United Nations Development Programme

Project Document template for projects financed by the various GEF Trust Funds

Project title: *Niger national child project under the Africa Minigrids Program*		
Country: Niger	**Implementing Partner (GEF Executing Entity):** Nigérienne Agency for the Promotion of Rural Electrification / *Agence Nationale Pour l'Électrification Rurale* (ANPER)	**Execution Modality:** *Full NIM*
Contributing Outcome (UNDAF/CPD, RPD, GPD): *UNDAF Outcome: By end of 2022, the target rural populations will have access to innovative supply chains that generate decent jobs, participate in crisis and disaster management mechanisms related to food and nutrition insecurity and sustainable management of natural and energy resources adapted to climate change* *By 2022, targeted rural populations have access to innovative value chains for decent job creation, participate in preventive mechanisms for the management of food and nutrition insecurity crises and disasters and the sustainable management of natural resources and energy adapted to climate change.* • *Output 1.2.: Vulnerable communities in targeted rural areas, particularly women and youth, are empowered to sustainably manage natural resources by improving access to renewable energy and alternative technologies Vulnerable communities in targeted rural areas, particularly women and youth, have required capacities to sustainably manage natural resources with increased access to renewable energy and alternative technologies.*		
UNDP Social and Environmental Screening Category: *Substantial*	**UNDP Gender Marker:** *2*	
Quantum Award ID: 1201256	**Quantum Project ID:** 00131725	
UNDP PIMS ID number: 6659	**GEF Project ID number:** 10832	
LPAC meeting date: 20 **October 2022**		
Last possible date to submit to GEF: 31 August 2022		
Latest possible CEO endorsement date: 19 December 2022		
Project duration in months: 48 months		
Planned start date: 1 September 2024	**Planned completion date:** 31 August 2028	
Expected date of Mid-Term Review (MTR) submission to the GEF: 1 September 2026	**Expected date of Terminal evaluation (TE) submission to the GEF:** 28 February 2028	
Expected Operational Closure Date: 31 May 2029	**Expected Financial Closure Date:** 30 November 2029	
Brief project description: As part of the UNDP-supported, GEF-financed Africa Minigrids Program (AMP), this project seeks to increase access to accessible, reliable, affordable, clean energy in Niger rural areas by increasing the financial viability, and promoting scaled-up commercial investment, in renewable energy (RE) minigrids, with a focus on cost-reduction levers and innovative business models. This will be achieved through 4 project outcomes: (i) Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in RE minigrid development; (ii) Innovative business models based on cost reduction are operationalized, with strengthened private sector participation in RE minigrid development; (iii) Financial sector actors are ready to invest in a pipeline of low-carbon minigrids and concessional financial mechanisms are in place to incentivize scaled-up investment; and (iv) Digitalization and data are		

mainstreamed into local minigrid market development, and knowledge, awareness, and networking opportunities in the minigrid space are improved and facilitated. The project is expected to bring about direct commissioning of at least 0.334 MW in solar photovoltaic (PV) generation capacity and 0.814 MWh of battery storage. The lifetime greenhouse gas (GHG) emissions reduction from project activities, particularly investment in minigrid pilots, is estimated at 17,015 metric tons of carbon dioxide equivalent (tCO2eq) (direct) and 2,052,000 tCO2eq (indirect). The number of direct beneficiaries is estimated at 13,534 people, of which at least 51 percent are women, as a result of 4 new and/or improved minigrid connections.	
FINANCING PLAN	
GEF Trust Fund grant	USD 1,601,376
UNDP TRAC resources	USD 300,000
Confirmed cash co-financing to be administered by UNDP	USD 300,000
(1) Total Budget administered by UNDP	**USD 1,901,376**
(2) Total confirmed co-financing to this project not administered by UNDP	**USD 136,457,017**
(3) Grand-Total Project Financing (1)+(2)	**USD 138,358,393**

SIGNATURES:

Signature: ***Mr MOUMOUNI BOUBACAR SAIDOU,*** *Ministre Délégué auprès du Premier Ministre, Chargé des Finances* 04 SEPT 2024.	**Agreed by Government Development Coordination Authority**	**Date/Month/Year:**
Signature: Pr Haoua AMADOU, *Ministre de l'Energie*	**Agreed by Implementing Partner** LA MINISTRE	**Date/Month/Year:** 15/08/24
Signature: Mme Jane O. YEBOAH, *Représentante Résidente ai*	**Agreed by UNDP** Jane O. YEBOAH D.R.R	**Date/Month/Year:** 13/8/24

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AFD	French Development Agency (*Agence Française de Développement)*
AfDB	African Development Bank Group
AMDA	Africa Minigrid Developers Association
AMP	Africa Minigrids Program
ANERSOL	National Agency for Solar Energy (*Agence Nationale d'Energie Solaire*)
ANPER	National Rural Electrification Agency (*Agence Nationale Pour l'Électrification Rurale*)
APE Solaire	National Association of Solar Energy Professionals *(Association Nationale des Professionnels de l'Energie Solaire)*
ARSE	Regulatory Authority for the Energy Sector *(Autorité de Régulation du Secteur de l'Énergie)*
BOAD	*West African Development Bank*
BPPS NCE	Bureau for Policy and Programme Support, Nature, Climate and Energy
CEMG	Clean Energy MiniGrid
CSR	Corporate Social Responsibility
DFI	Development Finance Institution
DREI	Derisking Renewable Energy Investment
E&S	Environmental & Social
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Center for Renewable Energy and Energy Efficiency
ESIA	Environmental and Social Impact Assessment
ESMAP	Energy Sector Management Assistance Program
ESMP	Environmental and Social Management Plan
EU	European Union
FISAN	Investment Fund for Food and Nutrition Security (*Fonds d'investissement pour la Sécurité Alimentaire et Nutritionnelle)*
GEF	Global Environment Facility
GEFSEC	Global Environment Facility Secretariat
GIS	Geographic Information System
GMG	Green minigrid
GoN	Government of Niger
IP	Implementing Partner
IPP	Independent Power Producer
IsDB	Islamic Development Bank
IRENA	International Renewable ENergy Agency
LCOE	Levelized Cost of Electricity
LDC	Least Developed Country
MERE	Ministry of Energy and Renewable Energies
MF	Ministry of Finance
MFF	MiniGrid Funding Facility
MFI	Microfinance Institution
M&E	Monitoring & Evaluation
MG	Minigrid

MSP	Medium Sized Project
NESAP	Niger Solar Electricity Access Project
NIGELEC	Electricity Utility in Niger
O&M	Operations & Maintenance
PASDEL	Project for Access to Energy Services and Promotion of Local Development (*Projet de l'Accès aux Services Energétiques et de promotion du Développement Local)*
PAYGO	Pay-As-You-GO
PDAE	Master Plan for Access to Electricity (*Plan d'Accès à l'Électricité*)
PERAN	Off-Grid Autonomous Rural Electrification Projects
PFD	Program Framework Document
PIF	Project Identification Form
PIR	GEF Project Implementation Report
POPP	Programme and Operations Policies and Procedures
PPG	Project Preparation Grant
PTFM	Multifunctional Platform
RE	Renewable Energy
RMI	Rocky Mountain Institute
SEFA	Sustainable Energy Fund for Africa
SESA	Strategic Environmental and Social Assessment (SESA) approach
SHS	Solar Home System
SNAE	National Strategy for Electricity Access (*Stratégie Nationale d'Accès à l'Électricité*)
STAP	GEF Scientific Technical Advisory Panel
TOC	Theory of Change
ToT	Training of Trainers
TSE	Special Electricity Tax (*Taxe Spécifique d'Électricité*)
WAEMU	West African Economic and Monetary Union
WB	World Bank

I. DEVELOPMENT CHALLENGE

General Context: Niger is West Africa's largest country (1,267 million km2) with one of the fastest population growth rates on the planet at 3.8%[1] reaching 24.2 million inhabitants in 2020[2]. However, this large landlocked country has one of the lowest population densities on the continent. About 80% of its area is barely inhabited desert and most of the population lives in rural areas in the southern parts of the country. Niger, classified as Least Developed Country (LDC), is one of the poorest countries in the world with 42% of its population living in extreme poverty in 2021 (under $1.90 a day)[3] out of which 75% are girls and women[4]. The population is comprised by 61% of working age women, however 84% men are part of the active population[5], therefore there is room to integrate women as part of the workforce. It has a weak economic diversification and competitiveness where agriculture accounts for almost 40% of its Gross Domestic Product (GDP) - mainly subsistence farming and herding. About 90% of its population works in the agricultural sector. About 90% of Niger's export revenues are related to mining including gold, uranium and thorium ores and concentrates[6].

In Niger the number of refugees and displaced persons keep rising especially at its borders with neighboring conflicted countries such Burkina Faso, Mali and Nigeria. In March 2021, according to UNOCHA, there were about 250,000 refugees and over 276,000 displaced persons in Niger (over half are estimated to be women and almost 66% are under 18 according to UNHCR).

The country, one of the hottest on the planet, is also increasingly vulnerable to natural disasters and climate change effects while barely contributing to Greenhouse Gas (GHG) emissions globally (0.009% in 2019[7]). Climate shocks lead to a high rainfall variability and negatively impact the socio-economic situation. Water constraints, desertification, reduced agricultural yields, land deterioration, food insecurity, rising food prices, rapid population growth and increased pressure on arable lands become commonplace.

COVID-19 has compounded the structural fragility of the country, in addition to security and climate issues, and leading to a lower annual economic growth rate (shrinking to 3.6% in 2020 compared to 5.9% in 2019)[8]. While investment efforts around oil are boosting the economic growth rate in 2021 and will continue in the coming years with the exploitation of new oil fields, the livelihoods of the population especially in rural areas will remain at risk.

Energy situation in Niger: The power mix in Niger is highly dependent - close to 80% - on cheaper hydroelectricity imports from neighboring Nigeria (on average 90% cheaper than the production by the national power utility NIGELEC according to a report in 2016). Another 18% comes from costly diesel thermal generation by NIGELEC. The utility gets its fuel tax-free to nourish its diesel generator.

Niger has considerable untapped renewable energy (RE) potential, and the Government wants to increase its share of RE in the power mix. Currently, solar energy accounts for 0.9% of power mix, the country is well endowed with solar irradiation throughout the year (6 Kwh/m2/day with a daily insolation of 9 hours) and therefore, the production is expected to increase to 30% by 2030 according to the Sustainable Energy for All (SE4All) Investment Prospectus (2019).[9]

Moreover, the Kandadji 130 MW hydropower plant is planned to be operationalized by 2027.

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[1] https://data.worldbank.org/indicator/SP.POP.GROW?locations=NE, visited on 4 May 2022
[2] https://data.worldbank.org/indicator/SP.POP.TOTL?locations=NE, visited on 4 May 2022
[3] https://www.worldbank.org/en/country/niger/overview#1 visited on 4 May 2022
[4] https://www.concernusa.org/story/poverty-in-niger/ visited on 4 May 2022
[5] https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=ML-NE-BF-TD-MR visited on 4 May 2022
[6] https://www.worldstopexports.com/nigers-top-10-exports/#:~:text=The%203%20biggest%20exported%20products,of%20Niger's%20overall%20export%20revenues visited on 4 May 2022
[7] https://ourworldindata.org/co2/country/niger, visited on 4 may 2022
[8] https://www.coface.com/Economic-Studies-and-Country-Risks/Niger, visited on 4 may 2022
9 IRENA, Niger Renewables Readiness Assessment 2013, available at http://www.irena.org/DocumentDownloads/Publications/RRA_Niger.pdf

National electricity capacity today represents only 272 MW (excluding mining companies Independent Power Producers IPP) with an import capacity of 194 MW. The existing national grid has a limited capacity in addition to being fragmented with 4 grids across the country that are not connected to each other.

Niger's electricity demand is expected to grow by 10% per annum[10] in the coming years - one of the highest growth rates in the world. Growing population and low electricity access rates are the main levers of this increase. The electricity access rate is one of the lowest in Sub-Saharan Africa at around 19.3% with 19.5 million people lacking access to electricity[11]. Based on a Multi-Tier Framework (MTF) survey done in 2018, 15.8% are connected to NIGELEC's national grid. In addition, discrepancies are relatively high between urban and rural areas; 48% in urban areas and only about 13% in rural areas (2022)[12].

Niger has taken some critical steps to improve the electricity access rate, especially in rural areas and energy markets by creating a regulatory body, *Autorité de Régulation du Secteur de l'Energie* (ARSE), to increase transparency and fair competition among numerous energy actors. The Government also created *Agence Nigérienne de Promotion de l'Electrification en milieu Rural* (ANPER), which is mandated to design, implement, and monitor rural electrification programs throughout the country.

Government has lately developed the Green MiniGrids (GMG) market through a variety of efforts to:

- Improve the legal and regulatory framework and create a conducive environment to promote access to electricity and the promotion of green minigrids (GMG), including via programmes/projects such as the World Bank's Electricity Access Expansion Project (NELACEP) and the African Development Bank's (AfDB) Green minigrid support Programme (funded by SEFA))[13], among others. However, a clear minigrid delivery model including the tariffication aspects is not yet available in this relatively nascent GMG market in Niger. The *Plan Directeur d'Accès à l'Électricité* (PDAE) for 2021-2025 identified clear criteria for rural localities which should benefit from MGs for their electrification (about 400 MGs). There is no active multi-stakeholder concertation framework yet in place around minigrids (MG) leading to limited experience sharing and some double work.
- Promote of green and hybrid minigrids development and management in rural areas in Niger. A variety of MG feasibility studies supported by development partners in collaboration with ANPER such as Power Africa, Liptako-Gourma Development Authority (ALG), World Bank, AfDB, etc. as well as the construction of MGs itself.
- Identify and test different delivery and business models for MGs. So far, these MGs adopt various business models financially sustainable and but are not supported by any relevant regulatory framework yet.
- Grant import duties exemptions on some solar MG equipment but are not considered sufficient by the local developers requesting for VAT tax exemption.
- Setup of some financial mechanisms to support rural electrification (e.g. via the Niger Solar Electricity Access Project NESAP project) including PAYGO for Solar Home Systems (SHS) and productive use, a dedicated credit line for local solar entrepreneurs available at partnering financial institutions but so far with a relatively high interest rate. For instance, *Plan International* partnered with a local microfinance institution, MFI Capital Finance, to provide guarantee lines for end-users to access *inter alia* solar ancillary equipment for productive use. The recently approved World Bank's Niger Accelerating Electricity Access

[10] https://www.se4all-africa.org/fileadmin/uploads/se4all/Documents/Country_IPs/PI_SeforALL_Niger_FINAL__1_.pdf viewed on 15 August 2022

[11] IEA, IRENA, UNSD, World Bank, WHO. 2022. Tracking SDG 7: The Energy Progress Report. World Bank, Washington DC)

[12] https://iea.blob.core.windows.net/assets/e2e30d7e-3051-4a25-9720-d608c7d6b2f4/TrackingSDG7TheEnergyProgressReport2022.pdf viewed on 15 August 2022

[13] https://www.afdb.org/en/news-and-events/sefa-grants-us-1-million-to-promote-green-mini-grids-in-niger-15990

Project (HASKÉ)[14] project will offer some subsidy for solar ancillary products to rural end-users (households, productive use) (World Bank, n.d.).

- Digitalize the energy space. Smart meters have been added for a few MGs including one operated by the private sector developer 'Africa Green Tech'. The HASKÉ project is considering an e-platform for tendering processes around MGs

Despite all the efforts made by the Government and the development partners through these projects, local private developers still lack sufficient capacities to promote the MG industry due to various risks: limited technical competencies, lack of financial capacities, missing suitable financial mechanisms provided by financial institutions in the country, limited payment capacities of very poor rural households in Niger, a conducive regulatory framework not yet available, MG profitability not yet clear, etc. An additional major hurdle lies in the low purchasing power of rural households across Niger unable to either access finance or to pay back their loans (including. PAYGO mechanisms).

Table 1 - Policy context for renewable energy minigrids in Niger

Policy / planning document		Relevance
Sector Policies	Strategic Vision / Development Plan: ***Stratégie de Développement Durable et de Croissance Inclusive 2035 (SDDCI)***, *2017 and* ***Plan de Développement Economique et Social (PDES)***	Electricity considered as crucial for human capital development as well as rural economy (access to water, irrigation, productive use/ income generating activities, women empowerment, youth employment) Acknowledgement that women are more vulnerable especially towards access to economic activities.
	National electricity policy: ***Document de Politique Nationale de l'Electricité (DPNE)***, 2018	Access to electricity for all; development of national energy resources; mobilization of the private sector. By 2021, the country aimed to electrify 1,400 localities, thereby achieving a 22% household access rate to electricity at the national level, including 10% in rural areas.
	Decree n°2019-027/PRN/MESU/DD of January 11, 2019 on the application modalities of the law n°2018-28 of May 14, 2018 determining the fundamental principles of environmental assessment in Niger	Determines the administrative environmental assessment procedure.
Strategies and Plans	National Electrification Strategy: ***Stratégie Nationale d'Accès à l'Électricité (SNAE)***, *2018*	Access to affordable, reliable and modern electricity services for all Nigeriens, based on the principle of social justice and equity. The target is at least 80% of the population by 2035 with the support of the private sector. Universal electricity coverage should be achieved as follows: 85% by grid extension from NIGELEC, 5% by MG and 10% by individual kits. Electricity services can be delegated, in the form of concession, leasing/affermage, interested management company or any other form of delegation, according to the conditions fixed by the application decree of the present law particularly in the field of green minigrids. This possibility is open not only to the State but also to local authorities. Pre-financing of meters to connect households, especially the most vulnerable ones, including for MG.

[14] https://projects.worldbank.org/en/projects-operations/project-detail/P174034

Policy / planning document		Relevance
	Energy and Electricity Sector Master Plan : ***Plan Directeur d'Accès à l'Electricité (2019-2035 / PDAE)***, 2019	Increase the electricity access through 3 main options (i) densification (ii) new electrification via grid extension and MG development (iii) individual solutions for remote localities. Location ranking and prioritization to be electrified, according to the 3 options above. Budget planning. About 400 projects covering around 1,000 localities have been identified for MG development.
	Nationally Determined Contribution (NDC) - ***CDN révisée***, *2021*	Key priorities for mitigation measure mainly around agriculture, forestry, water and energy. Regarding energy measures planned are around: improve access to electricity to 60% by 2030, reach 402 MXc for renewable energy production by 2030, reach 100MW for the off grid capacity by 2030, energy efficiency in the residential industry, household, transport and tertiary sectors; reduction of transmission and distribution losses; These measures in the energy sector should lead to a reduction of GHG emission of 5 324 ktCO2 by 2030.
	National strategy and actions plan of renewable energy, adopted in 2004	Aims to have 10% of the national power mix RE by 2020
	National Action Plan for RE - ***Plan d'Actions Nationale des Energies Renouvelables***, 2015	Increase contribution of renewables in the power mix up to 30%; Increase off-grid technologies capacity; Create a Renewable Energy national policy and a fiscal regime for renewables; Develop a strategic framework for PPPs
Laws	Electricity Sub-sector Law(s) and its application decrees ***Code de l'Électricité***, 2016	Ends the monopoly of NIGELEC, opening up the sector to private sector participation, particularly in generation and rural electrification Various application texts designed but not adopted at the same time or not yet adopted leading to misunderstandings
	Environmental legislation (pertinent to the energy sector): **Environmental Management Law**, 1998	Article 3.1. Activities, projects and development programs which, because of their size or impact on the natural and human environment, may affect the latter, are subject to prior authorization by the minister responsible for the environment. This authorization shall be granted on the basis of an assessment of the consequences of the activities, project or program updated by an environmental impact assessment prepared by the promoter and approved by the Ministry in charge of the environment.
	National Dialogue - ***Arrêté sur la création, organisation et composition du cadre national de concertation sur les énergies domestiques et alternatives***, 2002	National Dialogue focusing on domestic and alternative energy supply.
	Specific electricity tax, 2015	A tax applicable to all grids including off-grid that are under a delegation of services agreement. This tax of 2f/kWh is used at 60% to finance rural electrification and 40% to finance development and maintenance of public lighting, traffic

Policy / planning document		Relevance
		lights, grid extension, payment for power costs of municipalities
	Decree around homogenized tariffs for NIGELEC, 2017	A homogenized tariffication grid for all – urban and rural areas – has been developed and applied by NIGELEC across the country
Dedicated regulations (minigrids)	Tariff-setting regulation (tariff level, tariff structure, including connection fees) & subsidy design	Not applicable for minigrids *per se*. Only in the ***projets d'Electrification Rurale Autonome hors réseaux au Niger*** PERAN (see below), minigrid developers are allowed to offer cost-reflective tariffs (CAPEX & OPEX).
	Décret portant sur les Modalités de réalisation des projets d'Électrification Rurale Autonome hors réseaux au Niger (PERAN), 2019	Partially specifies the different delivery models around minigrids and individual kits with (1) public funding, (2) private funding and (3) private funding with a spontaneous application (without tender). In all cases the national PPP unit is involved. Minigrids should be based in priority on RE or hybrid solutions. They should be built complying with the state of the art and norms and regulations in Niger (which are non-existent yet for minigrid components) and should be designed to be potentially interconnected with the grid. When there is public financing involved, the MG developer can produce, transport, and distribute electricity in the given locality through a delegation of services for 5-10 years (renewable). The selection of the MG operator is based on a transparent tendering process. Minigrid developers are allowed to offer cost-reflective tariffs (CAPEX & OPEX).
	Market exit regulation at grid arrival	Not yet existent.
	Concessional Regime for minigrids - ***Conditions et modalités de conclusion des conventions de délégation et d'attribution des licences***, 2020	States all conditions and modalities for agreements around the delegation of electricity public services and the attribution of licenses in the energy sector including for minigrids
	Environmental review process for minigrid projects	The need for an environmental and social impact study for CEMG (Clean Energy MiniGrids) projects could be lifted according to the pilot size and location according to the relevant office at the Ministry in charge of Environment. A request for lifting (based on objective arguments) should be provided for each pilot in advance and approved by this office.
Standards	Generation technology requirements for minigrids	Not clearly stated but added to a certain extent on the specifications in tenders
	Quality standards for solar minigrid components	
	Standard waste management and recycling procedures	
	Specific grid codes for technical operation of minigrids	
	Interconnection standards	
	Quality of service standards	
Cross-cutting policy and regulation	Fiscal policy for minigrid components : ***Arrêté conjoint N°0029/ME/MF du 13 septembre 2017 portant liste des équipements et matériels à énergies renouvelables à exonérer des droits et taxes perçus en douane***, 2017	List of RE MG components (not exhaustive) that are exempted from any custom taxes and duties. Each year the list is updated. As quality standards are not clearly set, some components of lower qualities are imported and compete with prices that can go up to 7 times less than others.

Policy / planning document		Relevance
	Public-Private Partnerships Law or Framework: PPP Contracts Law, 2018	Minigrids with public financing go through a PPP contract and the dedicated unit to support and monitor the PPP. It is also stipulated that the sectoral law (Electricity Code) for the energy industry prevails over the PPP Contracts Law. The original financial eligibility threshold of 5bn Francs has been taken out after a revision of the law. While a maximum contribution of the State of 5% to any PPP is set, for MGs, a partnership with a subsidy of 50-80% has been designed whereby the Ministry of Energy signs the convention and transfers the subsidy then to ANPER.
	National Gender Policy - ***Politique Nationale de Genre***, *2017* *Plan d'Actions National pour l'intégration du genre dans l'accès à l'énergie, 2020.*	In its analysis chapter, the document acknowledges the crucial role of access to energy and its negative impact on income generating activities, additional burden for domestic activities and health of women. It is critical to have a gender-based approach towards access to modern energy. There are no sex disaggregated data around energy and electricity in Niger.
	National Climate Change Policy - ***Politique Nationale en matière de Changements Climatiques***, 2012	The policy relies on 6 key pillars all relevant to AMP Niger. (i) improvement of knowledge, promotion of R&D, production and dissemination of information on climate change; (ii) strengthening and developing the adaptive capacities of populations (iii) strengthening and developing actions to mitigate GHG emissions and promote (iv) the integration of climate change issues into national, regional and local planning tools; (v) capacity building of actors on climate change and (vi) the strategy for mobilizing financing for the implementation of the policy.

Risks & Barriers to renewable energy minigrid development

During the PPG, the preliminary conclusion of the currently ongoing Derisking Renewable Energy Investment (DREI) was made available and is presented in the Table 2 below. The DREI exercise is estimated to end by September 2022. It is expected to have a proper risk evaluation of minigrid expansion in the country at the start of the project.

Table 2 - Preliminary Conclusions of the DREI

N°	Risk Category	Description of underlying barrier	Risk Level	Preliminary recommendations from DREI analysis
1	**Energy market risk:** Risk arising from limitations and uncertainty in the energy market (off- and on-grid) regarding market outlook, access, price and competition	*Market access, competition and grid expansion:* Limitations and inability, including due to government regulations, of minigrid developers to access the electrification market; uncertainty regarding potential future competition in electrification; unclear, or lack of, grid planning and expansion policies. *Tariffs:* Uncertainty or inflexibility in electricity tariff regulations for minigrids. *Technical standards:* Lack of clarity, uncertainty and/or inconsistent government technical requirements for minigrids regarding (i) quality of service and (ii) grid integration, should it occur.	High	**Policy measures** • Publication of the Rural Electrification Master Plan and regular updating with information on concession areas ; • Establish a regulatory approach of 2 cohabiting regimes (light touch and comprehensive) for the granting of licenses, with a clear methodology for setting up required tariffs in the comprehensive regime and clear and balanced technical standards (revision of the PERAN decree). **Financial measures :** • Compensation system through a subsidy per kWh in the event of connection to the national grid → AMP Niger could consider supporting this measure after an assessment as stated in project activities Output 1.4 below).
2	**Social acceptance risk:** Risks arising from lack of awareness and resistance to renewable energy and minigrids in communities	Resistance by general public and local communities due to unfamiliarity with electricity and renewable energy sources; mis-information/perceptions and lack of awareness for minigrid offerings; resistance from incumbent businesses (e.g., diesel based generation) and users (e.g., SHS), disrupted by minigrids	Medium	**Policy measures :** • Community and public awareness impact campaigns → AMP Niger will cover this under Component 4

N°	Risk Category	Description of underlying barrier	Risk Level	Preliminary recommendations from DREI analysis
3	**Hardware risk:** Risk arising from limitations in the quality and availability of mini-grid hardware, as well as the customs treatment of hardware	*Quality of hardware:* Lack of access to information on quality, reliability (performance) and cost of hardware; lack of clarity or uncertainty regarding government technical standards to ensure safety of minigrid hardware; lack of availability of warranties for components *Availability of hardware:* Lack of a competitive market for buying hardware (from both international and domestic suppliers); where appropriate, lack of locally tailored hardware *Customs:* Cumbersome customs/clearing process for importing hardware, leading to delays in delivery; punitively high customs tariffs on minigrid hardware, particularly in comparison to other sectors.	High	**Policy measures :** • Development of standards and certifications for equipment; • Streamlined customs procedures - Clarification of equipment exempt from import taxes and VAT. → AMP Niger could consider supporting this measure after an assessment as stated in project activities Output 1.4 below.
4	**Digital risk:** Risks arising from use of cellular networks for remote monitoring and payments; the use of software; and abuse of consumer data	*Cellular networks and mobile money:* lack of cellular coverage in rural areas, where electrification needed; over-dependence on a single operator for reliable cell service and payment processing; lack of mobile money, or limitations relating to fees on mobile money transactions *Software:* Limited standardization of software and interfaces on minigrid developers' back-end data and operations, and mobile money payment platforms *Abuse of consumer data:* possible abuse of consumer data privacy on payments and usage; lack of understanding/clarity on uses of consumer information	High	**Policy measures :** • Telecommunications regulations for universal coverage and access to mobile money ; • Support capacity building for industrial associations for the sharing of best practices and standards. → AMP Niger will contribute to this under Components 2 (building the capacity of the industry association) and 4 (communities of practice in Niger and sharing knowledge with other communities of practice embedded activity with the AMP Regional project)
5	**Labour risk**: Risks arising from the lack of skilled and qualified potential employees	Lack of a competitive labor market of educated, skilled and qualified potential employees, leading to higher costs, hiring non-local staff and suboptimal performance	Medium	**Policy measures** : • Set up programs to develop a competitive and qualified labor market in renewable energies→ AMP Niger will support the analysis of existing curricula and programs for higher education and vocational training across Niger to identify gaps and support training activities at targeted institutions under Component 1.

N°	Risk Category	Description of underlying barrier	Risk Level	Preliminary recommendations from DREI analysis
6	**Developer risk:** Risks arising from limitations in the mini-grid operator's management capability, and its creditworthiness and cash-flow.	*Management capability:* lack of C-suite talent and experience to ensure effective execution (business planning, financial structuring, plant design (resource and demand assessment), installation, operations, and maintenance), and to manage challenges (limited information, unforeseen events) *Developer credit worthiness and cash flow strength:* Inability of developer to secure low-cost financing from investors due to lack of credit worthiness, or insufficient cash flows to meet investors' return requirements	High	**Policy measures :** • Improvement of network effects and information flow / technical assistance to promoters → AMP Niger will support targeted capacity building for local private sector operators based on a need assessment under Component 2. **Financial measures :** • Public loans, guarantees, public equity → AMP Niger will contribute with technical assistance to advance financing mechanisms to scale up CEMGs.
7	**End-user credit risk:** Risk arising from customers' willingness, ability, and methods of payment for electricity	*Lack of information on end-user credit worthiness:* Lack of end-user credit data with which to assess the ability of end-users to pay for the initial connection fees, ongoing electricity bills and ancillary equipment (e.g., lights and appliances) *Poor credit worthiness and non-payment:* Risk of delayed, reduced or non-payment by customers due to poor credit worthiness, lack of funds available, electricity theft and social dynamics	High	**Policy measures :** • Promotion of the productive use of electricity (PUE) → AMP Niger will strongly support PUE as a main focus for any pilot site. In addition, a national study will be conducted on opportunities to boost economic activities through access to electricity and productive use (Output 2.2.) • Facilitation of access to consumer credit / micro-credit → AMP Niger will facilitate consumer credit/micro-credit as part of Component 3 via technical assistance on relevant financing mechanisms and capacity building of financial institutions representatives in Niger • Government mandates to insure solvent key customers (ex: telecommunication tower) **Financial measures :** • Public loans, guarantees, public equit y→ AMP Niger will contribute with technical assistance to advance financing mechanisms to scale up GMG.

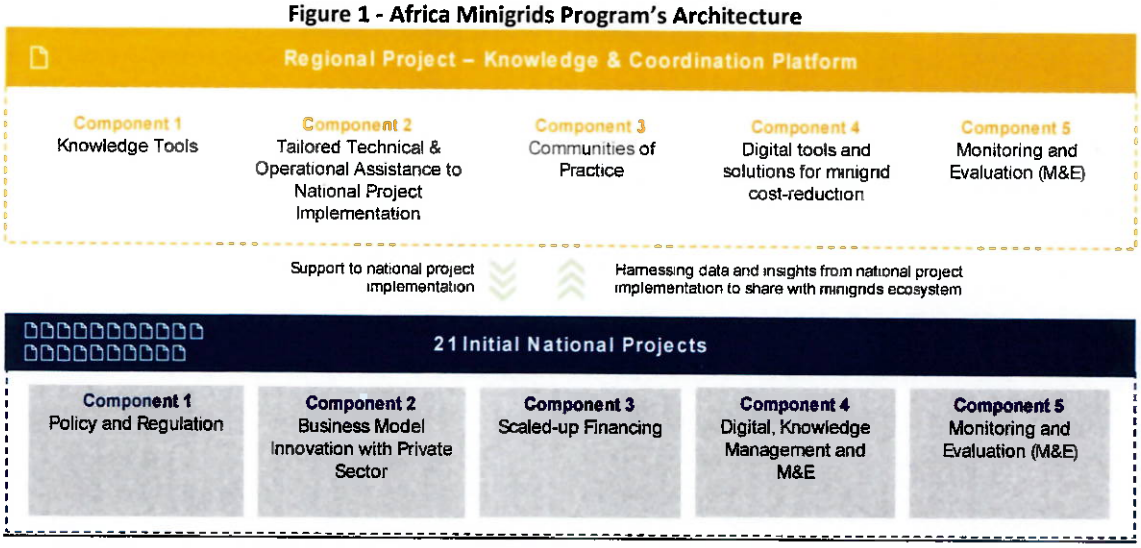
N°	Risk Category	Description of underlying barrier	Risk Level	Preliminary recommendations from DREI analysis
8	**Financing risk:** Risks arising from scarcity of domestic investor capital (debt and equity) for minigrids, and domestic investors' lack of familiarity with minigrids and appropriate financing structures	Capital scarcity - liquidity constraints in domestic banking: Limited availability of long-term domestic loans due to high banking reserve requirements Capital scarcity - under-developed domestic financial sector: Low number of well-capitalized actors (debt, equity, insurance, pensions); lack of regulatory clarity on new types of financial products Capital scarcity - competing incentives/ mandates: existing policies incentivize or mandate domestic financial sector (banks, pension funds) to invest in alternative, competing sectors to minigrids Limited domestic investor experience with minigrids: Lack of information, assessment skills and track-record for minigrid projects amongst domestic investor community; lack of network effects (investors, investment opportunities) found in established markets; lack of familiarity and skills with appropriate finance structures.	High	**Policy measures :** • Liberalize the national financial sector (reforms for new types of financing, incentives) • Technical assistance to financial institutions and investors → AMP Niger will provide technical assistance to these actors under Component 3 **Financial measures :** • Public loans, guarantees, public equity → AMP Niger will contribute with technical assistance to advance financing mechanisms to scale up CEMGs.
9	**Currency risk:** Risks arising from currency mismatch between domestic currency revenues and hard currency financing	Uncertainty due to volatile local currency; unfavorable currency exchange rate movements resulting in domestic currency revenues not being sufficient to cover hard currency debt/equity servicing; inability to economically hedge FX exposure due to illiquid FX derivative markets.	Low	**Policy measures :** • Support for the development of a foreign exchange market derivative products.
10	**Sovereign risk:** Risk arising from a mix of cross-cutting political, economic, institutional and social characteristics in the particular country which are not specific to mini-grids	Limitations and uncertainty related to conflict, political instability, economic performance, weather events/natural disaster, legal governance, ease of doing business, crime and law enforcement, land tenure and infrastructure in the country.	High	**Financial measure :** • Political risk insurance

III. STRATEGY

Programmatic approach. This project is part of the broader **Africa Minigrids Program (AMP)**, a regional technical assistance and investment program with the objective of supporting access to clean energy by increasing the financial viability and promoting scaled-up commercial investment in renewable minigrids, with a focus on cost-reduction levers and innovative business models. The programmatic approach aims to achieve greater impact by creating new minigrid markets across the African continent, which, in aggregate, will create scale and momentum, attracting private sector interest and investment. It will also allow for a broader sharing of knowledge and good practice, and create economies of scale in providing program services.

Program design. As shown in **Figure 1** below, AMP is comprised of two main elements: (i) a **Regional Project**, acting as the knowledge, advocacy and coordinating platform of the Program; and (ii) a cohort of an initial 21 **AMP National Projects** that share a common approach, seeking to reduce minigrid costs via five country-level components: (i) policy and regulations, (ii) business model innovation with private sector, (iii) scaled-up financing and (iv) digital, knowledge management and (v) monitoring & evaluation (M&E).

Figure 1 - Africa Minigrids Program's Architecture

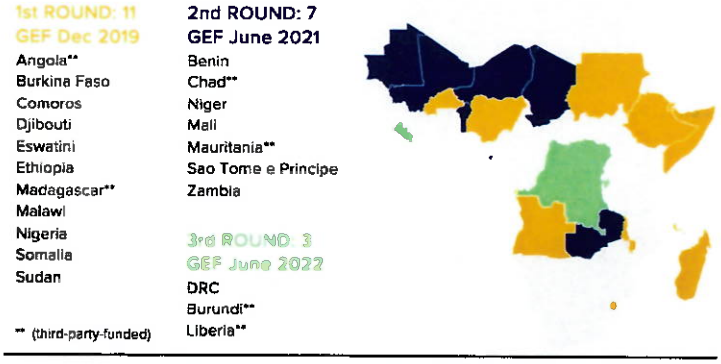


The program is initially supporting three rounds of national projects, totaling 21[15] in number, which together host an estimated total of **396 million people without electricity**,[16] or more than two thirds out of the 587 million total people without access to electricity in Africa. The initial AMP participating countries are shown in **Figure 2** below.

[15] A first round of 11 national projects approved at the concept stage in the GEF December 2019 work programme (Angola, Burkina Faso, Comoros, Djibouti, Ethiopia, Eswatini, Madagascar, Malawi, Nigeria, Somalia and Sudan). A second round of 7 national projects have been approved at the concept stage in the GEF June 2021 work programme (Benin, Chad, Niger, Mali, Mauritania, Sao Tome & Principe, and Zambia). A third round of 3 national projects (Burundi, DRC, Liberia) have been approved at the concept stage in the GEF June 2022 work programme.

[16] IEA (2022), Tracking SDG7: The Energy Progress Report, 2022, IEA, Paris https://www.iea.org/reports/tracking-sdg7-the-energy-progress-report-2022

Figure 2 - Africa Minigrids Program's participating countries list and map[17]



Country Strategy. Niger has been selected as one of the AMP National Projects as presented in Figure 2 above. The country is a poverty-stricken country with a large rural population (80% of total). A combination of climate, political instability and security shocks and crises has hampered the growth of Niger's economy. Niger must address a few the negative constraints if it hopes to reduce its structural fragility and achieve the sustained pace of economic growth needed to reduce development gaps. The country's economy is vulnerable to climate change and its population, more than 70% of whom work in subsistence agriculture, is affected by volatile weather conditions. The GoN prioritizes the power sector for both socio-economic development and climate adaptation. Unfortunately, current installed RE capacity is less than 1% of the power mix and the electricity access rate is less than 20% (and under 4% in rural areas). Yet, Niger has high and reliable solar irradiation intensity, and a significant opportunity for green mini-grids to play a major role in increasing electricity access. GoN has articulated in its National Electricity Policy (2018) an objective to have electricity access for all by promoting renewable energy. The National Electrification Strategy also mentions access to affordable, reliable and modern electricity services for all Nigeriens, based on the principle of social justice and equity with the support of the private sector. Moreover the '*Plan Directeur d'Accès à l'Électricité 2019-2035*' states that the electricity access increase should be done through 3 main options (i) densification (ii) grid extension and MG development (iii) individual solutions for remote localities.

So far, the minigrid market is at an early stage with 14 minigrids installed but not all are operational. Out of which 10 are owned by the Government (financed by Exim Bank of India), 1 by *Plan International* and 3 by private sector developers (1 offering a containerized MG solution). Other MGs are in the pipeline via the Niger Solar Electricity Access Project (NESAP – WB project)[18], 7 MGs with 2 Mauritanian companies, 2 MG with ANPER, 9 MG with Plan International (connected to women-led multi-functional platforms) as well as IsDB, BOAD, etc. The market development is still very nascent, with a lot of actors, there is room for testing delivery and business model improvement.

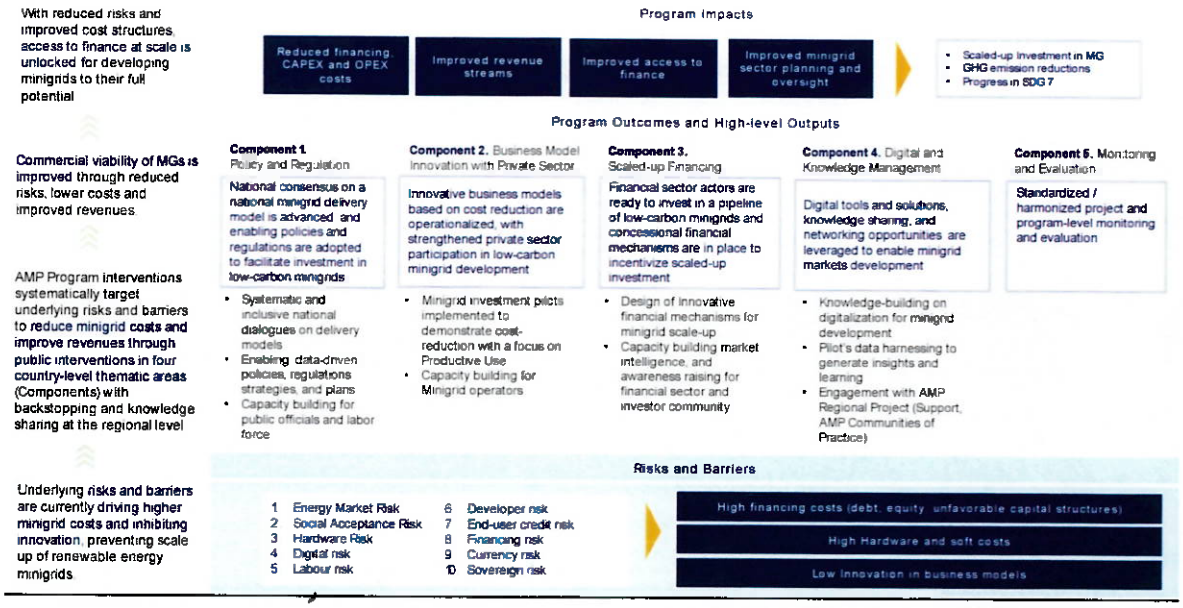
Program's Theory of Change (TOC). AMP Niger will follow the Regional AMP Theory of Change (TOC), developed in the Program Framework Document (PFD) and set out in **Figure 3** below. This TOC is premised on a baseline context where, while good progress is being made, several risks and barriers are driving high financing costs (equity and debt) and reducing the competitiveness of minigrids with respect to fossil-fuel based alternatives. All else being equal, the need for higher returns that reflect these risks translates into higher energy prices that, in turn, adversely affect affordability for the end-user, or lead to a larger subsidy requirements for rural electrification programs. As a result, renewable energy minigrids do not get financed and built at scale. By focusing on cost-reduction levers and innovative business models, the project can improve the financial viability of renewable energy minigrids which in turn can accelerate and scale up

[17] The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

18 https://projects.worldbank.org/en/projects-operations/project-detail/P160170

their adoption as part of the effort towards achieving universal energy access. When renewable energy minigrids are more competitive, private capital and commercial financing will then flow, resulting in various program benefits: investment at scale, GHG emission reductions, and electrification and lower tariffs for end-users.

Figure 3 - Africa Minigrids Program's Theory of Change



Alignment with GEF focal areas. The proposed strategy is aligned with the GEF Strategic Focal Areas CCM-1-1 "Promote innovation and technology transfer for sustainable energy breakthroughs for decentralized renewable power with energy storage", and CCM-1-3 "Promote innovation and technology transfer for sustainable energy breakthroughs for accelerating energy efficiency adoption".

UNDP's Derisking Renewable Energy Investment (DREI). The Program's TOC draws on UNDP's Derisking Renewable Energy Investment (DREI) Framework by focusing on cost reduction levers across the themes of policy and regulation, business model innovation and private sector as well as innovative finance that can be employed to reduce risk (e.g., policy derisking), compensate for risk (e.g., financial incentives) or transfer risk (e.g. financial derisking).

DREI is an innovative, quantitative framework to support policymakers to cost-efficiently promote private investment in renewable energy. A central focus of the DREI framework is on private sector financing costs. Developing countries often exhibit high financing costs for renewable energy due to investment risks that can exist in early-stage markets. The primary risks and barriers for renewable minigrid development and scaling up, as identified in the DREI Framework, are summarized in the Table 2 above. From an investor's perspective, these risks result in higher financing costs (equity and debt) and reduce the competitiveness of minigrids relative to alternative sources of energy (e.g., diesel generators). All else being equal, the need for higher returns that reflect these risks translates into higher energy prices that, in turn, or require larger subsidy requirements for rural electrification programs.

An opportunity is for policymakers to systematically address these investment risks, lowering financing costs and leading to competitive investment. Although there are both public and private strategies to address investment risks, the DREI framework is concerned mainly with public strategies, and identifies three central ways – often used in combination – that the public sector can improve the risk-return profile of private sector investment opportunities: (i) Reducing risk, targeting underlying barriers that create investment risk. These instruments are typically policies, such a legislation, or technical programmes ("policy derisking"); (ii) Transferring risk, shifting risk from the private to public sector. These

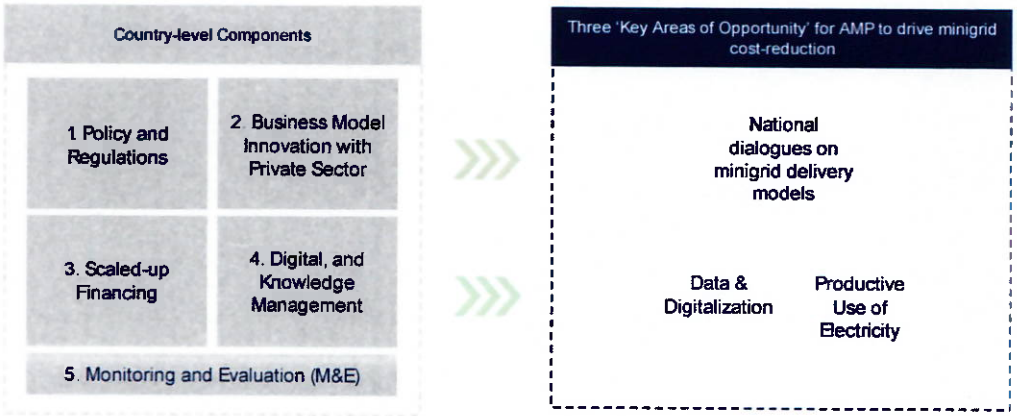
include instruments such as guarantees, or credit lines to commercial banks for on-lending ("financial derisking"); and (iii) Compensating for risk, increasing the return of investments. These are typically targeted subsidies for renewable energy ("direct financial incentives"). As RE minigrid markets mature, an opportunity also exists for diversifying risk through aggregation of multiple mini-grid assets ("portfolio derisking").

As regards AMP, UNDP's DREI framework will be applied either qualitatively and quantitatively at various points in the project cycle, both at the national level in each country, and then aggregated into regional knowledge products by the AMP Regional Project and disseminated widely. The DREI framework, both at the national and regional level (in aggregate), will act as the program's mechanism to harvest and disseminate data on changes in the financing costs, hard and soft costs, and resulting costs for minigrids.

Program's 'Key Areas of Opportunity'. The AMP has adopted a common architecture of five key components - a combination of enabling policy and regulations, business model innovation with private sector involvement, innovative financing and digital innovation - as the levers to lower investment risks, thereby reducing financing, hardware and soft costs while increasing revenues and improving system efficiencies. The last component is related to monitoring and evaluation (M&E).

Within this architecture, AMP will emphasize - and seek to develop comparative advantages - in three 'key areas of opportunity': (i) an emphasis on advancing national dialogues on minigrid delivery models, (ii) promoting productive uses of electricity, and (iii) leveraging data and digital solutions for minigrid cost-reduction. Collectively these three areas can guide AMP's overall direction, creating a niche identity for the program. This approach, illustrated below in Figure 4, is structured to advance the program objectives of cost-reduction and innovation for minigrids and give effect to the TOC. The way in which this project will address these areas of opportunity is described in detail further below.

Figure 4 - AMP's Key Areas of Opportunity



National dialogue on minigrid delivery models. A delivery model (refer concept in Box 1 below) that is suitable to country expectations and context for minigrids has proven critical to establish an enabling and attractive investment environment for minigrids. Equally, a delivery model that has not been defined or is not consistent with the national context, will be an impediment to scaled-up investment. An important focus of the AMP is therefore to encourage a national dialogue between key stakeholders in support of a suitable delivery model being defined.

Today, there is no clear delivery model(s) for MGs in Niger. Some key aspects are not yet clearly defined and are being tested. The *Decree on Modalités de réalisation des projets d'Electrification Rurale Autonome hors réseaux au Niger* (PERAN) (see Table 1 in the Development Challenge chapter above) gives a broad and flexible framework for MGs. In practice, existing and future minigrids are based either on concessions, others are fully private, others, lately, are based on affermage-lease and some are under ANPER's supervision and without any (private) operator yet.

In addition, based on the social equity principle promoted in a variety of guiding laws and strategies, the government has expressed to offer an average national uniform tariff across the country, for on- or off-grid. On the other hand, the PERAN Decree for CEMG (Clean Energy Minigrids) operators stipulates a cost-reflective tariffs. The Government informed that the discrepancy between these two tariffs would need to be compensated by ANPER. Therefore, a compensation mechanism is essential (see component 3).

Given the critical importance of the minigrid delivery model with its associated ownership, tariff structures and subsidy mechanisms in attracting private sector investment, Niger will have the opportunity to draw on the resources of the AMP Regional Project and the GoN's recent experience to identify the delivery model(s) most relevant to the country context, most feasible and with the best prospects of success. The possible options for each aspect need to be thoroughly understood by stakeholders and substantiated with real examples. The decisions for/against certain options must be openly discussed and weighed up in terms of the interplay between the aspects and the resulting consequences for the sector.

To this end, one of the first activities envisaged in the project is to get all relevant stakeholders on board and initiate a process of national dialogue to weigh up all aspects of minigrid delivery models (Output 1.1.).

Box 1 - The Concept of a Minigrid Delivery Model

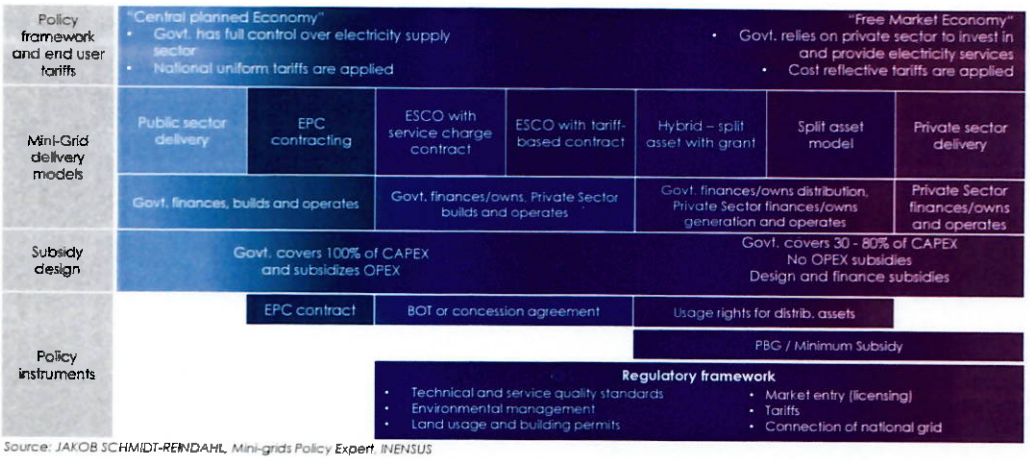
The concept of a minigrid 'delivery model' is a key concept for the AMP. This text box seeks to set out a common understanding of the concept and its importance to the national projects and overall program.

Definition: A minigrid delivery model, determined by the national government, is the cornerstone of a country's over-arching minigrid regulatory framework. It defines who finances, builds, owns and who operates and maintains the minigrids. Where applicable, it seeks to engage the private sector. A minigrid delivery model is closely associated to other key components of a minigrid framework, including tariff structures/mechanisms and subsidy levels/mechanisms.

In each country, identifying one (or more) delivery models will provide a framework for all sector stakeholders to plan for the longer term, particularly with regard to mobilizing private investment as one of the main objectives of the project. Figure 1 below describes the spectrum of design options for delivery models, across a number of different elements (ownership, policies, finance etc.)

This decision-making process around identifying a delivery model is complex and countries will be encouraged to establish a national dialogue for this purpose, involving all relevant stakeholders to varying degrees (different ministries such as energy, finance, health and environment, local authorities, the public, the media, the beneficiary communities, utilities, the private sector, and other key stakeholders) in order to build a national consensus on the basis of which large-scale deployment of mini-grids can be accelerated and have a sustainable impact.

Figure 5. Conceptual outline of minigrid delivery models



Source: JAKOB SCHMIDT-REINDAHL, Mini-grids Policy Expert, INENSUS

Digitalization (digital solutions and tools) and harnessing the data opportunity. The emergence of minigrids as a viable solution to electrify remote and isolated communities relies strongly on digital tools and solutions[19]. Digital technologies and solutions are fundamental to enabling off-grid electrification and offer significant potential to lower minigrid costs, reduce risks, and address barriers to scale. Many of the opportunities around digitalization are related to leveraging the large amount of data generated by minigrid projects to surface insights, learning and optimization. Data is a tremendously valuable asset in the minigrid sector that remains underutilized. The programmatic approach allows the AMP to make an impactful contribution to growing a data asset and harmonized digitalization in the sector. Employing digital integration as a catalyst for the minigrid sector reflects the UNDP digital transformation strategy that initiated a comprehensive process of connecting knowledge within the organization and across networks, creating opportunities, improving operational efficiencies, and building and maintaining partnerships and alliances. It also echoes the broader UN data-driven strategy and commitment to advance global "data action" with insight, impact and integrity.

In Niger, a digital platform centralizing all relevant data does not exist yet. However, the World Bank's HASKÉ project aims to cover some of this aspect with ANPER. A collaboration with other development partners will be sought, including UNDP, as discussed with the World Bank during PPG. This should lead to a comprehensive and integrative digital tendering and monitoring platform for CEMGs.

[19] Solutions are commonly grouped into four categories: (i) digital planning, (ii) digital operations, (iii) digital aggregation platforms, and (iv) digital payments

Box 2 - Digitalization and Minigrids

Digital opportunity for minigrids The figure below shows different categories of digital solutions in the minigrid sector: (i) digital planning, (ii) digital operations, (iii) digital aggregation platforms, and (iv) digital payments. In common to all these is the potential of digital technologies – whether used by policy makers, financiers or minigrid developers - to lower minigrid costs, reduce risks, and address barriers to scale.

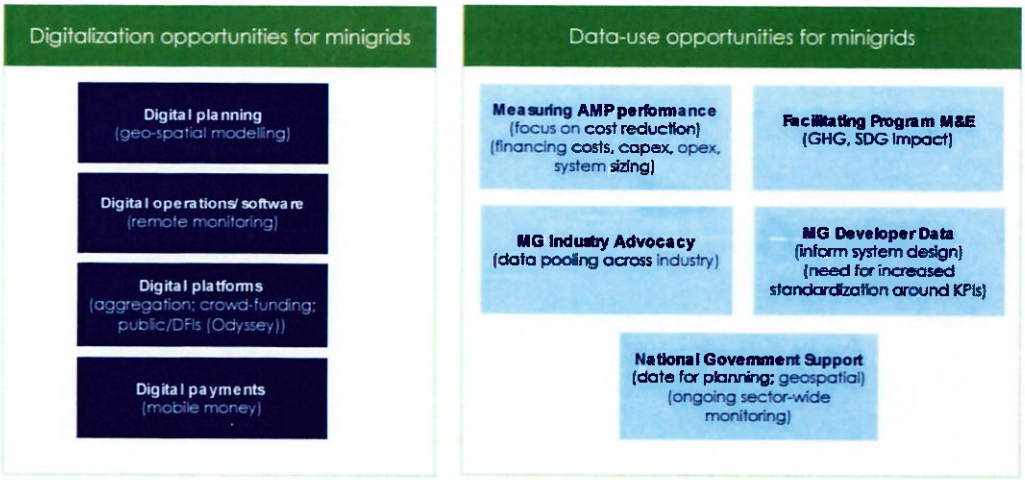


Figure 6. Digital and data opportunities for minigrids in the AMP

Data use opportunity for minigrids. Many opportunities around digitalization are related to leveraging the large amount of data generated by minigrid projects to surface actionable insights, learning and optimization to consolidate business models and technical solutions for scaling-up minigrids. For instance, the use of operational performance information from existing systems to forecast demand and design future minigrids can help avoid a very common pitfall of many minigrid systems which are significantly oversized and hence not financially viable.

Opportunities across the Program, and with the AMP regional project. The AMP provides a unique opportunity to develop a single set of metrics and guidelines for data collection, and use them to collect data from minigrid investment pilots across different national projects which the AMP Regional Project can then aggregate, derive insights from, and systematically disseminate knowledge with participating AMP countries and with the broader minigrids sector in Africa. At the same time, the link between the regional project and the total of eighteen (18) national child projects provides a unique 'distribution channel' opportunity across Africa for AMP to mainstream the use of digital tools and solutions for minigrids cost-reduction and scale-up.

Productive uses of energy (PUE). While PUEs are widely recognized as a key element to improve the viability and sustainability of minigrids, the AMP focus is uniquely tailored, taking a deliberate, integrated approach across a broad ambit of the Sustainable Development Goals (SDGs)[20]. With the benefit of global experience and best practices, the AMP pursues solutions where productive uses are embedded in agricultural value chains or around which economic activity can be anchored. The AMP's emphasis on energizing agricultural production is based on the demonstrated impacts and amplified benefits resulting from (i) improved product quality and increased yields, (ii) contributions to value addition, (iii) increased value retention within the rural communities, and (iv) contributions to socio-economic developmental objectives for rural areas, which in turn has a positive effect on the minigrid revenue model. Further recognizing that these multiple benefits cannot be assumed with energy access, but depend on wider development programmes, the

[20] As described by SEforAll, access to energy is not the end in itself, but a means to many ends. Reliable and affordable energy is needed to improve living standards, increase rural incomes, support delivery of health and educational services, and improve gender and social inequality. It also enables access to clean cooking technologies and fuels – essential to reducing indoor air pollution and associated health risks. https://www.seforall.org/sites/default/files/Beyond-Connections-Introducing-Multi-Tier-Framework-for-Tracking-Energy-Access.pdf

AMP approach combines the delivery of electricity infrastructure with innovative business models and various interventions aimed at encouraging economic activity, support business development and stimulate rural economic transformation with an emphasis on improved wellness, empowering women and youth as well as ensuring sound social and environmental stewardship.

The role of productive use is increasingly acknowledged by different stakeholders as critical in the delivery model in Niger. Power Africa's feasibility studies, for instance, highlight this. This includes anchor clients such as telecom towers as well as the role of cooperatives or technologies such as solar pumping irrigation, food processing equipment, lighting, etc.

Minigrid investment pilots' contribution to the Program's TOC. AMP Niger includes funds, under Component 2 (Business model innovation and private sector), for supporting minigrid investment pilots seeking to demonstrate innovative business models and cost-reduction opportunities. Minigrid pilots have a key role within AMP by contributing to demonstrate cost-reduction which can be leveraged to improve the financial viability of renewable energy minigrids. Minigrid pilots are aligned with one or more of the three key areas of opportunity mentioned above by demonstrating: (i) a particular delivery model or elements of a delivery model around which the government wishes to build capacity and engage with minigrid developers; (ii) productive uses of electricity and their potential to reduce costs and enable minigrid development at scale; and/or (iii) opportunities around digitalization and the use of data for minigrid cost reduction. Feedback loops to other national project activities (e.g., national dialogue, capacity building) and with the AMP Regional Project (e.g., Community of Practice) are intended to actively disseminate the learnings from the pilots to inform both the policy and regulatory environment as well as technical capacity building.

At the project preparation stage, considerable initial consultations, analysis and planning have been performed to advance the design of the minigrid pilots. This is described in Section IV below. At the beginning of project implementation, as an initial preparatory step, the PMU, in consultation with key stakeholders, and with support from the AMP regional project, will update and finalize the proposed approach to the design of the minigrid pilots, compiling a 'Minigrid Pilot Plan'. The project's 'Minigrid Pilot Plan' will include specifications on the pilot's approach that is aligned with key design principles set out in **Box 3** below. The project's Minigrid Pilot Plan will then (i) need to be reviewed and cleared by UNDP Niger CO and BPPS NCE and (ii) be shared with the Project Board.

Box 3 - Key principles for minigrid pilot implementation

Principle 1. Digital platforms. The use of digital platforms for tendering the pilots is a central element of the overall AMP and digital strategy for the project. With digital platforms emerging as critical enabler for procurement and operation of cost-effective and viable minigrids, using a digital platform for pilot projects provides an opportunity to build capacity of key stakeholders in using this facility which can then set the foundation for later using digital platforms for sector-wide, large-scale tenders or results-based financing programs. Digital platform software can manage the selection, Monitoring and Evaluation (M&E) and payments of pilots including capacity building of the Implementation Partner, Project Management Unit and minigrid developers. The digital tendering platform in Niger will be covered by World Bank's new HASKÉ project.

Principle 2. Productive use: third party ownership model. For pilots that will financially support the purchase of productive use equipment using an allocation under the GEF INV, it is required that the project will only provide its support via a third-party ownership model, as opposed to a self-ownership model. Third party ownership models involve the minigrid asset owner purchasing the productive use equipment, and then effectively leasing it back to the end-user, as part of an "energy as a service" offer.

Principle 3. Clear methodological basis for additionality for calculating the level of (GEF INV and/or UNDP TRAC)/financial support for capital expenditures (CAPEX). It is critical that the appropriate use of grant funding to the pilots be ensured, requiring a methodological basis for which the level of CAPEX subsidy will be determined during implementation using the principle of minimal concessionality. Suitable methodologies for minimal concessionality can include calculating the level of GEF INV support on the basis of achieving (i) Levelized Cost of Electricity (LCOE) parity with a diesel minigrid, (ii) LCOE parity with pre-existing residential tariffs, or (ii) LCOEs based on the willingness to pay of the end-users (via surveys etc.). During implementation, the AMP regional project may also provide updated guidance on suitable minimal concessionality methodologies.

Principle 4. Minigrid pilots data sharing. Pilot beneficiaries (e.g., minigrid operators) receiving support from the project will be required to share minigrid performance data with the national and regional project. Specific terms and conditions for data-sharing and how best to operationalize the commitment and its adoption by the beneficiaries will be defined and agreed upon with minigrid operators during project implementation, with support from the AMP Regional Project.

Principle 5. Compliance with UNDP Social and Environmental Safeguards and Gender requirements. Pilot projects receiving project funding are required to comply with all the relevant national standards of the country as well as UNDP standards as it pertains to social and environmental safeguards and gender equity. In support of this principle, an Environmental Safeguards Management Framework (ESMF), developed for the program, and a gender action plan accompany this ProDoc (Annexes 10 and 11). The ESMF will have to be incorporated and considered in developing the environmental and social management plans for pilot projects. A critical consideration under this framework is the need to ensure environmentally sound management of replaced equipment, including batteries, inverters and solar panels, after their usage. The responsible handling of waste with recycling of batteries and other recyclable equipment, should be clearly documented, budgeted and monitored in compliance with national and UNDP safeguards requirements.

Linkages to the AMP Regional Project: The project will align with the AMP Regional Project to foster knowledge sharing, learning, and synthesis of experiences in a multi-directional manner– i.e. flowing from the AMP Regional Project to the Niger project, and vice versa, and between the Niger project and other national projects within the Program. The main role of the AMP Regional Project is to make best practices in regulations and policies, innovative and inclusive business models, digitalization and technical support available to all AMP beneficiary countries, while providing technical and operational support for national projects' on-the-ground implementation. **Box 4** below provides a summary of the technical and operational support that will be available to the project. A full detailed elaboration of these offerings and the protocols attached to each service will be communicated to the project at the Niger project's inception workshop. The areas of support, listing of available firms/individual consultants under contract by the regional project and protocol for how the project can request and/or access such expertise (if needed/requested) will be elaborated in the first year of regional project implementation and disseminated to this project and the staff of all other participating AMP national projects.

Box 4 - AMP Regional Project Indicative Service Offering

Digital, Knowledge management and monitoring and evaluation (M&E)

Knowledge building/sharing. The regional project will curate, develop and share knowledge with the project on program's thematic areas (Policies and regulation, innovative business models, financing, digitalization).

Insight Briefs development and dissemination. National projects will gather data and audio-visual content (video footage, photos, etc.) highlighting national project activities which will be the subject of an 'insight brief' to be developed and widely disseminated by the AMP Regional Project.

Communities of Practice. One of the primary ways national project staff will interface with the regional project is via the 'Communities of Practice' (CoPs) and associated activities/platforms. While it is expected that many of the activities will be undertaken virtually (via internet-based platforms, webinars or digital platforms) it is also expected that the CoPs will include actual in-person workshops, meetings or training events that project staff will participate on.

Common M&E Framework/QAMF. The AMP Regional Project will develop, with inputs from national projects, a Quality Assurance and Monitoring Framework (QAMF) for measuring, reporting and verification of the sustainable development impacts of all minigrid pilots supported by national projects, including GHG emission reductions.

Data aggregation platform. The AMP Regional Project will deploy and use a web-based data management platform to aggregate data from all national project pilots based on the QAMF to track Results Framework indicators as well as program objectives, SDG impacts and GHG emission reductions.

Systematic data analytics and insights. The regional project will harness data shared by the national projects to extract insights and learnings which will be disseminated across all national projects and within the broader minigrids ecosystem.

Technical and operational support for national projects' implementation

Access to specialized expert international consultants in selected areas hired, retained, contracted and paid for by the AMP regional project and made available to all participating national project staff and selected beneficiaries on as needed basis. This support may range from virtual assistance to in-country missions.

Database of qualified international consultants and firms provided for information purposes to the project in an effort to assist in identifying high-quality experts and firms who may be available for contracting by national governments under their own procurement rules and modalities.

Generic terms of reference (ToR) for various standard activities will be provided to projects for information purposes.

Specialized advisory support for implementing UNDP's minigrid DREI analyses. During project implementation, the UNDP DREI Core team, working with the regional project, will make available to national teams and consultants the resources and tools to conduct full quantitative DREI applications, and will provide ongoing support and quality assurance.

Operational support for national projects. The AMP Regional Project will provide support to the project, on an ad-hoc and as-needed basis, through its PMU staff or by hiring or recommending subject matter experts, for the project to execute activities. Further details on specific support around M&E activities provided in Section VI (Monitoring and Evaluation Plan).

IV. RESULTS AND PARTNERSHIPS

Expected Results:
Five components and relevant outputs and activities have been developed to increase energy access in rural areas and stimulate the uptake of low-carbon minigrids (mainly solar-based) in Niger by improving the financial viability and promoting scaled-up commercial investment in such systems. The project focuses on the cost-reduction (hardware, soft and financing costs) and innovative business models for minigrids. UNDP's derisking approach will be adopted to catalyze private sector investments in the off-grid rural energy market. In doing so the activities proposed under the five project outcomes will seek to:

1. Advance national consensus on a national minigrid delivery model and adopt enabling policies and regulations to facilitate investment in low-carbon minigrids
2. Operationalize innovative business models based on cost-reduction, with strengthened private sector participation in low-carbon minigrid development
3. Facilitate financial sector actors' readiness in investing in a pipeline of low-carbon minigrids and ensure that concessional financial mechanisms are in place to incentivize scaled-up investment
4. Leverage digital tools and solutions, knowledge sharing, and networking opportunities to enable minigrids market development
5. Conduct the relevant project monitoring and evaluation

Greenhouse Gas (GHG) Emissions Mitigated. This project will result in GHG emissions reductions which will be measured via the GEF7 Core indicator 6: Greenhouse Gas Emissions Mitigated. This indicator captures the amount of GHG emissions expected to be avoided through the project's investment in renewable energy minigrid pilots and will be measured above a baseline value considering that in the absence of the project, the end users would have been supplied by fossil-fuel-based minigrid(s). Mitigation benefits include both (i) direct emissions reductions attributable to the minigrid pilot investments made during the project's implementation period, totaled over the lifetime of the investments (20 years); and (ii) Indirect emissions reductions resulting from the increased uptake of minigrids for off-grid electrification of rural areas due to replication, scaling-up and market change to which the project has contributed by creating a general enabling investment environment for minigrid market development, and facilitating subsequent investment flows. Annex 12 describes the methodology used to define targets for direct and indirect GHG emissions mitigated.

10% of the estimated indirect GHG mitigated of this project have been removed from the project and allocated to the AMP regional project, in line with the apportioning of the overall program budget and reflected in the PFD allocation of GHG emissions reductions across the different AMP national projects. This reflects the benefits of AMP national projects accessing the regional project's support which is expected to contribute and enhance the enabling conditions required for minigrids development across AMP countries.

Project components, outcomes, outputs and activities:

Some changes have been made regarding project components, outcomes and activities between the PIF (Concept Note) and the PPG (Project formulation). They are indicated in the table below:

Table 3 – Changes to the project based on baseline assessments

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
1.1 An inclusive national dialogue identifying minigrid delivery models is facilitate and supports an integrated approach to off-grid electrification	*$ 195,206*	*1.1. An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying priority interventions for an integrated approach to off-grid electrification*	*$ 250,428*	Slight wording change	
1.2 Minigrid DREI techno-economic analyses updated to propose most cost-effective basket of policy and financial derisking instruments and contribute to AMP Flagship Report on Cost Reduction		*1.4 Targeted policy and financial derisking instruments of the Minigrid DREI techno-economic analyses implemented and contributing to AMP Flagship Report on Cost Reduction*		Scope change as DREI analyses conducted in 2021-2022 on the "Support for rural electrification by renewable energy systems in the Liptako-Gourma region - Pilot phase" project executed by UNDP and financed by SIDA	The DREI analyses were conducted from late 2021 to June 2022 as part of the ALG project (Integrated Authority for the Development of the Liptako-Gourma, a region shared by 3 countries: Niger, Mali and Burkina Faso) executed by UNDP under SIDA financing. The derisking instruments were identified Some of them are considered and will be implemented as part of AMP Niger. A workshop sharing the targeted de-rising instruments of DREI under AMP will be held in Year 1. An update of the DREI will be conducted in Year 4.
n.a.		1.2 A review of the political and regulatory frameworks on the possible minigrid delivery models and suitable incentives is proposed in close collaboration with the National Dialogue Platform members and other development partners		Added an output on designing a suitable minigrid framework and what it should encompass	Focus will be put on clearly translating the suitable minigrid delivery model(s) into the political and regulatory frameworks. Relevant aspects of the framework will need to be identified at project inception as there are current progress made with ongoing projects from development partners. Therefore, an adaptive management approach will be required as changes will happen between PPG and implementation. This could include supporting cost-reduction efforts of equipment through existing but insufficient customs duties and tax exemptions on the one hand, and VAT reduction on the other hand as well as grid interconnection risks for private sector CEMG operators

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
1.3 Design of a tendering program and all required bidding documentation, support for tender management (including use of e-tendering systems, proposal evaluation, and transaction advisory)		*1.3. Analysis of existing (pre)-feasibility studies conducted for selected minigrid sites to enhance sector planning and decision-making on a delivery model for minigrid development*		Tendering program is already in place. The focus is put on leveraging the many existing (pre-)feasibility studies for pilot MG sites across the country. This will help the entire ecosystem, including the private sector, to select and operate MG in a sustainable and viable manner	As a nascent market especially, it is critical to elaborate suitable tender documents and contracts – homogenized. During PPG phase and through consultations especially with ANPER and World Bank, the "tendering toolbox" design is ongoing. Bidding documentation templates have already been developed and a digital tendering platform should be provided by the new World Bank HASKÉ project)
1.4. Capacity building provided to public official (regulator, ministries) specifically to design procurement/tender processes that incorporate cost-reduction levers and innovative business models		*1.5. Capacity building provided to public officials (regulator, ministries) to support cost-reduction levers and innovative business models*		Focus of the capacity building for public officials expanded	During PPG, the need for institutional capacity building around minigrids (in every aspect) has been raised at inception and validation workshops. Capacity building efforts for public officials will encompass a larger spectrum of topics around CEMG and related rural electrification. A rapid assessment of the current capacity, the needs and gaps will need to be done. This will inform the relevant training required and develop a modular based approach on each participants' knowledge level and needs.
n.a.		*1.6. Domestication of quality standards and norms for solar minigrid components, and institutional capacity of ANERSOL strengthened*		Additional output on standards as barely considered in this nascent CEMG market	Only a few standards have been yet designed around some solar equipment with ANERSOL and World Bank. To ensure good quality standards for both CEMG equipment and ancillary devices, it is critical to define relevant standards and enforcement measures. Customs duties and taxes could be remained for lower quality products (to be discussed during project implementation)
n.a.		*1.7. Public programmes (apprenticeships, certificates, university programs) to develop competitive, skilled labor market in minigrids facilitated*		Additional output on public programmes around minigrids	The limited competencies at national level on minigrids represent a hurdle for Niger's minigrid market development. National programmes, with a modular approach and at different levels to cover specific needs, will be facilitated, based on the existing local offer, the AMP regional e-training platform, South-South collaboration including with other AMP projects, etc.

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
2.1. Pilots developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost reduction in minigrids	*$545,591*	2.1. Pilots developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost reduction in minigrids	*$773,433*	n.a.	More funding allocated to pilot projects as key for the development of a nascent minigrid market in Niger, as well as to prove its value proposition and enabling the potential of scaling up to be unleashed. The initial (PIF) $300k allocated for the Long Term Low Emissions Development Strategy (LT-LEDS) has been reallocated to the CAPEX costs for CEMG implementation as other funds are sought to cover this activity (probably Climate Promise).
n.a.		*2.2. National report on opportunities to boost economic activities through electricity access and productive use*		Additional output	Given the fact that Niger's rural population is facing extreme poverty, the entry point to contribute to the MGs sustainability is the productive use of energy. This study will be useful for the pilot sites of AMP as well as other projects to identify value chains in rural areas where PUE could be significant.
2.2. Capacity of winning tender bidders strengthened to develop and implement cost reduction levers and innovative business models		*2.3. Capacities of private minigrid developers and communities are strengthened*		Changes in terms of scope of the capacity buildings efforts based on stakeholder consultations changes	Capacities of local private minigrid developers (winning tender bidders are not) as well as communities will be built and/or reinforced. A modular approach based on knowledge level, needs and capacities required will be put in place for better results, adoption and application.
n.a.		*2.4. Support provided to establish and grow a national industry association for private sector developers*		Additional output	AMP is focusing on the private sector's role in supporting the development of the MG market in Niger. The need to have a local industry association for advocacy, business collaboration and knowledge sharing purposes would make a difference for local private sector players, as well as the National Dialogue platform and the development of the CEMG market in Niger (and the project's success).
3.1. Design support, including development of operational guidance, provided for Minigrid Funding Facility (MFF, or equivalent financial mechanism) under rural electrification agencies/funds	*$175,000*	*3.1. Support financing mechanisms to scale-up RE minigrids investment*	*$147,844*	The variety of existing and potential mechanisms need to be assessed to determine which mechanisms(s) the project could support through technical assistance	Based on stakeholder consultations, including with IP ANPER, a sectoral fund would be welcomed including to ensure that the identified delivery model (Component 1) is applied in practice. Other existing financing schemes for minigrids and RE, as well as other sectors in Niger on the one hand, and a benchmark of successful financing mechanisms abroad could be considered. A comprehensive study is envisaged to assess the different options suitable for Niger. AMP Niger could then select where technical assistance could be provided to scale up financing for RE minigrids across the country.

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
3.2. Innovative financing solutions for minigrid development are identified and implemented through the MFF (or equivalent) with supporting human and institutional strengthening		n.a.		Innovative financing included under Output 3 1.	Innovative financing mechanisms are considered as potential financing mechanisms and will be evaluated under Output 3.1. Some innovative financing are already used in Niger incl. crowdfunding for a 100% private-sector led 100% RE minigrid (Africa Green Tech).
3.3 Financial sector capacity-building on business and financing models for renewable minigrids		*3.3 Domestic financial sector capacity-building on business and financing models for minigrids*		Slight rewording	
n.a.		3 4 Replication plan (including investment plan) for scaling up rural energy access developed		Added	A replication plan based on best practices and lessons learned, including from AMP Niger pilot projects as well as other MG projects in the country, will be designed to scale-up MG market development while leveraging well-functioning innovative business models and more. The replication plan will also include a financing plan linked to the financing mechanisms supported by the project under component 3
4.1. A project digital strategy is developed and implemented, including linkages to (and following guidance from) the AMP Regional Project	*$ 240,000*	*4 1 A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project*	*$263,960*	Slight rewording	
		4.2 A 'Minigrids Digital and Data Management Platform' is implemented to run tenders and manage data from pilots, and to support minigrids scale-up and cost-reduction		Additional output as the digital platform is a critical aspect of the digital strategy to be implemented Output 4 2 moved to Output 4.3.	In line with Output 4.1. as well as with the entire project's components, a minigrids data management platform suitable to Niger' needs will be implemented. This should be covered by World Bank's HASKÉ project. It shall facilitate the tendering process from A to Z, monitoring of pilot sites and other indicators, cost optimization. AMP will ensure that this platform is adapted to the requirements. The project shall complement this platform with a repository of all relevant data, studies, reports and more around rural electrification in general and minigrid in particular, at national

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
					level. Indeed, during project formulation, the lack of a centralized repository was a challenge to gather all relevant, reliable and most recent data. Stakeholder consultations confirmed this need with all actors' types (government, technical and financial partners, private sector)
4.2 Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots, including GHG emission reductions is adopted and operationalized based on standardized guidance from the regional project		*4.3 A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots supported, including GHG emission reductions, is adopted and operationalized based on standardized guidance from the regional project*			
4.3 Engage with regional project, including, but not limited to, via (i) Communities of Practice and (ii) capturing sharing lessons learned		4.4. Engage with regional project, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learned			
4.4. Monitoring and Evaluation (M&E) and Reporting, including (i) Conducting Inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid-Term Evaluation and (iv) Terminal Evaluation				Output 4.4. moved to Component 5 as per new guidelines from UNDP/GEF to have a separate M&E component	

Outputs with GEF budget at Concept Note		Outputs with GEF budget at CEO ER		Change	Justification
n.a.		*4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (including intervention zones) and with the regional project*		Added	To support visibility, adoption and minigrid market development and scale-up, targeted awareness raising campaigns at national (including political sphere and general public), and AMP regional levels will be designed and rolled out. This will include climate change risks and mitigation efforts.
	n.a.	*5. Monitoring & Evaluation*	$27,000		A dedicated component on monitoring & evaluation has been added to comply with GEF and UNDP processes and facilitate potential corrective measures to achieve the expected project's results. The budget related to M&E is split between GEF funds ($7,000) and UNDP TRAC funds ($105,256) for at total of $112,256

Component 1. Policy and Regulation

Outcome 1: Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in low-carbon minigrids.

As stated in the baseline, Niger is a relatively early-stage market for low-carbon minigrids. While 14 minigrids have been installed across the country under the supervision of ANPER, a clear national minigrid delivery model has not yet been clearly determined and adopted. The PERAN decree has broadly described different financing options but missing some concrete information on delivery and business models. Currently, a variety of models are on the ground with respect to ownership, tariffs, financing, etc. The need for a national delivery model with stakeholder ownership is crucial to support the market development with private sector involvement and investment.

The existing policy and regulatory framework for electricity in general and minigrids in particular is in place but still needs to be adapted, fine-tuned and adopted on the ground. The National Strategy for Electricity Access (SNAE) and the Master Plan for Electricity Access (PDAE) were prepared with GIS and techno-economic modelling electrification analysis across the country (including rural areas) leading to identifying the most suitable option for every locality across Niger: from grid expansion (NIGELEC), minigrids to individual kits. The PDAE 2021-2025 aims at enabling about 6,000 localities to have access to modern energy services out of which 300 minigrids. A DREI analysis is currently ongoing and to be completed by September 2022, it will determine which de-risking instruments to be supported by the GoN to facilitate the uptake of the low-carbon minigrids in Niger (see preliminary findings under Table 2 - Preliminary Conclusions of the DREI).

Output 1.1. An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying priority interventions for an integrated approach to off-grid electrification

The project will facilitate the establishment of a multi-stakeholder working group or platform to initiate systematic discussions that will inform the national government's identification of the optimal minigrid delivery model to meet the country's rural electrification objectives. The national dialogue will be centered around key issues regarding who finances, builds, owns and who operates and maintains the minigrids, and the related key components of a minigrid framework, including tariff structures/mechanisms and subsidy levels/mechanisms. It should lead to the official adoption of a national delivery model and a buy-in from all relevant stakeholders. Such a national dialogue platform has been highly welcomed by all stakeholders during the various consultations to facilitate coordination and avoid 'reinventing the wheel' and 'double work'.

This output includes the following activities:

Activity 1.1.1. **Establish multi-stakeholder national dialogue group/platform**

Support the establishment of a working group or a similar platform that includes a diverse and representative mix of stakeholders from Government, technical and financial partners, local authorities (collectivités), civil society, private sector, rural populations, local media and others, and initiate a national dialogue to identify the optimal minigrid delivery model based on the GoN's vision, the feedback from first MGs implemented in Niger as well as lessons learned from other AMP countries and beyond. The National Dialogue will be based on the Concertation Framework of energy sector players (*Arrêté portant création d'un cadre de concertation des acteurs intervenants dans le secteur de l'énergie*) that would be amended to include questions related to minigrids. After the review of this *Arrêté* a collaboration with the national dialogue platform around energy in Niger will also be envisaged. Efforts can be made to support and amplify women's and youth voices, for example, by ensuring at least 40% of participants are female and youth, and that at least one dialogue co-chair is female, that events are held at convenient times/places with childcare provided, and that communication barriers are addressed (i.e., linguistic barriers, digital/technology barriers, norms governing speaking in front of elders and members of the opposite sex).

Activity 1.1.2. **Provide inputs for national dialogue decision making**

Provide input to the discussion in the form of gap analysis, best practice reports, and suggestions for delivery models and make sure that the probable consequences of any decision taken for the overarching framework are evaluated and well understood. Support for ongoing gender mainstreaming of the dialogue may also be required.

Activity 1.1.3. **Establish feedback loop between national dialogue and the project**

Align the ongoing dialogue with activities implemented in parallel under the other outputs and loop respective (pre-)results back into the discussion. This should include, but not be limited to, activities which can shed light on trends and progress regarding minigrid cost reduction (e.g. DREI analyses and tracking of minigrid costs, resulting subsidy levels and electricity tariffs that will apply for minigrid pilots).

Output 1.2. A minigrid regulatory framework, including tariff model, tax regime, and grid expansion risk, is developed in close coordination with the authorities concerned and other development partners

Quite some efforts have already been made by various partners to support the GoN in creating a conducive policy and regulatory framework for minigrids and especially green minigrids, including AfDB and World Bank. At the time of writing, several other initiatives and activities are planned by different stakeholders, including GoN, ANPER, World Bank, AfDB and EU, around the general electricity regulatory framework including the minigrids regulatory framework.

Limits of the existing framework have been identified by many stakeholders and included in a recent diagnostic study on the policy and regulatory framework of the Electricity sector in Niger, including minigrids, financed by the EU. A revision of relevant policies and regulations starting from the Electricity Code and including minigrids and private investments is planned with the support of the World Bank's HASKÉ project. This revision is a prerequisite for the EU's involvement in the energy sector in Niger by 2023. A first draft of the revision should be available by December 2022 and a final version latest by April 2023. As such, UNDP Niger will participate in the dialogue on the revision prior to AMP Niger's project management unit (PMU) team being in place by early 2023.

The World Bank HASKÉ project will develop an online platform for the management of license applications located at ANPER. The digital platform will be used from designing to monitoring minigrid projects. This platform will be available to all relevant partners, including AMP.

This output includes the following activities:

Activity 1.2.1. Conduct a brief assessment of the actions taken in terms of minigrid regulatory framework since project formulation

A rapid assessment of actions taken and planned by other stakeholders will be conducted. The results and gaps of the assessment will be shared and discussed during the National Dialogue Committee. AMP's activities will then be adapted, where necessary, using an adaptive management approach and in line with the minigrid delivery model identified and selected by the national government and the National Dialogue Committee

Based on the stakeholder consultations as well as desk reviews, this *could* include - *if not covered yet at project launch* by the Electricity Code revision or other initiatives– the following:

- Develop the tariff model and calculation tool for isolated minigrids in collaboration with ARSE and taking the following into account:
    - ECREEE RE tariffication tool (financed by EUEI PDF 2017)
    - World Bank study conducted under the NESAP project
    - UNDP study recommending off-grid tariffication integrating payment capacities of rural populations and CAPEX realities for a private sector operator in Niger in 2016 (*cadre et schéma de gouvernance de l'électrification rurale*)
    - Results from the DREI study Analysis conducted during the project preparation phase
    - Lessons learned from the first implemented minigrids on national grid tariffs, business models, system sizing, CAPEX related aspects and recovery, payment capacities of end-users, types of end-users (residential, commercial, social), living/working arrangements of end-users (e.g., polygynous households, cottage businesses, child-headed households, displaced or resettled households) etc.
- Assess the grid expansion risks: the PDAE clearly defines which localities would be covered by a national grid expansion/densification by 2035 with specifics on off-grid solutions such as minigrids and individual kits. The risk of grid expansion and interconnection issues remain as the compensation schemes for private sector developers and operators represent an additional hurdle for the private sector to invest in minigrids.
- Set up standardizing and categorizing interventions of minigrid operators (technology type, etc.) - see output 1.6

Activity 1.2.2. Formulate articles to be added to relevant minigrid regulatory texts and support endorsement

The results and gaps assessment (Activity 1.2.1) will help identify legislation, policies, regulations, sector plans and strategies that require further analysis and development to properly address minigrid development challenges and risks. This activity will support further analysis and development of the policy derisking instruments as needed. The project, including through the National Dialogue platform, will support the endorsement of the revision of the relevant legal texts.

One such area of intervention could be the revision of a 2017 decree (updated in 2022) establishing tax exemptions applicable to solar PV technologies which has not yet addressed specific challenges faced by the minigrids sector.

Importing equipment (including RE related ones) are taxable in three ways: customs taxes and duties, VAT and other tiny taxes (including ECOWAS, WAEMU and statistics taxes - all together under 10%). In Niger, a 2017 joined act (*Arrêté conjoint portant liste des équipement et matériels à énergies renouvelables à exonérer des droits et taxes perçus en douane*) lists some solar components (mainly related to individual kits) that are exempted from custom taxes and duties. While this list should be updated once every year, the first review was done early 2022 encompassing some solar ancillary equipment (eg. solar pumps and solar refrigerators). The VAT (19% in 2022) was not included in that decree while it is hampering private sector energy services players.

Other areas of intervention could include:

- structuring arrangements after the Electricity Code revision
- adding VAT reduction or exemption to the relevant 2017 joint act (as stated above)
- revising standards and business models of minigrid operators (including technology type, etc.) - see output 1.6.
- adopting a Strategic Environmental and Social Assessment (SESA) approach where the role of local authorities and communities engage localities and highlighted in the regulatory framework. The "*Code des Collectivités*" and its relevant clauses will be considered where necessary.

Output 1.3. Analysis of existing (pre)-feasibility studies conducted for selected minigrid sites to enhance sector planning and decision-making on a delivery model for minigrid development

Feasibility studies have been undertaken by various donors and partners in coordination with ANPER in approximately 350 out of 500 localities identified as potentially relevant for electrification via minigrids. Component 2 will address activities to analyze and summarize the main findings and impacts on a suitable minigrid delivery and business model to be tested. Moreover, some additional (pre)-feasibility studies could be undertaken in the remaining villages (i.e.,150 villages) and which would nourish the decision-making on a delivery model and relevant financially sustainable business models for minigrids (see Component 2).

In addition to the demand assessment and trends, ability and willingness to pay, productive use (commercial and social), and other aspects, the economic development potential will be further assessed along with a holistic approach of all stakeholders and their needs (not only in terms of electricity).

This output includes the following activities:

Activity 1.3.1. Cluster existing (pre-) feasibility studies by type of village and needs and identify missing pre-feasibility studies per type of village/potential business model

Existing pre-feasibility studies undertaken by various partners (including private sector players) and available at ANPER will be collected, analyzed and grouped based on common specificities leading to specific delivery and business models. Objective criteria will be identified to categorize each locality. Consultations with selected stakeholders including on their feedback on existing minigrids and more will be conducted. Relevant updates and hypotheses (e.g., demand evolution, etc.) will be done where deemed necessary for the analysis as some studies have been conducted a few years ago already. Where possible, gender aspects can be added to the clustered feasibility studies (e.g., cultural groupings, women's land tenure, presence of micro-finance institutions and women's agricultural and artisanal co-ops, etc.) as well as environmental and social considerations.

Activity 1.3.2. Draw recommendations for sector planning and decision-making on a delivery model

Based on Activity 1.3.1. and benchmarks within AMP countries and beyond, different options will be elaborated with their respective strengths and weaknesses. These options will nurture the discussions and conclusions for the national delivery model within the National Dialogue platform (Output 1.1.).

Output 1.4. Targeted policy and financial de risking instruments of the Minigrid DREI techno-economic analyses implemented and contributing to AMP Flagship Report on Cost Reduction

As regards to AMP, UNDP's DREI framework will be applied either qualitatively and quantitatively at various points in the project cycle, both at the national level in each country, and then aggregated into regional knowledge products by the AMP Regional Project and disseminated widely. The DREI framework, both at the national and regional level (in aggregate), will act as the program's mechanism to harvest and disseminate data on changes in the financing costs, hard and soft costs, and resulting costs for minigrids.

DREI, by interviewing the private sector, is a well-suited tool to evaluate the risk environment and suggest instruments at various stages of the project to ultimately lower the project development costs. The DREI financial modeling stage captures hardware and soft costs to determine the levelized cost of electricity (LCOE) of the technology being assessed.

The preliminary conclusions of the DREI can be found under Table 2 above. The report will be shared and made available on the Regional AMP Knowledge Platform and will inform Niger's National Dialogue (Output 1.1) and the PMU to advance the scaling up of the market through derisking measures.

This output includes the following activities:

Activity 1.4.1. **Identify and disseminate specific DREI derisking measures**

Based on the national DREI analyses and the derisking measures, the PMU will select relevant DREI derisking measures specific for the AMP Niger project. This might lead to adapting some project outputs/activities accordingly. In Year 1, the project will build on the DREI workshops undertaken in 2022 and organize 1 round-table workshop with government, private sector and other key stakeholders to disseminate the identified DREI derisking measures to be covered by the project.

Activity 1.4.2. **Coordinate with regional project on national DREI analysis update (Year 4)**

In the final year, or year 4, of the national project's implementation period, whichever happens first, the original national-level DREI analyses will be refreshed to track evolutions in financing costs as well as in hardware and soft costs. For administrative efficiency, the regional project will fund and execute this update (a 'light quantitative DREI analysis'), on behalf of the national project. The deliverable will be a brief note of 2-5 pages on the DREI national update. The data from the national refreshed DREI analysis will be fed into an update note to the year 2 AMP flagship regional DREI knowledge product, which will provide an end-of-program overview of the evolution in minigrid costs across AMP countries. The national project's contribution to this activity will be: (i) facilitating the DREI national update (to be funded and executed by the regional project); and (ii) disseminating the findings of the national DREI update note, and the update to the regional flagship DREI product.

Output 1.5. Capacity building provided to public officials (regulator, ministries) to support cost-reduction levers and innovative business models

While public officials benefited and will benefit from various capacity building around low-carbon minigrids with the support of various partners, fact is that:

1. At various ministries and agencies, new nominations and appointments were made leading to a loss of institutional memory. Ensuring that knowledge is acquired and transferred to new staff is critical.
2. Knowledge disparities exist within a same unit/department as well as between entities (ministries/agencies/utilities)
3. Some aspects in terms of capacity building were not yet covered and AMP Niger aims at bridging these gaps (be it at regulatory, managerial or technical levels)
4. Training should target not only the ministry and the agencies related to energy but also other members of the National Dialogue Platform as access to electricity is a cross-cutting topic and is critical to support economic, social and environmental development across Niger.

This output includes the following activities:

Activity 1.5.1. **Analyze provided capacity building activities and identify gaps**

The following sub-activities would be conducted:

- List all capacity building activities around low-carbon minigrids in the past years with the support of public officials and technical & financial partners, and which ministry or agency benefited from it.
- Gather all training materials to avoid reinventing the wheel and upload them on a specific platform (as part of the Community of Practice under Component 4) so all public officials and beyond can access it.
- Assess the needs of targeted public institutions
- Identify gaps based on the training materials collected along with the feedback of public officials.
- Draw recommendations on capacity building efforts to be provided for public officials
- Coordinate with other development partners and beyond on their planned trainings around minigrids

A special focus will be put on incorporating gender aspects in the entire minigrid project life cycle including the tendering process (including gender scoring of tenders) as well as SES aspects.

Activity 1.5.2. Design comprehensive training materials and conduct workshops with a gender-diverse selection of public officials

Based on Activity 1.5.1., specific comprehensive training materials supporting the understanding and ownership of the identified national minigrids delivery model(s) by public officials will be developed and rolled out. These capacity building efforts lie on multiple approaches: (i) modular whereby participants will attend trainings based on their needs and knowledge level (ii) holistic aspect taking a village with all its activities around minigrids, i.e. including representative members of households, businesses, and social institutions (schools, health centers, etc.) and their respective needs, (iii) participatory where trainings are not purely academic but with a large space left to apply the knowledge and practical exercises.

The multi-country initiative around Solar Renewable Energy Training and Certification Program implemented by Burkina Faso's 2iE institute targeting engineers and staff from Ministries and national utilities (including 20% women) should be leveraged.

Activity 1.5.3. Conduct Training of Trainers (ToT)

A training for both, male and female trainers will be provided to targeted training institutions, ANPER and the Ministry of Energy and Renewable Energies, as well as the trainers of the Ministry of Technical Education and Vocational Training to contribute to ownership and sustainability of the various training modules. Institutional memory will hence be supported along with sharing these training materials with the national and regional knowledge practices around AMP.

Output 1.6. Domestication of quality standards and norms for solar minigrid components, and institutional capacity of ANERSOL strengthened

Today, there are no real quality standards for solar minigrid components. Article 5 of the PERAN decree stipulates that minigrids are build complying with state-of-the art standards and that the technologies selected should be interconnectable to the national grid. ANERSOL, the newly created agency (2018) supporting solar energy promotion, had benefited from technical assistance of WB, AfDB and AFD including building their quality control capacities.

This output includes the following activities:

Activity 1.6.1. Review existing standards and identify gaps

Together with ANERSOL, in collaboration with ECREEE, a review of existing national, regional and international standards around CEMGs will be conducted. Gaps will be identified and clear recommendations will be drawn. The results of this analysis will be presented to ANERSOL.

Activity 1.6.2. **Develop adapted standards**

Based on the review under Activity 1.6.1., ANERSOL and the PMU, with ECREEE's and Verasol's support, will design relevant standards and a plan to enforce these standards. Thresholds could be used around quality standards based on the installed capacity, e.g., under 350kW the standards would be simplified to avoid jeopardizing local efforts to electrify. Such a double standards system has been implemented for instance in Sierra Leone since 2020.

These standards should as much as possible take E&S aspects into consideration through SESA.

ANERSOL's mandate includes the definition of standards as well as the exclusivity for quality control of such standards. However, the capacities of the newly created ANERSOL related to standards and their enforcement are limited.

Activity 1.6.3. Reinforce ANERSOL's capacities

A workshop to present the review (Activity 1.6.1.) and standards (Activity 1.6.2) along with a training on how to reinforce these norms will be provided to ANERSOL's staff. Relevant training materials and documentation will be provided by the project.

Output 1.7. Public programmes (apprenticeships, certificates, university programs) to develop competitive, skilled labour market in minigrids facilitated

Climate and environmental risks and mitigation efforts as well as gender considerations will be included in the activities below.

This output includes the following activities:

Activity 1.7.1. Identify minigrid market needs in terms of competencies and jobs

A comprehensive analysis of the needs of the minigrids market, including efficient end-user appliances and equipment adapted to minigrid environments, in terms of competencies and jobs to contribute to its scaling up should be conducted. This preliminary study is critical to pave the way for the development of suitable training programmes and modules by academics to the market's needs. Such training should integrate a large part of practice and hands-on work, especially to include women who on average have less formal education, to facilitate ownership and direct application of learnings.

Activity 1.7.2. Analyze existing university and higher learning institutions programs and gap analysis

An assessment of the studies portfolio (including modules) around renewable energy and minigrids in particular at the University of Niamey, École des Mines, de l'Industrie et de la Géologie (EMIG) and other high learning institutions across Niger is carried out. Potential gaps compared to the market's needs (see 1.8.1) are identified, and recommendations are made. Bridging these gaps include strategic partnerships with Burkina Faso's 2iE, the soon to be relaunched Côte d'Ivoire's École Supérieure Interafricaine de l'Électricité and targeted higher learning institutions across the ECOWAS region and beyond, as well as ECREEE, IRENA and AMP's partner RMI. The analysis should encompass the inclusion of gender aspects in the curricula.

The analysis' findings will be introduced and shared to universities and higher learning institutions as an opportunity, as well as to the authorities in charge of providing budgets to these institutes.

Activity 1.7.3. Analyze existing vocational training programs and gap analysis

An assessment of the training portfolio (including modules) around solar PV installation and maintenance, battery maintenance, wastage &recycling, becoming a rural electrician and other relevant trainings will be conducted. This will include:

- vocational training courses designed by Plan International's CEMGs project financed by the EU and the Schneider Foundation and validated by the Ministry in charge of Vocational Trainings in Niger. This activity included a training of Trainers (ToT) aspect where 2 inspectors at the Ministry and 19 trainers in 2 vocational training centers (Dosso/Tilabéry and Marady/Zinder).
- training provided by energy service providers for their staff.

A particular focus will be put on certification aspects and their enforcement as this is key to raise awareness of, and ensure ownership by end-users (residential, commercial and social) of reliable quality cleantech solutions as a suitable alternative, especially minigrids. Lessons from Barefoot College-inspired experiences in West Africa will be used to determine the extent to which paper-based qualifications, even literacy, are prerequisites for electricity sector vocational training, hopefully lowering barriers to female enrollment. Gaps compared to the market's needs (see 1.8.1) will be identified, and recommendations drawn. The latter shall include discussions with ECREEE, IRENA, RMI (one of AMP's Regional Project implementers) as well as with AMP regional project and national child projects on how they go about for instance with the certification of solar PV and minigrids installers. Successful capacity building initiatives in other countries including 2iE institute in Burkina Faso etc. will also be leveraged, this includes also sharing best practices and lessons learned in promoting CEMG in the given country and relevant capacity building efforts.

The analysis' findings will be introduced and shared to vocational training centers (including the 2 training centers already capacitated by Plan International) as an opportunity, as well as to the authorities in charge of providing budgets to these institutes.

Activity 1.7.4. Train the trainers of relevant institutions in Niger

Based on the findings of activities 1.8.3. and 1.8.4., and the support of the targeted training institutions, the project will support some ToT activities of these institutions for both male and female trainers in collaboration with identified partners (see above).

Component 2. Business Model Innovation with Private Sector

Outcome 2: Innovative business models based on cost reduction are operationalized, with strengthened private sector participation in low-carbon/renewable energy minigrid development

Given Niger's electricity, and specifically minigrids' situation, policy and regulatory framework, and being an early-stage minigrid market, the project aims at enabling the proof of concept of minigrids with private sector engagement in rural areas. Thanks to innovative business models of demonstration pilots, rural communities will gain access to reliable, affordable and clean electricity. Lessons learned in Niger (with the support of a study conducted by Power Africa with ANPER) and in other countries have highlighted, especially in LDCs, that a minigrid can only become profitable and sustainable when based on:

- productive use
- and cost-reduction.

Such players, be it commercial (for-profit) or social (health centers, schools), are energy intensive during the day (or up to 24/7 such) where the sun is largely available and represent a relatively stable and significant electricity demand source. The project will support the identification of relevant energy intensive value chains in rural areas across the country (Output 2.2).

In terms of cost-reduction efforts, 3 levers are available:

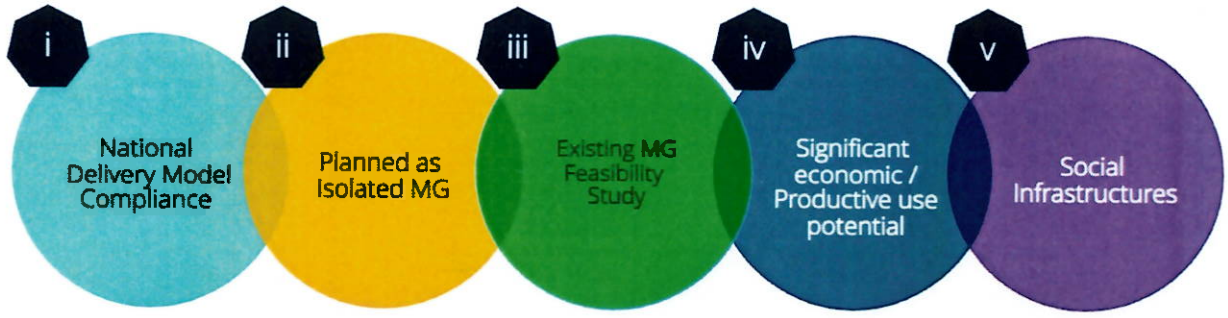
- Sector levers - related to legal requirements (e.g., legal registration, importation license, tariff approvals, environmental impact assessment, land usage rights, village level MOU) and mainly covered in Component 1
- Supply levers - related to the site preparation costs (e.g., site visits, community engagement, transports and logistics), CAPEX (e.g. civil works, electricity generation and storage equipment, distribution infrastructure, metering and monitoring equipment, VAT and duties) and OPEX (recurring infrastructure expenses, salaries and other HR related costs, O&M costs)
- Demand levers - related to customer uptake and demand stimulation (including flexible tariff regimes)

Output 2.1. Pilots developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in minigrids

The specific type and locations of pilot projects will be determined during implementation phase as:

- Additional information to carefully select pilot sites and identify the type of pilots would need to be gathered including a significant stakeholder engagement to ensure relevance and additionality of the pilot project
- For pilot projects led by the private sector, a competitive procurement process needs to be followed to select the private sector developers who will receive support for minigrid investments
- For pilot projects in combination with other initiatives such as multifunctional platforms supported by UNDP or other players, the relevance will need to be reassessed.
- Realities at PPG phase for a given site may drastically evolve (e.g., CEMG developed by other players, insecurity issues, etc.)
- Taking into consideration the exclusion criteria for minigrid locations stated in the ESMF (see Annex 8)

Nevertheless, some criteria have been identified with the Implementation Partners (IP), ANPER, and the responsible party for Component 1, the Ministry of Energy and Renewable Energies, in addition to the pilot project principles stated in the previous chapter:



(i) National Delivery Model Compliance

Niger's minigrid national delivery model is relatively mixed as in most nascent minigrid market. Today the pilot assets can be owned either the Government/the public utility NIGELEC, or the private sector, or communities. The country started with a concession model and now shifting towards an affermage model in a trial & test kind of approach. Given the very low electrification rate in rural areas, greenfield minigrids will be favored to test and demonstrate different business models (including also different technologies) in an early-stage market. It is possible that other delivery models be considered during implementation as the legal and regulatory framework around electricity and minigrids in particular will be undertaken by the World Bank (HASKÉ) by April 2023 in collaboration with relevant partners (including UNDP), and hybridization of existing diesel minigrids in rural areas would be welcome to - as this is the case for instance of health centers covered by World Bank's NESAP project. A combination of different RE sources minigrids (biogas and solar) will be considered. Each pilot project will also consider environmental, social and climate risks and mitigation measures, as well as gender considerations.

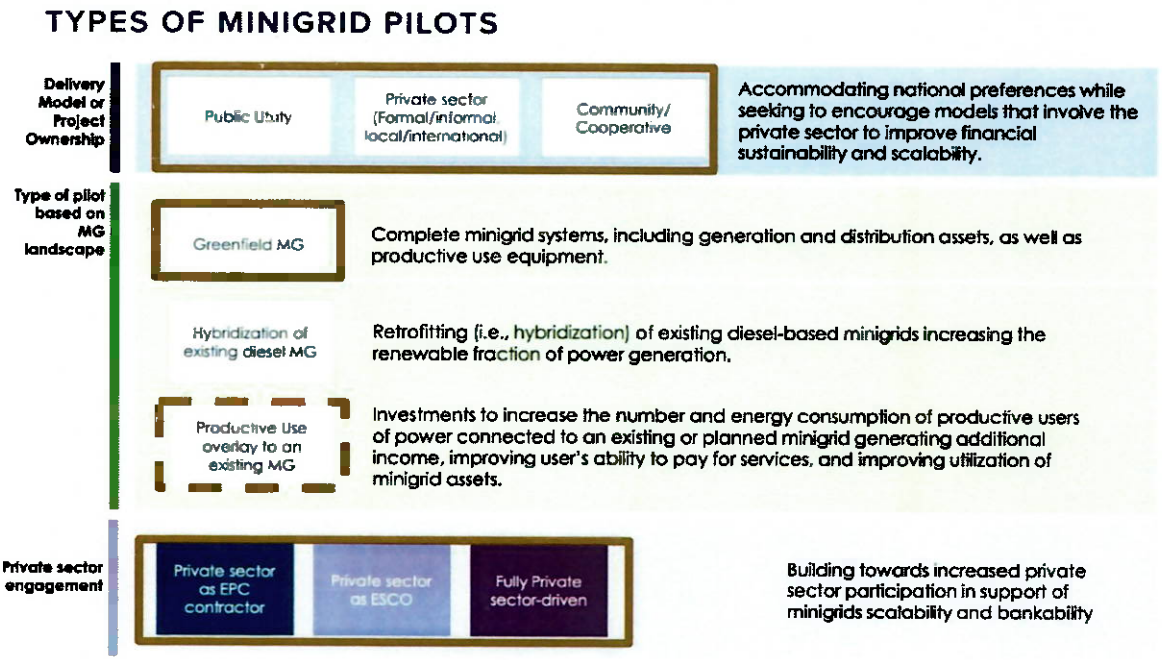


Figure 1- Proposed Delivery Model for Pilots

(ii) Planned as isolated MG

According to the PDAE, as indicated in the baseline and in Component 1, electrification efforts were categorized (grid extension/densification by NIGELEC, isolated minigrids, and individual kits based on specific criteria). Pilot projects under

AMP Niger shall be part of the list of villages identified for an electrification via isolated minigrids and that should not be interconnected to the grid before 2035. It could also include, as discussed with ANPER, existing CEMG pilot sites where there is no operator yet and owned by ANPER. A comprehensive study conducted by GIZ provides a preliminary financial plan and tendering documents for a private sector operator to bid (available also upon request at ANPER).

(iii) Existing minigrid feasibility study

Various development partners supported, in close collaboration with ANPER, the development of pre-feasibility studies for a large number of villages. To facilitate the timely uptake of the CEMG market in Niger, AMP will leverage existing pre-feasibility studies for its pilot site selection. The project would cover, where necessary, the update of this study to ensure a better CEMG sizing, including potentially unrecognized "latent" electricity demand from female producers. The update could also encompass, where deemed necessary, an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) for each site.

This includes the comprehensive CEMG feasibility studies conducted by Power Africa in 36 localities (available also upon request at ANPER).

(iv) Significant economic/productive use potential

The PDAE selected the isolated MG option wherever a village was relatively close to an 'economic development pole'. The project will go one step further and ensure that selected pilot sites are close to a significant 'economic development pole' (e.g., flourishing agricultural activities, mining sites, etc.) and already have (or the potential to become) their own economic activities which would be enhanced through electricity. The existence of a weekly market densifying economic activities on the market day and beyond along with the existence of anchor loads such as at least one telecom tower will be a must. Power Africa's feasibility studies on 36 localities were identified based on the telecom towers as an anchor load. Special considerations can be taken to ensure that electricity provision for productive use doesn't disproportionately advantage individuals, particularly men, who already have higher asset levels, access to finance, business tracks records, and professional networks; this can be accomplished through strategic partnerships with organizations actively working on women's empowerment and economic success. It may also be necessary to plan ahead to create sex-segregated business premises where women can work away from the public eye (if that is something culturally important to them and their families, i.e. they practice wife-seclusion, according to the gender assessment in Annex 10).

All pilots will have the productive use of energy (business and social) as the entry point (i.e. a necessary condition). This is at the heart of the project's theory of change, where the economics of minigrids can improve in a virtuous cycle of higher loads resulting in lower LCOEs. Under Output 2.2. economic activities that could be boosted through access to an accessible, reliable, affordable and greener energy across the country will highlight such productive uses. This include:

- Agricultural Loads (e.g. irrigation pumps)
- Productive Loads (e.g. milling, rice dehusking, oil pressing, wood/metal workshops,refriger)
- Commercial Loads (e.g. shops, bars, ice-makers, battery charging and renting, lantern renting, conservation)
- Anchor loads (e.g. telecom towers, mines, green-houses, hotels, loggias)

Productive use players could pay higher tariffs and provide load during the day which supports CEMG investment feasibility.

They could also pay based on kWh while households could pay a service-based fee.

Existing solar minigrids under ANPER's supervision (7) that do not have yet an operator, could benefit from AMP Niger by helping in finding a private sector operator and supporting the CEMG capacity increase using productive use as well as probably changing some batteries.

(v) Social infrastructures

Another criteria to pilot site selection is the existence of social infrastructures in the village, namely at least one school and one health center. Given the fact that Niger is facing a rampant extreme poverty phenomenon and a relatively low level of school attendance and healthcare - reinforced because of COVID-19, the need to incorporate social infrastructure is critical. Social infrastructures do pay their electricity bill as part of each sector's budget. However, there are often some delays - which should be considered in the financial model of the CEMG.

Gender mainstreaming efforts and monitoring will also cover social infrastructures whereby the latter will be asked to provide information on the gender breakdown of individuals served per year.

In addition to these selection criteria, the following 5 aspects need to be taken into consideration in the tendering process as well as at construction, operation and maintenance of the pilot projects:

Private sector involvement

In a minigrid nascent market such as Niger and with a rural electrification rate of only 1%, the private sector should play a crucial role to support universal energy access by 2035 as targeted in the SNAE. The pilots' delivery model will incorporate private sector involvement as Engineering, Procurement and Construction (EPC) contractor, ESCO or as an exclusive electricity player. Energy service providers should largely be local players supported in the tendering process, capacity building and facilitating access to finance (see Component 3).
In a focus group with local private sector CEMG developers and operators, the issue of having the opportunity to bid and gain experience from A to Z with relevant CEMG design and operation is tremendous. The requirements in tendering processes don't leave space for local players to bid as they lack the relevant experience, the necessary guarantees and credit lines. Thus, the project, during pilot site selection, could think of giving the opportunity to a consortium of local developers to design and operate from A to Z a CEMG.

Community engagement

The role of the community (households, businesses and social infrastructures) is critical to the pilot site's success. It will be informed, engaged and committed from the very beginning of the pilot site project, i.e. from the definition of the tendering specifications to the CEMG operations. A community board with male and female representatives shall be created in each pilot site to ensure the needs and capacities of the community are considered including on the tendering process preparation and evaluation as well as regarding operations and maintenance aspects of the CEMG.

Minimum concessionality of GEF INV support to pilots

The final design of the minigrid pilots, as set out in the minigrid pilot plan (output 2.1, activity 2.1.1 below), will ensure the efficient and appropriate use of GEF donor funding to the pilots. It will set out a clear methodological basis, for example to ensure LCOE parity with a reference tariff; or based on willingness/ability to pay (determined by a study - or the update of an existing minigrid feasibility study - during implementation). Such methodological assessments will be part of an overall package of financial due diligence/assessments that will be performed during the tender process to select pilot sites/developers.
Local authorities and communities may provide in-kind contributions themselves which will be evaluated during the implementation phase. This may include land and installation labor, as well as, thanks to capacity building efforts provided by the project, local monitoring and basic maintenance (with technical expertise support of the private sector minigrid operator), and local payment collection support and greater system security. Established local women, with buy-in from their families and community leaders, are good candidates for monitoring and maintenance tasks since they are less likely to move. They may also in some cases achieve higher payment compliance or unit prepaid sales (kWh) in cases where mobile-enabled PAYGO solutions are not prevalent. Financial inputs may also come from the Nigerien diaspora,

the private sector (productive use players of the community, KeyMaker model players, etc.), and some technical and financial partners.

Potential Electricity Demand

Pilot sites have to be carefully chosen based on the existing demand for productive use of energy (PUE) and not on the demand to be stimulated.

Digital data

As indicated in the previous chapter, in return for benefiting from GEF INV support as a pilot, the asset owner or operator of the minigrid pilot will have to share digital data from the minigrids performance with the AMP national project thanks to relevant digital equipment. More details can be found in the Box below.

Box 5 - Data sharing for minigrid pilots

Pilot beneficiaries (e.g., minigrid operators) receiving support from the project will be required to share minigrid performance data with the national project.

Specific terms and conditions for data-sharing and how best to operationalize the commitment and its adoption by the beneficiaries will be defined and agreed upon with minigrid operators during project implementation, including details of what data can and cannot be used, based on consultations with industry stakeholders and with support from the AMP Regional Project.

The specifications around the data generation by the demonstration pilots supported by the project will consult and follow guidance/standards provided by the AMP Regional Project. A standardized Quality Assurance and Monitoring Framework (QAMF) for application in all minigrid pilots supported under the project will be developed in year 1 of the regional project and disseminated to all national projects.

A digital platform will be procured by the project (under Component 4, Output 4.2) to serve different purposes including: (1) running digital tenders by which minigrid developers will be selected as beneficiaries to receive support under the project and (2) managing all technical and financial data related to minigrid sites.

Through the implementation of this digital management platform, minigrid developers selected to implement minigrid pilots with support from the project will have access to a set of best-in-industry tools for analyzing minigrids (e.g., demand forecasting, system optimization, distribution network design, detailed financial modeling at the site and portfolio level). Similarly, as part of the roll-out of the data platform, minigrid developers (as well as key government and other stakeholders) will receive capacity-building and in-depth training to use analytical tools and data management technologies.

As indicated above, in Niger, the digital tendering platform will be taken care of by World Bank's new HASKÉ project. During PPG, it has been agreed with World Bank that UNDP as well as other relevant partners (in addition to ANPER under which the platform would be located) will be consulted and actively involved in the tendering and roll-out phases. ANPER will take ownership and the lead to ensure coordination and partnership with all relevant stakeholders. This will also contribute to integrating AMP results to the digital platform supported by the HASKÉ project.

This output includes the following activities:

Activity 2.1.1. **Develop a detailed project plan (the project's 'Minigrid Pilot Plan') for advancing the project's minigrid pilot(s)**

The PMU will lead and develop, in close collaboration with other stakeholders and support from the AMP Regional Project, a detailed project plan (the project's 'Minigrid Pilot Plan') for advancing the minigrid pilot(s). Once prepared, the project's Minigrid Pilot Plan will first be reviewed for clearance by UNDP (CO and BPPS NCE), and then shared with the Project Board. This activity should be completed by the end of year 1.

Building on the initial design information in this project document and its annexes, including the key principles for minigrid pilot implementation described in **Box 3**, the project's Minigrid Pilot Plan (MPP) will determine, among other aspects, the following:

- Clear objective for the pilot(s)

- The minigrid delivery model(s) which will be demonstrated in the pilot(s)
- The proposed type of pilot: greenfield minigrid pilots
- The estimated target number of pilot(s), based on *ex-ante* estimates of available GEF INV and other funds needed to cover the CAPEX costs
- Inputs, as necessary, on site selection, including based on geo-spatial mapping, for the pilot(s)
- Site-specific assessments and other requirements (e.g., demand sizing, social and environmental safeguards assessments (ESIAs/ESMPs), gender assessments, e-waste disposal). Some assessments may be needed to be performed by the project *ex-ante*, to inform follow-up competitive tenders. The project's MPP will rely on existing feasibility studies and will update and complete them where necessary.
- The use of the digital platform for competitive tendering at ANPER, as necessary
- Ongoing data collection from minigrid pilot(s), including data-sharing requirements from minigrid pilot(s) (Refer to Box 5), as well as digital hardware requirements (Refer to Box 6)
- The project's approach to ensure minimal concessionality for the level of GEF INV support to the pilot(s) (when there are private sector beneficiaries)
- Review of the Implementing Partner's (IP's) modalities for transfer of GEF INV support to the pilot(s), ensuring they are aligned with UNDP's policies and financial rules
- If a pilot includes GEF INV support for productive use, ensuring the pilot takes a third party ownership model to productive use equipment
- Coordination and rationale on any associated project technical assistance activities which may benefit the minigrid pilot(s)

Box 6 - Indicative Specifications for Minigrid Pilots' Digital Hardware and Software

Offering	Details
Hardware requirements per site	· Inverter monitoring (monitoring & control) · Distribution monitoring · Optional current transformers for energy meter if more than 10 kW (single phase) or 30 kW (three-phase) · 24V power supply (50€) · Various data cables and installation material · Optional: 24V backup battery (50€) · Optional: Cabinet for the complete monitoring system · Industrial internet router · Industrial or high-quality Ethernet Switches
Hardware requirements per connection	· Smart meter

The types of pilot sites that *could be* considered during implementation could encompass the following:

- Around a Multi-Functional Platform (MFP) of a women's group (gender component) planned by a project and which will consider access to electricity via solar minigrids / adapted ancillary equipment
    - e.g. UNDP / PASDEL project - framework project where a proposal of combining a MFP can be submitted to UNDP
- A model called "Keymaker- 4th generation" where a private operator could have two roles: a) solar minigrid (production, transport and distribution of electricity) in the village with residential, commercial and social customers, b) but also an activity of conservation & agro-food transformation. This could be for example around

fishing (like Jumeme in Tanzania around Lake Victoria) or an agricultural value chain (local rice/rice steaming; peanuts/peanut oil, poultry farming, etc.)
    - e.g., with a robust cooperative member of the Federation of market gardening cooperatives in Niger to support their food production, conservation and processing activities (e.g. organic onion, rice, etc.)
- Around a refugee camp and its host community (such as in Ouallam, where an agro-ecological farm and the refugee camp are not electrified) - electrification here will also create income generating activities and improve the living conditions of host communities and refugees
    - Coordinate with the World Bank HASKÉ project as its aim is to cover the electrification of refugee camps
- A hybrid RE model with solar and biogas minigrids around several agricultural value chains including a more "sedentary" livestock component as a basis for the biodigester (issue of security and theft of livestock to be considered in the choice of sites)
- A site where local content will be highly favored for local developers and operators to gain the necessary experience to compete for minigrid tenders in Niger
    - A focus group of local operators and developers, organized during the PPG phase, identified this a big hurdle for the scale-up of the minigrids market through private sector with local companies

Activity 2.1.2. **Design the tender process for pilot(s) using a digital platform**

The project's pilot(s) may involve private sector engagement in various forms, including models involving private sector minigrid ownership, private sector EPC, and private sector O&M services. Where there is private sector engagement in the pilot(s), a competitive tender process will be executed using the digital tendering feature of the digital platform procured under Component 4.

Under this activity, the PMU, working with the digital platform vendor, specialist engineering, financial, procurement, and legal expertise, and the AMP regional project, will translate the approach set out in the project's Minigrid Pilot Plan into the design of a customized tendering process on the digital platform (to be implemented with ANPER leadership and coordination under World Bank's HASKÉ project), including requirements, specifications and evaluation criteria. Feedback can be solicited from a gender-diverse selection of private sector actors with experience responding to government tenders (not limited just to electricity) about whether the proposed digital modality and in-person supports will result in a more level or less level playing field for male and female prospective developers. The terms of reference will consider, among other factors, which the PMU will determine with support from the AMP Regional project, the following:

(i) establishing a requirement and incentives for pilots to share data with the project

(ii) including incentives for the proposals to be gender-responsive

(iii) including implementing the ESMP (including a requirement for environmentally-sound collection, storage and disposal of all electronic and electrical waste, including rechargeable batteries, associated with off-grid renewable energy technologies)

(iv) considering the different aspects set above before detailing outputs and activities of Component 2.

At the end of this activity, the tendering process on the digital platform will be ready to launch. The tender process itself should be launched before the end of Year 2.

Activity 2.1.3. **Execute tender, contracting and payments to the selected pilot beneficiaries**

In year 2, the tender will be launched and executed according to the design finalized in activity 2.1.2, resulting in minigrid developers/operators being selected as pilot beneficiaries. Submissions to the tender will be competitively assessed against evaluation criteria (engineering, financial, environmental, social, gender, etc.), with the PMU supported by appropriate expertise.

Following selection of beneficiaries, the PMU/IP will enter into legal contracts with the selected minigrids, again supported by appropriate expertise, and make payments on pre-defined milestones, including on commissioning of minigrid plants and following ESMP. The digital platform will validate payment milestones as part of a result-based financing approach. A top-up payment could be envisaged for operators connecting socially vulnerable groups.

Capacity building for government personnel with the digital platform would have been conducted by HASKÉ. Potentially some capacity building would be offered to private sector actors (if not already done) to engage with the competitive tender and adherence to social and environmental standards.

Activity 2.1.4. **Monitor pilot(s), collect and aggregate data shared by pilot(s)**

Data generated by the pilot(s) will be collected using the digital platform, connecting directly to remote monitoring and smart metering equipment. Data that are not amenable to be collected by remote sensing will be collected either by the minigrid operator or some alternative way to be defined by the PMU supported by appropriate expertise.

Data collected from the pilot(s) will be used at the project level to, among other purposes: (i) track the performance of the minigrid systems in real-time; (ii) validate the underlying pilot(s) assumptions and business case; (iii) track performance enhancement in minigrid capacity utilization; and (iv) generate insights and lessons learned to share with the AMP Regional Project.

Also, data collected from pilot(s) will be shared with the AMP Regional Project for aggregating and analyzing data across all AMP national child projects. The regional project will use these data to: (i) generate insights and lessons learned; and (ii) inform the development of knowledge products, both to be disseminated across AMP participating countries and the broad minigrid sector.

Collected data should also be gender disaggregated.

Output 2.2. National report on opportunities to boost economic activities through electricity access and productive use

This output includes the following activities:

Activity 2.2.1. Conduct an analysis on boosting rural economies

As part of the minigrid market development and scale-up efforts, a mapping of relevant high potential value chains (in economic and social terms) with possible linkages between those and energy use will be focused upon (including stakeholder mapping) at national level. The analysis will include:

- A mapping on primary processing opportunities in rural areas to shift the value addition from existing agricultural processing into rural areas. Much of the agricultural outputs of rural areas is, as a result of non-existent rural electricity availability, transported to, aggregated and processed in areas connected to the national grid (or even abroad).
- An analysis on the role minigrid can play in sustainable rural development. The potential opportunities to boost economic activities through electricity access and productive use will be mapped against the difference roles that can be played by:
    - Developers and operators - data supports the fact that investing in productive uses increases customer ability to pay and site Average Revenue Per User (ARPU)
    - National governments: stimulating productive uses in rural areas boosts the local economy, such as releasing female labor from low productivity traps into higher productivity domestic, agricultural and wage work, and as does improving the health and educational status of children and pregnant women
    - Development Finance Institutions (DFIs) - supporting increased electricity demand is a 'soft subsidy' for developers and a variety of socio-economic benefits
    - Investors - increased ARPU and ability to pay are key drivers of a project's bankability. This is also critical information for due diligence and capital raising
- A benchmark of best practices around minigrid value chain support and suitable innovative CEMG business models (e.g. Jumeme's keymaker model in Tanzania, etc.)
- A market sizing exercise to assess the financial and non-financial impacts (including environmental & social aspects) and the viability of minigrids in rural areas in Niger

Activity 2.2.2. Disseminate findings to facilitate the CEMG market scale-up

The comprehensive analysis and its main findings on boosting rural economies via CEMG will be shared via a workshop, publications and knowledge sharing means in Niger as well as abroad including the regional AMP knowledge sharing platform and relevant communities of practice.

Output 2.3. *Capacities of private minigrid developers and communities are strengthened*

While local private minigrid developers benefitted from capacity building activities as identified during consultation meetings at PPG phase such as with and by Power Africa, there are some remaining needs to complete the gaps to ensure sustainability.

As indicated, the role of the communities and their engagement from the very beginning of the electrification process is crucial for the CEMG project. Hence their capacities need to be built for an adapted operations and maintenance (O&M) service. Obviously, capacities to be reinforced for minigrid developers and communities vary.

This output includes the following activities:

Activity 2.3.1. **Assess the capacity gaps of local private minigrid developers and solar panel installers**

An evaluation of the capacities of local developers and installers will be conducted. This will include their familiarity with minigrid technical and service delivery design targeting the full spectrum of individual users (i.e., for men and specifically for women and youth), business opportunities, tender writing, innovative business models, successful and durable O&M of the minigrid, quality assurance, raising funds, environmental and social considerations, etc.

Activity 2.3.2. **Offer workshops and webinars to fill these gaps**

Based on the assessment in Activity 2.3.1, relevant workshops, webinars and other knowledge sharing efforts will be provided to local developers based in the capital city Niamey. existing training and support materials suitable to each of the gaps within AMP, its partners and beyond will be used as much as possible. This includes AfDB's Green Minigrid Helpdesk, ESMAP minigrid Design manual, Power Africa's raising fund technical assistance or AfDB's SEFA Quality Assurance Framework for Minigrids.

Training should also be offered to local solar panel installers based in Niamey as well as in pilot project localities. These hands-on trainings could be offered in collaboration with the Ministry of Technical Education and Vocational Training and its various vocational training centers across the country.

Activity 2.3.3. **Raise awareness and building capacities of communities**

Pilot sites communities will benefit from continuous awareness raising at launch and during implementation of the project as a whole, and pilot site construction and operation in particular. This will include general benefits of the minigrid (including climate change aspects), demand profile, forecast and stimulation, support in money collection for the provision of power, etc. A specific training will be provided to targeted youth and women in the communities on becoming rural electricians (including power connection), on basic maintenance of the minigrid, as well as other competencies depending on the implemented business model. As stated in Component 1, the modules developed by Plan International and the Schneider Electric Foundation, and validated by the Ministry in charge of Vocation Training, will be leveraged. Youth and women will be trained based on these training materials and trained trainers Efforts made in other countries including Barefoot College or 2iE in Burkina Faso, ProJeunes.Energie in North Côte d'Ivoire, etc. It is worth mentioning that maintenance requiring higher technical skills will be provided by the private sector operator. In addition, private sector operators will play a role in knowledge transfer, capacity building and regular support of these targeted youth and women.

Output 2.4. *Support provided to establish and grow a national industry association for private sector developers*

A private sector association for players in the solar industry has existed since May 2013 in Niger called 'APE-Solaire'. Some solar companies in Niger are either members of the association or requested to join. The main activity of APE-Solaire is to participate as a stakeholder in the ongoing development of the GoN's solar energy policy and regulation. Followed consultation during the PPG phase, the association could benefit from some strengthening that could be beneficial to the country in the development of CEMGs. APE solaire could become a powerful advocacy platform by including all relevant stakeholders such as the GoN and technical and financial partners.

This output includes the following activities:

Activity 2.4.1. **Develop and operationalize a national association of private sector RE providers and aspiring providers**

A rapid capacity gap assessment at APE-Solaire will be conducted based on interviews/focus groups of members and other solar energy products and services providers, as well as a benchmark of such successful associations with the support of AMDA - African Minigrid Developers Association[21]. This will enable local private sector operators to have a voice at the National Dialogue Platform and beyond, nationally as well as continentally and internationally (advocacy). Common interests include taxes and import conditions of solar and solar ancillary equipment, collaborating as a consortium of players to answer specific larger bids and competing with international developers, as well as a better outreach. The association could then have thematic sub-committees (if applicable) including one dedicated to minigrids. The association, also considered as a national chapter of AMDA, will seek collaboration with AMDA – African minigrid Developers Association. This industry association will become a member of the national chapter (an AMDA consultant located in Niger should become the chair of the minigrid committee of the association and could support advocacy, fund mobilization and interaction with its members (mainly private sector led associations and individual developer companies). Such an association can also play an intentional role providing role models and mentors to aspiring market entrants, especially youth and women, who face higher barriers to entry (e.g., lack of market information, weaker professional networks). APE-Solaire could also benefit from expertise and experience sharing with the AMP regional project and other AMP national projects.

Activity 2.4.2. **Strengthen the capacities of the RE private sector association**

The industry association would highly benefit from capacity building as an association. Indeed, an association operates in different ways compared to a private company. Capacities to be focused on encompass structuring, managing and moderating the association to ensure its well-functioning and its sustainability.

Component 3. Scaled-up Financing

Outcome 3: Financial sector actors are ready to invest in a pipeline of low-carbon minigrids and concessional financial mechanisms are in place to incentivize scaled-up investment

Access to low-cost, commercial capital (equity and debt), for both supply and demand, ideally in local currency, is key to reducing the cost of minigrids, and the scalability and sustainability of a minigrid market. Being an early stage minigrid market, there are only few financing schemes in place around minigrids in Niger. Thus, developing and scaling-up the CEMG market in Niger requires suitable financing mechanisms both on supply and demand sides.

Output 3.1. *Support financing mechanisms to scale-up RE minigrids investment*

This output includes the following activities:

Activity 3.1.1. **Identify existing financing schemes available in the country supporting access and use of energy**

A mapping exercise will be undertaken to identify and characterize all existing minigrid funding and support programs underway and planned nationally. From this a gap analysis will be conducted to identify the opportunities and challenges associated with different funding mechanisms.

During the PPG phase a preliminary mapping of available financing mechanisms related to access and use of energy in general has been undertaken. Some available financing products identified are:

On the supply & demand side:

- For SHS: World Bank's NESAP had created a USD 7 million credit line for some financial institutions in Niger. Sonibank and BSIC offer loans to solar systems providers, whereas Capital Finance has been targeting households, solar pumping systems and very small enterprises. However, the interest rate given to banks for the credit line (4.5%) was relatively high compared to the market and therefore impacted the final interest rate for loan takers. Developers would have to take a loan at 11.5% which was finally reduced to 8% and ultimately

[21] https://africamda.org/

few loans were given. The challenge was the high interest rate of the mortgage guarantee and the eligibility criteria which limited the list of eligible solar products (including ancillary equipment).

On the demand side: ·

- *Fonds d'Investissement pour la Sécurité Alimentaire et Nutritionnelle* (FISAN), a fiduciary fund for the promotion of agriculture that supports farmers to acquire equipment (mechanization) including e.g. solar pumping for irrigation purposes etc. to ensure food production and processing.
- PAYGO is offered by some enterprises like Olu Solar or High Tech Solution for household and productive use.
- Asusu: Former support for RE equipment through a former micro-finance institution in Niger that ended. This MFI, which has been dissolved, is planned to be revived under another entity soon.

The assessment will include innovative financing solutions both on supply and demand sides. This includes:

- Crowdfunding and crowdlending (already used in Niger for one private sector minigrid operator)
- Blockchain enables Finance
- Renewable Energy Certificates or Peace Renewable Energy Certificates
- etc.

Capacity building related to these innovative solutions are part of Output 3.2.

Activity 3.1.2. Assess the potential of aggregation of minigrid assets

The potential for national and regional financial aggregation of minigrid assets will be explored. The assessment should include an ESIA/ESMP that takes into consideration cumulative impacts of minigrids to be aggregated.

Aggregation can take the form of:

- Operational aggregation whereby operators cooperate to share access to operational or development resources. This can lead to considerable savings and cost reductions;
- Project aggregation whereby minigrids are bundled together to form larger investable assets. This process creates larger portfolios to crowd in investors that might not consider small projects. This level of aggregation requires upfront and standardized due diligence to be carried out before projects can be bundled. This further reduces transaction costs for investors. Aggregating across multiple developers and markets further reduces the risk. An example of this is the CrossBoundary Energy Access fund that bought a portfolio of sites from PowerGen in Tanzania.
- Connection aggregation exploits the large amount of data that is constantly being generated and uploaded to the cloud in near real time from the smart meters installed on minigrids. This information includes data on energy being consumed and revenue being generated from each individual minigrid connection. The granular nature of this data allows different types of customers to be aggregated into asset classes with different characteristics. For example, all of the high revenue producing, consistent connections (most likely based on a productive use of electricity) across multiple sites can be aggregated into a high performance class suitable for commercial investors willing to pay well for revenue producing assets.

Activity 3.1.3. **Benchmark successful financing mechanisms in other industries and countries**

There are few best practice of funds in Niger such as *"Mécanisme Commun de Financement"* (MCF) for the water sector, the FISAN for the agricultural sector and the locally managed Financing Facilities in Nigeria for instance its Rural electrification Fund and ESMAP-NEP Program both managed by the Rural Electrification Agency. The AMP Regional project could advise on the type of mechanism and approach that are in place in other AMP countries.

Activity 3.1.4. **Determine the main financial barriers**

Local and international private sector players will be engaged to determine key financial barriers for the development of the MG market in Niger. The African Minigrids Developer Association AMDA, ANERSOL, APE Solaire and any other organization with locally relevant private sector knowledge will be interviewed towards the same objective. The DREI analysis undertaken in 2021-2022 offers some de-risking measures that should be considered and implemented to overcome such financial barriers. The preliminary conclusions can be found under Chapter III - Strategy.

Activity 3.1.5. **Select relevant financing mechanisms and provide suitable technical assistance**

Based on activities 3.1.1. and 3.1.2., AMP Niger will select 1-2 relevant financing mechanisms to benefit from technical assistance.

This could include:

- a sectoral fund as initiated in December 2016 a decree to create a Financing Facility to promote RE and EE in Niger was adopted. This facility should have been located under the Ministry of Energy and Renewable Energies and focus on public funding and only accessible for the GoN and its related agencies. However, this facility never materialized. To facilitate the reach of universal electricity access by 2035, the design of a Minigrid Funding Facility (MFF) to support rural electrification and minigrids market in Niger has been welcome during stakeholder consultations. This Fund would receive the Special Electricity Tax (TSE - *Taxe Spécifique d'Électricité* that is collected by NiGELEC whereby 60% of the collected tax is used to support rural electrification and transferred to ANPER. The tax is collected from each kWh paid by electricity users of the national grid to contribute to a national unified tariff grid. In order to contribute to social justice in terms of electricity access as stated in the Electricity Code, offering a tariff matching the average national grid is considered a must by all public energy related institutions. Thus, the TSE could support the funding for the compensation to be paid to private sector developers and operators for the difference between the average national tariff of about 85F/kWh (≈$ 0.13) and the cost-reflective tariffs that private sector players would request to ensure their sustainable profitability and viability. This MFF should also be nurtured by the existing and upcoming minigrid market initiatives financed by development partners such as World Bank, AfDB as well as the AMP Niger project (for the pilot project sites - see Component 2) and private investments. A set of potential financing schemes will be identified as part of the Facility based on the delivery model that will be more clearly defined during project implementation.
- A result-based financing mechanism approach like the model that the pilots for AMP Niger under Component 2. Its design and governance could be informed by a gender-balanced set of stakeholders. Additional provisions may be required to ensure that women and men can access the mechanism in equitable measure (e.g., using scoring criteria, set-asides, special outreach, or offering women agency-based capacity strengthening services in parallel with the Fund's applications).

Relevant financing mechanisms should ensure that environmental and social considerations are taken into account when disbursing loans (see SESP in Annex 5).

Government stakeholders including ANPER will be engaged to ascertain the appetite for the different funding mechanisms proposed. The capacities of ANPER will be assessed as well as relevant institutions to support the selected financing mechanisms..

Activity 3.1.6. Train relevant ANPER staff on the launch and management of the selected financing mechanisms

Relevant ANPER staff will be trained on the selected financing mechanisms

Output 3.2. Domestic financial sector capacity-building on business and financing models for minigrids

Some efforts have been already conducted towards financial institutions to raise their awareness on CEMG (e.g., NESAP), but remain limited and do not include sufficient suitable as well as innovative financing solutions.

This output includes the following activities:

Activity 3.2.1. Build the capacities of the national financial sector

The local financial sector will only offer suitable and affordable financing solutions (demand and supply) once it gains awareness of and appetite for the minigrids market. De-risking means and lucrative opportunities around lending in the minigrids market in Niger will be put forward. Workshops will be conducted with representatives of the finance community - financial institutions and investors - whereby a variety of business models and financing schemes, as well as the best practices (including environmental, social and gender considerations) will be shared and discussed. Capacity building will be carried out with financial institutions to design and implement adapted financing schemes in close collaboration with the other Component 3 outputs.

Activity 3.2.2. Develop links with relevant stakeholders around financing and costs reductions

Links will be developed between local financial institutions, relevant government representatives (DGEME, agriculture and more) and international donors in order to explore hybrid and innovative schemes focused on unlocking finance and reducing risks and capital costs (e.g., first loss pools, currency hedging facilities, etc.). This includes for instance IRENA's marketplace, an online investment catalyst and connecting platform for technical and commercial RE solutions. In addition, awareness will be raised on climate risks and mitigation measures through the introduction and operationalization of low-carbon minigrids as well as the financial impacts of green solutions.

To ensure a good understanding and ownership of these solutions, capacity building for local financing solutions providers, local developers and energy solutions providers, government representatives, ANPER, NIGELEC, etc. will be provided.

Output 3.3. Replication plan (including investment plan) for scaling up rural energy access developed

This output includes the following activities:

Activity 3.3.1. Develop a replication plan for scaling up investment in minigrids

A plan for scaling up minigrid investments will be developed based on data gathered and lessons learned from implementation of project activities across all AMP countries and from GEF-funded minigrid projects worldwide, knowledge shared by the regional project with the national projects, and insights gained from participating in AMP Communities of Practice. The Program's comprehensive approach to reduce financing, hardware and soft costs will create the enabling environment to attract public and private investments. This coupled with sound knowledge management underpinned by a robust theory of change and a strategic environmental and social assessment is expected to catalyze markets.

Activity 3.3.2. Conduct relevant market survey

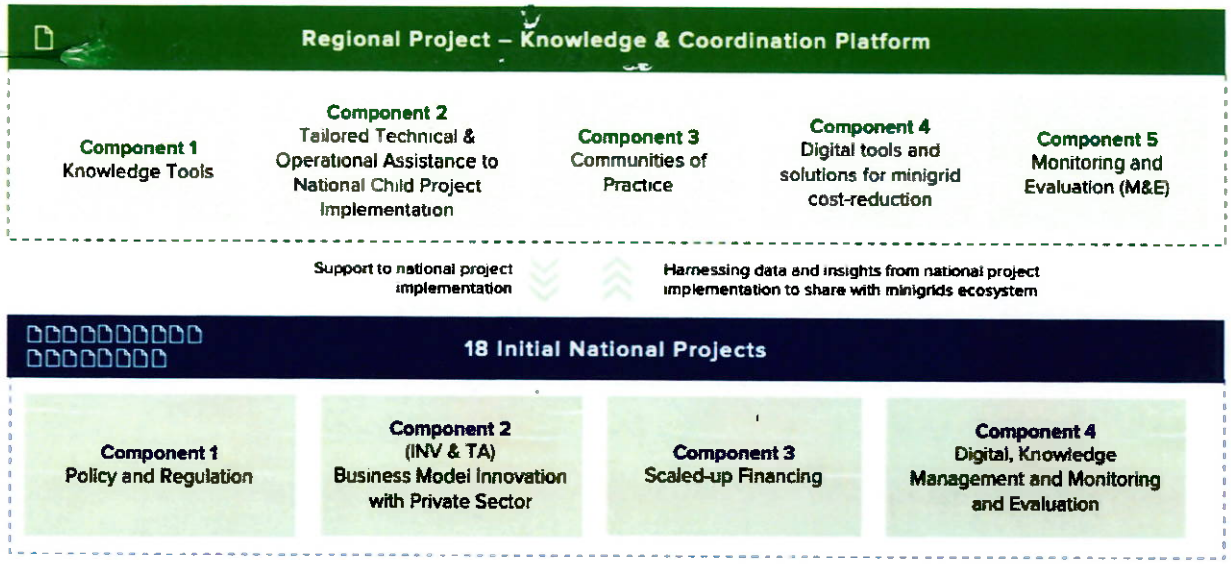
A more detailed market survey will be carried in Niger to assess scaling-up and replication impact potential.

Component 4. Digital & Knowledge Management

Outcome 4: Digitalization and data mainstreamed, across stakeholders, into local minigrid market development. Increased knowledge, awareness and network opportunities in the minigrid market and among stakeholders, including benefitting from linkages to international good practice

Linkages to the AMP Regional Project: Component 4 is a key interface with the AMP Regional Child Project. As such, details on linkages to the regional project as relevant for digital, knowledge management and data performance analytics activities under the project are addressed for each of the outputs described below.

Figure 7- Interactions between AMP regional and national projects



Output 4.1. A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project

This output includes the following activities:

Activity 4.1.1. **Develop and implement a project digital strategy (the 'Project Digital Strategy')**

All national child projects will develop a Project Digital Strategy in year 1 which will be implemented thereafter. The Project Digital Strategy will be updated on an annual basis to reflect learnings from project implementation, guidance received from the AMP Regional Project on digital/data tools and solutions, and insights gained from minigrid pilot(s) data. This includes:

- payments data (via the mobile money platform provider)
- energy usage behavior data (kWh consumption patterns - via the smart meter infrastructure)
- generation system data (including metrics like battery voltage levels- via the smart meter infrastructure)

Activity 4.1.2. **Draw recommendations for a national-level digital strategy for minigrid development**

Upon implementation of the Project Digital Strategy and based on lessons learned around opportunities to leverage digital tools and solutions for minigrid sector development, the project will develop a set of evidence-based recommendations for rolling out digital solutions for minigrids at the national level. These recommendations will be shared with key national stakeholders and provide the basis for developing a digital strategy for minigrid development post-project.

Output 4.2. A 'Minigrids Digital and Data Management Platform' is implemented to run tenders and manage data from pilots, and to support minigrids scale-up and cost-reduction

A Minigrids Digital and Data Management Platform is planned to be procured by World Bank's HASKÉ project and implemented by ANPER. At project implementation launch, the PMU should work with the ANPER and World Bank team to assess the platform. Based on these, the activities under this output could be adapted.

This digital platform would serve different purposes including:

Specifically, for minigrid investment pilots under Component 2:

- Running digital tenders by which minigrid developers will be selected as beneficiaries to receive support under the project
- Managing all technical and financial data related to minigrid sites

- Provide minigrid developers - selected to implement minigrid pilots with support from the project - access to a set of best-in-industry digital tools for analyzing minigrids (e.g., demand forecasting, system optimization, distribution network design, detailed financial modeling at the site and portfolio level)
- Capacity building for minigrid developers and government stakeholders around the use of the minigrids data management platform

The implementation of this data management platform by ANPER, the Implementation Partner, to run and manage minigrid tenders and then systematically monitoring minigrid pilots and collected data from pilots, is expected to result in improved project design and system optimization, reduced uncertainties and more transparency in minigrid tenders attracting more bidders and increasing competition, and lower transaction costs associated with bidding.

For the project and minigrid sector more generally:

- Provide a centralized database for all distributed energy projects/programs at national level including sector-wider, large-scale tenders or result-based financing mechanisms.
- Collect, manage and aggregate data from all minigrid sites
- Run digitized tenders and administer grants (other than for Component 2 pilots)
- Performance verification of minigrid systems for improved sector oversight
- Real-time monitoring and evaluation of electrification projects/programs
- Applying advanced analytics of minigrid portfolios to generate critical insights to advance the sector

Similarly, as part of the roll-out of the data platform, minigrid developers (as well as key government and other stakeholders) will receive capacity-building and in-depth training to use analytical tools and data management technologies.

The AMP Regional Project will make its own data management platform available to aggregate data from all national project pilots based on a common M&E framework.

This output includes the following activities:

Activity 4.2.1. **Support the development of Terms of Reference (TORs) for procuring a Minigrids Digital Platform**

The PMU will coordinate with HASKÉ, ANPER and all relevant stakeholders (National Dialogue) to co-develop relevant ToR. An adaptive approach will be used here at project at AMP project launch to assess the status of the procurement of the Minigrids Digital Platform.

The standardized TOR provided by the AMP Regional Project will be shared with ANPER, HASKÉ and any other relevant partner, and tailored to the specific country/project needs. Box 7 below provides indicative specifications for the Digital Platform.

The project will specifically ensure that some specific questions are added to the tendering process of sites, including key value chains on the site and their energy needs (supported by the results of output 2.2.), existence of a telecom tower, a school and a health center, gender-related aspects, etc.

Activity 4.2.2. **Ensure that the selected Minigrids Digital Platform matches the requirements**

The project will ensure that the country-level minigrids digital platform enables (i) convening and capacity building for key stakeholders (public/private), (ii) collecting and managing technical and financial data related to minigrid pilot(s) based on the project's Quality Assurance and Monitoring Framework (QAMF), including linking to the AMP Regional Project, and (iii) acting as the mechanism for running digital tenders for minigrid developers/sites.

Box 7 - Indicative Specifications for the Project's Digital Platform

The project digital platform will provide key functionality for the project in terms of acting as the (i) national digital convening platform for key stakeholders (public/private), (ii) providing ongoing data gathering and M&E on minigrids, including linking to the AMP regional project and (iii) acting as the mechanism for tenders for minigrid developers/sites.

Functionality	Details
National digital convening platform for key stakeholders	· Set up of a country-specific, web-based platform to manage all technical and financial data related to minigrid sites at the site and portfolio level · Single site register of minigrid sites, with geospatial views and technical/financial benchmarks for site assessment · Set of best-in-industry tools for analyzing minigrids, including demand forecasting, minigrid system design and optimization, and financial modeling · Capacity-building and in-depth training of key government and other stakeholders to use analytical tools and data management technologies
Technical data collecting platform: (remote monitoring & analytics)	· Direct integration with smart meters and remote monitoring systems for live data feeds and monitoring (with options to address lack of remote monitoring systems or other restrictions) · Big data analytics and customized reporting to calculate and report on standardized metrics for pilot performance, based on project QAMF · Quality assurance of data quality, accuracy, relevance, consistency · Interactive tools to analyze data, filter, and view at varying levels of granularity · All pilot-specific data can be rolled up into national view, and all country-specific data can be rolled-up into regional view
Financing platform for running tenders to select minigrid pilot beneficiaries	· Complete end-to-end management of e-tenders for minigrids customized to specific project/pilot needs (e.g. customized technology solutions, customized workflow, customized KPIs for pilot monitoring) · Automated proposal analysis for quantitative proposal components · Remote verification of connections through smart meter integrations · Automated M&E analytics for all RBF program indicators (connections deployed, amounts paid, gender/environmental impact metrics, etc.)

Activity 4.2.3. **Develop and operationalize a rural electrification platform**

One of the many findings during PPG was a lack of a centralized repository of documents around rural electrification (including market assessment, regulatory and legal texts, knowledge documents, feasibility studies, training materials and webinars, relevant events and conferences, etc.) and to avoid double work in the future. Relevant documentation would be collected and uploaded by relevant ANPER staff. Such a platform, located under ANPER, and accessible to relevant stakeholders, would be complementary to the specific Minigrids Digital and Data Management Platform. The latter would be integrated into the rural electrification platform.

Output 4.3. A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots supported, including GHG emission reductions, is adopted and operationalized based on standardized guidance from the regional project

This output includes the following activities:

Activity 4.3.1. **Provide inputs and feedback to the AMP Regional Project on the development of a standardized Quality Assurance and Monitoring Framework for application across AMP national projects (AMP-QAMF)**

A standardized Quality Assurance and Monitoring Framework for application in all minigrid pilots supported under AMP national projects (AMP-QAMF) will be developed in year 1 of the AMP Regional Project and disseminated to all national project staff. This AMP-QAMF will build upon the minigrid Quality Assurance Framework (QAF), which is a set of technical and financial performance monitoring indicator, developed by NREL, SEFA and others, as well as the considerable data gathering, pooling and analysis work ongoing by partners such as RMI, SE4All and AMDA.

It is expected that national project staff will provide both inputs and feedback on the development of this framework as well as on how best to operationalize the commitment to its adoption by the minigrid operators receiving support from the national project. Concerns around data privacy or sensitive data on the part of minigrid operators will be considered and addressed in each case.

Activity 4.3.2. **Operationalize the AMP-QAMF**

The adoption and utilization of this framework and associated data reporting protocols will be a mandatory requirement for all minigrid pilots supported under AMP (e.g., applicable to all national projects) and each minigrid operator/sponsor who is the beneficiary of investment subsidies and technical support by the project will be required to formally commit to using the QAF as a condition of assistance. The adoption of the QAF by all minigrid operators/sponsors supported under AMP national projects will ensure that the regional project can aggregate common data metrics and track a standardized set of key performance indicators across all minigrid pilots supported by AMP across all partner countries and report this data to the donor on a programmatic level.

To operationalize this, the parties operating the minigrids will be supported with the installation of smart meters and/or remote monitoring equipment as appropriate. Provision will also be made to support the operators to access this data and extract potentially valuable insights on their minigrid operations.
If appropriate, provision will be made to train relevant government agency representatives (and members of the Communities of Practice) in the use of a national minigrid dashboard reporting data on all of Niger's minigrid projects.

Output 4.4. Engage with regional project, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learned

The AMP regional project will support and facilitate knowledge management and information sharing between the regional child project and national child projects, among national child projects, and between the program and the larger minigrid community. Knowledge tools and good practices around minigrid cost-reduction in a variety of regulatory environments, and research and development tools, such as policy packages, template tender documents, and guidelines on productive use program designs will be made available. The toolkits will support both public and private sector (e.g., minigrid developers) and the overall minigrid market.

Activity 4.4.1. **Participate in AMP Communities of Practice (CoP)**

One of the primary ways national project staff will interface with the AMP Regional Project is via the 'Communities of Practice' (CoPs) and associated activities/platforms. While it is expected that many of the activities under the Regional Project Component #3 will be undertaken virtually (via internet-based platforms, webinars or digital platforms) it is also expected that the CoPs will include actual in-person workshops, meetings or training events. Among the topics to be covered, quality standards developed and enforced in other AMP countries around CEMG equipment and ancillary products should be included.

Activity 4.4.2. **Share research and lessons learned with the AMP regional project**

Research and lessons learned will be systematically shared with the regional project based on guidelines that will be defined by the regional project and shared at the project's Inception Workshop. Capacity building will be provided to the national project PMU to compile lessons learned and share knowledge effectively.

Activity 4.4.3. **Collaborate with the regional project on an 'Insight Brief'**

Every AMP national project is expected (during the four-year implementation cycle) to collaborate with regional project staff on the development of at least 1 'insight brief' capturing (in an accessible format) selected key highlights from a successful national project activity. The 'insight brief' can cover any activity of the project and take the form of a written

brief or video brief. The regional project has budgeted resources to produce 'insight briefs' (under its Component #1 Knowledge Tools), but the success of regional staff in producing insight briefs highlighting national project activities will be dependent on content and data provided by the national project team and stakeholders.

To facilitate such collaboration, the project will hire a consultant or local firm to gather data and audio-visual content (video footage, photos, etc.) on the subject for the 'insight brief'. The information and data collected at the national level will be provided to the regional project staff who will utilize this content and produce an 'insight brief' according to a standardized communications format for all AMP knowledge products for external audiences. The 'insight brief' will be produced in both the local/national language of the relevant national project as well as English for dissemination by the regional project to regional stakeholders and publishing on the AMP website.

Output 4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (including intervention zones) and with the regional project

This output includes the following activities:

Activity 4.5.1. Design a communication strategy

A communication strategy will be elaborated based on awareness raising campaigns and lessons learned. The awareness raising campaign experiences around sustainable energy across Niger and other AMP countries will be identified and leveraged where necessary. Available communication materials will be adapted. The communication strategy should include communication towards members of the GoN as well as the political sphere (National Assembly etc.) to showcase how critical electricity in rural areas is to contribute to sustainable development. It should also cover communication campaigns for the general public and have a yearly communication work plan designed to support the PMU and UNDP Niger to monitor and implement the activities.
This includes radio spots in local languages and banners. In addition, with at least 2 telecom operators (out of 4), SMS campaigns will be rolled out – 1 SMS per operator per month over the entire duration of the project. SMS content will be provided by the PMU. Digital means will also be leveraged to raise awareness for instance with the national digital promotion agency, Agence Nationale pour la Société de l'Information (ANSI), and some youth and women associations.
The project will develop its own website or a dedicated part in the AMP regional website.
Field visits will be organized on pilot sites to see, understand and discuss with local communities on their experience with the minigrids and energy access.
The leveraging role of schools and children will be envisaged to communicate the need to shift to renewable sources of energy and the catalyzing role of access to energy in rural areas to have access to lighting, cooking, productive use, etc.

Activity 4.5.2. Implement and monitor the communication strategy

The communication strategy will be rolled out and specific indicators defined in the communication strategy will be tracked to ensure the expected impacts. The communication strategy will be adapted if necessary, according to potential gaps that may arise during project implementation.

Component 5. Monitoring and Evaluation (M&E)

Output 5.1. Monitoring and Evaluation (M&E) and Reporting, including (i) Conducting Inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid-Term Evaluation and (iv) Terminal Evaluation

The AMP Regional Project will provide support to the project, through its PMU staff or by hiring or recommending subject matter experts, for the project to execute M&E activities such as the inception workshop, ongoing monitoring, and project evaluations. Further details provided in Section VI.

Activity 5.1.1. Hold an inception workshop and prepare a report

A project inception workshop held to officially launch the project and, among other aims, familiarize key stakeholders with the detailed project strategy, roles and responsibilities of the project team, and project planning instruments such as the Total Budget and Work Plan (Section IX), multi-year work plan (Annex 4), Monitoring Plan (Section VI), the Procurement Plan (Annex 11), the communication plan, ESMP (Annex 9) and the gender action plan (Annex 10), among others. The national inception workshop will be carried at the beginning of project implementation (within 60 days of CEO endorsement of this project). The workshop will be organized by the PMU with support from the IP and planned

with support from the AMP Regional Project staff. Staff from the AMP Regional Project PMU will participate either remotely or in-person in the Inception Workshop and will provide support to the project PMU to plan the workshop and develop materials and content that will facilitate project planning activities including the template for the Inception Workshop Report. The Inception workshop report will be prepared by the PMU and submitted to UNDP within (within 90 days of CEO endorsement of this project).

Activity 5.1.2. Undertake ongoing project monitoring

As set out in the Monitoring and Evaluation Plan (Section VI), data on Results Framework Indicators will be systematically collected and analyzed to provide decision-makers, managers, and project stakeholders with: (i) information on progress in the achievement of agreed objectives and the use of allocated resources, and (ii) regular feedback on performance of projects and programs taking into account the external environment. Information from systematic monitoring serves as a critical input to ongoing PMU management decisions (adaptive management), evaluation, and learning.

The GEF Core indicators included in the Results Framework (Section V) as per this Project Document (Annex 16) will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to the project's evaluations. Namely, the mid-term review (MTR) and terminal evaluation (TE) described under Activity 5.1.3 and Activity 5.1.4 below.

The project is accompanied by various plans including Stakeholder Engagement Plan (Annex 8), mitigation plan for project risks (Risk Register in Annex 6), and Gender Action Plan (Annex 10). These plans will be reviewed according to the monitoring and evaluation requirements.

According to the project's social and environmental risk rating, there is a need to carry out continuous monitoring of the social and environmental safeguards as proposed in the Environmental Social Management Framework (ESMF) and other SES frameworks/plans (Annex 9). The environmental and social management plan (ESMP) that will emanate from the application of the ESMF will also be monitored under this activity.

Data collected by monitoring GEF Core indicators, Results Framework indicators, project plans and social and environmental safeguards will be used to prepare the annual Progress Implementation Report (PIR) to report back to UNDP and/or GEF.

Activity 5.1.3. Conduct a Mid-term review (MTR) of the project

An independent mid-term review (MTR) will take place at the half-way mark of project implementation and will be conducted according to guidance, rules and procedures for such evaluations established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects. The MTR will be made widely available to all project stakeholders in the relevant language.

Activity 5.1.4. Conduct a Terminal evaluation (TE) of the project

An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The project's terminal GEF PIR along with the TE report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lessons learned and opportunities for scaling up.

Partnerships: The project will work with a variety of partners and initiatives to achieve the project's objective and results (see table below)

Table 4 - Identified partners for the AMP in Niger

Partner name	Description and contributions	Relevant project outputs
Ministry in charge of renewable energy	The Ministry has in charge the setting up of policy, legislative, regulatory, institutional, strategic and planning framework to promote the development of access to electricity in rural areas	All outputs relevant to component 1 and even all the overall outputs of the project since the Ministry has in

Partner name	Description and contributions	Relevant project outputs
	through renewable energy sources. A steering committee will be set up to monitor the implementation of the project. The Ministry is the beneficiary of component 1.	charge the management of the steering committee.
Ministry in charge of environment & Bureau National pour les Etudes et Evaluation (BNEE)	BNEE is responsible for evaluating all development projects and programs in Niger before they are implemented. The developer submits the project notice to the BNEE, which analyzes it. Following this analysis, the project is classified in one of the following categories A, B, C and D. Projects in categories C and D do not need an evaluation study. The evaluation of a project generates additional costs which, in the field of energy, would increase the cost per kwh. Therefore it is important to provide all the necessary information in the project notice so that the project is classified in the appropriate category	Contribute to the achievement of output 1.3 ; 1.5
Ministry in charge of vocational training	In Niger republic each municipality has a vocational training center. There are also in each region technical college and higher vocational training center. Hence different levels of training centers are available. They will contribute to the training of technicians to ensure the maintenance and repair of minigrids.	Contribute to the implementation of output: 1.7 ; 2.3
Ministry in charge of gender promotion	The ministry in charge of gender promotion implements the national gender policy. To this end, it will ensure that gender is taken into account in the implementation of the project.	Outputs: 1.1; 1.5; 2.1; 4.24.4;4.6
National Agency for the Promotion of Rural Electrification (ANPER)	ANPER's mission is to design, implement and monitor rural electrification development programs in Niger. To this end, With the support of the Government, it mobilizes funding and the private sector to promote the development of rural electrification. ANPER is currently in the process of awarding by leasing several minigrids already built to private operators. Currently, it is implementing several minigrid projects, financed by development partner including the World Bank, ADB, IDB, EBID, BOAD, Italian Cooperation, etc. With its own funds, ANPER is implementing a	ANPER is the implementing institution of the Niger AMP project. Hence it coordinates all the outputs.

Partner name	Description and contributions	Relevant project outputs
	project to install two minigrids of 140 kWc each in two localities.	
Africa Green Tec/private enterprise	This enterprise has already built a pilot containerized minigrid solar in the village of Amaloul with a digital monitoring system. Two technicians provide on-site maintenance. The tariff system is not based on cost reflective as stated in the electricity law but based on the ability to pay. It is currently developing a feasibility study for the electrification of 50 rural localities.	It could be a significant player in contributing to the achievement of outputs 1.1, 1.2, all the outputs of component 2, outputs 3.2; 3.3; 4.1; 4.2
National Agency for Solar Energy/ANERSOL	ANERSOL's mission is to promote and develop solar energy in all sectors of the national economy, in particular: Propose and popularize standards and labels for renewable energy equipment. Carry out quality control of renewable energy equipment. Control the compliance of installations and certification of private operating in the field of solar energy. Contribute to capacity building for actors in the field of solar energy. Through the support of partners, it has set up a technical platform used for quality control of renewable energy equipment and has set up communication activities to promote the development of off-grid solar market. This project could strengthen the capacities of the technical platform.	It will contribute to the implementation of the following outputs: 1.1; 1.2; 1.5; 1.6; 1.7; 2.3; 3.3.; 4.2
Professional Solar Association (APE-Solaire) and other non-members operating in solar energy	They have no experience in building solar minigrids but have very good experience in stand-alone systems for domestic, institutional, and productive use. They showed a strong desire to participate in the implementation of the project and specially to acquire additional technical skills required for the development of minigrids. Their participation and contribution would be decisive especially in the regulatory framework, pricing and the mobilization of financial resources. As part of the SEFA project, there are 3 private promoters who have benefited from support in carrying out feasibility studies for solar minigrids. They need to be trained for feasibility study, management and operating minigrid and suitable environment and financial mechanisms schemes.	They will play an important role, among others, in the following outputs: 1.1; 1.2; 1.4; 2.1 2.2; 2.3; 2.4; 3.2; 4.2; 4.5

Partner name	Description and contributions	Relevant project outputs
NGO Plan International Niger	It has built the first solar minigrid in Niger. The minigrid was handed over to ANPER. It supports rural communities in the Tahoua and Maradi regions with access to solar electricity (micro-grid) for both households and productive use. Through a partnership, it also trains beneficiaries women to ensure maintenance and operation of solar equipment/installations.	Contribute to the implementation of outputs 1.1 ; 2.1 ; 2.3 ; 3.2 ; 4.2 ;
Ecole des Mines de l'Industrie et de la Géologie	Train engineers in renewable energy. It could integrate training modules specific to solar mid-grids into its curricula	Could contribute to the achievement of outputs 1.1; 1.5; 2.3; 2.4; 4.2
Fédération des Coopératives Maraîchères du Niger	It carries out activities in the agricultural value chain, in particular IGAs. There is a possibility of taking into account in the selection criteria for the pilot sites the establishment of the production activities of the cooperatives. This association could raise grant funds from its partners such as the FAO or FISAN to contribute to the financing of the projects.	Activities centered on the productive use of energy. Take this into account as a criterion in the choice of pilot sites. Outputs: 1.1; 2.1; 2.3 and 4.2
World Food Organization/FAO	Supports actors in the silvo-agro-pastoral development chain, particularly in irrigation, livestock, farming, production and conservation of market garden products. The source of energy used are diesel or solar power in rural areas. Currently, FAO is implementing regional projects focusing on the value chain. Within the framework of this project implementation, there could be opportunities to replace diesel generators used for water pumping, for example. It would therefore be very interesting to explore potential synergies for the installation of a pilot minigrid on market gardening sites.	Outputs: 1.1 ; 2.1 ; 2.2 ; 2.3 ; 3.2 ; 4.2.
Multifunctional Platform Project/PTFM	Works in the promotion of PTFM for access to energy services, in particular: electrification, mills for processing cereal grains. Training artisans and beneficiaries in the upkeep and maintenance of PTFMs. The training of beneficiaries and the setting up of management committees. Possibility of co-financing if the sites selected correspond to their criteria	Contribute to output 2.1 by integrating the choice of pilot sites including its criteria.
National Financial Institutions	Through partners such as Power Africa and the NESAP project, some banking institutions have benefited from capacity building in energy access. They have also taken an active part as stakeholders in studies in the energy sector. In addition, as partners, for example through the NESAP project, SONIBANK, BSIC and Capital	Contribute to the achievement of outputs 3.1 ; 3.2 ; 3.3

Partner name	Description and contributions	Relevant project outputs
	finance have benefited from credit lines opened for private operators and consumers.	
World Bank	The World Bank is an institution that supports the government of Niger not only to set up an environmental framework favorable to the promotion of the energy sector but also in the financing of electricity access projects. Within the implementation of Haské project, it is planned to revise the electricity code but also to support ANPER in setting up a digital platform to, for example, facilitate the management of tender documents	Contributes to the implementation of outputs 1.2; 3.1 and 4.2
Fonds d'Investissement pour la Sécurité Alimentaire et Nutritionnelle/FISAN	This institution manages trust funds from development partners to promote the development of the silvo-agro-pastoral and tertiary sector. It provides grants to beneficiaries. These interventions indirectly concern the energy sector in the value chain. It could be an important partner in the implementation of this project.	Could help provide subsidies to minigrid beneficiaries in these target sites Output: 3.1;3.2
Power Africa	It has built the capacity of potential promoters of the renewable energy sector, particularly solar, to promote investment and the development of rural electrification. It also supported ANPER in carrying out feasibility studies for the development of solar minigrids built around telecommunication antennas. Possibility of selecting pilot sites among the feasibility studies sites carried out by Power Africa.	The following outputs 2.3; 3.1; 3.2; 3.3 and 4.2

Other ongoing initiatives as listed in the ANPER co-financing letters are supervised and directly implemented by ANPER, the project IP, and thus covered and articulated by ANPER directly.

1. Private sector's engagement in the project:

The project formulation launch workshop held on April 7, 2022, brought together the various stakeholders, including representatives of the private sector. The private sector was represented by the Association of Solar Professional (APE-Solaire) and other non-members of APE-Solaire.

Throughout the process of the Project formulation, representatives of the private sector were consulted. They welcomed this initiative very well. Thus, the stake around the project was shared with them and in return they provided very useful information which contributed to enriching the document.

During the project document validation workshop which took place on June 16, 2022, private sector representatives were also participants. This meeting was an opportunity for the private sector to fully appreciate the objective and expected results of the AMP Niger project and above all to understand the different activities planned by component but

also their expectations and their role to be played in the implementation of the project. They noted and remained hopeful that the implementation of the project will make it possible, if not to completely curb, to mitigate the negative impacts of the various obstacles, in particular the regulatory framework, financing, capacity building and dialogue between partners to promote the development of minigrids in Niger. The private sector has also expressed its deep concern about the marginalization to which it is subject in the awarding of contracts for the construction of minigrids under the pretext that it does not have the experience in minigrid. It is therefore recommended that the AMP Niger project considers the adequate involvement of local businesses in the implementation of pilot projects to strengthen their technical skills and ensure proper ownership of minigrid technology.

Co-financed activities

Several of the abovementioned partners have provided letters of co-financing for this project, as attached in Annex 13 to this project document. As further described in Table 5 below, some of these co-financed activities correspond to funds not flowing through UNDP accounts and whose results are not included in the project results framework. In this case, UNDP is accountable to monitor the risk to realization of co-financing amounts and realization amounts annually in the GEF PIR, at mid-term and at terminal evaluation. Specifically, potential risks associated with co-financing that may affect the Project, including safeguards related risks that fall within the project context or area of influence, will be considered in safeguards due diligence and the project risk register, and monitored accordingly. Risk management measures identified will be only those within the control of the UNDP project (e.g., managing reputational risk). See the ESMF (Annex 9) for more details on the management of risks related to the different types of co-financed activities in this project.

Table 5 - List of co-financed activities

Co-financing source	Co-financing type	Co-financing amount USD	Included in project results?	If yes, list the relevant outputs
ANPER	Grant	135,104,356	No	n.a.
ANPER	In-kind	76,490	Yes	PMC
UNDP	Cash	300,000	Yes	2.1., 5.2.,5.3.,5.4., PMC
SIDA	Grant	1,276,171	No	n.a.
TOTAL		**USD 136,757,017**		

N.B.: SIDA's co-financing letter (Annex 13) list it's relevant projects for AMP Niger with the timespan of its projects (e.g., 2020-2024). As AMP Niger will be implemented from 2023-2027, the amounts taken into consideration as co-financing activities will only cover 2023-2027. Thus, the amounts in the co-financing letters and the table do not coincide.

The co-financed amounts have been calculated as follows:

- SIDA: SIDA's "Liptako-Gourma rural electrification project" project lasts from 2020-2024 hence 2 years out of 4 are considered for AMP Niger. The total amount was divided by 4 (years) to have a broad approximation of disbursements per year.

ANPER: The projects breakdown amount listed in the letter has been calculated as from the beginning of AMP Niger, expected to start in 2023. The table below lists the projects and breakdown type (INV/TA) considering only the relevant proportion of the project (in relation to AMP's components and the proportion of these projects implement between 2023 and 2027:

Table 6 – Breakdown of ANPER co-financing letter projects

	Investment in US$	Technical Assistance in US$	Total in US$
Rural electrification project by decentralized solar energy in Niger financing of the Islamic Development Bank (IsDB)	24,870,000	7,130,000	32,000,000
Rural electrification project using hybrid micro power plants in 47 localities in Agadez, Diffa, Dosso, Maradi, Tahoua, Tillabéry and Zinder regions financed by the West African Development Bank (BOAD)	19,316,797	1,502,484	20,819,281
Rural electrification project using solar Photovoltaic systems and individual kits in 100 localities in Niger financed by IRENA/ADFD	13,750,000	1,219,973	14,969,973
Rural Electrification Project by Solar Photovoltaic Systems in the Regions of Dosso, Tahoua and Tillabéry, financed by EBID/Exim Bank	3,115,500	59,350	3,174,850
Photovoltaic rural electrification project in Niger - Keita and Illela departments financed by the Italian Agency for Development Cooperation	978,737	236,733	1,215,470
Electricity Access Acceleration Project (HASKÉ), Component 2. Strengthening the Ecosystem for the Development of Rural Solar Photovoltaic Mini-grids and Sub-component 4.2. Institutional Strengthening and Technical Assistance financed by the World Bank	22,500,000	2,500,000	25,000,000
Niger Solar Electricity Services Access Project (NESAP), Component 2: Rural Electrification through Solar Hybrid Mini-grids following a Delegated Service Operator Model	4,158,698	-	4,158,698
Rural electrification project by solar photovoltaic system of 250 villages in the Republic of Niger under financed by EBID (BIDC in French)	30,995,478	2,770,606	33,766,084
TOTAL in US$	**119,685,210**	**15,419,146**	**135,104,356**