impact Assessment study as the project is rather a business model that builds upon the sale of small-scale photovoltaic kits. National regulation does not foresee any need for an environmental impact assessment for their business model. However, Project 1 does have environmental and social impacts which have been benchmarked against IFC Performance standards in the following.

Table 49: S&E Summary Project 1

PS	Environmental and Social Management Plan Assessment	Score (1 = high; 3 = low)	Findings and Corrective Measures
	Project Categorization	C	Due to the very small size of each Solar Home System and its connection to a specific house, the Project 1 is classified as Category C
1	Assessment and management of environmental and social risks and impacts	1	The company is carefully managing risk on the CEO and Business Development level as well in the Quality Assurance department. Specific risk is related to electronic waste production, or the "gender-energy-poverty" nexus. Measure: disposal service, SHSs affect the education of households by extending study time and reading hours to after dark, and by that especially enabling girls involved in daytime household chores to do their homework
2	Labour and working conditions	1	In order to ensure safe working conditions, training about safety measures is performed. Moreover, the company has internal safety policies. the company provides full health insurance coverage for all employees. In order to address equal opportunity employment of the company, focuses on job opportunities for women, promotes them actively and fosters their inclusion into male-dominated employment sectors, such as the technical area and promoting jobs for women.
3	Resource efficiency and pollution prevention	1	Risk: Electronic waste production Measure: disposal service for components that are surplus of installation or other was.
4	Community health, safety and security	1	The company's business model actively increases community health, safety and security by preventing burn injuries, structural fires and unintentional ingestion of kerosene by children, indoor pollutants, such as carbon monoxide, nitrogen dioxide and formaldehyde, through substitution of kerosene. Risk of theft and burglary after dark reduced through substitution of kerosene lamps, diesel generators, and the resulting pollution, lighting external facades and housing in order to improve community security.
5	Land acquisition and involuntary resettlement	1	The company is not involved in land acquisitions; the Solar Home Systems are installed on customers' homes or parcels.
6	Biodiversity conservation and sustainable management of living natural resources	N/A	No biodiversity impact as the company's systems do not fall into critical habitats.
7	Indigenous peoples	N/A	No cultural resources of indigenous people will be used or affected by the company.
8	Cultural heritage	N/A	No cultural heritage sites will be used or affected. No cultural heritage sites have been affected so far; in the event that would change in the future, appropriate actions will be taken and tracked.

Source: Deutsche Bank

Gender Considerations

The following gender related impact features have been identified for the company.

- Energy access disproportionately tends to benefit women as they are typically responsible for household tasks, e.g. procuring kerosene or candles;
- Basically, equal chances to create jobs both for men and women:
- Local employees, customers and sub-contractors are equally trained in solar energy;
- The company itself is an equal opportunity employer with a recruitment policy that provides equal chances for both women and men;
- To-date approximately one third of the company's workforce is female, there is still a lack of qualified female technicians.
- The company targets the roots of gender inequality by:
  1) improving the livelihoods of women and girls through access to clean and efficient home energy sources;
  2) empowering women and girls:
  3) by improving learning conditions: SHSs affect the education level of private households by extending reading hours, particularly enabling girls involved in daytime household chores to do their school homework;
  4) the company targets to lift the dual constraints impacting women: a) lack of working capital and b) inability to afford a PV system – the company's pricing and monthly payment system makes energy more affordable for women to use their potential as entrepreneurs;
  5) The company will also track new entrepreneurial activity by women as a result of their access to electricity

- Positive impact on health especially for women and children who spend more time in the house: substituting kerosene/fuel by SHS minimizes indoor pollutant such as carbon monoxide, nitrogen dioxide and formaldehyde.

Project 2 Benchmark Investments

As part of their project development, the company of Project 2 commissioned an external Environmental and Social Impact Assessment study for two village mini-grids in order to receive regional or possibly national accreditation with the national council for future similar mini-grids to be built by the company, While the study is still in a draft version and will be submitted to NEMC soon, the study has been screened and benchmarked to the IFC Performance Standards in the following table.

Table 50: S&E Summary Project 2

PS	Environmental and Social Management Plan Assessment	Score (1 = high; 3 = low)	Findings and Corrective Measures
	Project Categorization	1	Most of the company's photovoltaic mini-grids are Very Small Power Producers (VSPP) under 100 kW and therefore fall into Category C, having a minor environmental and social impact.
	Requirement due to category of project: ESIA assessment draft available by external consultant	1	An Environmental Impact Assessment in accordance with the National Environmental Management Council (NEMC) Performance Standards has been conducted by City Engineering Company Limited (CECL), Dar es Salaam/Tanzania, for the mini-grid located in Melela-Mlandizi village, Melela Ward, Mvomero District, Morogoro Region, Tanzania; Final draft to be submitted to the National Environmental Management

			Council (NEMC) soon: CECL concludes as follows: “The transmission of electricity powered by solar energy is not anticipated to cause significant impacts to the environment as [for] the installation of [a] generation point, land requirement is small only about 1.5m² and is integrated in the land currently used for other activities which does not require relocation; other activities can continue with the system components are in place. Furthermore, it is not consumptively straining natural resources, and limited waste is generated. Lastly the proposed mitigation and management plans are already embedded in the project design and implementation plan. It is therefore recommended that the project shall be allowed to continue operating due to its sensitivity in increasing rural development.” The company is obliged to: - Undertake monitoring for the project - Undertake audits for the project and implement corrective measures - Implement mitigation and management measures for their project - Respond and address complains, regulatory requirements and orders Impacts are associated with the mobilization phase, the construction phase, the operation phase, and the decommissioning phase. An Environmental Management Plan as well as an Environmental Monitoring Plan have been prepared and will be submitted immediately after NEMC approval.
1	Assessment and management of environmental and social risks and impacts	1	Waste is limited and generated only during the construction phase or during system maintenance. Waste is collected and transported to headquarters in Dar-es-Salaam or to the Bagamoyo waste management facility where they are sorted and stored. Once volumes accumulate, solar panels and batteries are sent abroad back to the supplier for refurbishment and recycling. The only lasting environmental impact is the changed village landscape due to the poles carrying the photovoltaic panels and the control units.
2	Labor and working conditions	1	Health issues can potentially arise during the construction phase, the company already has a health and safety plan in place that includes having standard operation procedures and engineering controls ,e.g. automatic circuit breaker.
3	Resource efficiency and pollution prevention	1	Due to the limited space required for one panel and the company’s waste management system, the company has maximized resource efficiency and ensures pollution prevention. There is some minor dust during digging of footings foundations and mixing the concrete for the foundations.
4	Community health, safety and security	1	The company has a direct positive impact on local health services if a health facility is located within the respective village, connected to the mini-grid, and benefits from uninterrupted power supply.
5	Land acquisition and involuntary resettlement	1	No land acquisition or resettlement takes place as the required space for one photovoltaic panel with the control units is less than 1.5m².
6	Biodiversity conservation and sustainable management of living	1	Biodiversity is not affected directly as the mini-grids are located within human settlements.

	natural resources		
7	Indigenous peoples	1	During the mobilization phase, a strong dialogue with all local stakeholders takes place to help them understand the Devergy mini-grid system, how it will operate and how the village community will benefit from it. No cultural resources of indigenous people will be used or affected. The company ensures full respect for indigenous peoples, for their human rights, their dignity, and aspirations; for their livelihoods, and for their culture, knowledge, and practices.
8	Cultural heritage	1	During the stakeholder dialogue in the mobilization phase, all comments and concerns from local stakeholders are discussed and clarified. No cultural heritage sites have been affected so far; in the event of any such case, appropriate actions will be taken and tracked.

Source: Deutsche Bank

Gender Considerations

The following gender related impact features have been identified for the company:

- Energy access disproportionately tends to benefit women as they are typically responsible for household tasks, e.g. procuring kerosene or candles;
- Basically, equal chances to create jobs both for men and women:
- Local employees, customers and sub-contractors are equally trained in solar energy;
- The company itself is an equal opportunity employer with a recruitment policy that provides equal chances for both women and men.
- The company targets the roots of gender inequality by:
  1) improving the livelihoods of women and girls through access to clean and efficient home energy sources;
  2) empowering women and girls:
     - by improving learning conditions: improved lighting conditions affect the education level of private households by extending reading hours, particularly enabling girls involved in daytime household chores to do their school homework;
     - The company targets to lift the constraints limiting women: a) lack of working capital and b) inability to afford a PV system – the company's pricing and monthly installment system makes energy more affordable for women to use their potential as entrepreneurs;
- Positive impact on health especially for women and children who spend more time in the house: substituting kerosene/fuel by mini-grid connection minimizes indoor pollutant such as carbon monoxide, nitrogen dioxide and formaldehyde.

Project 3 Benchmark Investments

The company of Project 3 has not prepared an Environmental and Social Impact Assessment study so far as this has not been required by national law for the already installed photovoltaic plants. Going forward each project to be financed by UGEAP will be assessed independently with regards to the Program's Social and Environmental Safeguards as well as to regulatory requirements such as environmental permits required under national legislation. In the following environmental and social impacts of the general project types have been benchmarked against IFC Performance Standards:

Table 51: S&E Summary Project 3

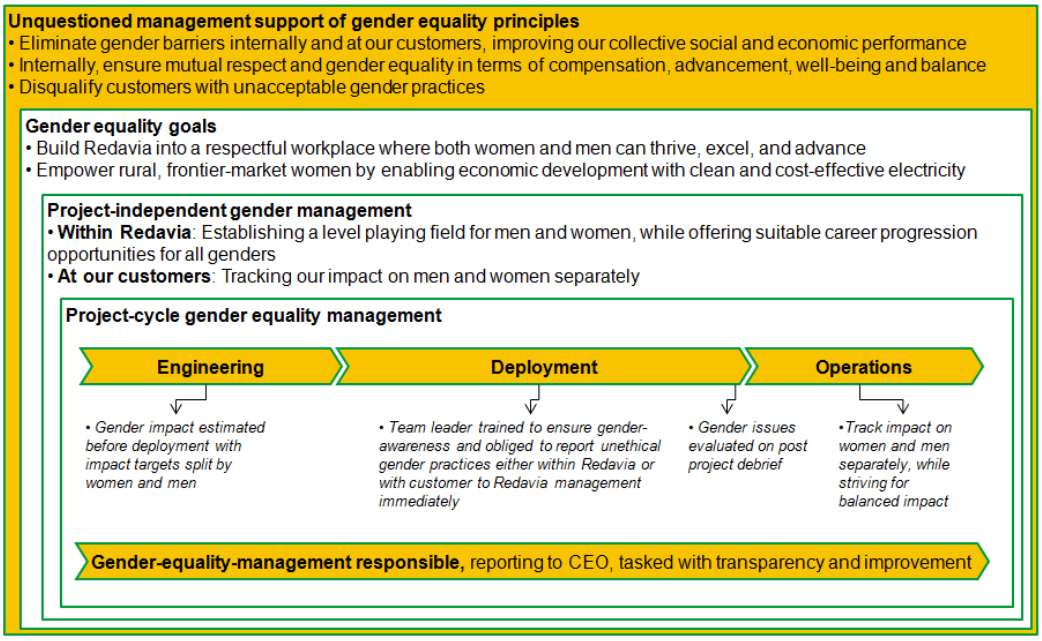
PS	Environmental and Social Management Plan Assessment	Score (1 = high; 3 = low)	Findings and Corrective Measures
	Project Categorization	2	The company's photovoltaic plants fall either in Category C or Category B depending on the plants' size.
	Requirement due to category of project: ESIA assessment available at the company's customers	2	The company provides technical equipment to replace diesel-generated electricity for the customer's own energy supply; As part of their due diligence on the client, the company checks if the customer has an ESIA for its operative site.
1	Assessment and management of environmental and social risks and impacts	2	The company does have an Environmental Management System in place. It has an independent environmental manager who directly reports to the CEO and has integrated certain environmental and social safeguards into their business routines, e.g.: Environmental impact management is part of entry-training for all employees; Suppliers & customers: Screening of supplier and customer environmental records and disqualification of suppliers or customers with unacceptable environmental records, along the entire project life-cycle: • Engineering: • Project specific environmental risks are mapped and managed in project Environmental Management Plan (EMP) • Deployment: • EMP discussed during deployment team project pre-briefing • Team leader measures on-site environmental behaviors and incidents per employee, per construction phase • Post-deploy 360° team review includes EM • EM behavior is basis for annual individual performance appraisal • Operations: • Quarterly 360° team review includes EM • EM behavior is basis for annual individual performance appraisal
2	Labor and working conditions	1	The company provides equal opportunities to all employees, ensures a good worker–management relationship, complies with national employment and labor laws, protects workers, in particular those in vulnerable categories, promote safety and health, and avoids the use of forced labor or child labor. The company has a Safety Management Framework. and safety principles get full management support: • All accidents can be prevented

			• Safety is a management priority • Safety is right and good business • the company has a responsibility to train employees to work safely • Safety goals are: • Zero accidents and injuries • Individual accountability through measurement of every activity of every project • Continuous 10% annual improvement, individually and collectively • Project-independent safety management: • Safety is part of entry-training for all employees • Role-specific installation-safety training at Weisweil reference site • There is a project-cycle safety management in place: • Engineering: • Project specific safety risks are engineering deliverable • Deployment: • Deployment team safety project pre-briefing • Team leader measures on-site safety (accident, near-miss, unsafe behavior) per employee, per construction phase • Post-deploy 360° team review includes safety • Safe behavior is basis for annual individual performance appraisal • Operations: • Quarterly 360° team review includes safety Safe behavior is basis for annual individual performance appraisal
3	Resource efficiency and pollution prevention	1	The company defines a series of activities to prevent/ abate pollution in wetland, ground water etc. as well as the handling of waste, effluent, emissions and other pollutants
4	Community health, safety and security	2	The company adheres to the IFC Sector Specific and General Environmental Health and Safety (EHS) Guidelines; compliance is monitored via the quarterly 360° team meeting. Security and safety issues beyond legal requirements will be instantly addressed.
5	Land acquisition and involuntary resettlement	1	The company is not involved in land acquisitions; the photovoltaic farms are installed on land owned by its direct customer.
6	Biodiversity conservation and sustainable management of living natural resources	1	Biodiversity issues are part of the Environmental Management System. Special attention will be paid to protected areas to avoid any adverse impact on critical habitats, rare or protected species, or water use.
7	Indigenous peoples	1	No cultural resources of indigenous people will be used or affected The company ensures full respect for indigenous peoples, for their human rights, their dignity, and aspirations; for their livelihoods, and for their culture, knowledge, and practices.
8	Cultural heritage	1	No cultural heritage sites have been affected so far; in the event of any such case, appropriate actions will be taken and tracked

Source: Deutsche Bank

Gender Considerations

- The company has recently prepared its gender policy:



- The company is sensitive about creating both jobs for men and women within their local maintenance partners, maintaining sustainable jobs on the side of their customers and improving the working and living conditions of female farmers who deliver their produce to the company's agro-processors.
- 25% of the company's direct employees are already women and the company pursues a gender sensitive human resource recruiting program as well as career development.

Gender Considerations

The following gender related impact features have been identified:

- Energy access disproportionately tends to benefit women as they are typically responsible for household tasks, e.g. procuring kerosene or candles;
- Basically, equal chances to create jobs both for men and women:
- Local female and male employees, customers and sub-contractors are equally trained in solar energy;
- The project developing company itself is an equal opportunity employer with a recruitment policy that provides equal chances for both women and men.
- The developing company targets the roots of gender inequality by:

1) improving the livelihoods of women and girls through access to clean and efficient home energy sources; keeping in mind that access to electricity for women and girls creates additional benefits for the household
2) empowering women and girls:
   - by improving learning conditions: improved lighting conditions affect the education level of private households by extending reading hours, particularly enabling girls involved in daytime household chores

to do their school homework;
    - The developing company targets to lift the constraints limiting women: a) lack of working capital and b) inability to afford a PV system – the company's pricing and monthly installment system makes energy more affordable for women to use their potential as entrepreneurs;
- Positive impact on health especially for women and children who typically spend more time in the house: substituting kerosene/fuel by mini-grid connection minimizes indoor pollutant such as carbon monoxide, nitrogen dioxide and formaldehyde.

F.4. Financial Management and Procurement

<Describe the project/program's financial management and procurement, including financial accounting, disbursement methods and auditing.>

Program Level

UGEAP as investment vehicle will appoint Deutsche Bank as Investment Manager. Additional Deutsche Bank will act as Investment Administrator. A list of tasks including financial management and procurement is listed in C.3. above.

The Investment Administration team is a separate team within Deutsche Bank (alternatively such services could be performed by an external service provider) that will operate under a service level agreement thus guaranteeing a four eyes principle and adherence to DB standards in line with DB's policies covering conditions and requirements towards outsourced services.

Tasks belonging to the Investment Administration include:

- financial accounting incl. NAV calculation;
- custodian services;
- administrative portfolio management (loan booking, interest rate calculation and monitoring on covenants and cash-flow of underlying investments);
- reporting based on input from Investment Management team.

Disbursement Process

For a new underlying investment the Investment Administration team will verify that the investee complies with all legal and regulatory requirements including AML and KYC provisions. For UGEAP the Investment Manager will apply Deutsche Bank's AML and KYC requirement which follow the OFAC recommendations. The Investment Management team will provide the respective documentation from the potential investee to the Investment Administration team.

Upon positive investment decision by the Investment Committee, the Investment Manager performs all necessary measures to enable the loan from an assets liability management perspective in terms of liquidity and mitigation of arising market risks, e.g. by entering into derivative instruments. The Investment Manager provides the Investment Administration team with the scanned version of the Investment Committee approval, the signed Financing Documents, Signing Certificate and Condition Precedent Documents (i.e. articles of incorporation, extract of trade register / banking license, authorized signatures with signatures samples or passport copies) as outlined in the loan agreement to the Investment Administration team and informs about the scheduled disbursement dates.

Upon completeness and sign-off of the respective documents and after receiving the signed payment instruction the Investment Manger instructs the payments, the Investment Administration team executes the payment from UGEAP's account to the investee.

Detailed processes on financial management and administrative management tasks will be outlined in the key

operational manual and will build on DB's existing systems being used in the management of existing public-private partnership funds.

Financial Management

The investment vehicle will apply IFRS standards. An annual audit of the financials will be performed by an independent auditor to be appointed by the Board of UGEAP following the Procurement Guidelines. The Investment Manager will provide the auditor with the required information. On the discretion of the Board of UGEAP further audits on social and economic safeguards or impact shall be performed on an ad-hoc or regular basis.

Reporting

Within the Investment advisory agreement certain reporting processes, routines and recipients will be defined.

Reports to be prepared include:

- *Financial Reports*
  - Quarterly Net Asset Value Report required under IFRS;
  - Quarterly financial statements (non-audited) which includes information on non-performing assets;
  - Annual Statements (audited)

Asset-related Reports

- Annual report on portfolio development and portfolio performance indicators
- Quarterly report on portfolio development and portfolio performance indicators
- Annual report on social and environmental compliance and impact

Procurement

Services to be procured by UGEAP include but are not limited to:

- Administrative Services
- Custodian Services
- Auditing Services
- Legal Advisor Services on Investment vehicle level
- Legal Advisor Services Investment level
- Board Secretary Services
- Other (e.g. Advisory Services on tax or accounting matters)

UGEAP as investment vehicle will have Procurement Guidelines that provide information on the requirements for the assignment of service providers and consultants. These Guidelines lay down the conditions to ensure transparent and fair competition that will offer equal opportunities to all participating service providers and consultants. Further details are given in each request for proposals.

Types of Procurement Procedures

Ancillary Services can be procured by UGEAP in four different ways, depending on the size of the transaction:

1. Tendering:

Project/services are awarded through a tendering process allowing candidates invited by the Investment Manager and/or the Board to submit a proposal choosing service providers and consultants from a short list of experts. The

short list is typically prepared through a pre-qualification exercise.

Selective Tendering:

The Investment Manager is allowed to consult candidates of his choice and negotiates the terms of the contract with one or more of them. The selection of candidates can be directly established by the Investment Manager based on prior contacting of two to five service providers/ consultants, depending on the project/services budget as specified below.

Single Sourcing:

The Investment Manager is allowed to consult one candidate of his choice to negotiate the terms of the contract.

Direct Implementation:

The Investment Manager carries the activities out directly, where needed complemented by additional expertise coming from external service providers and consultants. Such activities primarily include those that are related to specific strategic, commercial, or confidential objectives of the Investment vehicle.

Selection of applicable Procurement Procedures

The Investment Manager shall give preference to the Tendering or Selective Tendering processes, whereby:

- Tendering should be used for project/services above USD 280,000 (excl. value-added tax)

Selective Tendering for project/services ranging from USD 50,000 to USD 280,000 (excl. value-added tax). For the avoidance of doubt, Selective Tendering shall be applied, if it can be reliably estimated at the time of project/services procurement that the aggregate of projects/services to be provided by a service provider or consultant will exceed the threshold of USD50,000. Selective Tendering shall be the preferred procurement procedure in case of selecting providers of (i) administrative, (ii) custodian, (iii) auditing and (iv) legal advisor services. Notwithstanding such limit of USD 50,000, the role of the Board Secretary shall not be subject to Selective Tendering due to the sensitive nature of documents such Board Secretary will be required to review including but not limited to private sector investor commitment agreements.

Single Sourcing or Direct Implementation should be used for project/services below USD 50,000. Direct Implementation shall be regarded as the most effective procedure for:

- Research & Analyses, whenever such project/services are close to the core project/services of the Investment vehicle or inform the Investment vehicle in defining its strategic direction.
- Other activities related to strategic, commercial, or confidential objectives of the Investment vehicle as approved from time to time by the Board or the Investment Committee.

Tenders and the decisions on procurements will be overseen by a procurement committee. Tenders will be orientated towards ICB and NCBs to the degree possible and feasible.

Evaluation and Selection

The preparation of the tender documents, the conduction of the entire tender process and procedure as well as the evaluation of proposals will be carried out by the Investment Manager. The evaluation of service providers' and consultants' expertise and proposals is based on a series of factors. In the case of Tendering, these must be specified, with their respective weights in the request for proposals issued to potential respondents. Indicative factors include the service provider's/consultant's specific experience, the understanding of the terms of reference, the methodology proposed for the services, qualifications and experience of key personnel included to render the

services, regional experience, and proposed work program. In the procurement procedure the Investment Manager shall apply a weight of not more than 70% to the aggregate of qualitative factors while pricing shall be assigned at least a weight of 30%. In the case of changes of up to 10% of the initially approved budget with a maximum of USD 20,000, the Investment Manager may accept these changes. Evaluation reports can be made available to the UGEAP Board upon request.

Monitoring, Reporting and Terms & Conditions, Review Periodicity

The Investment Manager shall review conditions of each UGEAP service provider and shall procure competitive bids according to the procurement procedures set out above when considered necessary by the Board. Based on the approval of the Board the Investment Manager is responsible for supervising and managing the service provider's and/or consultants activities within the budget framework approved by the Board. For all service agreements with a duration of more than one year, the Investment Manager should assess the cooperation with the service providers, considering the underlying terms of reference and timeline for the services and report once a year to the Board. The report shall be delivered to the Board on an annual basis.

Details on the single projects with regards to the Financial Management can be found in F.4 Annex 1 – Project Level Information on Financial Management

G.1. Risk Assessment Summary

<Please provide a summary of main risk factors. Detailed description of risk factors and mitigation measures can be elaborated in G.2.>

The risk management framework of DB as investment manager of UGEAP allocates risks to the following categories while further sub-categories exist:

#	Risk Category
1	Strategic
2	Reputational
3	Investment Portfolio
4	Asset-Liability
5	Operational
6	Legal

While single risks are listed in section G.2, the following risk factors can have an impact on the success of UGEAP to fulfill its mission to increase green electricity access to all population strata in Africa:

Risk Factor 1.1 Insufficient Investment Opportunities;

Risk Factor 1.2 Capital Raised from Private Sector Investors Below Expectations

Risk Factor 3.2.2 Local currency depreciates which reduces the return that is produced from investments through the FRP structure

Risk Factor 4.1.3 Business of investee fails due to market change

Risk Factor 4.1.5 Too little financial cushion / headroom (equity and debt) forcing business / households into insolvency

G.2. Risk Factors and Mitigation Measures

<Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/program objectives from being achieved. Also describe the proposed risk mitigation measures.>

<Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?>

#	Category	Sub-Category	#	Risk Factor	Level of Risk (GCF Categories)	Probability of Occurrence (GCF Grades)
1	Strategy	Reaching End Beneficiaries	1.1	UGEAP does not fulfil its investment targets in terms of the number of investments and the USD amount expected to be invested to the benefit of End Beneficiaries	Select	Low
	Mitigant	- Close co-operation with reputable and capable local financial institutions - Tailor made solutions to enable local banks to serve the sector broadly which is “crowding the local bank into the solution” - In depth demand analysis of demand and investment climate of the Target Region				

				- Co-operation and knowledge sharing with technological solutions providers active in the Target Region to identify investable projects (ongoing discussions with over 40 technology providers) - Significant demand for infrastructure investments which UGEAP targets - Target Investments fit well into national and regional targets		
		Raising Capital	1.2	UGEAP does not attract sufficient capital to invest in a sustainable fashion	Select	Medium
	Mitigant			- UGEAP concept addresses institutional investors' concerns and is structured towards their needs - Investors require an offer to invest on short time horizons; as soon as GCF has given its positive decision, DB will finalize the structuring of UGEAP which allows for going to market with an appropriate proposal investor's can decide upon - DB has access to the full range of potential investors in various jurisdictions which gives access to a very deep and highly liquid market at the moment - Indicative feedback from target investors indicates that the investment proposition is attractive as investment thesis and in current interest rate environments		
2	Reputational	Breach of S&E Standards	2.1	Conduct of investee or investment targets contradict UGEAP's S&E standards.	Select	Low
	Mitigant			- Category 1 and 2 projects have limited to no negative S&E impact - DB's long track record of origination under S&E policies and guidelines - Only transactions will be originated that meet the S&E standards - 4-eye underwriting process within the IM including independent risk management function to oversee adherence to S&E standards - Selection of partnering institutions that have an adequate S&E management system in place - Ongoing supervision and reporting on S&E aspects - Legal documentation includes representations & warranties on S&E aspects which covers the requirement to adhere to standards that have to be in place with the investee as well as action items to address weaknesses identified in the underwriting process - Background searches and screening for reputational issues and past behavior by DB ('Know Your Customer')		
3	Asset-Liability	Maturity Mismatch Risks	3.1.1	Liquidity needed to pay returns towards A- and B-Capital is insufficient when due	Select	Low
	Mitigant			- Ongoing monitoring of the liquidity position of UGEAP by experienced portfolio manager - Forecast and simulation systems tailored to UGEAP's investments with tailored assumption sets - ALM policy ensuring a structurally front-loaded amortization profile with no negative asset-liability mismatches		
		FX Risks	3.2.1	Mismatch in currencies on assets and liabilities	Select	Low

Mitigant	- Principal of loans denominated in USD only - Capital from investors in UGEAP denominated in USD only - Effect at maturity partly mitigated by expected partial credit guarantee				
		3.2.2	Local currency depreciates which reduces the return that is produced from investments through the FRP structure	Select	High
Mitigant	- Forecasts of yields for investors assume a constant degradation of local currencies in line with current expectations - Currency shocks, from which economies recover, have limited effect on the lasting profitability of the funds - Interest rates on loans in local currency are typically variable allowing high inflation (causing downward pressure on FX) to be compensate by an increase in the lending rates				
		3.2.3	Local currency appreciates which increases the loss that can be recorded in the first loss ledger reducing the number of credit events the bank has to bear the risk on (FRP structure only)	Select	Low
Mitigant	- low likelihood that currencies will increase in value - strengthening of local currency generally correlates with an improvement in the local business environment which improves credit qualities making single losses less likely - through the profit participation, revenue of UGEAP increases which allows for further excess spread covering potential write offs				
	Interest Rate Risks	3.3.1	Interest Coverage Risks: Interest earned on the underlying investments is insufficient to meet target returns for A and B Capital investors.	Select	Medium
Mitigant	- origination uses minimum interest rate targets that are very likely to be achieved by investment managers - portfolio manager in charge to ensure profitability - sound market research on current investment opportunities - risk-based pricing approach to investments - investment committee deciding on the terms of single investments by UGEAP ensuring an independent decision - ongoing monitoring and forecast of profitability				
		3.3.2	Re-Investment Risk: Capital repayments from maturing investments cannot be re-invested at interest rates that are equal or higher to the maturing investment.	Select	Medium
Mitigant	- high pent-up demand for targeted investments is unlikely to be satisfied after only one round of UGEAP investments				

			- origination uses minimum interest rate targets that are very likely to be achieved by investment managers - portfolio manager in charge to ensure profitability - risk-based pricing approach to investments - investment committee deciding on the terms of single investments by UGEAP ensuring an independent decision - ongoing monitoring and forecast of profitability - In case UGEAP becomes structurally unable to serve its target returns, UGEAP shall have the right to partially repay capital to lower its funding base			
			3.3.3	Basis Risk: Timing of interest re-set dates and the point in time cash flows occur compared to the time cash flows are due.	Select	Low
		Mitigant	- UGEAP uses 3m USD LIBOR as reference rate which shall be matched by underlying loans - 3 months horizon chosen to be short in order to limit risk - Ability to make use of interest rate derivatives in case portfolio manager deems it necessary			
4	Portfolio	Credit Risk;	4.1.1	Business of investee fails due to third party failure (supplier, off-taker)	Select	Medium
		Mitigant	- Underwriting criteria and risk analysis covering the whole value chain - Focus on simple and proven technology to be used with limited user- or operator influence - Limit on transactions bearing construction risk / total portfolio of investments - Project developers with track record and experience in the relevant market - Focus on local solutions and technology			
			4.1.2	Business of investee fails due to failure of planning and wrong predictions in financial budgets / sales expectations	Select	Medium
		Mitigant	- Rigid due diligence by investment manager - Where needed, external assessments on technology and budgeting - Working with local financial institutions allows cross-comparison to other transactions / use of local knowledge - Ongoing supervision with quarterly financial reporting allowing for an early warning system to address challenges before they result in business disruption/insolvency			
			4.1.3	Business of investee fails due to market change	Select	Medium
		Mitigant	- Country distribution as well as regional diversification within a single country - Diversification of customers / off-takers (different population strata, industry sector and products) - Focus on simple and existing operational structure for the project that has sufficient alternatives in case market participants leave - Minimum equity requirement to cover periods in which markets may not produce the sales necessary by business to resume profitability			

		- Ensure customers with high willingness and ability to pay - On-going monitoring (quarterly) with ability to react / intervene on changing environments			
Mitigant		4.1.4	Business of investee fails due to management errors / improper conduct	Select	High
		- Lack of experience / track record an exclusion factor in the investment guidelines - Requirement for a clear and transparent ownership structure - Legal due diligence on management - Background checks on business owners and representatives in line with DB's AML / ATF procedures - Key man clauses in loan documentation in case necessary - DB's track record in selecting competent management teams across Africa			
Mitigant		4.1.5	Too little financial cushion / headroom (equity and debt) forcing business / households into insolvency	Select	High
		- Minimum equity requirements for new projects - Business must pass adequate profitability targets to pass underwriting criteria and incentives for equity owners to stay in the business - Strategy of existing owners must be long term oriented - Equity investors must have experience and existing business in the country - Loans bearing a cash flow oriented repayment structure (no bullets)			
Mitigant		4.1.6	Business of investee fails for reasons other than explicitly listed	Select	Medium
		- Proven and rigid underwriting criteria to be applied by UGEAP's investment manager - Underwriting along local financial institutions familiar and present in the market - Ongoing supervision with quarterly financial reporting allowing for an early warning system to address challenges before they result in business disruption/insolvency			
Mitigant		4.1.7	Portfolio of investments is too concentrated with single investments' failure having an over-proportionate effect on the yield investors into UGEAP expect	Select	Low
		- Build up a granular portfolio of loans reducing the impact of single defaults to the total book - Single investment limits set in the investment guidelines & policies of UGEAP to be maintained - Distribution across SSA targeted, corresponding to demand, which will allow for further granularity			
	Transfer and Convertibility Risks	4.2.1	The sovereign of the country imposes transfer and convertibility restrictions with regards to the duty of local individuals and businesses to	Select	Low

				serve payment obligations in foreign currency (in-side the country as well as externally);		
	Mitigant	- Choose countries with acceptable T&C risks with local currency not under devaluation pressure - Adequate FX reserves of the country in question (input to the country limit applicable) - Potentially making use of risk insurance in case prices are acceptable - Ongoing monitoring of macroeconomics				
		Political Risks	4.3.1	Any form of political intervention, on any level of sovereign power (communal, regional national), into the business conduct which includes attempt to expropriate the business / household.	Select	Low
	Mitigant	- GCF as anchor investor is expected to provide a certain degree of protection against interventions - UGEAP's investment objectives are aligned with national strategies and targets - Focus on private sector businesses that have no unnecessary link to governments - Due diligence to confirm adherence with applicable rules and legislation - Risk factor included in setting country and industry limits - Ownership structure of investee is screened for political exposure persons				
5	Operational	Fiduciary:	5.1.1	Investees make use of the funding from UGEAP in contradiction to its investment targets and guidelines	Select	Medium
	Mitigant	- Legal documentation setting out the use and purpose - Quarterly reporting of the underlying transactions to the investment manager - Documentation allowing for site inspections and verifications by investment manager or third party assessor - Quarterly reporting from investees on the underlying transaction to the investment management team & risk management - Quarterly review of portfolio with local partner financial institutions - Annual credit review of the investment by the investment manager, including site visits				
			5.1.2	Behaviour of investees is not monitored adequately (intensity, area of control, way of control)	Select	Low
	Mitigant	- Using remote reporting technologies receiving real-time use data from installations financed - Detailed due diligence and at least quarterly contact of investment during supervision by the investment manager, assisted by DB's Africa-based staff - Monitoring of the oversight by investment office controlled through supporting software of the investment manager - Routine visits to the countries including on-site inspections without prior announcement - Risk sharing with local financial institutions holding a stake in the investment which aligns interest with an institution that has operations on the ground				

			5.1.3	Fraud risks (internal and external)	Select	Low
	Mitigant	- 4-eye principal on investment due diligence, underwriting and proposal to investment committee - independent risk management process - use of reputable and independent legal counsel performing legal due diligence in case required - standard processes to identify individuals - split and documented responsibilities and processes - activities of the investment manager are subject to internal audit as well as banking regulation				
		Staffing:	5.2.1	Investment professionals in charge of investments by UGEAP do not possess the relevant / required experience, knowledge and capabilities	Select	Low
	Mitigant	- experienced team of investment managers with active business in Africa - rigid hiring requirements by investment manager coupled with attractive working environment to ensure sufficient talent is made available to UGEAP - investment committee staffed by long term investment professionals oversees investment activity - DB has local presence and staff in Africa who will provide support to UGEAP				
			5.2.2	There is a lack staff to fulfil the tasks in the respective roles of the service providers to UGEAP	Select	Low
	Mitigant	- adequate staffing plan is pre-condition to obtain DB internal approval on the UGEAP to be set up and marketed with investors, this applies to all funds managed by DB - deep pool of talents amongst the various business divisions allows for filling gaps quickly - businesses invested into are also partially covered by other divisions within DB which allows for potential collaboration (subject to with Chinese wall requirements) - dedicated teams within DB that deal with special situations spontaneously (work out, special incidents)				
6	Legal	Legislative:	6.1.1	Investees / investments breach existing legislation or regulatory requirements applicable to it before or during the investment period	Select	Low
	Mitigant	- External legal due diligence where necessary - Review of all required licenses and permits during the due diligence process as pre-condition before investment - External advice in case necessary - Representations and warranties in the loan documentation - Where required, legal opinions will be sought - Annual review of the investment in line with first-time due diligence criteria				

	- Documentation of initial due diligence and derived follow up / routine checks				
		6.1.2	Change of law causing existing investments or other operations of UGEAP to be in breach of law	Select	Low
Mitigant	- Proactive approach towards planned legislation that might become relevant - Experienced local operators and service units with proper business conduct - Focus on the three Investment Categories allows to monitor existing and changing legislation efficiently - Collaboration with GCF and other development partners in reform dialogue relevant to UGEAP's investments				
	Jurisdictional	6.2.1	Contractual agreements become unenforceable due to either inefficient or unreliable juridical systems	Select	Medium
Mitigant	- Choice of foreign law - Ensure arbitration to be enforceable - In case arbitration is un-enforceable, ensure full adherence to local law in addition to foreign law - Local partner institution to have aligned interest of UGEAP				
	Contractual	6.3.1	Contractual arrangements makes use of non-standard / no arms-length provisions or does not adequately document rights and duties of all parties	Select	Low
Mitigant	- Use of reputable local law and international law counsel in charge of loan documentation - Internal experience in loan documentation and standards applicable - 4 eye principal w.r.t. to loan documentation - experienced investment officers for project finance structures				
		6.3.2	Contractual agreement were executed without proper authorisation	Select	Medium
Mitigant	- local law opinion on corporate capacity condition precedent to disbursement - work with businesses that are already in operation for sufficient time (underwriting criteria)				

** Please expand this sub-section when needed to address all potential material and relevant risks.*

H.1. Logic Framework.

<Please specify the logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework.>

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level[101]	
Paradigm shift objectives	
Shift to low-emission sustainable development pathways	At the program level, UGEAP supports the paradigm shift to a low-emission sustainable development pathway by: • *Enabling local financial institutions to grow their financing activities of businesses in the clean energy sector through the supply of long term risk taking capital to local banks and hence innovate the traditional on-lending model;* • *Tapping into the deep pool of international capital supply and triggering access to private capital at scale for clean energy supply to local end beneficiaries (households and (V)SMEs); thereby facilitating impact at a larger scale and within shorter timeframes;* • *Increasing the efficiency of GCF's capital which will be leveraged by a factor of 4, thereby providing a show-case for blended public-private finance in SSA.* At the level of single transactions and projects, the shift of the paradigm to a low-emission sustainable development pathway is supported by the following: • *Combining sustainable economic growth and climate change mitigation by financing clean energy supply;* • *Technology transfer and innovation by financing state-of-the art proven technology and thereby support the rapidly growing industry to gain scale;* • *Scalability of the business models and the related technologies due to high standardization and proven business cases in the national context;* • *Bundle financial service with technical solutions which overcomes the barrier of high up-front costs for households and businesses that in the past favored fossil fuel based solutions due to their significantly lower or no up-front investment needs; and* • *Availability of local currency debt finance for projects generating local currency revenues.*

[101] Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (24m) (if applicable)	Final)	
Fund-level impacts						
M1.0 Reduced emissions through increased low-emission energy access and power generation	*1.1 Tons of carbon dioxide equivalent (t Co2 eq) reduced or avoided as a result of Fund-funded projects/program*	DB Carbon Measurement Tool results based on project developers' input	Fossil-fuel-based specific indicator in line with IMPVP stan-dards[102]	5m tCO2e	12m tCO2e after year 5 50m tCO2e after year 15	• UGEAP fulfils its investment targets in terms of the number of investments and the USD amount expected to be invested. • annual savings • distribution of projects in the spilt 20/20/60 over the 3 categories • Assume 50% of Category 3 transactions to be grid-connected and not replacing Diesel generation sets (which lowers the CO2e reduction) • Final target based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • mid target based on an investment of USD 200mn after 24 month • no change in the CO2 quantification approach and consumer behavior • If USD2,100m would be invested through reinvestments[103], significantly higher savings could be achieved which provides upside potential to the targets (year 15 scenario) •
Private sector capital mobilized	*Volume of finance leveraged (or*	Total CAPEX as recorded	0 (currently no private sector	UGEAP invested	UGEAP invested	• UGEAP does attract sufficient capital from private sector investors

[102] IMPVP is the International Performance Measurment and Verification Protocol accounting and reporting standard.

[103] Based on a cash flow model forecast on the available repayments from amortizing transactions that would produce cash to UGEAP which can be re-invested.

	mobilized) by UGEAP funding	in the DB Carbon Measurement Tool based on project developers' input	capital contribution for debt funding towards Target Investments)	capital: 200m Share of GCF / Total Capital <=0.2	capital:= >500m Share of GCF / Total Capital <=0.2	• Actual measurement over program lifetime • If USD2,100m would be invested through reinvestments, the share of GCFs funding would be significantly lower – which provides an upside.
Given the targets of UGEAP, DB has expanded the Paradigm Shift Objectives to be tracked by the M&V framework to include the amount of funding by which GCF's contribution will be leveraged.						

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (24m)	Final	
Project/ programme outcomes	**Outcomes that contribute to Fund-level impacts**					
M6.0 Increased number of small, medium and large low-emission power suppliers	*6.2 Number of households and individuals with improved access to low-emission energy sources*	quarterly report by project developer on the number of off-take points	0	61,520 energy consumers	153,800 energy consumers after year 5 461,400 energy consumers after year 15	• UGEAP fulfils its investment targets in terms of the number of investments and the USD amount expected to be invested. • Business of investees is successful and does not fail due to market changes, third party failure, regulatory changes etc. • distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestments, more consumers could be reached (year 15 upside scenario)

	6.3 MWs of low-emission energy capacity installed, generated and/ or rehabilitated as result of GCF support	quarterly report by project developer on the installed capacity	0	140MWp	346MWp after year 5 1,500 MWp after year 15	• UGEAP fulfils its investment targets in terms of the number of investments and the USD amount expected to be invested. • Business of investees is successful and does not fail due to market changes, third party failure, regulatory changes etc. • distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestments, a higher MWp amount could be achieved (year 15 upside scenario)
Employment created	*Number of direct jobs created*	Annual report by project developer on number of jobs created	0	2,000	5,000 after year 5 15,000 after year 15	• Progress of this outcome is affected by conduct of investees • distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestment, more jobs could be created (year 15 upside scenario)
Share of female employed	*Number of female over total number of employees*	Annual report by project developer	current (prior to first close) % of female employees	>=25%	>=40%	• Progress of this outcome is affected by conduct of investees • Direct jobs only
Access to electricity for women (Category 1 and 2 only)	*Females that have first time access to electrical energy as a percentage of the total number of population electrified first time*	Annual report by project developer	0	>=0.5	>=0.5	• UGEAP fulfils its investment targets in terms of the number of investments and the USD amount expected to be invested. • Business of investees is successful and does not fail due to market changes, third party failure, regulatory changes etc. • Progress of this outcome is affected by conduct of investees
Taxable revenues created within	*Amount of tax paid within the Target Region*	Annual financial reports by	current (prior to first close) tax	Positive trend	Positive trend	• UGEAP fulfils its investment targets in terms of the number of investments and the USD amount expected to be invested. • Business of investees is successful and does not fail due to

the Target Region		project developer	paid in the Target Region			market changes, third party failure, regulatory changes etc. • Progress of this outcome is affected by conduct of investees
Given the targets of UGEAP, DB has expanded the Outcomes, Outputs and Activities to be tracked by the M&V framework to include further socio-economic benefits and gender specific considerations.						
Project/programme outputs	**Outputs that contribute to outcomes**					
1.Category 1 Projects: Number of solar home systems installed	Category 1 Projects: Number of solar home systems	quarterly report by project developer on progress	0	60,000 solar home systems	150,000 solar home systems after year 5 450,000 solar home systems after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestment, more SHS could be financed (year 15 upside scenario)
2. Category 2 Projects: Number of mini-grids installed	Category 2 Projects: Number of mini-grids	quarterly report by project developer on progress	0	1,400 mini-grids	3,500 mini-grids after year 5 10,500 mini grids after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestment, more mini-grids could be financed (year 15 upside scenario)
3. Category 3 Projects: Number of renewable energy systems installed	Category 3 Projects: Number of renewable energy systems	quarterly report by project developer on progress	0	120 SME systems	300 SME systems after year 5 900 SME systems after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • If USD2,100m would be invested through reinvestment more SME systems could be financed (year 15 upside scenario)

4.Category 1 Projects: Total volume of capacity installed	Category 1 Projects: Total volume of capacity	quarterly report by project developer on progress	0	7 MWp	17MWp after year 5 70 MWp after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • The USD2,100m provides upside to the target number (year 15 upside scenario).
5. Category 2 Projects: Total volume of capacity installed	Category 2 Projects: Total volume of capacity	quarterly report by project developer on progress	0	5 MWp	11MWp after year 5 50 MWp after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • The USD2,100m provides upside to the target number (year 15 upside scenario).
6. Category 3 Projects: Total volume of capacity installed	Category 3 Projects: Total volume of capacity	quarterly report by project developer on progress	0	128 MWp	318 MWp after year 5 1,380 MWp after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • The USD2,100m provides upside to the target number (year 15 upside scenario).
7. Permanent jobs created	Number of permanent jobs created directly	Annual report by project developer	0	1,320	3,300 after year 5 15,600 after year 15	• Progress of this outcome is affected by conduct of investees • distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • The USD2,100m provides upside to the target number (year 15 upside scenario).
8. Share of women employed	Share of women over total number	Annual report by project	current at the time of	>=30%	>=45%	• Progress of this outcome is affected by conduct of investees

permanently	of permanent employees	developer	investments			
9. Temporary jobs created	Number of temporary jobs created directly	Annual report by project developer	0	680	1,700 after year 5 7,900 after year 15	• distribution of projects in the spilt 20/20/60 over the 3 categories • based on the target to invest USD500m annually over the 5 year fund raising period while re-investments over the remaining 10 years increase upside • capital can be employed entirely • The USD2,100m provides upside to the target number (year 15 upside scenario).
10. Share of women employed temporarily	Share of women over total number of permanent employees	Annual report by project developer	current at the time of investments	>=25%	>=40%	• Progress of this outcome is affected by conduct of investees
11. Access of women to technical training	Share of women being trained by project developers for either permanent or temporary jobs or for external service providers	Annual report by project developer	current at the time of investments	>=25%	>=50%	• Progress of this outcome is affected by conduct of investees

Activities	**Description**	**Inputs**	**Description**
1.1. DB contribute and originate funding for GEAP up to USD 500m	UGEAP will be an investment vehicle with DB as investment manager	1.1.1. GCF to invest into B-Capital of UGEAP	Activity 1.1.1 is a pre-condition for Activities 1.1.2 and 1.1.3.
		1.1.2. DB to invest into UGEAP	Activity 1.1.2 is a pre-condition for Activity 1.1.3
		1.1.3. DB sources additional public and private investors for A and B capital	Activity 1.1.3 is a pre-condition for investment activities to begin (Activities 2.1, 3.1 and 4.1)

2.1. DB identifies local partners	Close Funding and Risk Participation Agreements with up to 5 local financial institutions that have the capacity to invest each up to USD 50m over 5 years in Target Investments	2.1.1. Local banks or financial institutions as borrower from UGEAP	Required for risk participation structure
		2.1.2. Local banks or financial institutions as parallel investors to UGEAP	Required for syndication structure
3.1. DB identifies project developer / project owners with local partners		3.1.1. Project pipeline for UGEAP	Requirement to invest capital into projects that deliver Outputs as indicated above.
		3.1.2. Screen projects in line with UGEAPs guidelines and policies (Investment, S&E as well as outcomes with regards to climate and co-socio benefit indicators as listed above)	
		3.1.3 Due diligence on projects in line with UGEAP's guidelines	
		3.1.4 Documentation of financial structure in line with UGEAP's guidelines	
		3.1.5 Subject to approval, execution and disbursement in line with UGEAP's guidelines and	

		procedures.	
4.1. UGEAP invest along local financial institutions	Originate and underwrite projects to be funded to or syndicated with local partners	4.1.1. UGEAP to be set up as investment vehicle	Requirement to invest capital into projects that deliver Outputs as indicated above.
		4.1.2. Screen projects in line with UGEAPs guidelines and policies (Investment, S&E as well as outcomes with regards to climate and co-socio benefit indicators as listed above)	
		4.1.3 Due diligence on projects in line with UGEAP's guidelines	
		4.1.4 Documentation of financial structure in line with UGEAP's guidelines	
		4.1.5 Subject to approval, execution and disbursement in line with UGEAP's guidelines and procedures.	

H.2. Arrangements for Monitoring, Reporting and Evaluation

<Please specify institutional setting and implementation arrangements for monitoring and reporting. Please indicate how you will organize mid-term and final evaluations.>

Information and Reporting Framework

Within the Investment advisory agreement certain reporting processes, routines and recipients will be defined. Communication channels of the UGEAP will be a dedicated website of the fund to be maintained by the Investment Manager. The website will act as information exchange platform targeting investors as well as stakeholders. In parallel to the information that will be made public, reports will also be distributed to specific recipients only on a non-public basis.

Overall, key reports to be prepared include:

- *Quarterly*
  - To be published online:
    - Key fact sheet outlining the Fund's activities in the reporting quarter, including information on new investments, portfolio performance, defined impact indicators such as CO2 savings;
    - Each investment will be presented in a summary on the website;
  - For investors only through the custodian:
    - Quarterly, non-audited financial statements prepared according to requirements under IFRS;
    - Quarterly, non-audited valuation report detailing the net asset value of each investor's share at quarters' end;

Annual Report

- To be published online:
  - An annual report on the operations of the UGEAP covering the following sections;
    - Activities report on investments;
    - Activities report on funding;
    - Social & Environmental compliance report including impact reporting;
    - Financial results (balance sheet and profit & loss calculation) according to requirements under IFRS;
- For investors only through the custodian:
  - Audited financial statements in accordance with IFRS;
  - Audited valuation report detailing the net asset value of each investor's share at the end of the financial year.

Quarterly and annual investor reports will include data on the leverage GCF would have achieved with its investment into the UGEAP.

An impact evaluation can be conducted at the end of the investment term.

Institutional Setting and Implementation Arrangement for Carbon Reporting

In its function as investment manager of the UGEAP, Deutsche Bank will further assume the obligation to:

- assess the expected CO2e savings from a single investment prior to the investment (forward-looking assessment) and form a decision in line with the guidelines of the UGEAP that also define eligible investments from a carbon emission reduction perspective;
- monitor / estimate the actual CO2e savings as a result of UGEAP's investment over the lifetime of the

installation;

Within Deutsche Bank's Sustainable Investments practice, dedicated staff is in charge to support the Investment Management Team in these tasks and provide carbon and energy management services. The team provides technical services and strategies to ensure investments made globally in renewable energy and energy efficiency measures reduce energy consumption primary energy consumption and/ or CO2e as prescribed by UGEAP's investment criteria.

Analysis & Monitoring Process

Within the investment guidelines and the operating manual monitoring, reporting and verification processes, routines and responsibilities will be defined. The overall process can be divided into 4 steps covering the lifetime of the investment of UGEAP:

- Pre-Assessment of the targeted investment
- Due diligence on the calculation of the expected CO2e / energy savings (annual and lifetime)
- Monitoring of the realized CO2e / energy savings (annual and lifetime)
- Verification of the reported CO2e / energy savings (annual and lifetime)

The following chart depicts the relevant actions in the different phases and the results:

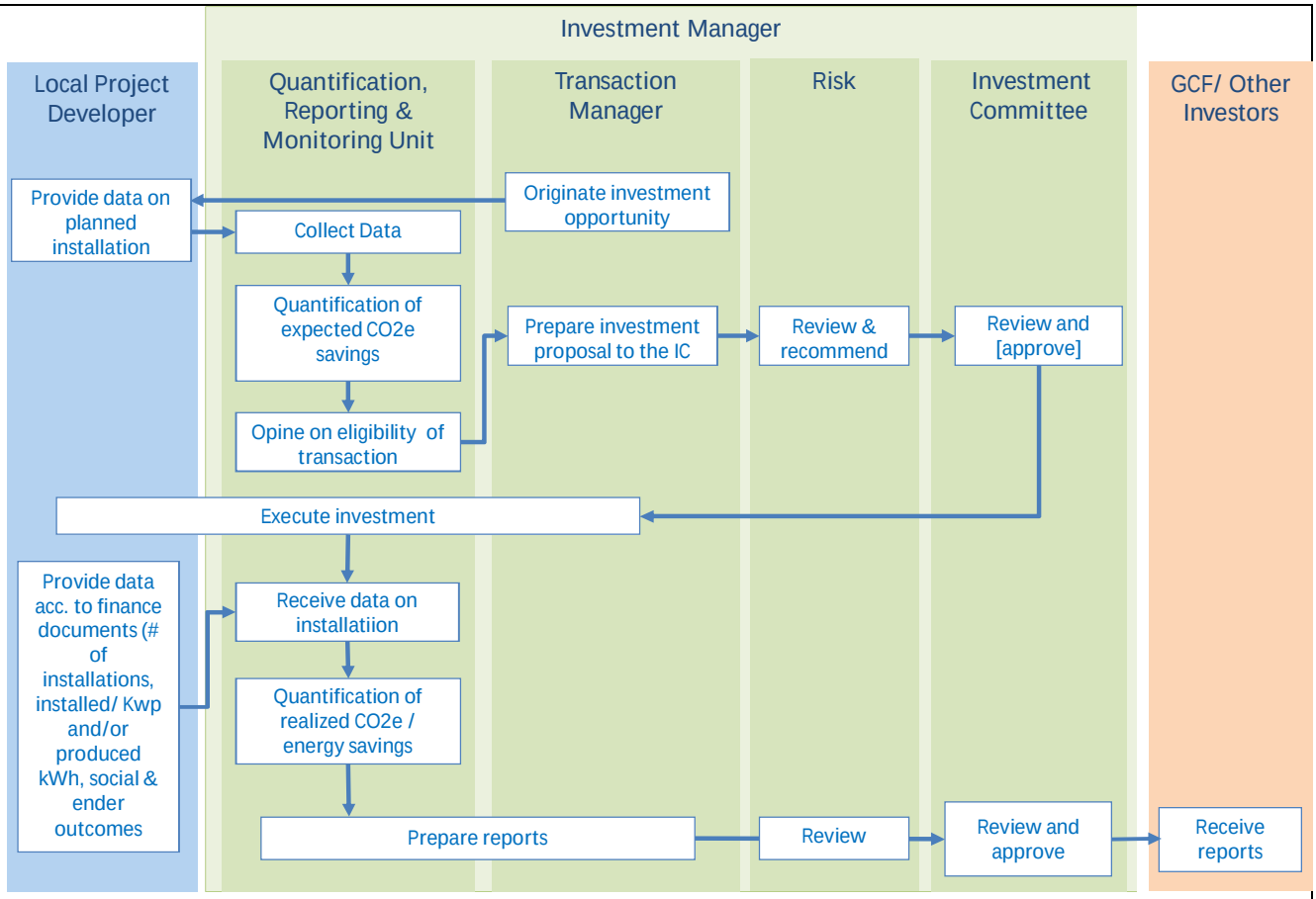
Graph 25: Phases of CO2e savings measurement

Phase	Pre-Assessment	Due Diligence	Monitoring	Verification
Action	▪Check if transactions fit into general profile of CO2 savings and other impacts	▪Quantification of expected CO2 savings through methdologies for Cat. 1-3 as outlined in Section E.1.2	▪Collection of reports from project developer	▪Calculation of CO2 numbers based on agreed methodologies
Outcome	Eligibility of transaction	Expected CO2 numbers (annual/ lifetime)	Number of installations/ installed kWp	Realized CO2 savings

Source: Deutsche Bank

The following process chart provides a detailed overview of the different steps and interaction between the different teams of the investment manager as well as the relevant interaction with the owner of the installation that shall receive funding facilitated by UGEAP.

Graph 26: Process chart on information flow and responsibilities



Source: Deutsche Bank

Applicable Standards & Guidelines

Selected investment opportunities that fall into the target range of the UGEAP have been analyzed by the carbon accounting experts in line with the most appropriate methodology, the results of which are presented in section E.1.2. While on selected installations data from operations were available, DB has chosen to apply a unique framework, methodologies developed by and for the CDM, to quantify the expected CO2e savings in order to provide for a consistent approach.

However DB's carbon accounting procedures and guidelines cover the whole spectrum of potential scenarios for an investment in the future, beyond methodologies that are applied by the CDM. This is to increase the quality of information and address the limitations of assumption based approaches. I.e. CDM methodology used above is limited by its scope and hence may be inappropriate for larger installations that also deviate from the kind of installations that formed the basis when the methodologies were developed.

Additional to the methodology outlined in Section E.1.2, the standards used by Deutsche Bank to calculate and report savings also for other fund mandates and investment activities are:

- *Key calculation principle: Energy savings (when actual data available)*
  - International Performance Measurement and Verification Protocol (IPMVP);
  - IPMVP Core Concepts (2014);
  - IPMVP Concepts and Practices for Determining Energy Savings in Renewable Energy Technologies Applications (2003);

- IPMVP Concepts and Practices for Determining Energy Savings in New Construction (2006)

Key calculation principle: Energy savings (estimated approach in case actual data is not available)

- Clean Development Mechanism

Focus calculation: Measurement and verification standards

- EU Directive 2006/32/EC

Key calculation principle: Carbon savings and accounting

- ISO 14064-2 (2009)

Static data sources

- GHG Protocol Stationary Combustion Tool (2014)
- DEFRA (2015)

DB foresees that these standards would also be applicable to UGEAP since the existing CO2e savings reporting infrastructure shall be used of UGEAP also.

For each investment the baseline and savings calculations will be aligned with the most appropriate international standards and protocols. These decisions will be influenced by the type of technology, available data and size of investment.

Institutional arrangements for monitoring socio-economic benefits

Through its existing investment funds DB has experience in requesting reporting from investees on socio-economic indicators and monitoring their development. KPIs are clearly defined at the time of financial documentation and investees are asked to report on them in regular intervals. In some cases, DB collaborates with experienced parties as compliance advisors. UGEAP can follow a similar model, whereby regular reporting will need to be provided by the investees, while DB with the support of a qualified external party (such as the International Labor Organization or a local university or research institute) can verify and triangulate the data provided.

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I. Supporting Documents for Funding Proposal (not part of the public version)	
☐	NDA No-objection Letter
☐	Integrated Financial Model that provides sensitivity analysis of critical elements (xls format)
☐	Term Sheet
☐	Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan
☐	Map indicating the location of the project/program
☐	Timetable of project/program implementation

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

To: The Green Climate Fund ("GCF")
Songdo International Business District
175, Art Center-daero
Yeonsu-gu, Incheon 406-840
Republic of Korea

Cotonou, January 22, 2016

Re: Funding proposal for the GCF by Deutsche Bank AG regarding the Universal Green Energy Access Programme (UGEAP)

Dear Madam, Sir,

We refer to the UGEAP programme in Benin as included in the funding proposal submitted by Deutsche Bank AG to us on 20 January 2016.

The undersigned is the duly authorized representative of the Directorate General of Climate Change Management, the National Designated Authority of Benin.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the UGEAP as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of Benin has no-objection to the programme as included in the funding proposal;
(b) The programme as included in the funding proposal is in conformity with Benin's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

MECGCCRPRNF

Name: Mr. Comlan Médard Ouinakonhan

Title: National Designated Authority

84

REPUBLIC OF KENYA
THE NATIONAL TREASURY

Telegraphic Address: 22921
Finance – Nairobi
FAX NO. 310833
Telephone: 2252299
When Replying Please Quote

THE NATIONAL TREASURY
P O BOX 30007 – 00100
NAIROBI

Ref: CONF/MOF/281/02/84

Date: 21st October, 2015

Ms. Héla Cheikhrouhou,
Executive Director,
Green Climate Fund,
Songdo, Republic of South Korea.

Dear Ms. Cheikhrouhou

Re: Funding proposal to the Green Climate Fund by Acumen's – "KawiSafi Ventures Fund" and Deutsche Bank's – "Universal Green Energy Access Platform"

We refer to **Acumen's KawiSafi Ventures Fund"** and **Deutsche Bank's – "Universal Green Energy Access Platform" programs** to be implemented in Kenya as included in the funding proposal submitted by **Acumen Fund Incorporated** and **Deutsche Bank** to the National Treasury as the **"National Designated Authority"** for the Green Climate Fund (GCF). Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the programs as included in the funding proposal.

The two programs are in accordance with our Intended Nationally Determined Contribution submitted to the UNFCCC. Kenya aims to achieve a low carbon, climate resilient development pathway and seeks to abate GHG emissions by 30% by 2030 relative to the BAU scenario of 143MtCO_2eq in line with our sustainable development agenda. This will include, among others, the promotion and implementation of expansion in ***geothermal, solar*** and ***wind*** energy production as well as, other renewable and clean options, hence, the need for the international support in the form of finance, investment, technology development and transfer, and capacity building.

The purpose of this letter, therefore, is to inform you that our national process for ascertaining no- objection to the two programs as included in the funding proposal has been dully followed. The no-objection applies to only those activities proposed for the implementation within the scope of the agreed programs. We also acknowledge that this letter will be made publicly available on the GCF website.

Yours Sincerely

DR. KAMAU THUGGE, EBS
PRINCIPAL SECRETARY/NATIONAL TREASURY/GCF FOCAL POINT

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel. No. 061 – 2842568
Fax. No. 061 - 229936
E-mail: pmuteyauli@yahoo.co.uk

Cnr of Dr. Kenneth David Kaunda Street
& Robert Mugabe Avenue
Private Bag 13306
Windhoek

Enquiries: Mr. P. Muteyauli

Date: 6 October 2015

Green Climate Fund
G-Tower, 24-4 Songdo-dong, Yeonsu-gu
Incheon City, Republic of Korea

Dear Sir/Madam,

SUBJECT: FUNDING PROPOSAL FOR THE GREEN CLIMATE FUND BY DEUTSCHE BANK REGARDING 'UNIVERSAL GREEN ENERGY ACCESS PLATFORM'

We refer to the programme 'Universal Green Energy Access Platform' in the Republic of Namibia as included in the funding proposal submitted by Deutsche Bank to us. The undersigned is the duly authorized representative of the Ministry of Environment and Tourism, the National Designated Authority of the Republic of Namibia.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the programme as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of the Republic of Namibia has no-objection to the programme as included in the funding proposal;
(b) The programme as included in the funding proposal is in conformity with the Republic of Namibia's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

Yours Sincerely,

Ministry of Environment & Tourism
06 -10- 2015
Office of the
PERMANENT SECRETARY
REPUBLIC OF
NAMIBIA

M. Lindenque
Permanent Secretary

All official correspondence must be addressed to the Permanent Secretary

FEDERAL MINISTRY OF ENVIRONMENT

HEADQUARTERS, MABUSHI, ABUJA.

Ref No. FMENV/DCC/544/Vol. 1 Date: 01 April 2016

To: The Green Climate Fund ("GCF")
Songdo International Business District
175, Art Center-daero
Yeonsu-gu, Incheon 406-840
Republic of Korea

Dear Madam,

Re: Funding proposal for the GCF by Deutsche Bank AG regarding the Universal Green Energy Access Programme (UGEAP)

We refer to the UGEAP programme in Nigeria as included in the funding proposal submitted by Deutsche Bank AG to us on 20January 2016. The undersigned is the duly authorized representative of the Federal Ministry of Environment, the National Designated Authority/focal point of Nigeria.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the UGEAP as included in the funding proposal. By communicating our no-objection, it is implied that:

(a) The government of Nigeria has no-objection to the programme as included in the funding proposal;
(b) The programme as included in the funding proposal is in conformity with Nigeria's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.
Kind regards,

Name: Dr. Yerima Peter Tarfa
Title: Director, Department of Climate Change

UNITED REPUBLIC OF TANZANIA
VICE PRESIDENT'S OFFICE

Telegrams :"MAKAMU",
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6 Albert Luthuli Street,
P.O.BOX 5380,
11406 Dar es Salaam.
TANZANIA.

Ref: BD.38/90/01/P

09 October 2015

The Green Climate Fund ("GCF"),
Songdo International Business District,
175, Art Center-daero,
Yeonsu-gu, Incheon 406-840,
Republic of Korea.

Re**: Funding proposal for the GCF by Deutsche Bank AG regarding the Universal Green Energy Access Programme (UGEAP)**

Dear Madam,

We refer to the UGEAP programme in Tanzania as included in the funding proposal submitted by Deutsche Bank AG to us on 07 October 2015.

The undersigned is the duly authorized representative of the Office of Vice President, the National Designated Authority/Focal Point of Tanzania.

We hereby communicate our no-objection to the UGEAP as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of Tanzania has no-objection to the programme as included in the funding proposal;
(b) The programme as included in the funding proposal is in conformity with Tanzania's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the programme as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the programme as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme in Tanzania.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

Sazi Salula
Permanent Secretary

Environmental and social report(s) disclosure

Basic project/programme information	
Project/programme title	Universal Green Energy Access Programme (UGEAP)
Accredited entity	Deutsche Bank AG
Environmental and social safeguards (ESS) category	Intermediation 2 (I2)

Environmental and Social Risk Management Report (ESRM)	
Date of disclosure on accredited entity's website	2016-06-20
Language(s) of disclosure	English and French
Link to disclosure	ESMR: https://www.db.com/cr/de/konkret-alternative-investments.htm
Other link(s)	http://