



**GREEN
CLIMATE
FUND**

Meeting of the Board
18 – 21 August 2020
Virtual meeting
Provisional agenda item 11

GCF/B.26/02/Add.10

28 July 2020

Consideration of funding proposals - Addendum X

Funding proposal package for FP138

Summary

This addendum contains the following seven parts:

- a) A funding proposal titled "ASER Solar Rural Electrification Project";
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat's assessment;
- e) Independent Technical Advisory Panel's assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
- g) Gender documentation.

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Funding Proposal

Project/Programme title:	ASER Solar Rural Electrification Project
Country(ies):	Senegal
Accredited Entity:	West African Development Bank (BOAD)
Date of first submission:	2020/01/21
Date of current submission	2020/05/21
Version number	<u>V.1.5</u>



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Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the [GCF Information Disclosure Policy](#), project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

“FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]”

ACRONYMS

ASER : Senegalese Agency for Rural Electrification (Agence Sénégalaise d'Électrification Rurale)
ASN : Standards Association of Senegal (Association Sénégalaise de Normalisation)
AML/CFT : Anti-money laundering - combating finance of terrorism
APR : Annual Performance Report
BCEAO : Central Bank of West African States
BE : Baseline Emissions
BOAD : West African Development Bank (Banque Ouest Africaine de Développement)
CDM : Clean Development Mechanim
CoP : Conférence of Parties [to the United Nations Framework Convention on Climate Change]
COPERES : Council of Professionals of Renewable Energies in Senegal
CRSE : Electricity Sector Regulatory Commission (Commission de Régulation du Secteur de l'Électricité)
DER : General Delegation for Women and Young Entrepreneurs (Délégation générale à l'Entrepreneuriat Rapide des Femmes et des Jeunes)
DEEC : Direction de l'Environnement et des Etablissements Classés
DREEC : Divisions Régionales de l'Environnement et des Établissements Classés
ER : Emission Reduction
ESMF/ESMP : Environmental and social management Framework/Plan
ECOWAS Economic Community of West African States
ECREEE ECOWAS Centre for Renewable Energies and Energy Efficiency
ERIL : Local Rural Electrification Initiative (Électrification Rurale d'Initiative Locale)
ERPA : Emission Reductions Purchase Agreement
ESIA : Environmental and Social Impact Assessment
FONGIP : Priority Investment Guarantee Fund (Fonds de Garantie des Investissements Prioritaires)
FONSIS : Sovereign Strategic Investment Fund (Fonds Souverain d'Investissements Stratégiques)
FSE : Special Support Fund for the Energy Sector (Fonds Spécial de Soutien au secteur de l'Énergie)
GCF : Green Climate Fund
GDP : Gross Domestic Product
GEF : Global Environment Facility
GHG : Green House Gases
IPP : Independent Power Producers
IRENA : International Renewable Energy Agency
KYC : Know Your Customer
LPDSE Letter of Development for the Energy Sector (Lettre de Développement du Secteur de l'Énergie)
MCC : Millennium Challenge Corporation
MEP : Ministry of Energy and Petroleum
MFI : Microfinance institutions
MEFP : Ministry of Economy, Finance and Planification
M/SME : Micro/Small Medium Enterprises
NDA : National Designated Entity
NDCs : Nationally Determined Contributions
NGO : Non-Governmental Organization
O&M : Operation and Maintenance
OECD : Organization for Economic Cooperation and Development
PE : Project Emissions
PMU : Project Management Unit (Unité de Gestion du Projet)
PNER : National Rural Electrification Program (Programme National d'Électrification Rurale)
PoA : (CDM) Programme of Activities
PPER : Priority Rural Electrification Program (Programme Prioritaire de l'Électrification Rurale)
PPPs : Public Private Partnership
PREM : Multi-Sectoral Energetic Projects (Projets Energétiques Multi-sectoriels)
PSE : Plan Senegal Emergent
PUDC : Emergency Community Development Program (Programme d'Urgence de Développement Communautaire)
PV : Photovoltaic
RE : Renewable Energy
ROGEP : Regional Off-Grid Electrification Project
SENELEC : Société Nationale d'Electricité du Sénégal
SDGs : Sustainable Development Goals
SHS : Solar home system
ToR : Terms of Reference
UNFCCC : United Nation Framework Convention on Climate Change
WAEMU : West African economic and monetary union

(*) Some institutions' names and acronyms are retained in French

A. PROJECT/PROGRAMME SUMMARY			
A.1. Project or programme	Project	A.2. Public or private sector	Public
A.3. Request for Proposals (RFP)	Not applicable		
A.4. Result area(s)	<p>Check the applicable GCF result area(s) that the overall proposed project/programme targets. For each checked result area(s), indicate the estimated percentage of GCF budget devoted to it. The total of the percentages when summed should be 100%.</p> <p>Mitigation: Reduced emissions from:</p> <p><input checked="" type="checkbox"/> Energy access and power generation:</p> <p><input type="checkbox"/> Low-emission transport:</p> <p><input type="checkbox"/> Buildings, cities, industries and appliances:</p> <p><input type="checkbox"/> Forestry and land use:</p> <p>Adaptation: Increased resilience of:</p> <p><input type="checkbox"/> Most vulnerable people, communities and regions:</p> <p><input type="checkbox"/> Health and well-being, and food and water security:</p> <p><input type="checkbox"/> Infrastructure and built environment:</p> <p><input type="checkbox"/> Ecosystem and ecosystem services:</p>		
			GCF contribution: <u>100%</u>
A.5. Expected mitigation impact	1,127,447 tCO₂eq (2021 – 2045)	A.6. Expected adaptation impact	<p><i>Adaptation co-benefits to 344,000 beneficiaries (38,900 households)</i></p> <p><i>4% of Senegal rural population</i></p>
A.7. Total financing (GCF + co-finance)	198,692,182 Euros	A.9. Project size	Medium (Upto USD 250 million) ¹
A.8. Total GCF funding requested	75,445,176 Euros		
A.10. Financial instrument(s) requested for the GCF funding	<p>Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.</p> <p><input checked="" type="checkbox"/> Grant EUR 1,821,945 <input type="checkbox"/> Equity <u>Enter number</u></p> <p><input checked="" type="checkbox"/> Loan EUR 73,623,231 <input type="checkbox"/> Results-based payment <u>Enter number</u></p> <p><input type="checkbox"/> Guarantee <u>Enter number</u></p>		
A.11. Implementation period	2021 - 2026	A.12. Total lifespan	25 years (PV equipment lifetime)
A.13. Expected date of AE internal approval	2/24/2020	A.14. ESS category	B
A.15. Has this FP been submitted as a CN before?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has Readiness or PPF support been used to prepare this FP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
A.17. Is this FP included in the entity work programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.18. Is this FP included in the country programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

¹ Equivalent to EUR 225 million

A.19. Complementarity and coherence	<i>Does the project/programme complement other climate finance funding (e.g. GEF, AF, CIF, etc.)? If yes, please elaborate in section B.1.</i> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
A.20. Executing Entity information	Government of the Republic of Senegal represented by the Senegalese Rural Electrification Agency (ASER)
A.21. Executive summary (max. 750 words, approximately 1.5 pages)	
<p>This proposal aims to foster the development of off-grid renewable energy mini-grids to reduce CO₂ emissions from the Senegal power sector whilst contributing to electricity access objectives and promoting gender-balanced rural economic growth. Low-carbon universal access is a critical pillar of the Emerging Senegal Plan (PSE) phase II, as the energy sector was considered one of the greatest success of PSE phase I², with national power generation increasing two-fold between 2012 and 2018, and 20% of the energy mix derived from clean energy sources.</p> <p>Currently, only 42% of Senegal's rural population has access to electricity. Electricity access rate is still relatively low and reveals a great disparity between urban and rural populations, with regional disparities that are even more dramatic in terms of the level of coverage. With coverage rates ranging from 12% in Kedougou to 70% in Dakar, only five other regions (Diourbel, Saint-Louis, Matam, Thiès, Ziguinchor) have been able to achieve an electrical coverage rate of at least 50%. Two regions (Kolda and Kedougou) have a coverage rate of less than 20%. At the departmental level, Salémata, Medina Yoro Foula, Ranerou and Saraya have an electrical coverage rate of less than 10%³. These low rates are due to excessively high costs of investment and operations, dispersal and low level of consumption, yet the benefits of rural electrification are undisputed, significantly improving the quality of life of communities and increasing productivity. Distributed renewable energy generation also help increase the reliability and resilience of power supply by making it less vulnerable to disruptions caused by natural disasters. Multiple socio-economic and socio-ecological co-benefits can further contribute to improving living standards of the communities.</p> <p>The Government of Senegal is thus committed to tackle this issue and has pledged to reach universal energy access by 2025. Meanwhile, lack of resources means that any improvements are likely to be met through carbon-intensive grid extensions and diesel-powered generators (lower upfront cost). However, the Government of Senegal (GoS) has committed, through the Paris Agreement (2015) and COP21, to contribute to the international collective effort to mitigate climate change emissions and put in place adequate adaptation measures. In the energy sector, this commitment has resulted in the definition of strategies and the implementation of priority actions presented in the Nationally Determined Contribution (NDC) of Senegal.</p> <p>The objective of the proposed project is to support the GoS by providing concessional co-funding needed to mobilise private sector participation in the domestic renewable energy market and achieve its low-carbon rural electrification goals as proclaimed in the Nationally Determined Contribution (NDC) of Senegal, under the form of sovereign loan and grant de-risking local operators' involvement while alleviating GoS tariff compensation burden following harmonization.</p> <p>Climate change in Senegal is predicted to affect average yearly rainfall with an increase in rain intensity leading to flooding, along with increased air temperatures and sea level rise. Its effects on water resources thus include stressors affecting hydropower production, which contributes more than 10 percent to the country's electricity supply and is susceptible to variable rainfall and increased evaporation rates of retention ponds and dams⁴. Its effects are also particularly faced by the agriculture sector where the majority of agricultural activities are heavily dependent on the pumping of underground water. Rural electrification improves access to groundwater and thereby supports higher agricultural productivity and better food security. In addition, other income-generating activities are made possible through access to electricity and thereby information and communications technologies, improving household resilience.</p> <p>Proposed intervention</p> <p>In line with Senegal NDCs⁵ and its national ambition of universal access to electricity by 2025 (SE4All), this project, to be executed by the Senegalese Rural Electrification Agency (ASER) under delegation of the Government of Senegal, aims at deploying 100% solar mini-grids in a thousand (1,000) isolated villages across Senegal, i.e. half of the most vulnerable, least attractive locations to be electrified, by rural electrification concessionaires. By channelling</p>	

² Official speech of President Macky Sall in Paris in December 2018

³ MPE 2019. SE4All Universal Access Operational Plan for Implementation of the rural electrification program

⁴ USAID, 2017. Climate Change Risk in Senegal: Country risk profile⁵ See Senegalese NDC energy sector pledges in section B1, including solar rural electrification targets

⁵ See Senegalese NDC energy sector pledges in section B1, including solar rural electrification targets

concessional funding and by easing the connection of beneficiaries and facilitating access to productive users of energy, the project will accelerate and perpetuate the electrification of communities that remain outside the perimeter of PPER (Rural Electrification Priority Plan') private concessionaires and Senelec intervention.

The project will mobilize concessional resources from the GCF to engage private sector local operators with acceptable risk-reward conditions, complementing BOAD co-financing and Senegal resources mobilized towards 1,000 newly electrified villages through 100% solar photovoltaic mini-networks. In addition, a grant is requested for strengthening the capacity of the main rural electrification stakeholders, for facilitating first connection access to most vulnerable eligible social services and women & youth-entrepreneurs based on the experience of JAPPALE coupons⁶ and lessons learned from PPERs, and a loaned guarantee facility for catalyzing access to local micro-financing towards productive and gender users of energy.

Climate impacts

Whilst the energy sector is very exposed to diverse impacts of climate variability and change through changes in energy supply (e.g. disruption of operations and distribution) and demand (growing populations and evolving power needs), it is a strong contributor to the drivers of climate change, namely through the emission of greenhouse gases.

The proposed project seeks to place Senegal on a low-carbon energy trajectory relative to its energy sector high-GHG baseline. By benefitting 38,917 newly electrified rural households within 5 years (32 MW total solar PV mini-grids ultimate capacity) across 1,000 villages, **it will result in an estimated 45,098 tCO₂ annual emission reductions impact i.e. 1.13 M. tCO₂ to be avoided over its technical lifetime, resulting in an abatement cost of 28.8 GCF€/tCO₂e.**

Moreover, access to electricity from renewable sources will co-benefit the resilience of rural livelihoods to climate variability and their adaptive capacity related to disaster risk reduction and recovery, alleviating climate stress and improving access to water and agriculture productivity, health and community empowerment, and information and communication services.

⁶ See section B.3 for description of this innovative voucher system helping rural households in Senegal afford the fees to connect to electricity solutions that best fit their needs

B. PROJECT/PROGRAMME INFORMATION

B.1. Climate context (max. 1000 words, approximately 2 pages)

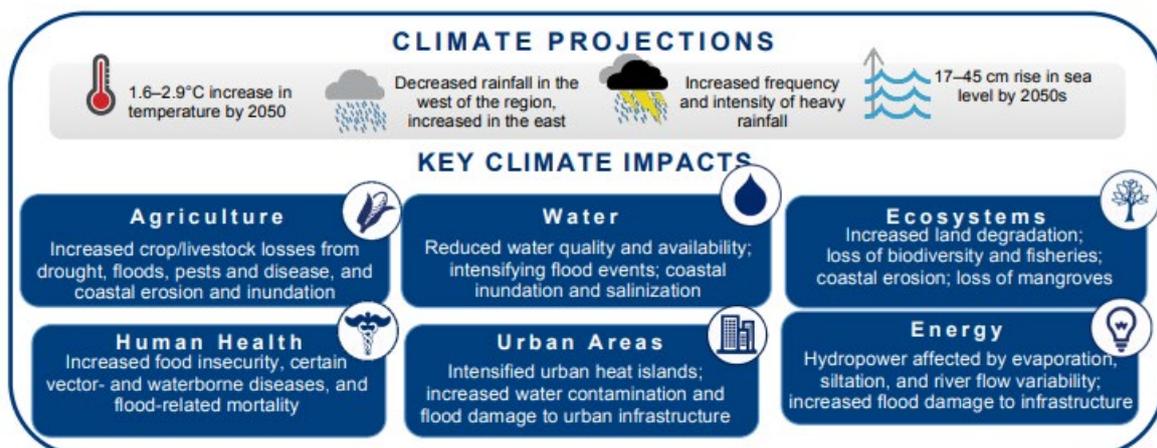
GENERAL OVERVIEW OF KEY CLIMATE CHANGE IMPACTS AND DRIVERS IN SENEGAL

Senegal's climate is generally characterized as tropical, with one rainy season from May–November and a dry season dominated by dry, hot harmattan winds between December and April. Temperatures and rainfall vary across regions, with rainfall generally increasing from north to south and temperatures increasing from coast to interior. Along the coast, temperatures are cool, ranging from 17–27°C. In the northern Sahelian zone, the climate is characterized by cool nights (minimum of 14°C) and hot days (maximum of 40°C). The north has a longer dry season from November–May, and receives about 360 mm of rainfall the rest of the year. Moving south, rainfall increases and reaches up to 1,500mm per year in the extreme south. Hot and humid, the southern region averages temperatures of 30°C throughout the year.

Climate trends since the 1960s include⁷:

- Increase in average temperatures by 0.9°C, with higher rates of warming in the north and more pronounced between October and December.
- Twenty-seven more 'hot' nights per year since 1960.
- Decline in rainfall; although rains have partially recovered since the mid-1990s, they have not recovered their pre-1970 levels and remain 15 percent below the long-term average.
- Rainfall decline is most significant in the southern region during the wet season (June– September).

Regional key climate hazards and climate projections consistently make West Africa one of the world's most vulnerable regions to climate variability and change, in particular at the energy sector level (Figure 1):



Source: USAID, 2018. Climate Risk Profile: West Africa

⁷ USGS 2012. A Climate Trend Analysis of Senegal

The four climate indices that are most relevant for the energy sector in Senegal and West Africa are as follow:

- Mean Annual Temperatures (projected to increase by 2.1°C in 2050 based on RCP 8.5 high emissions scenario used in IPCC 5th Assessment Report)⁸
- Temperature Seasonal Variability (changes in cooling degree days that capture the amount of heat that society would like to reduce by period through some form of active cooling)
- Extreme Events Precipitation (as warmer air has a higher capacity to carry moisture in form of water vapor, future climate raises the likelihood for strong rainfall events and particularly towards extremes), while Mean Annual Precipitation will fall by -46.0mm in 2050
- Drought / Wet-conditions Standardized Precipitation Evapotranspiration Index (raising pressure on water resources for direct hydropower production or indirectly through power plants cooling)

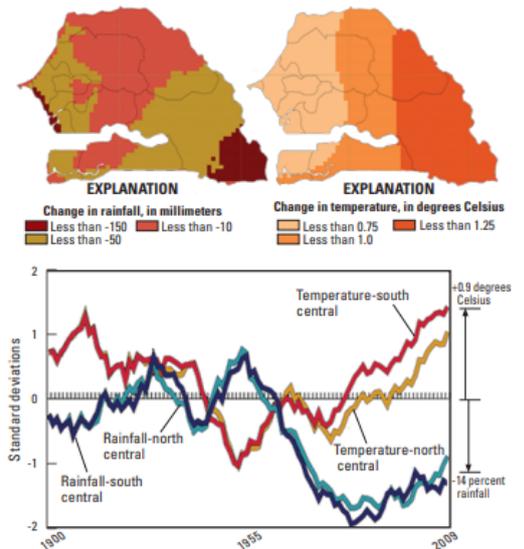


Figure 2: Observed and projected change in June–September rainfall and temperature for 1960–2039 (top), together with smoothed rainfall and air temperature time series for June–September for southern and north-central Senegal (bottom right). Mean rainfall and temperature are based on the 1920–1969-time period.

Actually, more extreme heavy rainfall events, and reduced river flow in some areas, are projected to increase evaporation and siltation, damage to dams and turbines creating challenges for hydropower development ; hence the relevant diversification of energy sources promoted by the solar rural electrification project, as opposed to the predominant strategy of national grid extension.

Research estimates that by 2050, climate effects exacerbating unsuitable development practices will reduce hydropower potential in the Volta River Basin by nearly 50%. River flow in Senegal and the Gambia will decrease by 8 percent and 22 percent, respectively. Regional hydropower systems at risk on both Senegalese cross-border river basins are:

- Organisation for the Promotion of the Senegal River (OMVS) which includes Senegal, Mauritania, Guinea and Mali around common hydropower assets:
 - Manantali hydropower plant (200MW operating since 2002, 30% owned by Senegal)
 - Felou hydropower plant (62 MW operating since 2013, co-sponsored by Mali, Mauritania, and Senegal)
 - Gouina hydropower plant (140 MW, in construction in Mali)
 - Koukoutamba hydropower plant (294 MW in construction, which will be OMVS' fourth and largest hydropower project)
- Gambia River Basin Organisation (OMVG) which covers the Gambia, Guinea, Guinea-Bissau and Senegal shared hydropower project(s):
 - Kaleta (240 MW operated by Guinea since 2015, exporting 30% of its power to Senegal and Guinea-Bissau)
 - Sambangalou (128 MW, in construction, owned at 48% by Senegal)
 - Souapiti (450 MW, in construction)
- Multiple regional interconnections as part of the West African Power Pool (around 1/3 of annual electricity consumption within ECOWAS is exchanged on the interconnected network)

Multi-variable climate vulnerabilities of the region's energy sector are summarized in below Table 1:

⁸ at the shorter horizon of 2035, scenario RCP4.5 forecasts for Senegal are:
- Cumulative rainfall decrease of 9.40 mm
- Rainy season start delays of 5 days ± 3.34
- Rainy season duration reduction by 8.3 days ± 4.46
- Minimal and maximal temperatures are expected to increase by 0.6-0.7 °C.

Climate Stressors and Climate Risks ENERGY	
Stressors	Risks
Rising temperatures and evaporation rates	Decreased or more variable water availability for hydropower generation and thermal power generation cooling systems
Increased frequency and intensity of heavy rainfall events	Reduced hydropower reservoir capacity due to increased sedimentation
Reduced rainfall and longer dry spells in western Sahel	Increased damage to hydropower infrastructure (dams and turbines) from flooding and river sediment loads
Sea level rise	Increased damage to power transmission and distribution infrastructure from surface and seawater flooding, landslides, coastal erosion, and storm surges, leading to outages or shortages

Source: USAID, 2018. Climate Risk Profile: West Africa

Whilst the energy sector is very exposed to diverse impacts of climate variability and change through changes in energy supply (e.g. disruption of operations and distribution) and demand (growing populations and evolving power needs), it is a strong contributor to the drivers of climate change, namely through the emission of greenhouse gases.

According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), 27% of Senegal's 2011 GHG emissions arose from **energy**, making it the second most emitting sector as per below chart (Figure 3). Emissions in the energy sector (Figure 4) are forecast to quadruple by 2030 in the business-as-usual scenario, dominated by fossil fuel consumption (Senegal NDC).

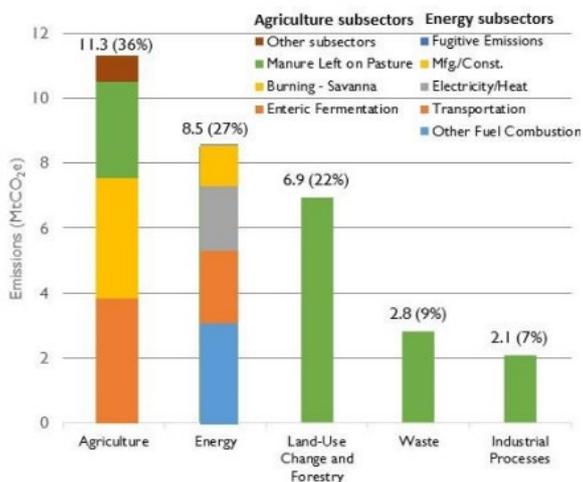


Figure 3: Senegal GHG Emissions by sector (2011)

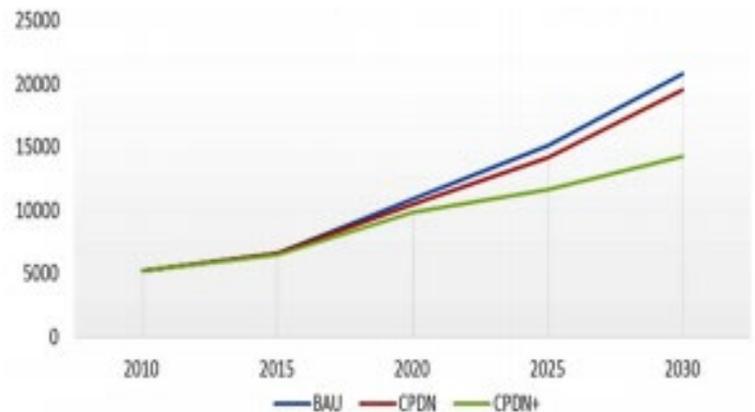


Figure 4: Senegal Energy sector CO₂eq emissions forecast 2010-2030 (GgCO₂e)

KEY CHALLENGES OF THE ENERGY SECTOR RELATED TO CLIMATE CHANGE IN SENEGAL

Senegal is a regional leader for West Africa, with a reputation of economic and political stability. The country is expected to maintain its strong rate of economic growth, having registered over 6 percent per annum for the last four years. With a highly urban population — roughly half is concentrated around cities — the Government of Senegal is focused primarily on grid expansion in urban areas due to their high population densities and lower expansion costs efforts. However, rural populations, low density and remotely located, present more challenges than opportunities regarding energy access. With 196,000 square km, 54% of the 15 million population of Senegal live in rural areas. Whilst the GDP per capita is 1,521 \$ (2018), over 50% of the rural population lives under the poverty line. In this context, the energy sector faces three major challenges: (i) meeting the National commitments for clean energy and mitigation; (ii) responding to the adaptation for beneficiary communities; and (iii) building capacities at institutional level in the rural electrification subsector.

Meeting the National commitments for clean energy and mitigation

The Sustainable Energy for All (SE4ALL) targets

Following the declaration of the United Nations General Assembly which considered 2012 as “The International Year of Sustainable Energy for All (SE4ALL)”, an initiative called “global access to sustainable energy for all by 2030” was launched by the UN, in collaboration with several development partners such as the World Bank, with the main specific objectives to be achieved by 2030 below:

- Guarantee universal access to modern energy services;
- Double the rate of improvement in energy efficiency, and
- Double the share of renewable energies in the overall energy mix.

Senegal joined this initiative and worked to achieve appreciable results in terms of access to electricity: 64% national access rate and 33.2% in rural areas in 2016, with interesting prospects that leave glimpse the execution of current projects and programs. Indeed, the Government aimed to reach a rural electrification rate of 60% in 2019 and universal access to sustainable electric services by 2025.

To achieve these results, the country has mainly used, apart from the grid-connected system, isolated secondary and regional power plants operating mainly on fossil fuels. These plants have reduced profitability, very high production costs and emit significant greenhouse gases (GHG). However, Senegal is endowed with a large solar energy resource. Over most of country's territory, the solar irradiation is above 2 000 kWh /m²/year for Global Horizontal Irradiation and above 1 800 kWh/m²/year for Direct Normal Irradiation (Ministere des Energies Renouvelables, 2011). This provides good prospects for photovoltaic solar power projects.

Today, among the 14 regions of Senegal, 9 have an electrical coverage rate of less than 60%. These show a rate of between 31% and 56%, with the exception of Kédougou and Kolda who are the most disadvantaged with 12% and 17% respectively. These figures obviously indicate a significant effort is expected in these two regions in particular, but also mask the equation of the absolute number of localities that remain to be electrified in each region. With the exception of Dakar (4), Kédougou (423), Matam (762), Sedhiou (748) and Ziguinchor (473), all the other regions each have at least 1,000 localities to be electrified. Overall, 14,519 localities remain to be electrified and a population of 3,372,458 to be covered by 2025.

Achieving universal access by the end of 2025 is listed as a priority of the GoS Emerging Senegal Plan, translated into a National Rural Electrification Program (PNER) under implementation according to the following phases:

The National Emergency Program for Rural Electrification (PNUER 2015-2019)

- Accelerating the implementation of Rural Electrification Concessions and Local Initiative Rural Electrification (ERIL)
- Carrying out PNUER projects with State and partner funding

The Complementary Program for Universal Access by 2025

- Implementation of a "Universal Access" investment program

The Complementary Program for Universal Access is structured according to 6 key axes, including the promotion of decentralized systems through installation of 100% solar or hybrid mini-grids to connect 4% of the remaining rural population whilst 95% will be connected to the national grid.

Senegal NDC⁹

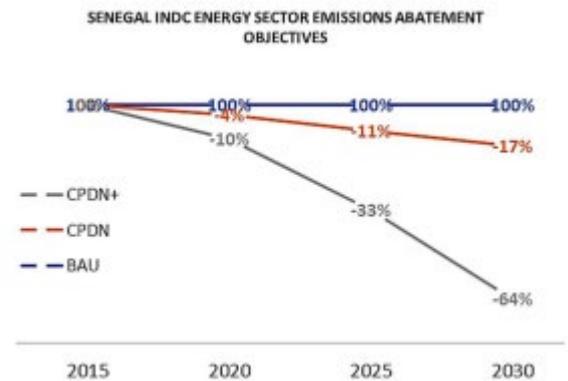
Following on from the ratification of the UNFCCC (1994) and the Kyoto Protocol (1991), Senegal has submitted three National Communications (NC) to the UNFCCC: the First NC was submitted in 1997; the Second NC in 2010; and the Third NC in January 2016). During this period (2011), Senegal also established the National Climate Change Committee (COMNACC) in 2011 and 14 Regional Climate Change Committees (COMRECCs) at regional levels. These committees will orchestrate the implementation of Senegal's INDC, which later became its First NDC when Senegal ratified the Paris Agreement in September 2016.

Senegal's NDC targets an economy-wide relative emission reduction of 21% by 2030 compared to BAU (blending CO₂, CH₄ and N₂O), at an estimated cost of implementation of 6.80 billion USD. The unconditional part of its mitigation target amounts to 5% reduction while the additional 16% (\$5 billion estimated costs of implementation) are conditional on the support of the international community. Its mitigation objectives span, on the one hand, the production of electricity from renewable sources and with improved energy efficiency, including in off-grid areas, the reduction of greenhouse gas emissions in terms of biomass and waste, and the planning of resource mobilization that involves the implementation of national development strategies, and, on the other hand, reduction of GHG emissions through energy efficiency in buildings, transport and industry.

The contribution of the energy sector has been broken down into 3 sub-sectors:

- (i) electricity and domestic fuel;
- (ii) energy efficiency; and
- (iii) transport.

Part of the emissions reduction policy in the sector is based on the increase of renewable energies in electricity production by 30% by 2030. The above **Figure 5** shows the reduction commitments of the corresponding emissions, according to the unconditional (CDPN) and conditional (CDPN+) scenarios depicted in below **Table 2 (electricity sub-sector)**:



Electricity sub-sector's unconditional (CDPN) options	Electricity sub-sector's <u>conditional</u> (CDPN+) options
<p>Programme EnR (Renewable Energies) 1</p> <ul style="list-style-type: none"> ▪ Solar PV: power plants of a total capacity of 160 MWc ▪ Wind: power plants of a total capacity of 150 MW ▪ Hydro: power plants of a total capacity of 144 MW / 522 GWh 	<p>Programme EnR 2 (2020 - 2025)</p> <ul style="list-style-type: none"> ▪ Solar PV: commissioning of an additional capacity of 200 MWc ▪ Wind: commissioning of an additional capacity of 200 MW ▪ Biomass: commissioning of an additional capacity of 50 MW ▪ Solar – CSP: commissioning of an additional capacity of 50 MW ▪ Hydro: commissioning of an additional power generation of 200 GWh in 2025 ▪ Replacement of Jindal 320 MW coal power plant by two Liquefied Natural Gas Combined Cycle of 400 MW (2025: 200 MW and 2028: 200 MW)
<p>Rural Electrification (PNUER)</p> <ul style="list-style-type: none"> ▪ 392 villages electrified with solar or hybrid mini-grids (diesel / solar) 	<ul style="list-style-type: none"> ▪ 5,000 villages electrified by solar mini-grids for universal access to electricity*

* Senegal 2015 NDC number of 5,000 villages suitable for solar mini-grids was recently updated as being 2,348 remaining vulnerable localities in the latest PNER Operational Plan, of which the proposed project aims at fast-tracking 1,000 – almost half – with the support of the GCF.

Responding to the adaptation for beneficiary communities

Among climate change threats, Senegal is vulnerable to drought, flooding and related health epidemics. Priority areas for adaptation measures include agriculture and health sectors with particular attention to promoting access to: (i) weather & climate information in order to mainly reduce vulnerability to flooding that affects most of the peri-urban populations in one hand, and agricultural lost and damages due to drought towards rural communities; and (ii) basic installations for achieving communities resilience mainly to climate-induced health hazards (health centres) and stress on agriculture (water pumping).

The importance of access to energy in improving the resilience of poor communities to the negative effects of climate change, has been demonstrated, particularly in the health sectors, access to water for consumption and agriculture (through electrical pumping), in the diversification of livelihoods and in the field of climate information systems for the establishment of an effective early warning system. For example, according to the World Health Organization, the world's poorest populations are more frequently exposed to number of climate-sensitive diseases from extreme weather events and disasters. However, for many people the basic requirements for achieving resilience on health, such as a safe energy supply for cold storage of medicines, operation of health centres at night, etc., are not being met. Climate change implies, in particular, the quality and composition of water which is compromised, thus

affecting the nutritional status of populations and water security. Severe cholera epidemics have occurred due to floods with major riverbed overflow and subsequent water contamination. Similarly, salinization is a predominant handicap of public health, at the origin of the recrudescence of cardiovascular diseases in the regions of Kaolack and Fatick and in Casamance in particular, but also of dental fluorosis which is rampant in the area, this salinization seriously threatens Casamance.

A safe energy supply is also important to put in place an effective early warning system in allowing populations to have access to climate information or previsions thanks to their mobile phone which need to be recharged (currently forcing some women to walk up to 6-7km away), their television sets or radios, and Internet. Agriculture in Senegal is predominantly rain-fed and so erratic weather patterns present an ever-increasing risk to smallholder farmers across the country. Late onset of rain can lead to a reduced growing season; unexpected torrential rain and flash-flooding can lead to farmers losing scarce resources of seed, other farm inputs and labour together with the loss of topsoil, resulting in declining food security. These climate change effects also combine with socio-economic changes – population growth and competition for scarce resources – to provide challenges to any development strategy. Being able to anticipate climate fluctuations from a few days to a few months in advance can be decisive in allowing smallholder farmers to adapt their agricultural practices to compensate. Vulnerability analysis with farmers identified that accurate and early weather information is essential for farmers to mitigate risk and practice effective adaptation measures. Information may be available both internationally and through national meteorological agencies and would be access via mobile phone, TV or radio and help overcome the challenges of other early warning systems that struggle to get the information down to the “last mile” to farmers on the ground, especially farmers with low literacy levels.

In terms of livelihoods, Senegal women and youth are very active in the agricultural value chain and they are found in the processing and petty trade segments. In the processing chain, they are organized into women's promotion groups (GPF) or economic interest groups (GIE) or micro enterprises to jointly address the challenges and issues of empowerment. They face many constraints, especially those related to the correct supply of inputs and other factors of production such as energy. The poor access to productive energy limits their activities of transformation, storage of raw materials, conservation and packaging of finished products. Hence rural electrification can support more income-generating activities and thereby increase the resilience of vulnerable people and households.

Giving that all of the sectors targeted for the growth of the Senegalese national economy, such as agriculture, livestock, fishing, tourism, health and nutrition issues, access to water, remain vulnerable to the effects of climate change, the Government of Senegal has made the issue of adaptation to climate change a priority as part of the country's NDCs. To this end, a special place has been given to the promotion of climate information and the establishment of an early warning system which requires access to reliable and sustainable energy.

Building capacities at institutional level in the rural electrification subsector

Under the Priority Rural Electrification Program (PPER), Senegal is divided into 11 overall services territories: those belonging to Senelec and 10 territories slated for concession to private operators. Operators for each territory are responsible for all generation, transmission, and distribution within those territories and are mandated to undertake grid extension. From 2008–2013, six of these concessions were successfully tendered to private consortiums, while the remaining four concessions were officially granted to Senelec in late 2018:

Table 3 below details the six concessions awarded to private operators for 25 years, following international procurement process, and remaining four concessions attributed to SENELEC:

Geographic concession	Private concessionaire	Concession signature date	Entry into force
▪ Dagana-Podor-Saint Louis	Compagnie Marocco-Sénégalaise d'Electricité (COMASEL Louga)	30/05/2008	29/03/2011
▪ Louga-Linguère-Kébémér	Compagnie Marocco-Sénégalaise d'Electricité (COMASEL Louga)	19/11/2009	29/11/2011
▪ Kaffrine-Tambacounda-Kédougou	Energie Rurale Africaine (ERA)	29/06/2011	24/12/2013
▪ Kaolack-Nioro-Fatick-Gossas	Electricité Du RIP (EDR)	22/11/2012	12/11/2014
▪ Kolda-Vélingara	Kolda Energy	29/07/2013	09/04/2015
▪ Mbour	SCL Energie Solutions	09/11/2012	16/11/2018

- *Sédhiou - Ziguinchor - Oussouye - Bignona*
- *Foundiougne*
- *Matam – Bakel*
- *Diourbel - Bambey - Mbacké - Rufisque - Thiès - Tivaouane*

SENELEC

The Senegalese Rural Electrification Agency (ASER) was formally created by decree in 1999 with the sole aim of promoting rural electrification. The Agency is autonomous, however it functions under the tutelage of the Ministry for Energy and the Ministry of Finance, whilst also reporting to the CRSE. Its roles and responsibilities are laid out

in Article 30 of the 1998 Electricity law which include:

- Development of rural electrification programs in line with national plans;
- Provision of financial and technical assistance to support rural electrification initiatives;
- Encouragement of 'bottom-up' rural electrification project proposals from private operators;
- Organisation of invitations to tender for 'top-down' electricity distribution concessions;
- Provide loans and grants to licensed entities that operate in rural areas;
- Supervision of the contracted installations resulting from these activities;
- Manage the Rural Electrification Fund.

Table 4 below provides an overview of mini-grids coordinated by ASER over the past 15 years:

YEAR	PROGRAM / DONOR	NUMBER OF MINIGRIDS
2005-2006	Isofoton-ASER/ SPAIN Govt	9
2008	PERACO-ASER/Govt of Netherlands	18
2010	PERACO-ASER/Govt of Netherlands	70
2011	Daye Ouwens-ASER/ Govt of Netherland	10
2011	Merl-ASER/Govt Austria	27
2019	ECREE-ASER / UE Facility	40

Source: USAID Power Africa 2019 – Off-Grid market assessment for Senegal

In addition to this situation, from 2000 to 2019, ASER has realized more than 12 Grid extension projects enabling the electrification of more than 3,000 villages.

Issues contributing to the unsustainability of O&M included non-cost-reflective tariffs, under-sizing of the grid, and lack of metering and monitoring. In response to the former, the concept unrolled end of 2019 behind harmonization is that the government now compensates operators for the difference between their cost-reflective tariff and the harmonized tariff, implying systematic metering. The GoS pays this compensation through its Special Fund for Energy Sector Support (Fonds Special de Soutien au Secteur de l'Énergie).

The grid expansion modeling for 2025 demonstrates a clear densification of the Medium Voltage network planned in the western parts of the country, where population density and consumption are higher, as well than a significant number of off-grid solutions in the eastern part of the country. This densification is made in great majority by ramifications of the existing Medium Voltage backbones and planned.

There is a need to strengthen operational capacities of the solar rural electrification stakeholders, especially ASER, for planning, implementing and monitoring of the 100%-photovoltaic mini-grids component

PROPOSED INTERVENTION

The proposed project intends to uphold the renewable share of Senegal's ambition to reach universal energy access by 2025 by fostering solar-powered mini-grids development in isolated villages that are not connected to the national electricity grid, which would still rely on fossil fuels or suffer from unmet needs under the baseline scenario. GCF funds are sought for financial and technical assistance to align Senegal energy access program with its NDC, decarbonizing and climate-proofing rural electrification with the following outputs:

- strengthened operational capacities of the solar rural electrification stakeholders for planning, implementing and monitoring of the 100%-photovoltaic mini-grids component
- **38,900 households electrified by 1,000 mini-grids within 5 years,**
- enhanced access to 3,739 gender-balanced productive uses equipment and social services in all the targeted villages

Having opted for the concept of rural electrification concession and public-private partnership to make the private sector a major player in rural electrification, Senegal has already been able to mobilize significant funding - over 67 billion CFA (EUR 102 M) raised through KfW-Ipex.

Together with BOAD co-funding and the GCF-requested remaining financial need, this 1,000 solar mini-grids project will generate direct emission reductions of 45,098 tonnes of CO₂ equivalent per year over 25-y lifetime. ASER rural electrification program (grid extensions, solar home systems and distinct mini-grids that will be clearly demarcated from the GCF project) being already registered under the Clean Development Mechanism (CDM),¹⁰ its monitoring and reporting of emission reductions will be conducted in accordance with the UNFCCC-approved renewable-powered rural electrification CDM methodology AMS III.BL “Integrated methodology for electrification of communities”. The CDM offers a recognised MRV framework that will enable BOAD to transparently track the GHG impact of invested funds over time and subsequently report progress to the GCF as well as integrate them into Senegal’s NDC accounting and reporting. While separate carbon finance from the World Bank PoA replenishes the JAPPALE household connection voucher scheme, however, the GCF supported activities will not result in carbon credits issuance and trading, unlike the CDM-supported complementary program.

In parallel of the CDM PoA synergies, ASER will coordinate the collaboration between other relevant initiatives in both Senegal and neighbouring countries in order to optimise the project outcome. These include: Lighting Africa’s initiative in Senegal¹¹, the regional off-grid electrification project (ROGEP) overseen by the ECOWAS Centre for Renewable Energy and Energy Efficiency, and the World Bank’s Scaling Solar, which represents a significant driving force in achieving Senegal’s NDC targets with regards to solar PV installed capacity, yet outside of the scope of the GCF project.

Linkages between energy access, resilience and adaptation co-benefits

- Access to weather & climate information: rural electrification will improve access to forecasts, early warnings systems knowledge & best practices through Information and Communication Technologies (ICTs) such as radio, TV, mobile phones, and reliable, affordable and resilient types of energy services
- Livelihood viability: rural electrification fosters new income and employment sources, water pumping and agriculture processes and irrigation systems that improve productivity and food access, efficient time savings for new enterprises, and more climate-adapted productive users
- Gender circumstances: rural electrification opens opportunities for women empowerment, social development and wellbeing, improved health and access to health services particularly beneficial for women and children, improved socio-economic status by access to better education, and time savings allowing time to be used more productively

B.2. Theory of change (max. 1000 words, approximately 2 pages plus diagram)

Senegal’s off-grid electricity market and barriers

The solar PV market is growing in Senegal, and the country is showing its intention to become the solar leader in the region, tapping on its favourable photovoltaic power potential (opposite **Figure 6**). However, these efforts are almost exclusively focused on large-scale implementation – in only 2017, 6 grid-connected PV plants are being connected for a cumulative capacity of 113.5 MW. The vast majority of this power feeds back to urban areas.

The attractiveness of decentralised solar PV mini-grids and solar home system (SHS) products is also becoming apparent due to decreasing costs of solar panels and related technologies; however, implementation of these technologies has remained limited to date. This is largely due to access to finance barriers and lack of technical expertise, which this project aims to tackle.

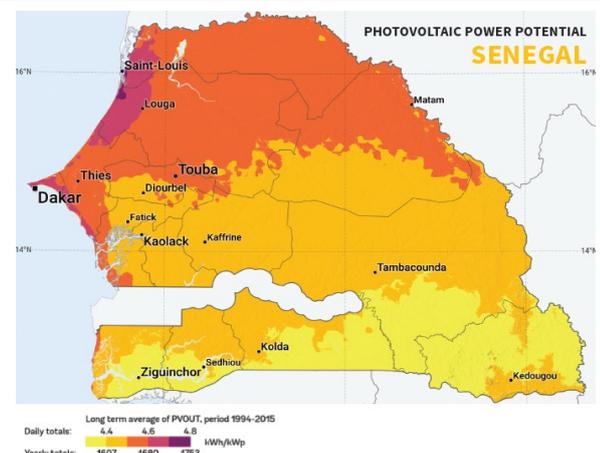


Figure 6: World Bank, Solargis, 2017.

¹⁰ UNFCCC (2018) Senegal Rural Electrification Program. CDM programme documentation is available [here](#). Note that none of the grids to be developed under this project will be included in the CDM PoA.

¹¹ Lighting Africa – Senegal. More information available at: <http://bit.ly/2eXf12m>

The majority of the decentralised energy provision services currently in place in Senegal have been implemented in the 3 ‘top-down’ PPER pilot concessions of Dagana-Podor-Saint Louis, Louga-Linguère-Kébémér and Kaffrine-Tambacounda-Kédougou. Despite the documented potential, these initial concessions have only delivered a fraction of their planned results in their first implementation phase. Progress in the first half of 2018 was insufficient to meet the 30% electrification target for this first phase, due to the slow start-up of dealers, the high connection costs and the difference between the rates applied by the dealers and those of SENELEC making the cost per kWh higher in rural areas than in urban areas. In addition, local financial institutions have limited familiarity with renewable energy investments, and project finance at attractive terms (e.g. cost of capital, tenors) is not widely available in Senegal. As of end of 2018, 4,138 rural villages have been electrified out of 21,170 rural villages in total and 2,513 rural villages are already under development; hence 14,519 villages are still awaiting electrification, which represents 2.3 million inhabitants to address by 2025.

In parallel to the paradigm shift in terms of avoiding substantial GHG emissions for the country by diversifying energy supply from thermal-powered national grid extensions, solar rural electrification can tackle established climate vulnerabilities of off-grid communities to health & water sanitation, agricultural & economic productivity as well as empower women and young populations to build more climate informed & resilient livelihoods. Droughts, floods and other severe weather events indeed have serious consequences for rural livelihoods and economies, pushing vulnerable communities further into poverty – all the more as climate variability and change can make these events more frequent and more damaging.

Besides households, solar energy could indeed power a myriad of different productive activities that can be mechanized across agriculture, industry and commerce, transforming people lives while avoiding emissions. These include appliances for trades-people such as sewing machines and carpentry tools, equipment for farmers such as water pumps and processing machines, and for retail outlets such as refrigerators and blenders. The productive use sector is dominated by pumping, however, limited development has occurred around solar mills or regarding cold chain applications. Given the importance of agriculture in predominantly rural off-grid areas and since close to 50% (over 750,000) of Senegalese households are active in the agricultural sector, a focus can thus be made on water pumping/irrigation, refrigeration and cooling, and processing use cases¹²:

- Water pumping & irrigation - The area of land in Senegal with good potential for irrigation is estimated at 497,500 ha. Electric and diesel pumps are frequently used, e.g. pumping for banana plantations.¹³
- Agro-processing - the most important agricultural products in terms of gross production value include groundnuts and rice, before milk, hence an established potential for solar-power milling, threshing, and drying.
- Refrigeration & cooling – since over 450,000 households in Senegal are involved in livestock breeding, the potential in this market is significant. It is estimated that an installed capacity of close to 20 MW would be required to serve all livestock farmers for milk storage.¹⁴

In the sector of social services, the project’s focus also targets safe energy supply for cold storage of medicines, operation of health centres at night, and effective Information & Communication Technologies and early warning systems allowing populations to have access to climate information or previsions.

However, several obstacles still prevent the full realization of solar power potential for servicing communities and productive users¹⁵:

- Information-wise, the advantages and possibilities of solar energy are poorly known and sometimes misunderstood. Users do not necessarily have the right information on quality or reliability of solar products on the market, nor enough visibility on the costs as compared to their limited ability and willingness to pay. Required implementation capacities include technical, transactional, marketing and communication expertise.
- Upfront investment costs of solar infrastructures and equipment are out of the affordability range of most households and rural microenterprises¹⁶. Available financial resources rates and maturities mismatch real needs from operators and end-users, both towards traditional financial institutions and households credit sources.
- Incentives are unclear in the context of an evolving regulatory sector, existing concessions model update, applicable tax and tariff, resulting in frustrations among the private sector. Focusing on distribution channel efficiency, tax/fiscal policies and financing costs is necessary for facilitating the uptake of productive applications to serve as anchor loads and sustain solar mini-grids business models.

¹² https://www.get-invest.eu/wp-content/uploads/2019/06/GETinvest-Market-Insights_SEN_PV_Guide_2019.pdf

¹³ Limited information is available about the exact number of traditional pumps in operation in the country with a frequently stated number — from sector stakeholders in country — being 25,000.

¹⁴ Using the data from Progrès-Lait led by ASER & ENDA Energie, covering 100 milk conservation platforms by solar systems with 20kWp batteries

¹⁵ Cartographie du secteur de l’énergie solaire au Sénégal. 2017

¹⁶ <https://www.lightingglobal.org/wp-content/uploads/2019/09/PULSE-Full-Study.pdf>

Recognising this, the Ministry of Energy and ASER planned to adapt the financing model to be applied across all 10 concessions to help overcome the access to affordable finance barrier currently hampering progress, hand-in-hand with efforts to harmonise electricity tariffs nationwide in order to alleviate the current pricing disparities witnessed in the 'pilot concessions'. Outside of the concessions and grid extension-targeted localities (7,559), remaining off-grid solar-targeted villages thus call for the following shift framework to meet Senegal's rural electrification Nationally Determined Contribution and Universal Access ambitions:

Figure 7 : Theory of change diagram

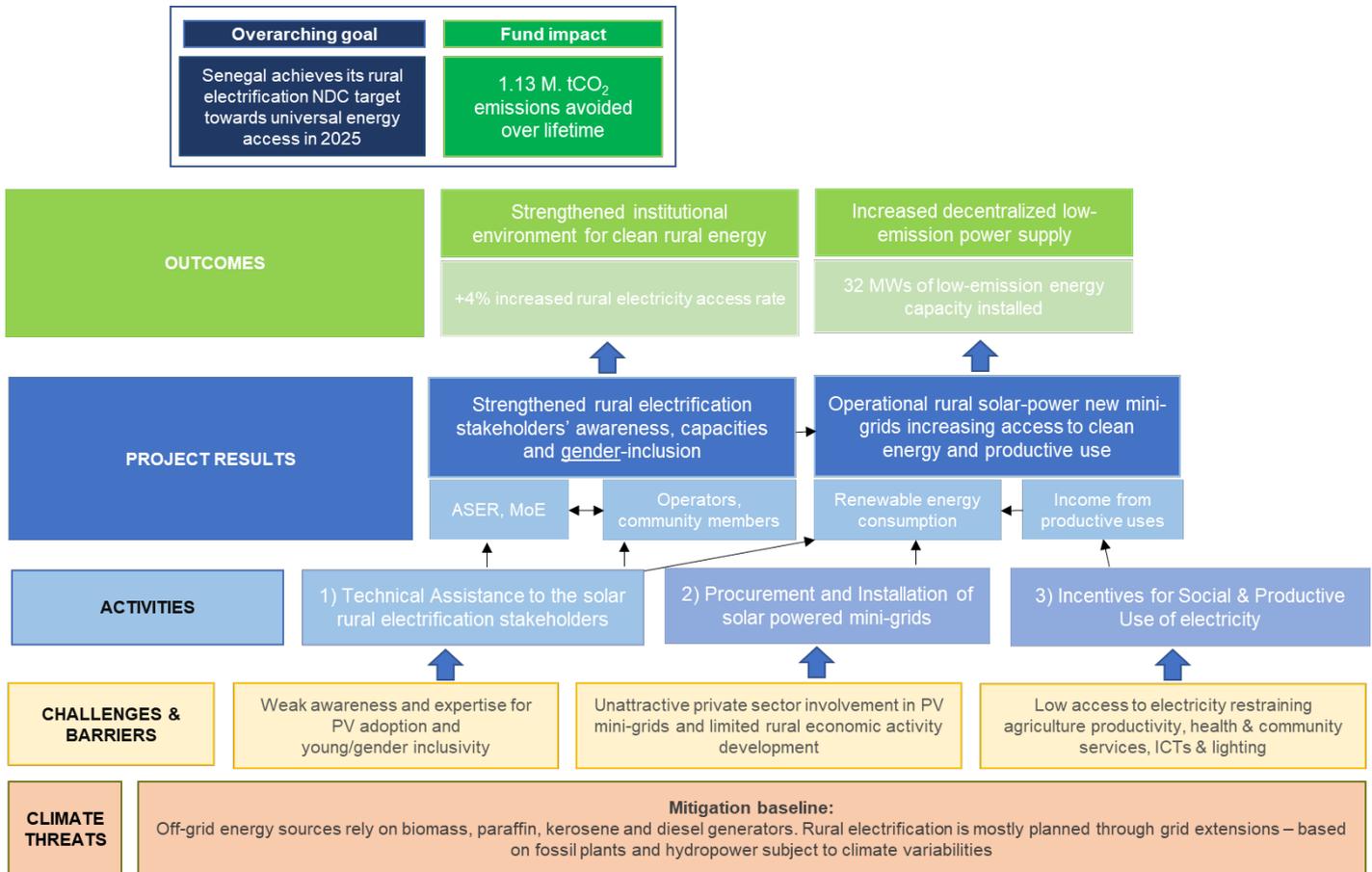


Table 5 below provides details of the project's objectives achievement logic:

Barrier removal actions to be undertaken by the project	Assumptions underlying the project actions
<ul style="list-style-type: none"> ▪ Capacity building of the project's key stakeholders for enabling solar mini-grids deployment framework, starting with the end-user beneficiaries' awareness and appropriation, the socially-equitable competencies of ASER-hosted Project Management Unit and gender-based community groups, and the environmental expertise and knowledge management required upstream and downstream ▪ Concessional co-financing of the low-carbon power generation assets to de-risk local operators' participation and secure the best combination of tariff and service from the conceded solar energy mini-grid networks, meters and public lighting ▪ Incentives for connection of eligible social services (such as Information & Communication Technologies, health centers and schools), women & youth-entrepreneurs to the PV mini-grids and mechanism to facilitate access to resilient productive 	<ul style="list-style-type: none"> ▪ Senegal politically recognized rural vulnerabilities to climate change and its Rural Electrification National Plan offers potential for 100% solar electrification in remaining 2,348 off-grid villages ▪ Senegal aims to integrate climate change mitigation into institutions that exist and can host and retain trained staff ▪ GCF involvement brings down the WACC to an acceptable level to Senegalese treasury ▪ Private operators are interested in investing low upfront capital risk ▪ Appropriate micro-finance network is available in rural areas ▪ Households are aware of climate change and have the capacity to pay for clean energy

equipment financing through microfinance (such as water boreholes, refrigerators), climate information and early warning

▪ *Rural energy development success builds on extensive community mobilization, and capacity building for efficient electricity use*

B.3. Project/programme description (max. 2000 words, approximately 4 pages)

Overall Objective

The objective of the proposed project is to contribute to reducing GHG emissions by boosting the solar PV mini-grids component of the country's ambitious goal of reaching universal energy access¹⁷ in 2025 by providing concessional co-funding needed to mobilise private sector participation in the domestic renewable energy market, thus supporting the achievement of Senegal's Nationally Determined Contribution, which mentions rural electrification as a key objective. Vulnerable and geographically dispersed rural communities currently disconnected from any grid are the key beneficiaries of this program, with a special focus on women and children through productive uses, community services and early warning systems.

To meet Senegal's target pledged under the SE4ALL initiative, a national rural electrification investment program has been prepared by the government. The execution of the program is delegated to the *Agence Sénégalaise d'Electrification Rurale (ASER)*, the Senegalese rural electrification agency, on the basis of an Operational Plan released in December 2019. The overall 2019-2025 Complementary Program for Universal Access is valued at FCFA 690 billion (USD 1.17 billion), which mostly covers a) medium-voltage grid extension; and b) rural mini-grids electrification investments. **Financial support from the Green Climate Fund is requested to contribute concessional and grant co-finance to triple its solar mini-grids electrification component** for the benefit of 344,000 inhabitants (4% of the 8.64 million rural population).

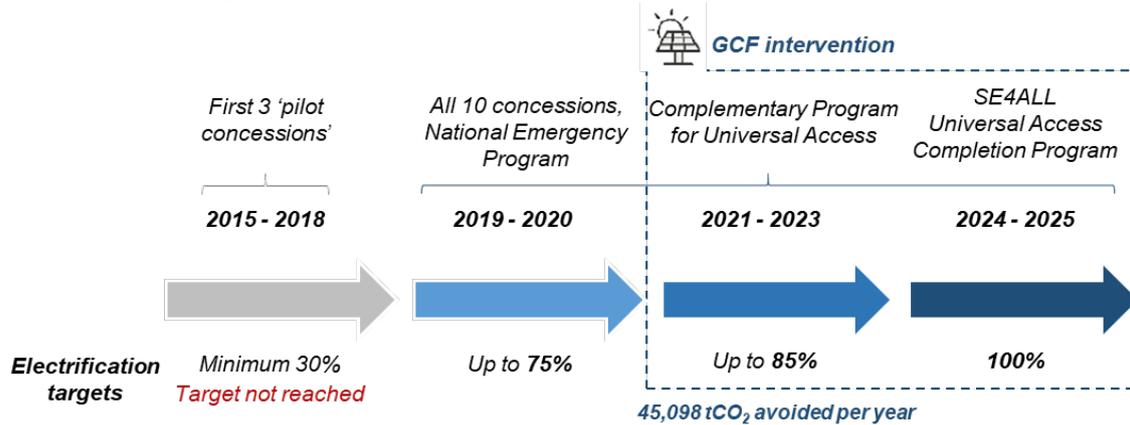
GCF Project's components

The project presented for the GCF's consideration targets a FCFA 130 billion (EUR 198.7 million) investment package pursuing decentralised, renewable energy generation in rural communities, through 100% solar PV mini-grids as a sustainable, climate-friendly solution for vulnerable communities' electricity access. The project is to be implemented between 2021 and 2025 by ASER as the Delegated Executing Entity by the State of Senegal, nationwide.

Of this amount, FCFA 47 billion (EUR 71.7 million) of concessional, sovereign loan from GCF is to be dedicated to procuring and installing solar mini-grids, lowering up-front risk for private sector to 5% of the investment costs to step-in and operate the solar power mini-grids assets (Component 2). FCFA 940 million (EUR 1.4 million) of grant will be dedicated to Technical Assistance (Component 1) and Project Management, besides FCFA 1.5 billion (EUR 2.3 million) of financial incentives for productive use (Component 3). The grant will cover two components: (i) the provision of technical assistance – transactional, marketing and communication expertise to enable the uptake of productive uses including a gender equality promotion program to ensure women and children noticeably benefit from the realised electrification efforts, and (ii) the financial incentive for community services and productive users connection through redeemable vouchers, while the productive equipment acquisition through microcredit guarantees will be loaned.

¹⁷ 'Access' as defined by the multi-tier framework developed by World Bank under the Sustainable Energy 4 All initiative. This multi-attribute framework includes seven dimensions - Capacity, Duration, Reliability, Quality, Affordability, Legality, Safety

Figure 8: Overview of the timing of the proposed investment¹⁸



Component 1: Technical Assistance to the solar rural electrification stakeholders (EUR 3.7 mln¹⁹)

Outputs	Activities
Output 1.1 - Capacity building of rural electrification stakeholders	Activity 1.1.1 - Trainings on procurement procedures, project management and GCF requirements
	Activity 1.1.2 - Seminars and trips and workshops (technology watch, public consultations, conferences, sharing of experiences, etc.)
Output 1.2 - Gender action plan implementation	Activity 1.2.1 - gender-relevant community-organizations mapping & tutoring
	Activity 1.2.2 - gender-stakeholders training (PMU – local operators – community organizations)
	Activity 1.2.3 - gender-oriented communication campaign
Output 1.3 - Environmental & social downstream activities	Activity 1.3.1 - E&S measures implementation and monitoring
	Activity 1.3.2 - Establishment of a recycling unit for batteries and other waste (CFL, other electronics)

This component targets capacity building of the project's key stakeholders (ASER-hosted Project Management Unit, Ministry of Energy, local operators, rural beneficiaries incl. community-based organizations), to favour the implementation of a sustainable framework of the delivered services and benefits of the solar mini-grids, starting with the end-user beneficiaries' climate information, solar power benefits awareness and appropriation, the technical and administrative competencies of the PMU, gearing gender and youth institutionalization, and the environmental expertise and knowledge management required upstream and downstream:

To the benefit of the Project Management Unit and the Ministry of Energy

- Trainings on procurement procedures, project management and GCF requirements
- Seminars and trips and workshops (technology watch, public consultations, conferences, sharing of experiences, etc.)

To the benefit of the targeted rural beneficiaries (prioritizing women and young involvement)

- Gender action plan implementing activities (gender-oriented training, awareness raising, and community-organizations tutoring) in partnership with DER²⁰, leveraging and rolling-out its framework in the remote villages of the GCF intervention

¹⁸ other programme activities (including PPER) are not directly related to the GCF project and do not impact on the achievement of the GCF project's goals

¹⁹ excluding Project Management Costs of EUR 0.4 mln

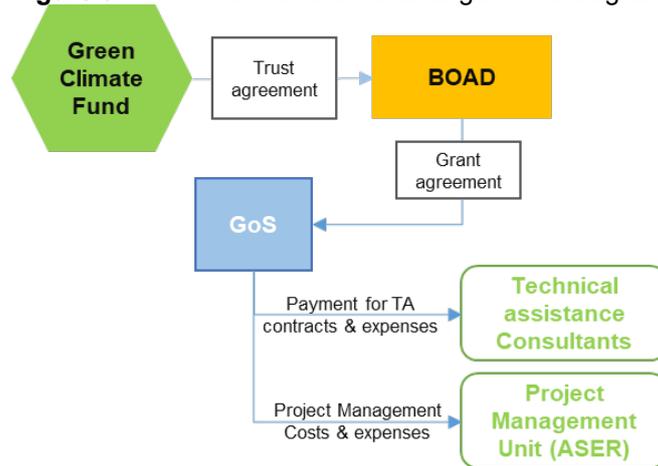
²⁰ The General Delegation for Women and Young Entrepreneurs has been set up by the President of Senegal to help boost entrepreneurship, which is the main occupation of the Senegalese population, while promoting economic, financial and social inclusion as well as territorial equity.

in order to (i) Organize awareness, financial education and entrepreneurship events for vulnerable youth and high school students, and identify potential entrepreneurs, (ii) Accompany and coach young people in the development of their idea and the creation of their business plan, and (iii) Providing tailor-made technical support to local incubators and spaces dedicated to their employability

To the benefit of local concessionaires operating the targeted villages mini-grids

- Monitoring of ESMP implementation and environmental and social support
- Setting up a recycling unit for batteries and other waste (CFL, other electronics), in order to manage the potential negative cumulative effect of the used batteries and other systems on the environment. The recycling unit is to be installed on governmental land, however its construction and operation will be procured from private sector and conceded for exploitation under the supervision of the State (who will retain ownership of the assets) based on ASER-DEEC convention. Local operators will remain responsible for the collection and transportation of the e-waste; the recycling operator's responsibility starting at reception towards treatment

Figure 9: Technical Assistance arrangements diagram



N.B. in order to prevent conflicts of interest, the Ministry of Finance will also be involved under delegation from the GoS Executing Entity for Component 1 that includes ASER and the Ministry of Energy as beneficiaries.

Component 2: Procurement and Installation of solar powered mini-grids (EUR 192.2 mln)

Outputs	Activities
Output 2.1 - Preparation of detailed Engineering Studies	Activity 2.1.1 - Site selection, engineering studies & Specific environmental and social analysis for each site
Output 2.2 - Supply, installation and commissioning of equipment	Activity 2.2.1 - Solar PV power plants construction and minigrid deployment
	Activity 2.2.2 - Smart meters installation & miscellaneous aleas
Output 2.3 - Modern public lighting	Activity 2.3.1 - Deployments of solar street lighting
Output 2.4 - Control and supervision of work	Activity 2.4.1 -Control and supervision of work

Financing the bulk of the technology investment to de-risk local operators' participation in funding solar energy production equipment, synchronization and control tools, low-voltage mini-grid networks and connections, civil engineering (competitive Request for Proposals, which control and supervision of construction will be assigned to independent experts), allowing private operators to offer the best combination of tariff/service. Pending detailed Engineering studies, the mini-grids will include solar PV plants ranging from approximately 15-45 kW peak (expected average of 32 kW) together with inverters and clean battery systems for energy storage, as well as local distribution lines and meters tailored to villages categories by size, ranging from:

- Kit I: villages with populations between 100 and 200 inhabitants: 15 kWp
- Kit II: villages with populations between 200 and 400 inhabitants: 23 kWp
- Kit III: village with a population between 400 and 750 inhabitants: 30 kWp
- Kit IV: village with a population between 750 and 1500 inhabitants: 45 kWp

From ASER's experience in designing and implementing solar mini-grids projects in Senegal (more than 130 mini-grids already installed and 270 under implementation), the compartmentalization was carried out on the basis of an initial classification of villages done, considering their respective population and level of equipment in terms of productive and social basic infrastructures (school, health, boreholes, etc.). On the basis of this village segmentation by population, a demand analysis questionnaire has been elaborated and a survey done after sampling of villages reflecting the main characteristics of each type of village. After the survey, a standard energetic profile has been elaborated for each type or category of village. From these energetic profiles, different standardized types of PV kits have been selected for the project at this feasibility level (see Annex 2 Feasibility Study for details tools utilized and sample modelling results).

At this stage, the sites are selected on the basis of their access rate of the non-electrified areas. Department having an electrification rate below 10, 20% are priority areas. In addition, high priority is given to remote areas located far from the existing MV grids (more than 5 to 7km) with small population (less than 700 inhabitants) for the GCF intervention.

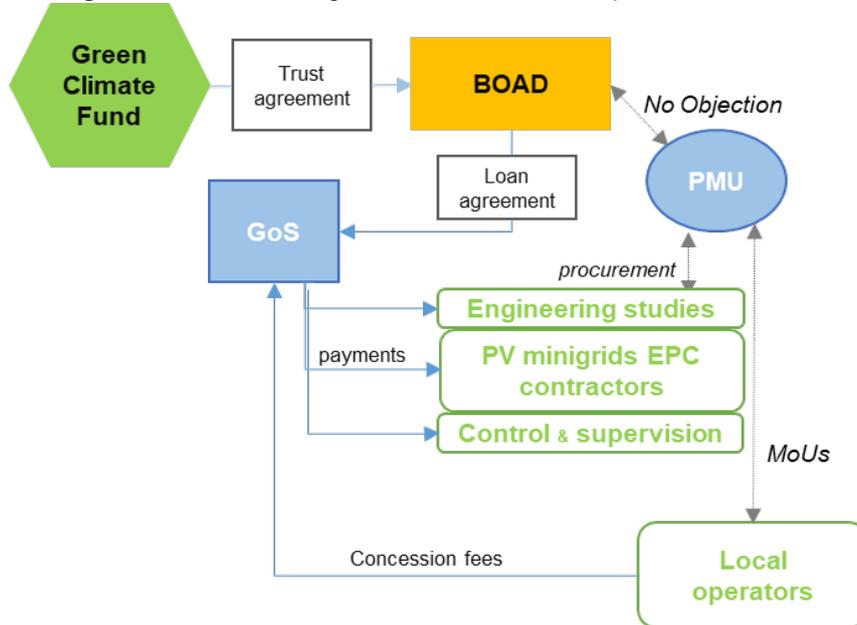
The mini-grid connections will cater for Tier 3 to Tier 5 service levels. A consumer may upgrade from a lower service level to a higher service level, and vice-versa.

Service level	Power demand (watts)	Daily capacity (kW-hrs)
Tier 3	>200	> 1 kWh/day
Tier 4	>800	> 3.4 kWh/day
Tier 5	> 2kW	> 8.2 kWh/day

Local concessionaires will not be involved in the mini-grids construction (procured to EPC by ASER) but in the meters initialization & official connection activation once low-voltage and indoor installations of the households and productive users have been realized. Therefore, the GoS represented by ASER (i.e. the EE) will remain responsible for implementation of this Activity, rather than concessionaires, and it will engage concessionaires as service provider to assist with the implementation of this Activity.

- **Deployment of modern public lighting** from solar energy will also be realized in the project's rural areas and help provide suburban security and economic growth in the villages. The Germany-financed deployments of solar street lighting will consist of the procurement and installation of energy-efficient (LED) public lighting equipments.

Figure 10: Solar mini-grids construction and operation structure



Component 3: Incentives for Social & Productive Use of Electricity (EUR 2.3 mln)

Outputs	Activities
Output 3.1 - Gender & social connections	Activity 3.1.1 – Connection of eligible social services, women & youth-entrepreneurs to the PV mini-grids
Output 3.2 – Micro-financed productive equipment credits guarantees	Activity 3.2.1 - Implementation of mechanism to facilitate access to productive equipment financing through microfinance

Social services and productive equipment will respectively lead to the development of sustainable livelihoods and enhance the capacity of villages to pay for solar power supply, strengthening the mini-grids business model viability while maximizing social and gender inclusivity. This bottom-up component aims at supporting productive use & services access to off-grid solar power and related revenue-generating production/transformation equipment through a two-level financial assistance:

- **Gender & Social connections** (result-based payment) for eligible social services and women & youth-led enterprises 'PREM' (Multi-Sectoral Energetic Projects), lifting the upfront connection costs related to the indoor installation of community services (such as health clinics & schools) and gender-focus productive users (predominantly agriculture-related) , to stimulate anchor load demand and ground the mini-grids sustainable operation.

Besides general eligibility criteria (geographic location within a village where electricity is available from the concessionaire, first electrification of the women or youth entrepreneur with productive use intention or community service need justification and compliance with the technical conditions required by the concessionaire), the identification of beneficiaries of the coupons distribution will be empowered to the gender-mainstreaming communities in selected villages once informed about the rules and objectives, to build ownership and commitment among beneficiaries. A Memorandum of Understanding (MoU) will govern between ASER and the concessionaires, containing the legally-binding rules of the project towards Subsidy Payment Requests, the eligibility of beneficiaries and a set of rights of the coupon beneficiaries. ASER will pre-approve the concessionaries coupon distribution plans on a periodic basis.

When making use of the coupon, the beneficiary must: remit the coupon to the concessionaire, pay the remaining value and sign the payment receipt. Concessionaires will only be able to confirm the coupon in the coupon software after initializing the electrical connection. This confirmation will allow ASER to be informed on the beneficiary's connection, and honor the corresponding Subsidy Payment Request (SPR) from concessionaires. After payment to the concessionaires, ASER will issue a Subsidy Payment Confirmation, in order to link payment to specific SPRs, which will allow the traceability of payments, and to keep the financial history for each coupon.

This mechanism inspires from the original JAPPALE coupon program, a World Bank carbon-finance voucher system to reduce electricity connection costs for rural households, thus making connection costs accessible to rural populations in order to increase access to electricity and significantly increase the rate of dealer penetration into the electrification market²¹. For productive users, the vouchers nominal value will be set at 100,000 CFA (150 EUR) and prioritize youth & women-involving activities, giving right to a reduction on connection fees which can be redeemed by the operator upon verified completion of connections, aiming at the following objectives:

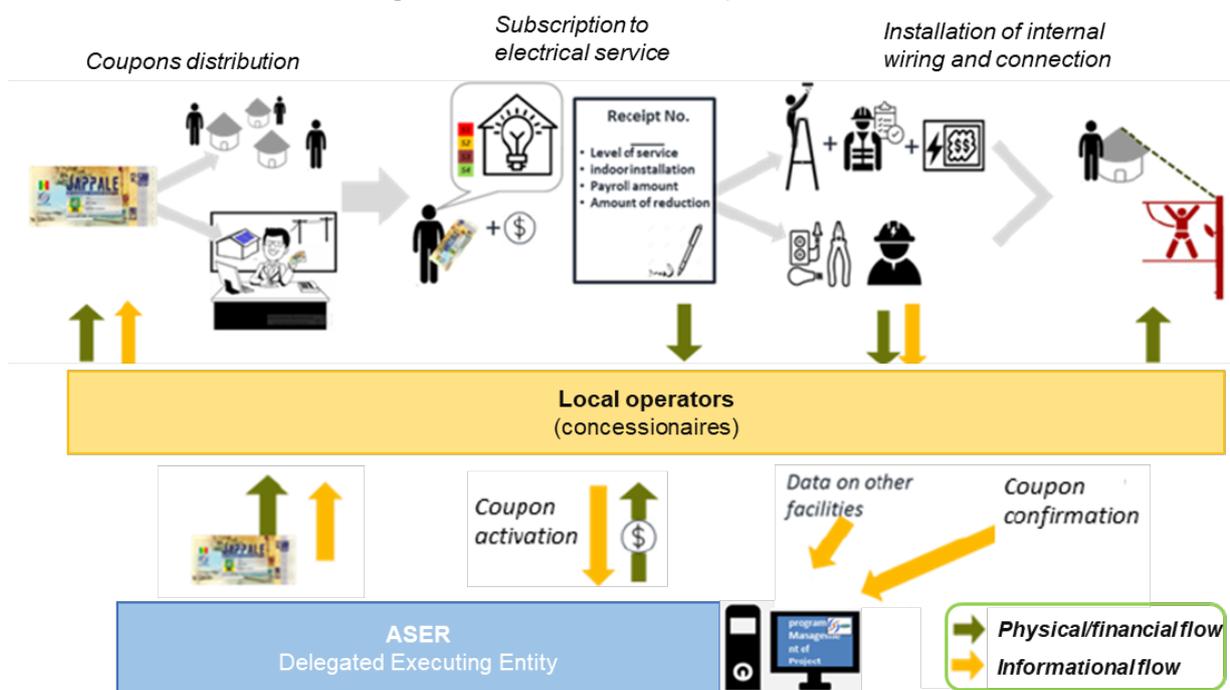
- Eliminate the access barrier constituted by connection costs (installations, connection or first top-up costs),
- Guarantee the safety of installations and the application of energy efficiency measures,
- Increase the service rate in electrified villages,
- Contribute to achieving the overall goal of universal access

A JAPPALE scheme concept evaluation and adaptation in relation to tariff harmonization as well as best practices for scaling up throughout the territory have been released in 2019, including a valuable set of recommendations about the software, the training material, villages selection, activation payments, e-codes confirmation and communication²². Likewise, ASER will provide coupons to concessionaires, who will distribute coupons in villages or at their agency, for eligible clients who opt to go directly to the agency.

²¹ Emission reductions achieved under Component 2 will not be used to subsidize the coupons of the World Bank JAPPALE programme, because distinctly monitored and not to be issued under the CDM.

²² As per World Bank 2018-11 minutes from the last steering committee of the JAPPALE vouchers project, and World Bank 2019-01 pilot implementation report

Figure 11: Scheme of the coupon mechanism



- **Productive equipment acquisition credit access facility;** Guarantee issued to cover the loans extended by a micro-finance institution for the purchase of resilient productive use equipment by rural entrepreneurs and support for the development of micro businesses²³ across agriculture, industry and commerce (equipment for farmers such as water pumps and processing machines like grinding mills, appliances for trades-people such as sewing machines and carpentry tools, and for retail outlets such as refrigerators and blenders).

Examples show that there is increased interest in financing renewable energy applications for productive use in Senegal. Nevertheless, the lack of access to medium and long-term agriculture financing and credit, in particular for smallholders facing land tenure issues, remains a critical barrier and will need further attention if the country is to successfully tap into these markets²⁴.

Table 6: Top six Micro-Finance Institutions (MFIs) in Senegal by outstanding loan amount²⁵

MFI	Total loan portfolio (USD million)	Number of Borrowers	Total deposits (USD million)
CMS	202.5	nc	242.9
ACEP Senegal	73.9	49,000	19.4
MicroCred – SEN	101.11	48,000	48.44
PAMECAS	60.98	89,000	60.69
U-IMCEC	17.77	21,000	12.52
MECAP	11.9	Nc	7.53

MFI selection will remain at the discretion of the Government of Senegal (Ministry of Economy and Finance) and be subject to eligibility criteria (including geographical proximity with rural target beneficiaries, energy-related products management abilities and financial capacity criteria) & BOAD due diligence that will assess civil / criminal and regulatory antecedents and sanctions lists – on top of obligations in the AMA between GCF and BOAD; the Bank will conduct also administrative investigations into corruption, fraud, coercion, collusions and inconvenient practices, and make use of the relevant national authorities for the necessary criminal investigations. Upon BOAD’s experience, this financial guarantee will be a loan proceed committed for covering part of the risk taken by the microfinance institutions (maximum 40% of receivables deemed irrecoverable). The resources will be managed by a Partner Financial Institution to be competitively selected by the Government of Senegal among national institutions like Banque Agricole,

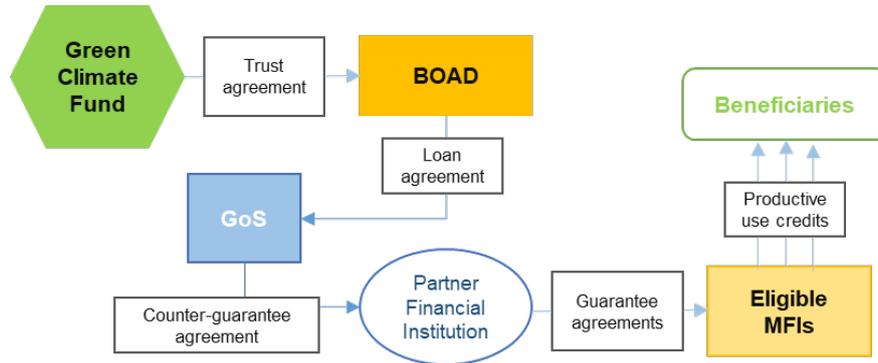
²³ Principles and operational guidelines to be further developed during Year 1

²⁴ 2019. GET. Invest market insights — Senegal: renewable energy applications in agricultural value-chains

²⁵ MIX. Link: <https://www.themix.org/> — accessed January 2019

Crédit Mutuel, COFINA, FONGIP, following BOAD due-diligence and general minimum criteria including reputational/recognition, governance and regulation, systems and experience.

Figure 12: Microfinance guarantees structure diagram



Business Model

The GCF sovereign loan to the Government of Senegal intends to reduce local operators' risks in operating and maintaining solar mini-grids in the smallest, most remote vulnerable villages to be electrified in Senegal. Based on the limited upfront concession fee of 5% of investments levied from the local operators and the applicable compensation from harmonized tariffs, private sector profitability can be expected above 12%, when full equity investment from operators in the same context would return a negative IRR (unless governmental tariff compensations payable to operators are increased fivefold to reach a comparable return, given the communities limited ability to pay which translated in tariff harmonization). Project arrangements, procurement and ownership remain under the GoS, while construction is contracted to private suppliers and local operations & maintenance to historical concessionaires.

The project will create an enabling environment for the private sector to step in and to provide the necessary co-finance and expertise, **delivering the following outputs by 2025:**

- strengthened institutional capacities for mobilizing private sector towards Universal Access completion, enhancing rural stakeholders' awareness and gender-driven participation
- 38,917 households electrified by rural mini-grids, focusing on solar solutions with battery storage
- financially-incentivized implementation of 3,739 'Projets Énergétiques Multi-sectoriels', for the solar powering of productive uses (mostly irrigation, refrigeration and agro-processing) and community services (such as schools, clinics) in villages with more than 250 inhabitants.

In doing so, the project will reach up to over 344,000 rural inhabitants, tabling on a progressive growth in demand, diversified between households improving their living standards, emerging productive economic uses and reinforced community services. Based on its 25 years projected supply, the project is estimated to contribute to the mitigation of at least 45,098 tonnes of CO₂e equivalent per year, i.e. 1.13 M. tCO₂ to be avoided over its technical lifetime.

Besides its **mitigation impact** and environmental co-benefits including (i) reduction of air pollution due to fossil fuel consumption and improvement of air quality thanks to promotion of renewable energies and (ii) reduction of pollution by waste oils at thermal power plants, the project's **adaptation co-benefits** will feature:

- Greater resilience to climate-stresses through reduced vulnerability to water scarcity, diseases and farming yields
- Illuminated studying and access to ICTs
- Socially-equitable avenues for income generation

Indeed, the introduction of modern energy and related productive incentives in the rural communities will actually lead to specific socio-economic and gender-sensitive development effects including:

- better sanitation and social services and increased possibility of activities during evening hours
- long-term effects through schooling and information, as well as changed migratory patterns
- increased availability of safe drinking water, refrigeration and mechanization for food production and sale
- improved access to climate / weather / best practises information through radio, television, and the Internet
- better health of especially women and girls following improved indoor lighting and decreased air pollution as well as safer streets and reduced distances to cover in search of energy services and/or resources
- local economy stimulation, employment generation and value-added revenue increases lifting rural areas out of poverty
- fossil fuel imports savings, improving households power purchase and in turn, the country's energy security & fiscal balance

Figure 13: proposed alternative technologies by type of settlement (ASER)

SIZE OF VILLAGES		MINI-GRID			OFF-GRID	
		Grid	DIESEL	HYBRIDE SOLAR/DIESEL (50% SOLAR ENERGY)	100% PV	SHS
>500 INHABITANTS		✓	✓	✓	✓	✗
100 - 500 INHABITANTS	DENSE AREAS	✓	✓	✓	✓	✗
	DISPERSED AREAS	✓	✓	✓	✗	✓
<100 INHABITANTS	DENSE AREAS	✓	✗	✗	✓	✗
	DISPERSED AREAS	✓	✗	✗	✗	✓

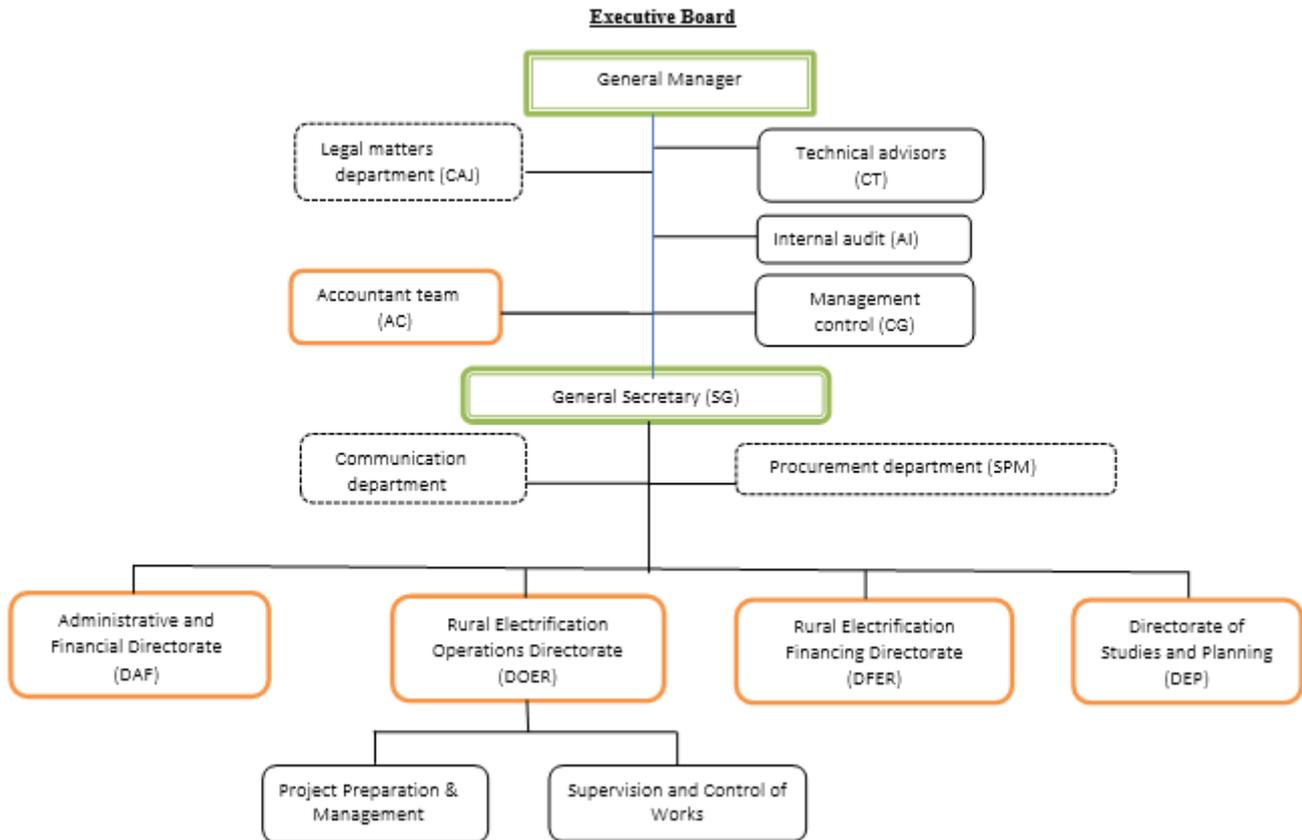
- At the peri-urban level, off-grid solutions are not suitable given the presence of networks MT and BT
- past experiences using diesel have shown that the logistics of fuel can be very expensive and complex (with supply disruptions in more isolated regions)
- Investments in SHS can be envisaged in very small villages and isolated (in the eastern parts of the country) for which an investment in the extension of the network or in a mini-network is not justified from an economic point of view.

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

In its role as representant of the Executing Entity (Government of Senegal), ASER will ensure operational supervision of the project from procurement and construction of all mini-grids until end-beneficiary installations. The project implementation unit will be integrated at ASER general management level, with a Project Coordinator acting under the supervision of a Steering Committee (*Comité de Pilotage – CP*). It will rely on the following structures to assume its coordination functions:

- the Technical Monitoring Committee (CTS) which will support the coordination and monitoring of the project work implementation;
- the operational structures (management units) of ASER General Management which will be responsible for the implementation of the project.

Figure 14: ASER management organogram



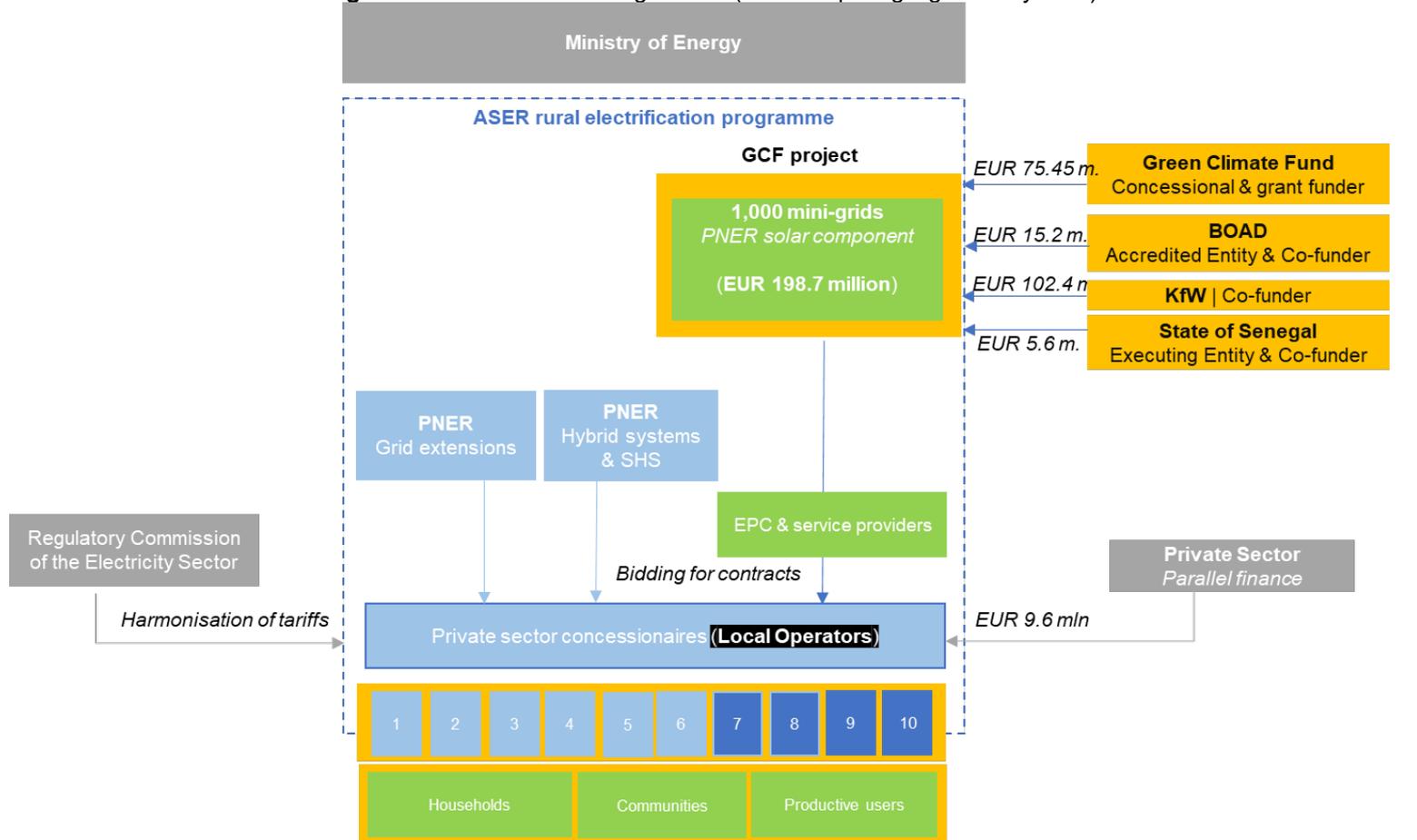
ASER Project Management Unit will be based within ASER premises and comprise:

- a Project Coordinator
- an expert Engineer in Renewable Energies (solar)
- a Financial Analyst
- an UN Procurement Specialist
- a person in charge of Monitoring and Evaluation,
- an Environmental and Social Safety officer

The project's legal, contractual, institutional and financial arrangements will include the following stakeholders:

- NDA (National Designated Entity): The Ministry of Environment and Sustainable Development acts as the Senegalese NDA and is supportive of the ASER program and the proposed GCF project. It was introduced to the NDA during the Senegalese National Committee on Climate Change, as early as September 2017. The NDA has provided a letter of no objection upon the Funding Proposal preparation stage.
- AE (Accredited Entity): BOAD will act as the AE, trustee and co-financier of the ASER GCF project. BOAD already has an ongoing financing relationship with the Senegalese government, and made available a total sum of CFA 12.22 billion (USD 22.00 million) through subordinate, longer-term loan, no yet disbursed and conditional upon the provision of concessional co-finance by a partner financier, as part of the total budget for the 1,000 villages. It will enter into a Trust Agreement with GCF for the entire amounts to be loaned and granted to the GoS.
- CRSE (Regulatory Commission of the Electricity Sector): The Commission is mandated to protect consumers against excessive electricity tariffs, ensure access and quality of service, enhance competition among IPPs and supervise SENELEC's performance. In the project, the CRSE will be responsible for monitoring compliance of operators against set tariffs and terms of reference as well as grievances once the assets are commissioned.

Figure 15: Institutional arrangements (GCF scope highlighted in yellow)



Regulatory framework for the development of mini solar grids

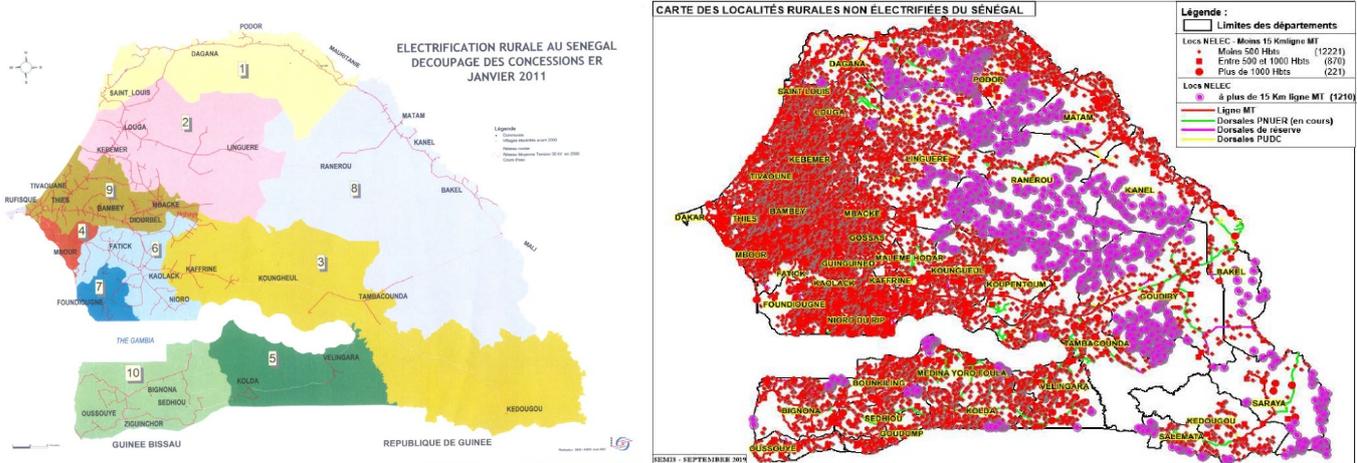
- ✓ Law 98-29 relating to the Electricity Sector
 - o Guarantee the country's electricity supply at the lowest cost
 - o Broaden people's access to electricity, especially in rural areas
 - o Attract the significant private investments required for the development of the sector
- ✓ Law 2010-21 on renewable energies
 - o Diversify sources of production by using renewable energies.
 - o Promote the dissemination of equipment related to renewable energy technologies.
- ✓ Decree 98-334, setting the terms for issuing and withdrawing licences or concessions for the production, distribution and sale of electrical energy
- ✓ Decree 98-335 relating to the principles and procedures for determining and revising tariff conditions.
- ✓ LPDSE/2019-2023 (Policy Letter for the Development of the Electricity Sector), including mini-grids related advocacies:
 - o Implementation of the electricity tariff harmonization at national level
 - o Electrification of community services and productive uses by integrating the gender approach for sustainable improvement of rural people's living conditions
 - o Support for renewable energy development by setting up incentives for facilitation of the acquisition of renewable energy equipment
 - o Establishment of a promotion and quality control system of renewable energy equipment

Project implementation map

The country has been divided into 10 geographic concessions, whereby each concession groups a number of localities for which an international bidding process was enacted. An international bidding process has been completed in 6 out of the 10 concessions,

identifying the most competitive private sector concessionaires²⁶ that are tasked to build, operate and maintain assets for a fixed period, while the remaining 4 have been attributed to SENELEC public scope; the first phase of implementation ('Programme National d'Urgence d'Électrification Rurale' covering the period 2015 – 2018) being under finalisation.

Figure 16: map of Senegal rural electrification concessions (left) and unelectrified villages (right, SEMIS) as of 2019



Lack of adequate (debt) finance has forced private sector concessionaires in the initial 'pilot concessions' to charge excessive electricity tariffs to rural customers to allow investors meet their financial return requirements. While the national electricity tariff has been set at harmonized levels of FCFA 90-97 (EUR 0.14-0.15) per kWh²⁷ for low to medium power domestic subscribers, concessionaires currently charge as high as FCFA 250 (EUR 0.38) per kWh. The gap is compensated by the Government in a harmonization effort aiming at removing the disparity in electricity tariffs – representing a burden of 11 billion FCFA (USD 19 million) per year, which the GCF intervention will help phasing out. When factoring high grid-connection costs (and internal house wiring), only the most affluent rural households could afford to sign up for such services, leaving the vast majority disconnected.

ASER, the Government's delegated contracting authority for the development of rural electrification in Senegal, has set up a new organisation to meet current challenges. To guarantee a successful implementation of this program, ASER has developed a Strategic Development Plan (PSD) which defines the main axes around which its intervention will be articulated during the period 2019-2023. It has also formulated an operational plan for implementing the 'Complementary Program for Universal Access' enabling Senegal to reach its objective of universal access by 2025.

The Accredited Entity

The West African Development Bank (BOAD) will act as the Accredited Entity, Trustee (the FAA between GCF and BOAD will be in the form of a trust arrangement) and co-financier of the ASER project. BOAD, in its role as AE, will be responsible for the overall management of this project, including (i) all aspects of project appraisal; (ii) administrative, financial and technical oversight and supervision throughout project implementation; (iii) ensuring funds are effectively managed to deliver results and achieve objectives; (iv) ensuring the quality of project monitoring, as well as the timeliness and quality of reporting to the GCF; and (v) project closure and evaluation.

BOAD has been active in Senegal since its inception and has cooperated with both the Senegalese Ministry of Finance and the ASER program for a long time. As of December 2019, BOAD has a total of FCFA 128.8 billion in public sector loans in Senegal, supporting 191 projects and initiatives. BOAD is also closely engaged in the Senegalese energy market, managing an aggregate amount of FCFA 239.9 billion in loans to the sector, equivalent to 23.3% of all outstanding loans to the Senegalese government.

BOAD recognises the potential of the ASER program to scale-up and contribute to the Bank's ambition to promote rural electrification and development in its target region, hereby both tackling climate change mitigation and strengthening the resilience of the most vulnerable communities. In 2014, BOAD provided a medium-term (2 year) loan valued at FCFA 5 billion (USD 9.06 million) to the

²⁶ These include ERA - African Rural Energy, COMASEL - Maroc-Sénégal Electricity Company, ENCO - Energy Service Company, and SCL - Energy Solutions

²⁷ The national tariff of FCFA 97 per kWh is based on a SENELEC 2017-2030 production plan that defines the average cost of electricity generation at FCFA 62 per kWh; a cost of transmission estimated at 20 FCFA per kWh; and the cost of distribution of 15 FCFA per kWh; and the remainder linked to electricity loss.

Senegalese government, which was used to support the initial development phase of the ASER program. In 2015, a second longer-term loan valued at FCFA 10 billion (USD 18.12 million) was issued to the government, to be serviced by the project.

BOAD promotes the balanced development of its member countries and fosters economic integration within West Africa by financing priority development projects. BOAD has identified the off-grid renewable energy generation component of the ASER program as a highly relevant and viable investment opportunity given its transformational mitigation impacts. BOAD's contribution of FCFA 10 billion (EUR 15 million) to this project is conditional upon the provision of concessional co-finance by a partner financier. This will enable BOAD to offer debt finance with more attractive terms to the targeted concessionaires by a) lowering the cost of capital by 2.4%; and b) softening the repayment terms by extending the loan tenors and introducing longer grace periods – two barriers currently hampering scaled-up investments by the private sector in the domestic energy market.

Figure 17 : Visualisation of the financing plan of the project

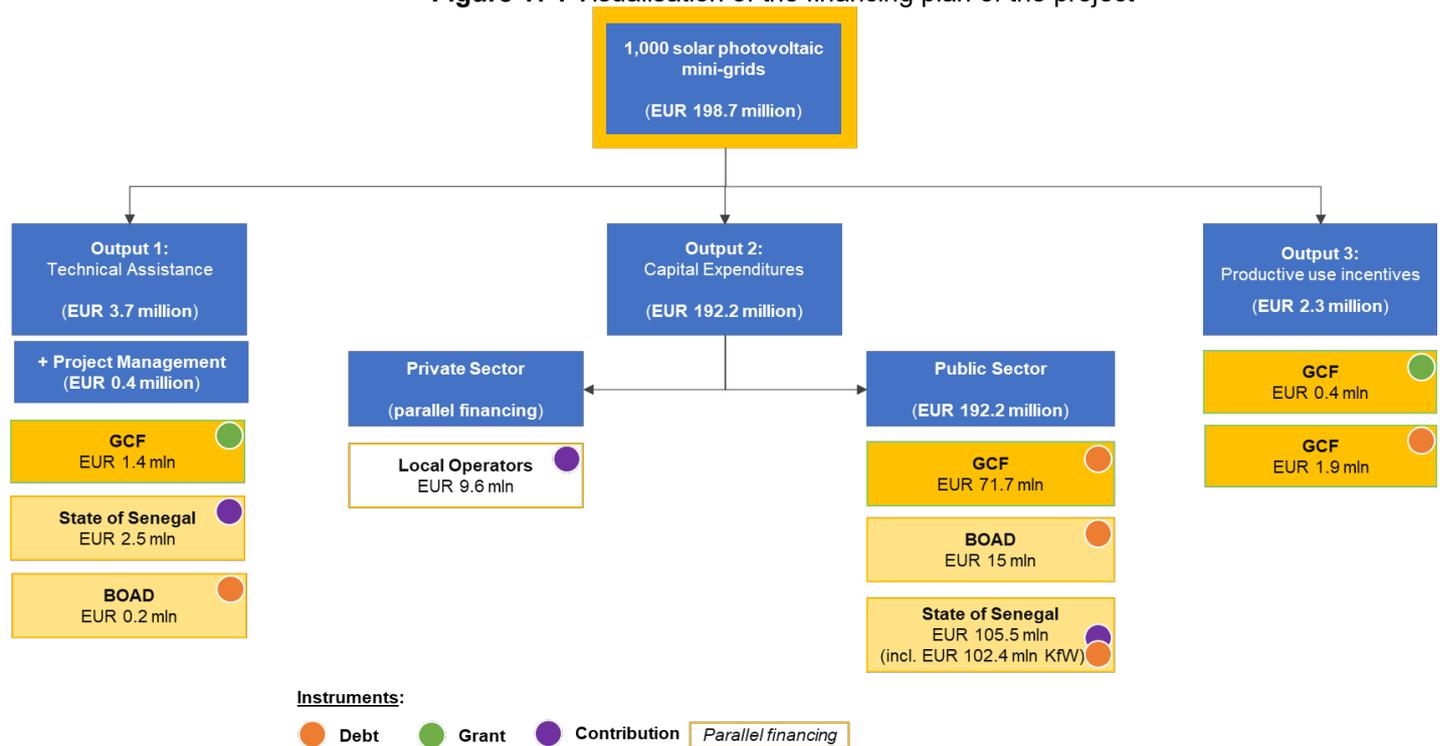
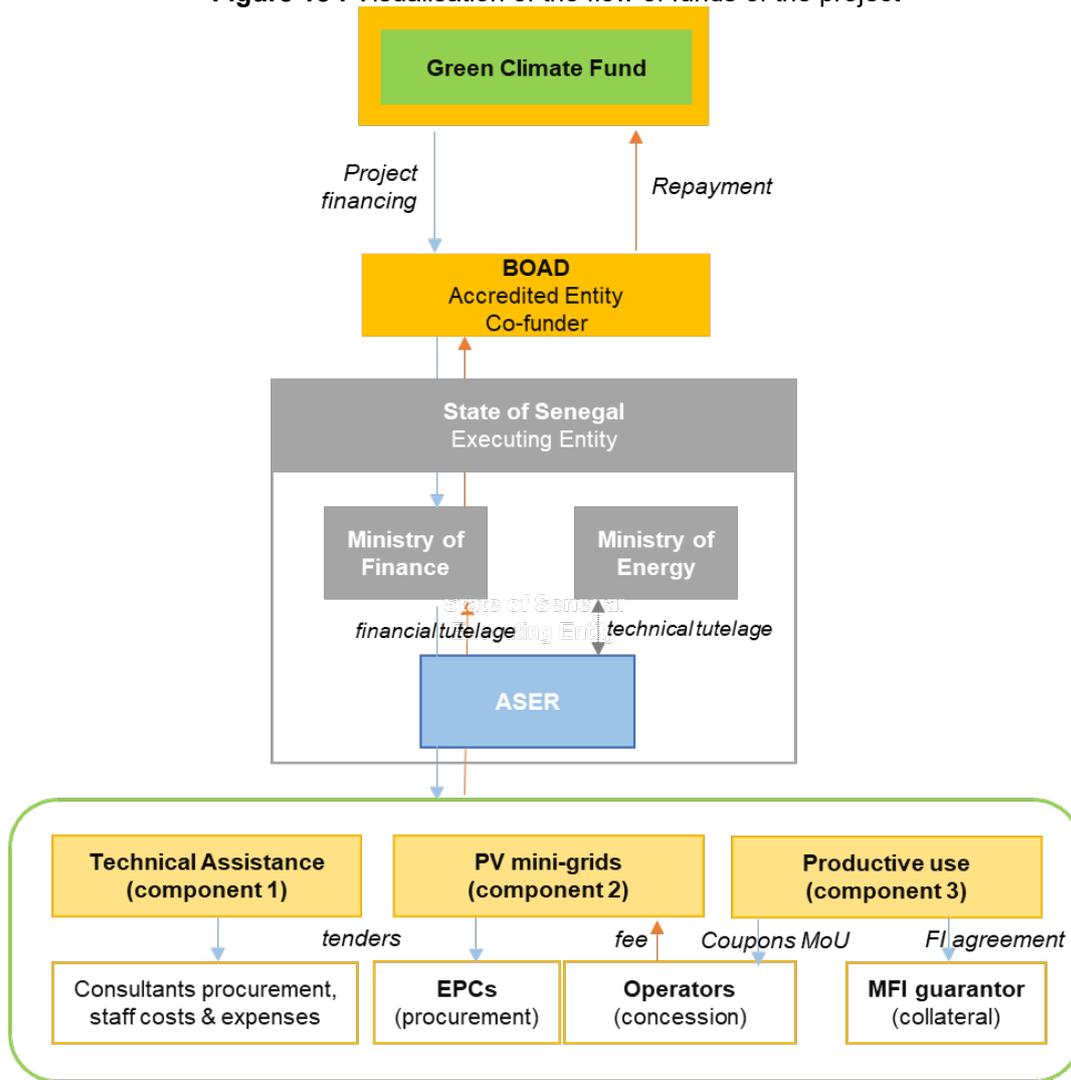


Figure 18 : Visualisation of the flow of funds of the project



Eligibility criteria

<i>EPCs</i>	<i>Operators</i>	<i>MFIs</i>
Detailed technical selection criteria to be developed as part of the Technical Assistance in component 1	<ul style="list-style-type: none"> ✓ existing concessionaires Licensed by the Ministry of Energy ✓ ability to invest 5% of the total cost per minigrid 	<ul style="list-style-type: none"> ✓ approved by the Ministry of Economy and Finance ✓ regulated and licensed for the duration of the guarantee ✓ number of years of experience and operation in the target rural areas & products, ✓ financial situation over the last three (03) years through ✓ pre-agreed effective lending rate cap to be applied to end-users
<i>Beneficiaries under Activity 3.1.1 and Output 1.2</i>		<i>Partner Financial Institution</i>
<ul style="list-style-type: none"> ✓ geographic location within a village where electricity is available from the concessionaire, ✓ first electrification of woman-led or youth-led enterprise with productive use intention, or social service need ✓ compliance with the technical conditions required by the concessionaire 	<ul style="list-style-type: none"> ✓ <i>the identification of beneficiaries of the coupons distribution will be empowered to the gender-mainstreaming communities in selected villages once informed about the rules and objectives, to build</i> 	<ul style="list-style-type: none"> ✓ <i>Rating of BB or higher or industry recognition as a key player in the microfinance sector</i> ✓ <i>Reputable and sound ownership, management, and governance standards</i> ✓ <i>Status as a duly registered, regulated, and licensed entity in Senegal</i>

✓ priority to women and youth (below 40 years old)	<i>ownership and commitment among beneficiaries</i>	✓ <i>Acceptable underwriting systems and servicing platforms in place</i> ✓ <i>3 years of experience in lending to MFIs</i>
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Applicable tariff structure

Senegal has completed a tariff harmonization process since 2019 that brings all electricity tariffs in the country in line with those charged by the national utility SENELEC, on the basis of the Prepaid WOYOFAL category described below.

Tariff Option	1 st tranche	2 nd tranche	3 rd tranche
UD-PP	From 0 to 150 kWh	151 - 250 kWh	> 250 kWh
UD-MP	From 0 to 50 kWh	51 - 300 kWh	> 300 kWh
UP-PP	From 0 to 50 kWh	51 - 500 kWh	> 500 kWh
UP-MP	from 0 to 100 kWh	101 - 500 kWh	> 500 kWh

Tariff CATEGORIES	Electricity Price in FCFA/kWh			Fixed monthly prime FCFA/kW
	1 st Tranche	2 nd Tranche	3 rd Tranche	
Domestic usage (UD)				
Domestic Small Capacity (DPP)	90.47	101.64	112.65	
Domestic Medium Puissance (DMP)	96.02	102.44	112.02	
Professional Usage (UP)				
Professional Small Capacity (PPP)	128.85	135.68	147.68	
Professional Medium Capacity (PMP)	129.81	136.53	149.24	
Prepaid (WOYOFAL)				
Domestic Small Capacity (DPP)	90.47	101.64	101.64	
Domestic Medium Capacity (DMP)	96.02	102.44	102.44	
Professional Small Capacity (PPP)	128.85	135.68	135.68	
Professional Medium Capacity (PMP)	129.81	136.53	136.53	
<i>Street Light</i>		118.16		3,007.21

Source : CRSE decision on SENELEC new applicable tariff

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

Senegal is a regional leader for West Africa, with a reputation of economic and political stability and a long track record of peaceful democratic elections. The country is expected to maintain its strong rate of economic growth, having registered over 6% per annum for the last four years. However, it is facing delays and difficulties in realizing its universal access milestones and associated NDC contributions for the rural electrification sub-sector, especially in the most remote and smallest vulnerable villages where grid extension is not feasible.

It is noted that in rural areas, due to high investments costs, concessionaires charge high electricity tariffs. The differentiated tariffs between SENELEC (the national utility company) and concessions have generated a lot of resistance to electrification in rural areas. To enable the government to reach universal (and equitable) energy access by 2025, an adapted financing approach that enables access to affordable finance and creates investor confidence needs to be adopted.

According to the study funded by the European Union to help Senegal define the appropriate procedure for the harmonisation of tariffs (aligning the cost of electricity for rural consumers to grid-connected terms), a compensation mechanism towards the concessionaires' initial tariff levels as a consequence of the reduction in retail tariffs amounts needs an effort of 11 billion FCFA (USD 19 million) per year. The analysis showed that 100% solar systems – if funded by grants or other sources of funding – could be profitable, since the vast majority of costs are related to the investment.²⁸

The requested GCF contribution has a dual aim:

²⁸ GESTO 2018 SE4ALL Rural Electrification Program for Senegal | Action Plan & Investment Prospectus

- GCF's concessional contribution is required to ensure that, in combination with BOAD's loan and other nationally mobilized resources, the average cost of capital of outstanding debt does not exceed 4%. Without GCF financing, the Senegalese government will have to borrow more from international financial institutions²⁹ at unfavourable terms and delays. Hence the need for external support becomes more urgent if climate change mitigation is to be achieved within the ambitious timeframe.

With the help of GCF concessional loan, ASER project's average cost of capital is reduced by 2.4% (to a level of 3.9%, instead of 6.3% without the GCF) thus lightening its debt obligations weigh on the government's balance sheet. The long tenor of 40 years further optimizes its debt servicing schedule to viable instalments.

- Furthermore, by providing a mix of long-term concessional debt and grant to ASER, BOAD and the GCF will make the investment proposition significantly more attractive for private sector investors, who are required to contribute 5% of the total investment cost in equity. This lowered contribution level is necessary to an acceptable rate of return to equity investors above 12.6 %³⁰ and strengthen the debt service coverage ratios of new investments, in the most remote and vulnerable villages that would otherwise not be financially viable on the private sector's own funding.

Based on the limited upfront concession fee levied from the local operators and the applicable compensation from harmonized tariffs, private sector profitability can be expected at 12.6%, when full equity investment from operators in the same context would return a negative IRR (unless governmental tariff compensations payable to operators are increased fivefold to reach a comparable return, given the communities limited ability to pay which translated in tariff harmonization).

The GCF's grant contribution will further de-risk the investment by reinforcing capacities and stimulating productive anchor demand through components 1 and 3.

B.6. Exit strategy and sustainability (max. 500 words, approximately 1 page)

Beyond the GCF intervention, the project benefits will be sustained throughout the Universal Access Completion Program as follows:

- The estimated cost reduction from the diversification from imported fossil fuels through the introduction of renewable power generation will reduce the cost of grid-based rural electrification and will free public resources that will be redirected to rural electrification. In the medium-term, this will result in improved public debt conditions and lower the cost at which Senegalese entities (both public and private) will be able to secure debt. Lowered cost of capital will, in turn, strengthen the case for investments in the domestic renewable energy sector, mobilising private sector capital.
- The Technical Assistance component will contribute to ensure that a stable regulatory framework is created to oversee the national electricity tariff regulation. ASER being a state body, the loan will be made to the Government of Senegal which will be the Executing Entity, represented by ASER as the delegated project owner; this arrangement will avoid legal problems. Long-term certainty concerning the tariff policy will further strengthen investor confidence in the domestic energy sector, creating an investment environment where by 2025 new investments in the decentralised power generation projects can be supported on a purely commercial basis.

Project sustainability and exit provisions will also be embedded in contractual arrangements (cf. draft ministerial order relating to the conditions and modalities of realization and operation of off-network rural electrification projects in Senegal), entailing:

- operating titles with a duration of 25 years
- provision for the renewal of equipment included in the rate base provided that these provisions are used to fund an escrow account
- case of extension of the network of SENELEC or of a concessionaire in the perimeter of an off-grid electrification project before the end of the current operating permit on said perimeter

²⁹ Rural Electrification lenders round table expected in April 2020

³⁰ UNFCCC CDM energy sector expected return on equity threshold in Senegal
(<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v10.0.pdf>)

C. FINANCING INFORMATION						
C.1. Total financing						
(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)		Total amount		Currency		
		75.445176		million euro (€)		
GCF financial instrument		Amount	Tenor	Grace period	Pricing	
(i)	Senior loans	73.623231	<u>40</u> years	<u>10</u> years	<u>0</u> %	
(ii)	Subordinated loans	-				
(iii)	Equity	-				
(iv)	Guarantees	-				
(v)	Reimbursable grants	-				
(vi)	Grants	1.821945				
(vii)	Results-based payments	-				
(b) Co-financing information		Total amount		Currency		
		123.247006		million euro (€)		
Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniority
BOAD	Senior Loans	15.244902	million euro (€)	<u>10</u> years <u>3</u> years	<u>7.6</u> % ³¹	<u>senior</u>
Senegalese Government	Grant	5.606169	million euro (€)	Enter years Enter years	Enter%	Options
KfW	Senior Loans	102.395935	million euro (€)	<u>10</u> years <u>0.5</u> years	<u>6.14</u> %	<u>senior</u>
(c) Total financing (c) = (a)+(b)		Amount		Currency		
		198.692182		million euro (€)		
(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)		<p>With regards to the tenor between the GCF and BOAD, it should be noted that BOAD funding has already been approved by its board of directors for the project, mobilizing resources from States and on the international financial market according to characteristics which are reflected in the cost of the resource. Each year, the characteristics of the resources are fixed by the senior authorities of the Bank accordingly. As the cost of BOAD resources is higher, the request for GCF concessional resources is meant at reducing the project's WACC for the Senegalese State which is the borrower, and lighten its debt servicing in smaller instalments to improve viability.</p> <p>Private sector parallel equity financing will amount to EUR 9.6 mln, which will be channeled for the tariff harmonisation funding (result-based compensation), beside their operational expenditures and batteries replacement cost to be provisioned yearly in escrow account.</p> <p>Tax exemptions will be granted to rural electrification equipment supply by framework convention between ASER and the Ministry of Finance.</p>				
C.2. Financing by component						
Component	Output	Indicative cost million euro (€)	GCF financing		Co-financing	
			Amount million euro (€)	Financial Instrument	Amount million euro (€)	Financial Instrument

³¹ Fixed interest rate, on top of which a commitment fee (0,5%) and a service fee (1%) are due.

1. Technical assistance to the solar rural electrification stakeholders	1.1 Capacity building of rural electrification stakeholder	0.94	0.23	Grants	0.24 0.47	Loan Grant	BOAD GoS
	1.2 Gender action plan implementation	1.23	0.61	Grants	0.61	Grant	GoS
	1.3 Environmental & social downstream activities	1.57	0.5	Grants	1.07	Grant	GoS
2. Procurement and Installation of solar powered mini-grids	2.1 Preparation of detailed Engineering studies	3.49	0.58	Loan	0.24 2.660	Grant Loan	GoS KfW
	2.2 Supply, installation and commissioning of equipment	177.16	70.81	Loan	2.91 89.36 14.09	Grant Loan Loan	GoS KfW BOAD
	2.3 Modern public lighting	6.10			6.10	Loan	KfW
	2.4 Control and supervision of work	5.48	0.29	Loan	4.27 0.91	Loan Loan	KfW BOAD
3. Incentives for Social & Productive Use of Electricity	3.1 Gender & social connections	0.39	0.39	Grants	-		
	3.2 Microfinanced productive equipment credits guarantees	1.94	1.94	Loan	-		
Project Management Cost	-	0.39	0.09	Grants	0.30	Grant	GoS
Indicative total cost (EUR)		198,692,182	75,445,176		123,247,006		

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities? Yes No

C.3.2. Does GCF funding finance technology development/transfer? Yes No

GCF-funded Technical Assistance to the solar rural electrification stakeholders will amount to EUR 3.7 mln, including among others, *Gender action plan implementing activities, Monitoring of ESMP implementation and environmental and social support, Subsidy for setting up a recycling unit for batteries and other waste (CFL, other electronics) and Training on procurement procedures and GCF requirements*

D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's [Initial Investment Framework](#).

D.1. Impact potential (max. 500 words, approximately 1 page)

In terms of **mitigation**, the project will contribute to climate action in the generation of emission reductions of 1.13 M. tonnes of CO₂ equivalent by 2045. The estimated emission reduction potential arises from the implementation of renewable energy-based rural electrification replacing the continuous, alternative use of fossil fuel-based solutions.

ASER rural electrification initiatives are registered under a Clean Development Mechanism (CDM) Programme of Activities (PoA), including technological distinctions³² between Project Activities of Mini-Grids, Grid Extension, Solar Home Systems and (upcoming) Portable Solar Lamps.

Approved Methodology applied is AMS-III.BL. - Integrated methodology for electrification of communities³³.

Figure 19: Flow diagram for baseline and project scenario showing emissions sources

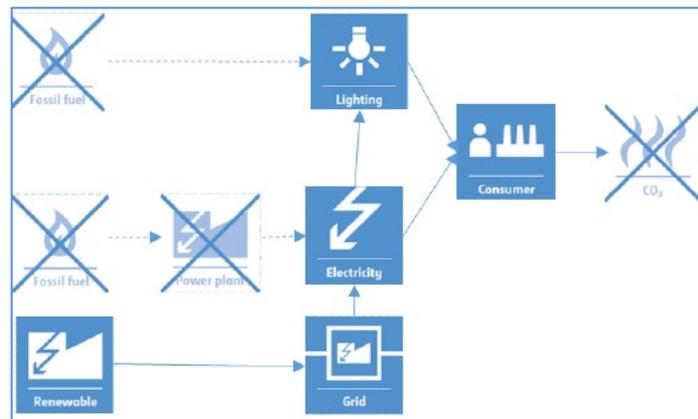
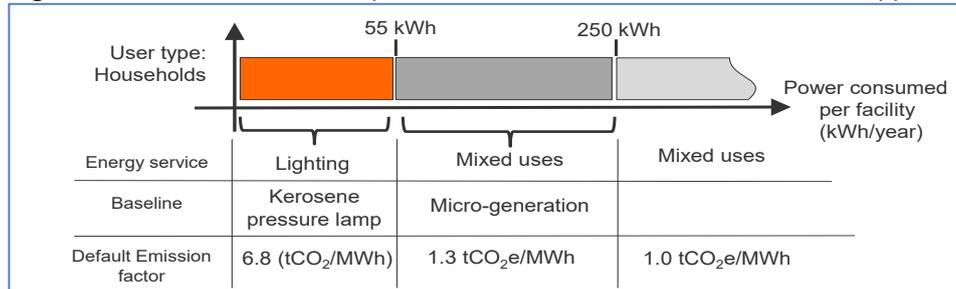


Figure 20: UNFCCC CDM simplified emission reductions determination approach



Summary calculations:

$$BE_y = \sum(ECT_{x,y} \times EFCO_{2,T})$$

Where:

- $BET_{y,T}$ = Baseline emission from consumers Types in year y (tCO₂)
- $ECT_{x,y}$ = Annual electricity consumption of consumer Types in year y (MWh)
 - If $ECT_{x,y}$ is equal to or less than 0.055 MWh, then a default value of 6.8 (tCO₂/MWh);
 - If $ECT_{x,y}$ is less than or equal to 0.250 MWh but greater than 0.055 MWh, then:
 - o For the portion up to and including 0.055 MWh, a default value of 6.8 (tCO₂/MWh);
 - o For the portion greater than 0.055 MWh, a default value of 1.3 (tCO₂/MWh);
 - If $ECT_{x,y}$ is greater than 0.250 MWh but less than or equal to 0.500 MWh, then:
 - o For the portion up to and including 0.055 MWh a default value of 6.8 (tCO₂/MWh);

³² UNFCCC (2018) Senegal Rural Electrification Program. CDM programme documentation is available [here](#)

³³ N.B. Under this CDM methodology's eligibility requirements, at least 75% (by number) of the project consumers shall be households

- o For the portion greater than 0.055 MWh and less than 0.25 MWh/y a default value of 1.3 (tCO₂/MWh); and
- o For the portion greater than 0.250 MWh a default value of 1.0 (tCO₂/MWh);
- If EC_{T1M,j,y} is greater than 0.500 MWh then a default value of 1.0 (tCO₂/MWh) for the entire portion (i.e. default values of 1.3 (tCO₂/MWh) or 6.8 (tCO₂/MWh) are not eligible for any of the portions)

		1	2	3	4	5	->25
	year	2021	2022	2023	2024	2025	years
Households connections	#	11 675	23 350	38 917	38 917	38 917	38 917
PREM completion	#	374	1 122	2 617	3 739	3 739	3 739
Electricity demand growth	%/y	3.2 percent per annum					
Baseline emissions	tCO ₂ e/y	7 782	19 932	33 220	34 272	35 357	1 127 447
Project emissions	tCO ₂ e/y	-	-	-	-	-	-
Emissions reductions	tCO₂e/y	7 782	19 932	33 220	34 272	35 357	1 127 447

Table 7: Underlying mini-grids beneficiaries' specific consumption breakdown

User type	Specific consumption (kWh/day)	Emission factor (kgCO ₂ /kWh)
School	2,5	1,0
Mill	15	1,0
Dispensary	7,68	1,0
Health center	15,28	1,0
Health shop	4	1,0
Boutique	8	1,0
Sewing maching	0,5	1,0
Borehole pump	33	1,0
Public lighting	0,3	1,0
Religious center	1,5	1,0
Socio-educational house	1,5	1,0
Household	1,2	2,67

In terms of **adaptation co-benefits**³⁴, the programme will contribute to fostering resilience and sustainable development in the following ways:

- Increasing access to electricity in (remote) rural areas, with a particular focus on women and children as the key beneficiaries, with equalized gender roles and enhanced access to education and information (a dedicated EUR 1.2 million gender equality promotion program will target this development).
- Diversifying energy generation portfolio in relation to scattered geography (decreased vulnerability to disasters), fuel use needs (no fuel supply at risk of extreme weather events), cooling/refrigeration needs and water use needs (removed dependence on water challenges), supporting a more climate-resilient power system
- Climate-resilient productive assets deployment thanks to the revolving guarantees of up to 40% of nominal loans of 3-y average duration (the GCF funding being worth EUR 20 mln total borrowings), improving reliability of water and food chains, as well as services in health, education and social institutions, throughout 3,739 'Projets Energétiques Multi-sectoriels' including farmers, entrepreneurs, schools and clinics lacking electricity
- Providing employment opportunities and supporting economic growth in rural areas. Affordable renewable electricity will further strengthen the economic resilience of rural households as it will improve community income levels and reduce migration patterns.

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

The project is designed to produce a paradigm shift by supporting the transition away from a traditional energy pathway that would otherwise continue to be dependent on imported fossil fuels³⁵ especially in the most remote and smallest vulnerable villages where grid extension is not feasible, to a progressive, low-carbon and sustainable

³⁴ see CCKN and IISD (2014) case study on adaptation benefits from rural solar electrification projects in Senegal

³⁵ Senegal imported 655 ktoe of oil in 2015 and used 305 ktoe of it to generate electricity, according to the African Energy Commission

pathway that prioritises decentralized energy generation and gender involvement, focusing both on electricity for economic development (value-added productive use) and for improved access (community adaptive capacity) of marginalised rural areas. The project intends to achieve the following paradigm shift potentialities:

- *Crowd in private sector capital and expertise*
Given the lack of technology track-record and the financial sector's limited know-how of clean energy investments (particularly when it comes to decentralised power generation), private capital for the targeted investments is prohibitively expensive. The proposed financing package offers a solution to incentivise participation of the private sector by increasing investor confidence. Confidence is enhanced by making available concessional finance and grant funding that significantly lower the WACC by over a third (2.4%), thereby strengthening debt-service coverage ratios and increasing overall profitability in the long run. The private sector, which is required to contribute 5% of the total investment in equity (concession fee), furthermore brings in much-needed technical expertise to operate these assets cost-effectively and sustainably. This collaboration will greatly improve the business environment in the energy sector, which, according to the IMF, currently stands out as the weakest of all economic sectors in Senegal.³⁶
- *Improve the investment framework and disseminate knowledge through knowledge-sharing and learning*
The TA component will focus on designing and implementing productive use-targeted de-risking tools that both satisfy the capacities of the final beneficiaries and reflect the needs of private sector operators, which is expected to generate a powerful trickle-down effect on the national economy. Combined with the gender equality promotion plan, the programme is expected to have significant positive co-benefits on the economic resilience of the most vulnerable communities in Senegal.
- *Modernise the rural economy through increased solar-powered productive use*
The demonstration of transformative potential of productive uses leveraging solar energy will provide a compelling case for their adoption in agriculture and other sectors of activity. The vast majority of Africa's off-grid households are in rural areas and largely engaged in agricultural activities – for sustenance, for income, or both. Most are smallholder farmers, often without access to electricity to power electrical appliances which would help them increase their yields, water access and sanitation. Solar rural electrification is an effective way of improving community assets through cheaper delivery of services (health, education, water & agriculture), increasing quality of life and enhancing the adaptive capacity of communities.
- *Enhance Senegal readiness for leveraging further climate finance opportunities*
Senegal already has a proven leadership in accessing climate finance for adaptation purposes – Centre de Suivi Ecologique (CSE), a public utility association based in Senegal, was the first national institution to access international climate finance (as the nominated National Implementing Entity for the Adaptation Fund since 2010), based on a proposal from the National Committee for Adaptation to Climate Change (COMNACC) through the Designated Authority (MEDD, which is also the GCF NDA for Senegal).
The Technical Assistance embedded in this project will contribute to building expertise in public-private mitigation activities coordination and implementation in the rural electricity sector, backed by a robust MRV system, which will also help to further attract public and private climate finance, including from carbon markets.
- *Encourage regional replication by advancing fossil-fuel grids to clean energy and low-carbon development*
Senegal's electricity access rate is 68% nationally and it stands only at 42% in rural areas. Senegal is a Least Developed Country and lacks the resources to finance the roll-out of the planned rural electrification activities. Under a business-as-usual scenario, any improvements in the rates of rural electrification are likely to be met through diesel-powered generators (due to its relatively low upfront cost). Neighbouring countries, including some of BOAD's other member countries, face similar obstacles. The financial package proposed by BOAD and complemented by the requested GCF contribution will enable ASER to mobilise private sector investment in the domestic energy sector by facilitating access to affordable, long-term finance. Without this concessional finance, private sector concessionaires will struggle to get their projects financed or will only do so against excessively high tariffs to end-customers. Such business-as-usual scenario would lock in carbon intensive infrastructure – a pathway that the Government of Senegal aims to avoid.

³⁶ IMF African Department (2015) *Making Senegal a Hub for West Africa*

The ambition of this program is to demonstrate a blueprint to a clean-energy future that can be followed by other nations. The shift from BOT regional concessions to a public pre-financed concession fee model will lower long-term power generation costs and secure improved energy access for all segments of the population.³⁷ Proof of concept will allow other countries in the ECOWAS region to replicate this sovereign approach, with a higher likelihood of commercial financiers stepping in to provide the required pre-finance directly to the private sector project developers. Collection of the concession fees (5% of the solar mini-grids CAPEX) will contribute to funding tariff harmonisation and off-grid renewable electrification through the Special Support Fund for the Energy Sector (FSE), which in turn support the country's NDC implementation plans without needing to rely on international, concessional (climate) finance.

Lessons learned throughout the project lifetime (2021 – 2025) will be disseminated regionally. The ambition of these activities will be to encourage replication of best-practice approaches both within WAEMU member states (e.g. Benin, Burkina, Côte d'Ivoire, Guinea Bissau, Mali, Niger, and Togo) as well as across the entire ECOWAS region. This will be achieved through the development of knowledge products, delivery of regional workshops, and publication of relevant resources targeted at partner countries that face similar technical, financing and institutional issues.

D.3. Sustainable development (max. 500 words, approximately 1 page)

The implementation of ASER project will place Senegal on a sustainable, climate-resilient development pathway in relation to several Sustainable Development Goals:

- **SDG 7 (ensuring access to affordable, reliable, sustainable and modern energy for all),**
- SDG 1 (poverty reduction - Improved Productivity and economic diversification)
- SDG 3 (health improvement – Avoided use of diesel/kerosene/paraffin)
- SDG 5 (gender equality and empowerment of women and girls)
- SDG 8 (decent work and economic growth)

It will contribute to these sustainable development benefits in the following ways:

Economic co-benefits

- Enabling productive uses of electricity and income-generating activities through improved reliability of power supply, including for irrigation and climate-resilient agriculture practices
- Improving the country's energy security budget deficit which is negatively impacted by the import of fossil fuels in foreign denominated currencies
- Lowered operating costs for enterprises benefitting from the generated renewable energy, including clinics and schools that will reduce or eliminate their dependence on diesel
- Direct creation of employment opportunities including construction and maintenance provision services, highly relevant given the decentralised nature of the rural electrification program
- Indirect creation of employment opportunities by creating possibilities for shop owners and entrepreneurs to manufacture or import new technologies that can be powered by electricity.

Social co-benefits

- Improved health conditions, as renewable energy-powered lights will reduce the use of kerosene lamps and eliminate indoor air pollution which causes eye irritation and lung injury
- Enhanced conditions in educational and social institutions
- Poverty reduction through the promotion of income-generating activities
- Improved access to potable water and water pumping for crop irrigation.

Environmental co-benefits

- Reducing the risk of ground-water contamination caused by leaking diesel generators
- Reduction in local air pollution and noise disturbances on local communities by eliminating the use of diesel-generated electricity (by 2025 no diesel-only mini-grids will remain in Senegal).

Gender co-benefits

³⁷ Gesto Energy Consulting (2016) Programme d'électrification rurale pour le Sénégal 2015-2025 : Plan de Financement

- Increasing access to electricity in (remote) rural areas, ensuring that men and women are equally benefitting from the initiative. ASER will offer special support to promote equal opportunities arising from the rural electrification project through the TA component for both men and women
- Freeing up time for women (previously allocated to household tasks, through the use of mills and access to drinking water supply among others) and children (increasing light time available at night) to engage in productive and education activities that improve income generation and strengthen social standing.
- Positive discrimination will be made against women's microenterprises by setting up mechanisms to take better advantage of the energy opportunities that will arise: training of target groups in trades, design of business plans around activities identified beforehand and access to micro-financing for equipment and provision of connection coupons to the most vulnerable, support for a good organizational and institutional structuring of women's organizations

D.4. Needs of recipient (max. 500 words, approximately 1 page)

Vulnerability of recipients

The electricity sector in Senegal (a Least Developed Country) is mostly exposed to mitigation-related climate risks through (i) decreased/variable water availability for hydropower generation and thermal power generation cooling, (ii) increased damage to hydropower infrastructure from flooding and river sediment loads, and (iii) increased damage to power transmission and distribution infrastructure from sea level rise and coastal erosion. Adaptation-related climate vulnerabilities of off-grid rural communities span disruptions caused by natural disasters like increasing mean temperatures, rainfall variability and droughts with consequences in terms of diseases, water scarcity, food insecurity, lower agricultural and economic productivity as well as disempowerment of women and young populations from building more resilient livelihoods. These water resources, agriculture, livestock and health risks are further aggravated by the expensive fossil fuels, low income and limited employment burdens on development and wellbeing.

Growing national debt level

Senegal's public debt currently stands at USD 7.5 billion, representing 57% of the country's GDP. A combination of exchange rate depreciation and a dependence on foreign debt places the treasury at risk. The Ministry of Finance is committed to reduce debt ratios over the medium term by means of fiscal consolidation, improvements in the current account and improved debt management policies.³⁸ With the help of GCF concessional loan, ASER project's average cost of capital is reduced by 2.4% (to a level of 3.9%, instead of 6.3% without the GCF) thus lightening its debt obligations weigh on the government's balance sheet. The long tenor of 40 years further optimizes its debt servicing schedule to viable instalments (further sustained by private operators' 5% concession fee collection towards the harmonization fund).

Local capital market constraints

Given the pricing risk and lack of track-record of similar projects in the country, local financial institutions are unwilling to provide affordable financing solutions to project developers. High costs of capital force project developers to charge excessive electricity tariffs, denting demand and sustainability of investments. Lessons learned from the first phase of the initial 3 'pilot concessions' indicate that investor confidence in off-grid renewable energy IPPs is still weak. Furthermore, there is a significant mismatch between the amount of money that rural consumers can pay for electricity and the minimum tariffs that private concessionaires need to charge to meet their required rates of return. As such, a shift from the current BOT scheme to a concessional finance model is required to offer local financial lenders a de-risked proposition and help the sector mobilise private sector finance sustainably.

Without the concessional co-finance extended through BOAD and the GCF, the investment hurdle for local financiers will continue to exist and access to affordable finance will remain an issue for the concessionaires. The result will be lagging rural electrification rates, highly variable electricity tariffs and the inability to meet the government's target of achieving universal access by 2025. By demonstrating successful engagement of private sector concessionaires in the proposed project, the perceived risk of future interventions is expected to decline. Consequently, commercial funders will have more confidence to step in by the time GCF's involvement comes to an end.

³⁸ In accordance with the 'Plan Senegal Emergent' launched in 2014 – the country's new development model aimed at accelerating its progress toward emerging market status – low inflation and controlled public debt are key objectives to contribute to sustainable long-term economic growth

Limited institutional capacities

Despite the recent liberalisation of the national energy market and allowance of IPPs to compete with SENELEC, institutional capacities in both the public and private sectors are still insufficient to lay the foundation for an enabling environment. Technical support to strengthen the technical and gender capacity of the PMU, implementing partners, private concessionaires and community beneficiaries with a focus on gender mainstreaming throughout the project cycle is necessary. Furthermore, outreach to national and regional commercial financiers is needed to maximise the replication potential of the project in neighbouring countries. The proposed EUR 3.7 million TA component aims to overcome the current institutional gaps.

D.5. Country ownership (max. 500 words, approximately 1 page)

The project falls under the auspices of the Ministry of Energy and is fully endorsed and co-financed by the Ministry of Finance, also processing all disbursement requests with BOAD acting as the Trustee for the sovereign loan and grants from the GCF. The Ministry of Environment and Sustainable Development (the NDA) has been following the preparation of this project since its inception and assured BOAD and ASER of its willingness to support this GCF funding application due to its clear alignment with the following national strategies and development plans:

- The Senegalese Nationally Determined Contribution submitted to the UNFCCC in September 2015, which lists rural electrification as a key component of this action plan. The document refers to the commissioning of 392 mini-grid systems (unconditional pledge) and up to 5,000 villages connected through PV mini-grids contingent on external support (conditional target)³⁹
- The government's commitment to the SE4ALL initiative, which identifies rural electrification as one of the most important components of the global program. Senegal has committed to achieve universal access to electricity by 2025
- The National Strategy for Economic and Social Development adopted in 2012 (SNDES), in which the government is committed to increase access to electricity in rural areas in an affordable and equitable way
- Universal access to energy in rural areas is considered in the '*Plan Sénégal Emergent*' as a fundamental factor for economic development and for the fight against poverty. The main objective of the plan is the emergence of Senegal to promote economic growth as a strong leverage for human development
- The '*Plan Sénégal Emergent*' also aims to reduce the cost of generation to a value between 60 and 70 FCFA / kWh (EUR 0.09-0.11) in the long-term. Investment in renewable energy generation will reduce the government's dependence on fossil fuels which are expensive to import.
- Fiscal exemption on VAT was granted by the State of Senegal to all rural electrification related equipment. This agreement shall be subject to periodic renewal by mutual agreement.

Implementation of these mitigation activities is slower than desired because of various constraints, including absence of capital and insufficient institutional capacity and experience. However, the country has instituted the agencies and structures required to finalise and implement these climate action plans/strategies.

D.6. Efficiency and effectiveness (max. 500 words, approximately 1 page)

The adequacy of the instruments proposed to the GCF (long term, subordinated project debt to be mixed with private sector concessionaires' equity and grant finance towards the public sector) is based on the following elements:

- Given the relatively high CAPEX investment required by off-grid renewable energy technologies relative to other fossil-based alternatives (which offer lower CAPEX demands but higher operational costs), there is need for project debt with longer tenors of at least 10 to 15 years. Local financial institutions, if at all willing to provide debt co-finance to the concessionaires, limit debt tenors to 5 to 7 years. Such short repayment schedules, combined with high costs of capital, negatively impact the competitiveness of the concessionaires and dent scale-up potential.
- The proposed financing plan, whereby a) BOAD's loan and the GCF's concessional loan contribution enable ASER to reduce WACC by over a third for the overall project CAPEX until 2025; and b) longer-term concessional debt offered to ASER subsequently lower concessionaires required equity investments (down to 5% concession fee, to be collected on the Special Support Fund for the Energy Sector administered by CRSE for tariff harmonization and renewable energy development) as well as commercial loans from local financial institutions. Lower upfront CAPEX demands combined with softer financing terms will strengthen the concessionaires' debt service coverage ratios and profitability, a prerequisite to a maturing, private sector-led market space.

³⁹ UNFCCC (2015) *Contribution Prévue Déterminée au Niveau National*

- Experience in other countries indicates that extended debt tenors are capable of increasing returns on equity by 3%, or even higher. Such increase will positively impact the attractiveness of new investments to sponsors, and reduce the burden of tariff harmonization compensation for the Senegalese Treasury.

The GCF's total contribution of EUR 75.45 million will leverage a total public-private investment of EUR 208 million, representing a leverage ratio of 1.8. In terms of cost-effectiveness of the proposed intervention, the impact is estimated as follows:

- Total project financing EUR 198.7 million
- Requested GCF contribution of EUR 75.45 million
- Estimated emission reduction potential generated over the project lifetime is a cumulative 1.13 M. tonnes of CO₂e
- Calculated cost per tonne CO₂e equals EUR 176.2
- Calculated GCF cost⁴⁰ per tonne CO₂e equals EUR 28.8

Although the estimated abatement cost of the project may be higher than the abatement cost of typical larger-scale renewable energy programmes, it should be noted that the project aims to promote decentralised systems with battery storage capacity in disperse and isolated areas with relatively low consumption where connection to the national network is not technically or economically justifiable.

Best practices

ASER "Minima Techniques - Règles Environnementales" (Minimum Technical & Environmental Standards) including technical standards for low voltage and medium voltage distribution systems, and comprehensive standards for the solar components and systems (IEC 61215 and IEC 61646 for the PV modules, and a laboratory testing standard IECQ QC 001002)

E. LOGICAL FRAMEWORK

This section refers to the project/programme's logical framework in accordance with the GCF's [Performance Measurement Frameworks](#) under the [Results Management Framework](#) to which the project/programme contributes as a whole, including in respect of any co-financing.

E.1. Paradigm shift objectives

Please select the appropriated expected result. For cross-cutting proposals, tick both.

- Shift to low-emission sustainable development pathways
- Increased climate resilient sustainable development

E.2. Core indicator targets

E.2.1. Expected tonnes of carbon dioxide equivalent (t CO ₂ eq) to be reduced or avoided (mitigation and cross-cutting only)	Annual	45,098 t CO ₂ eq
	Lifetime	1,127,447 t CO ₂ eq
E.2.2. Estimated cost per t CO ₂ eq, defined as total investment cost / expected lifetime emission reductions (mitigation and cross-cutting only)	(a) Total project financing	<u>198.7 mln</u> Euros
	(b) Requested GCF amount	<u>75.4 mln</u> Euros
	(c) Expected lifetime emission reductions	<u>1,127,447</u> t CO ₂ eq
	(d) Estimated cost per t CO₂eq (d = a / c)	<u>176.2</u> Euros / t CO ₂ eq
	(e) Estimated GCF cost per t CO₂eq removed (e = b⁴⁰ / c)	<u>28.8</u> Euros / t CO ₂ eq
E.2.3. Expected volume of finance to be leveraged by the proposed project/programme as a result of the Fund's financing, disaggregated by public and	(f) Total finance leveraged	<u>132.8 mln</u> Euros
	(g) Public source co-financed	<u>123.2</u> Euros
	(h) Private source finance leveraged	<u>9.6 mln</u> Euros
	(i) Total Leverage ratio (i = f / b)	<u>1.8</u>

⁴⁰ In grant-equivalent, i.e. concessional funding costs accounted at 5% discount rate

private sources (mitigation and cross-cutting only)	(j) Public source co-financing ratio ($j = g / b$)	<u>1.6</u>
	(k) Private source leverage ratio ($k = h / b$)	<u>0.1</u>
E.2.4. Expected total number of direct and indirect beneficiaries, (disaggregated by sex)	Direct	344,040 172,208 of females ⁴¹
	Indirect	-
E.2.5. Number of beneficiaries relative to total population (disaggregated by sex)	Direct	4% of Senegal rural population (2.2% of Senegal total population)
	Indirect	-

E.3. Fund-level impacts

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
<i>M1.0 Reduced emissions through increased low-emission energy access and power generation</i>	<i>M1.1 Tonnes of carbon dioxide equivalent (tCO_{2eq}) reduced or avoided - gender-sensitive energy access power generation</i>	Annual CO ₂ emission reductions Monitoring, Reporting and Verification by independent CDM-DOE auditor or local carbon verifier	0 (tCO _{2eq})	44,324 tCO _{2eq}	130,563 tCO _{2eq}	Renewable energy-based rural electrification replacing the continuous, alternative use of fossil fuel-based solutions (CDM AMS-III.BL baseline methodology) in households, commercial facilities such as shops, public services/buildings and small, medium and micro enterprises (SMMEs).

E.4. Fund-level outcomes

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term)	Final	
M5.0 Strengthened institutional and regulatory systems	<i>M5.1 Institutional and regulatory systems that improve incentives for low-emission planning and development and their effective implementation</i>	Micro-Finance Institutions balance sheet summary verified by the Partner Financial Institution	No subsidy/guarantee for rural productive users [Emerging Senegal Plan]	2.5 mln Euros micro-finance borrowings guaranteed for productive uses	3.3 mln Euros micro-finance borrowings guaranteed for productive uses	Rural energy development success builds on extensive community mobilization, and capacity building for efficient electricity use Barriers for mainstreaming solar PV projects are

⁴¹ <http://www.ansd.sn/>

						overcome, the capacity of the stakeholders developed and the financial incentives implemented
M6.0 Increased number of small, medium and large low-emission power suppliers	<i>M6.3 MWs of low-emission energy capacity installed, generated and/or rehabilitated as a result of GCF support</i>	ASER database & CRSE independent verification/clearance	0	19 MW	32 MW	Private operators are interested in investing in the sector

E.5. Project/programme performance indicators

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Strengthened rural electrification stakeholders awareness, capacities and gender-inclusion	Percentage of rural electrification procedures, communications and decisions reflecting women & youth priorities	Community-based gender committees meeting minutes, gender-sensitive communication tools and PREM MoUs	0 (no gender-specific framework, communication strategy in use by ASER or Community-Based Organizations)	50%	75%	Senegal politically recognized rural vulnerabilities to climate change and the interest of gender institutionalization at both national bodies and local committees levels Investment targets are achieved, less turnover and higher retention rate of trained agents Rural energy development success builds on extensive community mobilization, and capacity building for efficient electricity use
	Number of additional vulnerable localities attributed to rural electrification operators	ASER database & CRSE independent verification	0	600 localities	1,000 localities	
Operational rural solar-power new mini-grids increasing access to clean	MWh energy consumption from installed solar plants	Installation project reports and concessionaires billing	0	24,815 MWh	74,879 MWh	GCF involvement brings down the WACC to an acceptable level to Senegalese treasury

energy and productive use	% of sales income from total productive use by SMEs and community services of clean energy	Local operators tariff harmonization requests breakdown, ASER aggregated database	Baseline to be surveyed according to the implementation sites of the mini-grids ⁴²	30% of total clean power sales from SMEs and community services	60% of total clean power sales from SMEs and community services	Appropriate micro-finance network is available in rural areas and access coupons mechanism understood
Energy-improved basic needs services for achieving resilience	Number of coupon-subsidized connections of eligible social services, women & youth-entrepreneurs to the PV mini-grids	ASER coupon distribution plans & Subsidy Payment Confirmation s database	Baseline to be defined according to the implementation sites of the mini-grids ⁴²	1,529 newly connected eligible social services, women & youth-entrepreneurs to the PV mini-grids	2,548 newly connected eligible social services, women & youth-entrepreneurs to the PV mini-grids	Access to electricity fosters agriculture productivity, health & community services, ICTs & lighting benefits

E.6. Activities

Activity	Description	Sub-activities	Deliverables
1. Technical Assistance to the solar rural electrification stakeholders	Capacity building of the project's key stakeholders, to favour the implementation of a sustainable framework of the delivered services and benefits of the solar mini-grids, starting with the end-user beneficiaries' awareness and appropriation, the technical and administrative competencies of ASER Project Management Unit, and the environmental expertise and knowledge management required upstream and downstream	<p>Activity 1.1.1 Trainings on procurement procedures, project management and GCF requirements</p> <p>Activity 1.1.2 - Seminars and trips and workshops (technology watch, public consultations, conferences, sharing of experiences, etc.)</p> <p>Activity 1.2.1 - gender-relevant community-organizations mapping & tutoring</p> <p>Activity 1.2.2 - gender-stakeholders training (PMU – local operators – community-based organizations)</p> <p>Activity 1.2.3 - gender-oriented communication campaign</p> <p>Activity 1.3.1 - E&S measures implementation and monitoring</p> <p>Activity 1.3.2 - Establishment of a recycling unit for batteries and other waste (CFL, other electronics)</p>	<p>Project Launch workshops and public consultations report</p> <p>Gender committees creation MoU, trainings and communication strategy</p> <p>Entrepreneurship awareness and tutoring events attendance/minutes</p> <p>Operational facility for used batteries, CFL and electronic waste recycling</p> <p>Independent survey on income generating activities implemented by capacitated rural women organisations</p>
2. Procurement and Installation of solar powered mini-grids	Financing the bulk of the technology investment to de-risk local operators' participation in competitive Request for Proposal to select the bidder who offers the best combination of	<p>Activity 2.1.1 - Site selection, engineering studies & Specific environmental and social analysis for each site</p> <p>Activity 2.2.1 - Solar PV power plants construction and minigrid deployment:</p> <ul style="list-style-type: none"> - PV energy equipment - Civil works - LV grids 	<p>Detailed engineering studies & specific environmental and social analysis reports</p> <p>EPC ToRs for procurement</p> <p>Contractualization of supply, factory inspection</p>

⁴² Baseline to be defined during inception and reported/agreed to the satisfaction of the GCF in the project inception report

	tariff and service for solar energy production equipment, synchronisation and control tools, low-voltage mini-grid networks and connections, civil engineering.	<ul style="list-style-type: none"> - Control & synchronisation devices - LV connections - Indoor installations Activity 2.2.2 - Smart meters installation & miscellaneous aleas Activity 2.3.1 - Deployments of solar street lighting Activity 2.4.1 -Control and supervision of work	of first kits and installation reports Commissioning reports of the 1,000 mini-grids implemented and handed over to local operators
3. Incentives for Social & Productive Use of Electricity	Social services and productive equipment will lead to the development of sustainable livelihoods and enhance the capacity of villages to pay for solar power supply, strengthening mini-grids business model visibility while maximising social & gender inclusivity	Activity 3.1.1 - Connection of eligible social services, women& youth-entrepreneurs to the PV mini-grids Activity 3.2.1 - Implementation of mechanism to facilitate access to productive equipment financing through microfinance	PREM baseline surveys Coupons design workshop Coupon software dashboard MFIs due-diligence Guarantee issuer selection and contract Micro-finances guarantee facility summary for the 3,739 solar-powered SMEs and community services Final Monitoring and Evaluation Report

E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

Monitoring

As with all projects supported by BOAD, this intervention will be monitored by BOAD project management team as per the relevant internal policies and procedures. As the accredited entity agency, BOAD will be responsible for supervising monitoring activities, implementation conditions and for reporting periodically to the GCF under the terms to be defined by GCF and BOAD. The project progress will be monitored by the entity responsible for M&E in the Project Management Team based in Senegal.

The present project will comply with the BOAD appraisal, approval, monitoring and supervision standards and procedures involving all relevant teams (engineer, financial analyst, procurement expert, E&S specialist, climate finance specialist, financial management officer, and monitoring specialist). The implementation and monitoring of each stage of the project will be guided and managed by the BOAD project cycle management framework.

Monitoring and reporting of achieved emission reductions will be conducted in accordance with the approved CDM methodology AMS III.BL “Electrification of rural communities using renewable energy”. The CDM offers a UNFCCC-approved MRV framework that will allow BOAD to transparently track the GHG impact of invested funds over time, and subsequently report progress to the GCF. Moreover, using consistent baseline and monitoring methodologies across different climate finance programs enables NDC integration.

The Division in charge of climate finance will perform due diligence, implementation monitoring, risk monitoring and mitigation. For that purpose, the Division in charge of climate finance, assisted by the Department in charge of Monitoring and Evaluation, will be working closely with the project management team based in Senegal in order to monitor the progress of each component of the Project.

Reporting

Reporting by the project management team based in Senegal to BOAD will be in line with the standard loan agreement, and the BOAD will conduct a biannual supervision. Reporting of the BOAD to GCF: The BOAD will comply with the relevant GCF policies in the reporting and evaluation arrangements for this framework. The BOAD will provide the annual performance report (APR) to the GCF during the four-year implementation period. In addition, during the sub-loan lifetime, semi-annual activity report on the status of the GCF-financed individual sub-projects will be provided. In addition, following the arrangement under the AMA, an inception report, interim and final evaluation reports, and financial information reports (semi-annually throughout the life of the loan) will be submitted.

Evaluation

The evaluation arrangements for this framework will comply with the related BOAD and GCF policies. The GCF funded activity interim and final evaluations will be conducted by an independent expert evaluator recruited by BOAD. The final evaluation is conducted 06 months after the reception of the project completion report.

After two to five years of closing, the project will undergo ex-post evaluation that is guided by internationally accepted principles for the evaluation of development assistance, in particular, the Organisation for Economic Co-operation, and Development Assistance Committee (OECD DAC) evaluation guiding principles, and the good-practice standards.

F. RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

Selected Risk Factor 1

Category	Probability	Impact
Other	Low	High

Description

Awareness, capacity & marketing risk

There is a risk that the solar powered mini-grids' potential and their de-risked investment opportunity, which the project aims to create, do not get sufficient communication and promotion and fail to mobilise the relevant local operators/investors. Similarly, beneficiaries (households and especially productive users and communities) require proper information, awareness raising and marketing efforts to overcome the lack of knowledge and sometimes negative perception that populations might have about solar technology as a permanent electrification solution.

Mitigation Measure(s)

This is mitigated by the implementation of component 1 Technical Assistance activities as well as component 3 to incentivise productive use. Besides, a two-level grievance mechanism (ASER & CRSE) will be available to all targeted customers:

i) in relation to the selection of villages, sites, and the electrification process in general, the populations can address directly to ASER which will take the appropriate measures to remedy, in relation with its operational service providers in the field. For this purpose, a computerized system allowing a good feedback of information is being deployed, in addition to the classic system of referral and processing by administrative mail.

(ii) in relation to the operation of the service in rural areas (quality of service, incidents, damage, safety, performance in providing the services described and validated in the concessionaire's service regulations), the population first addresses its complaints to the concessionaire, which is required to give a contact number to customers and to intervene in the event of solicitation, according to the procedures described in the concession contract and its specifications. The concessionaire is also obliged to keep a register of complaints and to report regularly to the Electricity Sector Regulatory Commission (CRSE). Nevertheless, if the operator's customer is not satisfied with the reaction of the concessionaire, it must refer the matter to the CRSE, which is mandated to monitor the implementation of the concession contracts and compliance with commitments on behalf of the State.

iii) in relation to regulatory or legal claims made by the concessionaire who feel aggrieved or in danger in relation to the operating conditions, they shall refer to ASER and the CRSE for handling the matter. For this purpose, activity reports are required by ASER and which the concessionaire is obliged to transmit at the intervals laid down in the concession contract.

Selected Risk Factor 2

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

Variable commercial risk

The slow uptake or progressive ramp-up of rural electrification beneficiaries might impair the first year(s)' financials of the local operators/investors. Similarly, all productive demand load profiles may not be suited to solar power solutions. Unlike non time-critical energy demand (e.g. irrigation and manufacturing/agro-processing), time-critical demand (e.g. cooling & refrigeration) involve surges in power needed to bring and keep temperatures down regardless of the instant availability of solar power.

Mitigation Measure(s)

<i>Sound market assessment and modular sizing of the proposed technical solutions should be tailored to the circumstances of each mini-grid in order to cater for power demand extension as per the growth in demand; over-sizing of photovoltaic panels & storage capacities (batteries) shall be considered.</i>		
Selected Risk Factor 3		
Category	Probability	Impact
Technical and operational	Low	Medium
Description		
Operations & Maintenance risks		
Underperformance of decentralised renewable energy technologies could lead to lower production of energy and revenues, as there has been limited experience with financing decentralised renewable energy projects in rural parts of Senegal to date. Limited track record and data on nationwide historical performance implies that higher-than-expected variability in performance can occur, impacting the revenue-generation potential of the concessionaires.		
Mitigation Measure(s)		
<p><i>This risk will be mitigated by ensuring:</i></p> <ul style="list-style-type: none"> - <i>the choice of quality pieces of equipment at procurement & construction (cf. ASER “Minima Techniques”). The concessionaires will minimise risks by only sourcing commercially proven, independently certified solar panels, storage solutions and inverters</i> - <i>that the concessions are awarded to entities that can demonstrate relevant experiences and/or capacity in the operation and maintenance of the implemented technologies in accordance with best industry practices. Furthermore, the concessionaires will be expected to manage maintenance reserve accounts to allow for timely maintenance and replacement of components, when needed.</i> 		
Selected Risk Factor 4		
Category	Probability	Impact
Governance	Medium	Low
Description		
Monitoring risk		
As per ASER’s experience with the 4 awarded PPER concessionaires, different data practices pose a risk of improper, incomplete or unharmonised data collection and transmission to ASER’s coordination structure (both technical, accounting and financial information).		
As ASER rural electrification program signed an emissions reduction purchase agreement (ERPA) with the World Bank’s Ci-Dev program in 2016, which is as of 17 May 2018 a registered programme under the CDM, there is a need for a clear demarcation between the contribution of different climate finance sources in order to prevent double-claiming of emission reductions.		
Mitigation Measure(s)		
<i>To mitigate the risk of double-claiming or double-counting, ASER will apply the CDM MRV framework (methodologies AMS III.BL) for GCF project activities, yet Emission reductions supported by the GCF will not be claimed elsewhere and not result in the issuance nor transfer of any carbon credits. Therefore, the project’s linkage with the CDM infrastructure adds transparency to the mitigation outcomes achieved and prevents any form of double claiming or double counting.</i>		
Selected Risk Factor 5		
Category	Probability	Impact
Prohibited practices	Low	High
Description		
Environmental/disposal risk		

Inappropriate dismantling/recycling of mini-grids components (e.g. batteries) could lead to environmental contamination. Communities in developing regions are already struggling with contaminated sites and soil pollution from unregulated car battery recovery and recycling. Unsound end-of-life management and recycling can cause severe lead poisoning of people and negatively affect the environment. There is a risk that inappropriate battery disposal under the project will generate similar negative externalities.

Wrong-doing and financial malversation risk

No individuals or entities subject to United Nations Security Council Resolutions imposing financial sanctions will be involved in or benefitting from the activities of the project.

Mitigation Measure(s)

While pollution caused by mishandling or disposal of batteries involved in mini-grids installations can be harmful, the end-of-life issues associated with the used batteries has been noted in earlier consultations and a management plan has been drafted to mitigate the risk of any spillage or inappropriate disposal of batteries. Specifically, concessionaires will be requested to a) regularly assess and maintain their entire portfolio of batteries, and b) together with ASER develop a collection and disposal scheme for expired batteries and equipment. ASER will carefully monitor the disposal process of used batteries to prevent any negative impacts to the environment. BOAD will also ensure implementation of the environmental and social measures set forth by the project.

G. GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

The project falls under Category B, according to the BOAD classification given that the project entails the installation and production of renewable energy, and given the limited scale of the proposed interventions, i.e. installation, in each concerned village, of a solar power plant (power from 15 to 45 kWp) associated with low voltage (LV) lines.

In practice, for projects with multiple sites and where the exact location of the sites is unknown, an ESMF was developed (Cadre de Gestion Environnemental et Social – CGES in French) at the national PNER level⁴³. To better optimise the management of the environmental and social aspects of the solar rural electrification project, a follow-up program and detailed recommendations concerning institutional arrangements have been proposed in the ESMF. Thus, monitoring will be carried out by the concessionaires; "internal" monitoring (or supervision) will be provided by PNER's Environmental & Social Experts; "external" monitoring (inspection) will be carried out by the CRSEs and the DREEC; mid-term and final evaluation will be carried out by independent consultants.

Locations and scope of the environmental and social impacts for each mini-grid will be determined during the project execution based on a screening process that will be undertaken according to the guidelines provided in the ESMF. For such small scale mini-grids, there is no need for a fully detailed ESIA, since the overall project is categorised as having medium risk (B), but only a simplified Strategic E&S assessment. Required studies (ESIA/analysis) for subprojects will be realized when specific sites are contracted before the installation of the mini-grids, and when the E&S documents are disclosed locally in the local administrative buildings (townhall, and local chief offices).

The sites of mini solar power plants will not affect protected areas and reserves because they will be located at the village level; and in general, protected areas and reserves are far from villages. In addition, the project sites will be set up so as not to displace populations or destroy economic assets. The beneficiary communities will provide small sites in villages for small-scale solar plants as their contribution to the project. There is no need for a resettlement plan since there will be no resettlement. Thus, PS5PS 5 will not be triggered. PS 7 does not apply for there is no indigenous population as defined by the World Bank Group's policy, on which those of BOAD and GCF are based, in the project area. Furthermore, PS 8 does not apply for activities related to the construction of such small isolated solar PV systems. Those systems will not need a great amount of excavation: thus, there will be no potential risk for cultural heritage degradation in beneficiaries' communities.

Environment and Social Management Framework (ESMF) documents are attached to this Funding Proposal.

Potential impacts and risks of the project

The major potential positive consequences of this type of project relate to

- job creation and increased local income during the construction phase. With the project, the construction works will have certain repercussions on the national and local economy. The employment of Small and Medium-sized Enterprises will lead to a high use of labour (especially local) whose revenues will galvanize the economic activities of the localities concerned. In addition, the sites will develop certain related activities (catering, trade, etc.) in the areas concerned, which will help increase the income of the population;
- improving the level of access to electricity in the area;
- contributing to the achievement of Senegal's electrification objectives;
- promoting economic development in polarised areas;
- promoting the development of local SMEs / SMLs by securing the electricity supply;
- extending the coverage of the electricity network;
- influencing gender and poverty reduction strategies;
- contributing to the fight against climate change – positive impact on global CO₂ emissions by limiting the use of fossil fuels

Potential negative consequences and mitigation measures for Project activities

- Solar photovoltaic systems are considered to be one of the least environmentally harmful energy options. As a result, little environmental impact is anticipated from the implementation of this system. The main potential impact is the risk of pollution in the event of poor storage or uncontrolled disposal of used batteries (leakage of

⁴³ MEDD 2016. PNER CGES

lead and acid which can pollute soil and water) and which can constitute sources of accidents, especially for children.

- During operation, the risk to the natural environment would firstly be caused by an accidental spill of sulfuric acid during maintenance operations and during the packaging of defective or end-of-life batteries. ASER, in partnership with the Concessionaires, will facilitate the establishment of a battery recovery system.
- Solar power plants are inspected by maintenance technicians. The risks incurred by the latter are those linked to the handling of the acid and the explosion of the batteries if the batteries used are with liquid electrolyte. In addition, there are risks associated with the presence of a battery in a living room (intoxication and explosion) if certain instructions are not followed.
- There are also risks of theft and other deliberate damage to the solar panels, in the absence of security

Mitigation / improvement, monitoring and institutional measures anticipated at this stage:

Construction phase	Operation phase
Social measures linked to loss of property and displacement of populations	Fire safety
Measures to reduce the effects on natural resources	Measures against the development of pests
Pollution control measures	Waste management
Dust mitigation measures	Risk management for maintenance operations
Water supply measures for construction sites	Management of noise pollution from installations
Safety measures	
Measures to avoid and settle social conflicts	
Measures to combat the risks of STI / HIV / AIDS transmission	

Institutional arrangements

For the monitoring of the implementation of the E&S measures, it is planned, through an agreement with the Ministry of the Environment and Sustainable Development, to extend institutional support to the Department of Environment and Listed Establishments (DEEC). DEEC will in turn support the Senegalese Rural Electrification Agency (ASER) in the implementation of the environmental and social management component of the Project.

A Public Consultation Plan will aim to ensure social acceptability of projects at the community level by putting all stakeholders in a network for sharing information on the project and its interventions. The strategic planning of and the provision of information on the project should start by forums/gatherings in the form of Regional Development Committees (CRD) organized in the regions. In this context, Local Information and Monitoring Committees (CLIS) will be set up at the level of each community concerned. The role of these committees will be:

- to support ASER in the social appropriation of the project at the local level;
- to mobilize the different community actors for a peaceful implementation of the project;
- to serve as a framework for the amicable resolution of any conflicts (land or other).

An NGO or local association specializing in social mobilization could help facilitate the establishment and operations of these sectoral or socio-professional groups, but above all ensure quality and equity in representation (marginalized groups, gender, etc.).

At the national level, the PNER program already complies with national regulations, including Law 2001-01 of January 15, 2001, on the Environment Code. It was already subject to a Strategic Environmental Assessment validated by the State of Senegal with the issuance of an environmental compliance certificate N° 05 AUG.2019 / 021963 to ASER.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

The State of Senegal is committed to international conventions for integrating gender issues in policies, standards and programs to facilitate its transversality at the institutional level. A Ministry of Gender was created for the first time in 2010 and during the same year, the law instituting absolute parity in totally or partially elected assemblies was adopted. It entered into force during the legislative elections of July 2012 and for the first time in the country's political history, the number of women MPs has increased from 19.2 to 42.6%. However, women are still affected by disparities at all levels and gender issues touch on poverty, health, education, access to finance, employment, access to land and the means of production, among others. Women are active in the production sectors, the small market economy and the informal sector. Any action tending to strengthen them in these sectors, reflects on their economic power, their

participation at the strategic level and the well-being of the family. Access to electricity can therefore constitute an important input, but also a bulwark against constraints that affect gender relations. However, until 2018, energy was not yet perceived by policies targeting gender equality as a factor which could improve women's participation in the national economy, but rather as a sector beyond the scope of the Implementation Plan of the National Strategy on Equity and Gender Equality (PMO-SNEEG)⁴⁴.

Cooking and motive power remain the main gender issues in the energy sector. The collection of wood is the exclusive domain of women and the use of biomass leads to considerations about their health and that of children, hence there are measures aimed at modernizing cooking fuels. As for electricity, its weight in the reduction of gender inequalities is important because of the opportunities in access to modern energy services instead of motive power.

Before carrying out the diagnosis on gender accounting in the rural electrification national program, ASER has been involved in gender audits for policies and in energy programs conducted in 2005-2007. After several attempts to develop a program impact monitoring framework, a gender-sensitive manual intended to strengthen the results-based management of electrification programs was produced in 2012. In addition, it should be noted that ASER recently completed (in 2019) its Strategic Plan for Development (PSD) 2020-2023 where gender mainstreaming becomes a reality in the formulation of planned lines of intervention.

However, many factors still constitute constraints to allow ASER achieve effective gender mainstreaming. These include:

- the lack of sustained collaboration between ASER and the institutions in charge of the issues gender;
- the pricing of electricity which does not integrate preferences towards women and poor people;
- the beneficiaries' lack of resources for the initial investment necessary for starting professional, revenue-generating activities and;
- the lack of energy services for an optimized use of electricity at the productive and professional level.

Based on the constraints and challenges identified, a gender action plan for the rural electrification program using solar mini-grids was developed focusing on three main results, from which a series of actions to be implemented were identified: (i) gender is institutionalized in ASER; (ii) the energy needs of men and women are understood and met; (iii) access to finance for the development of economic and professional activities is supported. The implementation of this action plan calls for the active involvement of ASER and the synergy between all partners and development actors.

The project will confer substantial benefits on gender, due to its nature. The objective of the project is not only limited to curbing climate change by bringing renewable electricity to the rural populations, but also it greatly contributes to creating wealth and consequently reducing, even eliminating poverty. Rural women, through access to electricity, will thus find an opportunity to make their activities profitable with the possibilities offered by electric current. For example, energy-powered pumps reduce all the drudgery women endure to draw water. The socio-economic co-benefits on the lives of populations and particularly on women is very certain. The project also creates wealth. It has strong cross-sectoral links with various socio-economic sectors (agriculture, health and education). Electricity could therefore bring about a lot of positive changes at almost every level of the various business sectors. These include:

- promotion of income-generating activities;
- the acquisition of household appliances (more comfort for the populations);
- the reduction of exhausting chores of the rural woman, an increase in the schooling rate of the children, in particular the girls, and better school results;
- the development of cultural and leisure activities.

The full gender assessment and project-level gender action plan are provided as annex 8.

The Accredited Entity will validate the terms of reference for the recruitment of the consulting firm which will be in charge of the activities in close synergy with ASER, and validate the monitoring reports on the implementation of activities and the final evaluation of the project.

⁴⁴ At least 75% of women with access to alleviating equipment have additional human energy to devote to productive, social and leisure activities in 2011

- BOAD provided technical support for the development of the Gender Action Plan. In its implementation, it will monitor its implementation according to what is defined in the said action plan through field visits, review of reports submitted by the Senegalese side and recommendations for corrections to be made.
- BOAD has recruited a Sociologist, Gender Specialist, who ensures compliance with the implementation of gender action plans developed in the context of projects under funding of the FVC; it is not covered in the project budget.
- It was planned the training of a gender staff to ensure the implementation of the action plan. This specialist is supported in the project framework through the budget.
- In operational side, women groups and enterprises will be targeted through the project as described in the gender assessment

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

Financial management and procurement under this project will be guided by relevant BOAD rules and regulations, as well as relevant provisions in the Accreditation Master Agreement (AMA) signed by BOAD and the GCF as part of BOAD's accreditation to the GCF. The provision of the grant proceeds (Technical Assistance and social & gender connection coupons funds) will flow from GCF to AE based on the agreed payment schedule, subsequently to the funded activities based on the Procurement Plan. The provision of the BOAD loan will be made to ASER through the Ministry of Finance (Senegal Treasury) as per the Fund Flow Diagram (Figure 18), and subject to a reimbursement plan to be agreed. BOAD will carry out financial transfers in accordance with its own policies, procedures and rules for which it has been accredited for. Goods, and services financed from the GCF loans and the BOAD Loan will be acquired by either:

- limited consultation after expression of interest for sub-components
- international call for tenders for the components
- open consultation on a WAEMU scale of specialized design offices for the realization of the sub-components
- national call for tenders

Procurement

To ensure that financing is applied in ways that adequately secure the BOAD's mandate while maximizing development effectiveness, the Bank encourages and promotes sound, fair, transparent and well performing procurement systems.

BOAD's Guidelines for procurement of consultancy services financed by a loan or advance of funds (2016); and Guidelines for the award of works contracts, goods and services (other than consultancy services) (2016) will be applied by ASER in the project's procurement.

BOAD will conduct an analysis of the procurement files and give its no objection.

AML/FT Due diligence

As part of the prevention and fight against money laundering, BOAD has developed a Financial Security Policy (2016). This internal document constitutes the general framework of the control system covering all of BOAD's activities relating to the prevention, surveillance and management of money laundering and terrorist financing risks.

BOAD's Financial Security Policy is inspired by the international standards defined by the United Nations through its specialized structures, the Organization for Economic Cooperation and Development (OECD) whose recommendations are issued by the International Financial Action Group (FATF) and provisions of Directive 02/2015 / CM / UEMOA of 02 July 2015 on the fight against money laundering and terrorist financing in the Member States of the West African Economic and Monetary Union. ("WAEMU Directive").

The policy requires to disclose information about its clients' transactions to the relevant authorities in cases where international rules and local law require regulated financial institutions to do so, including cases of money laundering.

Under its due diligence, the Bank will assess civil / criminal and regulatory antecedents and sanctions lists. The Bank also conducts also administrative investigations into corruption, fraud, coercion, collisions and inconvenient practices, and make use of the relevant national authorities for the necessary criminal investigations.

The Bank integrates measures to combat illicit financial flows, the fight against money laundering and terrorist financing in the internal operations of the Bank Group.

In the context of this project, concerning ALM/FT, the concerned stakeholder will:

- ensure that the funds financing the Project are not of illicit origin and in particular are not related to fraud against Senegal's financial interests, corruption, organized criminal activities, terrorism or drug trafficking; and
- forward to the Bank without delay any information raising suspicions as to the unlawfulness of the sums invested in the company and in the Project;
- notify the Bank without delay if it has known at any time of any information indicating the illicit origin of all or part of the funds of the structure;
- not enter into a business relationship, directly or indirectly, with persons or entities on the lists established by the United Nations Security Council or its committees pursuant to Security Council resolutions, by the Council of the European Union in application of its Common Positions and / or by the African Union as well as on any other relative or complementary resolution and any act of implementation thereof in connection with the fight against the Laundering of Capital and the financing of terrorism.

AUDIT

Audits will be undertaken in accordance with BOAD Guidelines for Financial Reporting and Auditing of Projects. The Financial Agreement with Senegal will require the submission of Audited Financial Statements to BOAD within four months after each year-end. An independent external auditor will be recruited based on Terms of Reference acceptable to the Bank (not later than four months after effectiveness) for the entire duration of the project. The Financial Statements will be audited in accordance with international auditing standards.

BOAD will prepare a Management Letter to provide observations, comments, and recommendations for improvements in accounting records, systems, controls and compliance with financial covenants in the Financial Agreements. The cost of the audit will be met from project resources. BOAD will ensure KYC standard-compliant due diligence process including anti-money laundering and other evaluations of sponsors is followed thoroughly.

G.4. Disclosure of funding proposal

No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

H. ANNEXES

H.1. Mandatory annexes

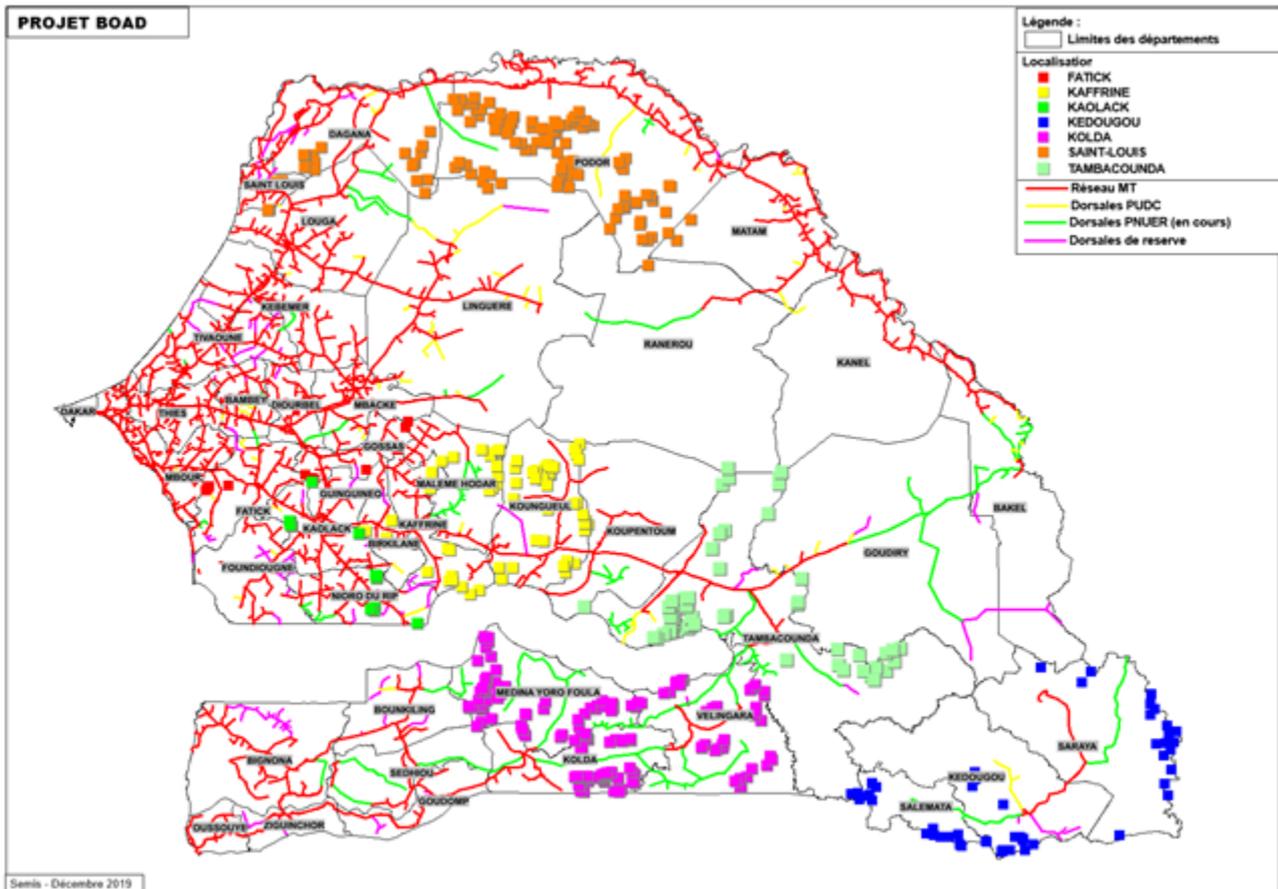
- Annex 1 NDA no-objection letter(s) ([template provided](#))
- Annex 2 Feasibility study - and a market study, if applicable
- Annex 3 Economic and/or financial analyses in spreadsheet format
- Annex 4 Detailed budget plan ([template provided](#))
- Annex 5 Implementation timetable including key project/programme milestones ([template provided](#))
- Annex 6 E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3):
 - Environmental and Social Impact Assessment (ESIA) or
 - Environmental and Social Management Plan (ESMP) or
 - Environmental and Social Management System (ESMS)
 - Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People’s Plan, Land Acquisition Plan, etc.)
- Annex 7 Summary of consultations and stakeholder engagement plan
- Annex 8 Gender assessment and project/programme-level action plan ([template provided](#))
- Annex 9 Legal due diligence (regulation, taxation and insurance)
- Annex 10 Procurement plan ([template provided](#))
- Annex 11 Monitoring and evaluation plan ([template provided](#))
- Annex 12 AE fee request ([template provided](#))
- Annex 13 Co-financing commitment letter, if applicable ([template provided](#))
- Annex 14 Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

- Annex 15 Evidence of internal approval ([template provided](#))
- Annex 16 Map(s) indicating the location of proposed interventions
- Annex 17 Multi-country project/programme information ([template provided](#))
- Annex 18 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
- Annex 19 Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
- Annex 20 First level AML/CFT (KYC) assessment
- Annex 21 Operations manual (Operations and maintenance)
- Annex 22 Other references

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

Annex 16 – map of proposed interventions



Annex 22 – other references (bibliography)

- 2015, Ministère de l'Énergie et du Développement des Énergies Renouvelables. SE4All Action plan
- 2015, DFID - Literature Review on Energy Access and Adaptation to Climate Change
- 2016-11 PNER - CADRE DE GESTION ENVIRONNEMENTALE ET SOCIALE (CGES)
- 2016 PNUD Cartographie secteur solaire entreprises inclusives Senegal
- 2017-11 UFC-MCA Amélioration-de-l'accès-à-l'électricité-en-milieux-rural-et-péri-urbain-
- 2018_USAID ATLAS_Climate Change Risk Profile – West Africa & Senegal
- 2018 GESTO FR-Prog Inv Acces Universel SE4All Senegal
- 2018 Plan Senegal Emergent PAP 2019-2023
- 2018-09 Université Paris Dauphine, PSD. Accès universel et durable à l'électricité au Sénégal.
- 2019-01 Projet coupons JAPPALE Report 3 - Mise en oeuvre de la distribution - FR_FINALv
- 2019 GETinvest-Market-Insights_SEN_PV_Guide_2019
- 2019 UE FR-Programme d'appui au développement des énergies renouvelables pour l'accès universel
- 2019-02 MCC-willingness-to-pay-for-improved-electricity-services-in-senegal
- 2019-09 report Market Opportunity for Productive Use Leveraging Solar Energy (PULSE)
- 2019-10 USAID-Senegal-MarketAssessment-Final_508
- 2019-09 Rapport FINAL_plan operationel SE4ALL acces universel
- *[draft] 2019 Projet Arrêté Ministériel Electrification Hors-Réseau Senegal*

- *2014 CCKN & IISD - Exploring Trends in Low-Carbon, Climate-Resilient Development*



N°.....13.....MEDD/DEEC/DCC

Dakar, le

27 MAR. 2020

To: The Green Climate Fund ("GCF")

Mr. Yannick Glemarec

G-Tower, 24-4 Songdo-dong, Yeonsu-gu
Incheon City, Republic of Korea

Re: Funding proposal for the GCF by "West African Development Bank (BOAD)" on the "Aser Solar Rural Electrification" project

Dear Sir,

We refer to GCF financing project "Aser Solar Rural Electrification" in Senegal as included in the funding proposal submitted by "West African Development Bank (BOAD)" to us on 21 January 2020.

The undersigned is the duly authorized representative of the National Designated Authority of Senegal.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the Project "Aser Solar Rural Electrification" as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of Senegal has no-objection to the Project "Aser Solar Rural Electrification" as included in the funding proposal;
- (b) The Project "Aser Solar Rural Electrification" as included in the funding proposal is in conformity with Senegal's national priorities, strategies and plans;
- (c) In accordance with the GCF's environmental and social safeguards, the Project "Aser Solar Rural Electrification" as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the Project "Aser Solar Rural Electrification" as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the Project "Aser Solar Rural Electrification".

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

Madeleine Diouf SARR

AND Senegal



Environmental and social safeguards report form pursuant to para. 17 of the IDP

Basic project or programme information	
Project or programme title	ASER Solar Rural Electrification Project
Existence of subproject(s) to be identified after GCF Board approval	No
Sector (public or private)	Public
Accredited entity	Banque Ouest Africaine de Développement (BOAD)
Environmental and social safeguards (ESS) category	Category B
Location - specific location(s) of project or target country or location(s) of programme	The project sites are located in 1,000 villages spread over seven (07) administrative regions of Senegal. They are Kaffrine, Kaolack, Fatik (in the Centre), Kolda, Kédougou, Tambacounda (in the South), and Saint-Louis (in the North).
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	Tuesday, May 5, 2020
Language(s) of disclosure	English and French
Explanation on language	French is the official language of Senegal.
Link to disclosure	English translation: https://www.boad.org/wp-content/uploads/2016/10/EES_Projet_Solaire_BOAD_ASER_12012020_english-translation_rev2403.pdf French: https://www.boad.org/wp-content/uploads/2016/10/Rapport-provisoire_EES_Projet_Solaire_BOAD_ASER_FVC_revu-23032020.pdf
Other link(s)	N/A
Remarks	An ESIA consistent with the requirements of a Category B project is contained in the "Environmental and Social Impact Assessment (ESIA): Preliminary Version".
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on	Tuesday, May 5, 2020

accredited entity's website	
Language(s) of disclosure	English and French
Explanation on language	French is the official language of Senegal.
Link to disclosure	English translation: https://www.boad.org/wp-content/uploads/2016/10/EES_Projet_Solaire_BOAD_ASER_12012020_english-translation_rev2403.pdf French: https://www.boad.org/wp-content/uploads/2016/10/Rapport-provisoire_EES_Projet_Solaire_BOAD_ASER_FVC_revu-23032020.pdf
Other link(s)	N/A
Remarks	An ESMP consistent with the requirements of a category B project is contained in the ESIA's Chapter 8 titled "Environmental and Social Management Framework Plan".
Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)	
Description of report/disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Explanation on language	N/A
Link to disclosure	N/A
Other link(s)	N/A
Remarks	N/A
Disclosure in locations convenient to affected peoples (stakeholders)	
Date	Tuesday, May 5, 2020
Place	The documentation made available on BOAD website, and in Senegal in locations that are accessible for the beneficiary people, especially Agence Sénégalaise pour l'Electrification Rurale (ASER); Direction de l'Environnement et des Etablissements Classés (DEEC) in Dakar ; and at regional level within Regional Directorate for environmental affairs (Direction Régionale de l'Environnement et des Etablissements Classés - DREEC) ; and within the BOAD national representation in Senegal.
Date of Board meeting in which the FP is intended to be considered	
Date of accredited entity's Board meeting	N/A
Date of GCF's Board meeting	Tuesday, June 23, 2020

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP138

Proposal name:	ASER Solar Rural Electrification Project
Accredited entity:	West African Development Bank (BOAD)
Country/(ies):	Senegal
Project/programme size:	Medium

I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
<p>The project proposes a public-private partnership business model for investing and operating small-scale solar mini-grids, which fits with the country context. The shift from "Build, Operate, Transfer" regional concessions to a public pre-financed concession model will result in triple benefits: (1) increased energy access for remote areas of the country; (2) private-sector contribution achieved through lowering the initial investment cost; and (3) realizing a uniform tariff across the country, with an electricity price that aligns with affordability for the poorest. It sets a good example in terms of country ownership, with a significant level of co-financing by the country which then partners with the GCF in de-risking energy access activities to reach levels acceptable to the private sector and affordable to the communities</p>	
<p>The project will promote productive use of electricity along with wider access to electricity, therefore ensuring the financial sustainability of the project while bringing in significant economic and social co-benefits. The productive use of electricity across 1,000 rural villages will promote job creation and support grass roots-level economic activities which, as well as being a sustainability pillar of the project, would make it a green stimulus</p>	

package to support post-coronavirus disease 19 (COVID-19) pandemic recovery	
The project provides a solid framework for scalability and replication of public-sector investment into small-scale renewable energy mini-grid programmes in many sub-Saharan Africa countries where energy access rates are low and the socioeconomic characteristics are similar to Senegal	

2. The Board may consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XVIII, titled “List of proposed conditions and recommendations”.

II. Summary of the Secretariat’s assessment

2.1 Project background

3. Although Senegal has been steadily increasing its national electrification rate, with almost fully electrified urban areas, the majority of people in rural areas still do not have access to electricity (approximately 58 per cent). For basic energy needs, households mainly rely on fuelwood for cooking, and kerosene lamps for lighting – which are expensive and cause health and environmental hazards. The rural electricity sector has been characterized by high upfront investment costs and operation costs that are too high for rural operators to bear, which has led to the need for recurring government subsidies to help private-sector operators maintain revenue levels that keep them in business. Meanwhile, the effects of climate change are posing challenges to the livelihoods of the rural population.

4. The main barriers that have been identified as contributing to low electricity usage rates in the rural areas of Senegal are high upfront investment costs, high levels of operational costs to run remote electricity assets, and the low level and widely dispersed nature of consumption, all of which have resulted in low interest for participation by the private sector. This project aims to tackle these barriers through a set of integrated interventions. GCF will provide the concessional financing needed to mobilize private sector participation in providing rural households with access to modern solar-powered mini-grids in 1,000 isolated villages. The GCF proceeds will also be used to subsidize connections to the mini-grids through a coupon/voucher scheme, which will not only make the connection charge affordable, but also accelerates the commercial viability of each mini-grid by catalysing “anchor customers”. This, together with the promotion of the use of electricity from a renewable source for income generating activities (i.e. productive use), which will be achieved together with local micro-finance institutions, has the potential to considerably increase the financial viability of each private sector-operated solar mini-grid. In addition, the capacity of main rural electrification stakeholders will be strengthened to enable the deployment of a network of solar mini-grids and facilitate project implementation.

5. The project is expected to reduce greenhouse gas (GHG) emissions by approximately 1.13 million tonnes of carbon dioxide equivalent (tCO₂eq) over its technical lifetime by moving away from the use of traditional energy resources. GCF finance will support the implementation of the Government of Senegal’s plan to scale up and accelerate rural electrification through private concessionaires with an acceptable risk-reward ratio. It will also greatly help the

poorest and most vulnerable among the country's population to adapt to an increasingly warmer climate.

6. The total project cost is EUR 198.7 million. The project is structured around three components: an investment component (component 2) and an incentives programme for productive use of electricity (component 3) which together are funded by a GCF loan of EUR 73.6 million; and a technical assistance component (component 1) that aims to build the necessary capacity of energy stakeholders, to be funded by a EUR 1.8 million GCF grant, complemented by co-financing from the Government of Senegal (EUR 5.6 million contribution) and other partners, including loans from the German development bank, KfW (EUR 102.4 million), and the accredited entity (AE), the West African Development Bank (BOAD) (EUR 15.2 million).

7. The environmental and social safeguards classification of the project is category B.

2.2 Component-by-component analysis

Component 1: Technical assistance to the solar rural electrification stakeholders (total cost: EUR 3 million; GCF cost: EUR 1.65 million, or 55 per cent)

8. This component will provide capacity-building to the project's key stakeholders. The capacity-building includes operational support, training and technical assistance to build the capacity of a project management unit hosted by the executing entity (EE), the Senegalese Rural Electrification Agency (ASER); for example, strengthening and standardizing its procurement processes and its institutional capacity for monitoring and quality control to meet GCF requirements. This component will also support the implementation of a gender action plan to ensure women's participation in and benefits from the project interventions. Local concessionaires will be trained to operate the recycling unit for batteries and other waste to minimize the potential environmental and social impact caused by the deployment of solar mini-grids.

9. This component includes the overall project management cost, which amounts to EUR 0.56 million and is sufficiently justified.

Component 2: Procurement and installation of solar-powered mini-grids (total cost: EUR 188 million; GCF cost: EUR 75.4 million or 40 per cent)

10. Under this component, solar-powered mini-grids will be installed in 1,000 selected remote villages. After construction of the mini-grids, current local private sector concessionaires will take over the operation and maintenance of the assets through an amendment to their current concession agreement, granting them the right to extend revenue collection to the newly electrified areas. Deployment of modern public lighting will be fully financed by KfW to help provide suburban security and economic growth in the villages. The procurement and installation of solar-powered mini-grids will absorb most of the GCF concessional loan, which is to be lent to the Government of Senegal.

Component 3: Incentives for productive use of electricity (total cost: EUR 21.5 million; GCF cost: EUR 5.7 or 26.5 per cent)

11. Rural customers that are currently served by Senelec, the national electricity company of Senegal, and are in the periphery of the concession areas enjoy lower tariffs than those within the remote concession areas, therefore discouraging energy access beyond the areas covered by Senelec. Therefore the application of a uniform tariff alone will not suffice to incentivize new connections. With GCF proceeds, connections to the mini-grids will also be subsidized using a coupon/voucher which will not only make the connection charge affordable, but will also accelerate the commercial viability of each mini-grid by drawing in larger customers. This way,

the pace of connections among rural households will increase and the project can reach out to the poorest and most vulnerable rural populations.

12. Another aspect of this component is promoting the productive use of electricity generated from renewable sources through the provision of a guarantee facility. The guarantees issued are designed to cover the loans extended by micro-finance institutions to the beneficiaries of electricity in the areas of mini-grids undertaking for the purchase of productive use equipment. This will lower the cost of loans to rural entrepreneurs that support the development of micro-businesses in the areas served by the mini-grids.

13. Successful implementation of component 3 can boost private concessionaires' confidence and interest in the rural electrification investments, thereby ensuring the project objective is achieved. The innovative design of this component also has huge economic stimulation benefit in the targeted area, further enhancing the climate resilience of the local population while facilitating recovery actions following the coronavirus 19 disease (COVID-19) pandemic.

III. Assessment of performance against investment criteria

3.1 Impact potential

Scale: Medium

14. The project achieves mitigation impacts and considerable adaptation co-benefits. The uptake of renewable energy technologies will provide access to electricity through direct household connections, leading to GHG emission reductions amounting to 1.13 million tCO₂eq throughout the project lifetime. Meanwhile, the project is expected to directly benefit 344,000 people and better prepare them to adapt to the potential impacts of climate change.

15. Overall, the impact of the project is assessed as medium. Its mitigation potential is balanced by a medium level of GHG reductions, which is an embedded characteristic of levels of electricity demands in the rural areas of Senegal. However, the project also achieves significant adaptation co-benefits and paves the way for broader socioeconomic impacts across 1,000 villages.

3.2 Paradigm shift potential

Scale: High

16. GCF concessional finance is critical to crowd in the private sector, which at the moment is limited and has low interest in the targeted areas where investment in mini-grids is not commercially viable. The subsidized approach, which lowers the upfront investment costs for setting up the assets, plays a catalytic role by enabling the private sector to engage in activities that would otherwise be unprofitable. Increased electricity demand – made possible by the increased number of connections and promotion of productive use of electricity – will in turn allow the local private concessionaires to reach a critical scale to make the concessions more viable and sustainable. This model has the potential to be replicated in other African countries that have similar barriers in provision of electricity to remote subsets of population.

3.3 Sustainable development potential

Scale: High

17. The proposal has the potential to generate relevant co-benefits, particularly for the economy and society of Senegal, which rely on the development of the energy sector. In terms of economic co-benefits, the promotion of productive use of electricity will likely produce greater prosperity and generate income for the communities, thus moving them out of poverty (Sustainable Development Goal 1). This is particularly important in the light of the COVID-19

pandemic, if green stimulus is given priority for almost all affected countries. Moreover, moving away from traditional sources of energy (fuels) to clean solar electricity will result in environmental benefits such as reduction of local air pollution and noise impacts on local communities. Component 3 also promotes access to electricity for social use, which widely contributes to the sustainable development potential of the project.

3.4 Needs of the recipient

Scale: High

18. The needs of the recipient are assessed to be high. Senegal is a least developed country with a population of 16.3 million, of which almost 55 per cent live in rural areas. Senegal has steadily increased electrification rates, with almost fully electrified urban areas; however, the majority (58 per cent) of people in rural areas do not have access to electricity and non-electrification rates in some remote areas can be as high as 90 per cent. For basic needs, households have to rely on fuelwood for cooking. This use of traditional fuel is expensive and poses both health and environmental concerns. Meanwhile, the impacts of climate changes are being felt by the poorest people in the country.

19. The Government does not currently have the full financial capacities and knowledge to achieve universal access to electricity. Senegal's public debt currently stands at 57 per cent of the country's gross domestic product. This, together with the exchange rate depreciation and a dependence on foreign debt, places the treasury at risk and limits its ability to borrow capital at the market rate to implement its rural electrification programme. The GCF concessional loan will reduce the average cost of capital to 3.9 per cent compared with a rate of 6.3 per cent without GCF intervention.

3.5 Country ownership

Scale: High

20. The project is properly aligned with national priorities concerning climate change mitigation and adaptation, including the Senegalese nationally determined contribution, the national strategy for economic and social development, and Plan Sénégal Emergent. Moreover, the national designated authority of Senegal communicated to GCF, through its country programme, that it has placed this project as priority under the first replenishment period of the GCF.

21. BOAD, as a direct access entity to the GCF, has longstanding experience in Senegal as well as in the energy market. The EE, ASER, was created with the sole aim of promoting rural electrification and has been involved in various rural mini-grid/grid extension programmes.

22. The project design took into consideration perceptions, concerns, expectations and recommendations received during the stakeholder consultations, including those of administrative and local authorities of the region, rural communities, and ASER. The national designated authority of Senegal was also supportive of this proposed project at its early stage and issued a no-objection letter at the funding proposal stage.

3.6 Efficiency and effectiveness

Scale: Medium

23. The efficiency and effectiveness of this project is assessed to be medium due to the resulting higher capital expenditure (CAPEX) per unit of GHG abatement achieved. The estimated cost of GHG abatement for GCF is EUR 28.8/tCO₂eq (EUR 177/tCO₂eq for the entire project), which could be seen as on the high side compared with some benchmarks. However, it is worth mentioning that, because the financial instrument is a loan, it is fair to relate the cost of impact to the grant equivalent part of this loan only. It is also worth noting that access to clean electricity in the context of this project has considerable adaptation benefits. The viability of the

project will, however, broadly depend on the quality of the construction and the obligation passed through to the concessionaires. Without GCF financing, the Government of Senegal would have to borrow at market rates, which would increase the costs for the project and stress the balance sheet of this least developed country. The AE and the Government are requested to pass on GCF concessionality to end-beneficiaries through a uniform tariff.

24. An economic analysis shows the project's economic internal rate of return (IRR) to be between 10.3 and 13.2 per cent, depending on the tariff level and electricity consumption level. The financial analysis shows that concession holders will be paying 5 per cent up front of CAPEX for the concession rights, but are obliged to make reinvestments for inverters (every 15 years), batteries (every 7 years) and solar panels (every 25 years). With these reinvestments and the operation and maintenance costs factored in, the IRR is expected to be 12.6 per cent at the subsidized tariff level. The financial IRR is sensitive to electricity consumption and tariff level, therefore the success of enforcing the tariff and component 3 in promoting the productive use of electricity are key.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

25. **Environmental and social risk category.** The AE states that the project is risk category B. The Secretariat agrees with this categorization, considering that the interventions on the ground involve installations that are micro to small-scale (15 to 60 kW capacity) solar photovoltaic (PV) power grids in 1000 villages all over the country. The project sites are located in villages spread over seven administrative regions of Senegal, clustered into three zones, namely centre (Kaffrine, Kaolack, Fatick), south (Kolda, Kédougou, Tambacounda) and north (Saint-Louis).

26. **Safeguards instruments and disclosure.** The AE has prepared an environmental and social impact assessment (ESIA) consistent with the requirements of a Category B project. The ESIA also contains an environmental and social management framework plan in both English and French.

27. The paragraphs below summarize the status of compliance and conformance of the project to environmental and social safeguards (ESS) performance standards 1 to 8 of the GCF interim ESS standards.

28. **ESS 1: Assessment and management of environmental and social risks and impacts.** The ESIA provides a description of the political, legal and institutional context of the project. It describes the environmental and socioeconomic profile of the intervention areas and assesses and proposes management strategies for the project's identified potential risks and impacts. It presents the institutional arrangements for implementing the measures, including monitoring and reporting on environmental and social performance.

29. **ESS 2: Labour and working conditions.** The project involves construction-related risks and impacts to occupational health and safety because it will involve civil engineering works and the installation of solar PV plants, ancillary facilities and local distribution lines in the target villages. The project will follow national decrees on labour and working conditions, and the environmental and social management framework plan includes measures to monitor the use of personal protective equipment during construction and operation and maintenance activities of workers.

30. **ESS 3: Resource efficiency and pollution prevention.** The ESIA covers the management of wastes from construction activities. Regarding wastes generated during operation and maintenance, the ESMPF requires the formulation of a waste management plan to

ensure that wastes such as discarded lead–acid batteries and other potentially hazardous wastes (e.g. used oils and accumulators) are handled by authorized agencies.

31. **ESS 4: Community health, safety and security.** The target villages are the most remote, isolated and least financially attractive villages in the country. Hence, there is a risk during construction that construction worker behaviours will clash with local customs and traditions and would expose the host community to non-endemic diseases. To minimize this risk, the project will give priority to the recruitment of local labour and this will be incorporated in contracts with developers. The project will also facilitate the establishment of training programmes for local villagers to help them acquire the skills needed for the construction, operation and maintenance of the facilities.

32. **ESS 5: Land acquisition and involuntary resettlement.** The individual PV grids would require lands; for example, up to 1,800 square metres for a PV panel field, plus a buffer zone of about 50 m and rights of way for the access roads. The project may incur temporary loss of use of agricultural land because of the opening of tracks and the installation of equipment and facilities on the construction sites. These activities could result in a reduction of land available for cultivation and may interfere with agricultural land development. To mitigate this, the project plans to give priority to the use of marginal land for the installation of the power plants. The project will provide compensation to the owners of lands impacted by the activities, using the guidelines on resettlement in the National Rural Electrification Programme’s Resettlement Policy Framework as the reference for all rural electrification interventions in the country.

33. **ESS 6: Biodiversity conservation and sustainable management of living natural resources.** Some of the target villages are located near protected areas, but there is low probability that a PV grid, its facilities and/or access roads will fall within declared protected areas of natural habitat. Moreover, the power plants will be located within or in the immediate vicinity of the villages and the project will implement measures to avoid siting project facilities in areas with high biodiversity potential.

34. **ESS 7: Indigenous peoples.** In its assessment, the AE has declared that this performance standard is not applicable using the ESS standard definition of indigenous peoples. In circumstances where this would be triggered, the project will, prior to commencing any activities that have potential application of the AE’s environmental and social standards on indigenous peoples, furnish to the GCF copies of such social assessment, its indigenous peoples policy and any associated management plans including, as applicable, evidence that free, prior and informed consent from the indigenous communities has been obtained for the purposes of the relevant activities. During the AE’s stakeholder engagement process there was a request that the project should take into account the local sociocultural context of the sites as well as provide compensation for affected people; and it was noted that the local communities consulted expressed a desire for the project activities.

35. **ESS 8: Cultural heritage.** The project includes measures to prevent the installation of project components in areas that would have a negative effect on cultural heritage sites. Nevertheless, a “chance find” procedure will be followed if and when items of cultural, historical or archaeological interest are discovered by the contractors in the course of construction activities.

36. **Institutional arrangements.** The implementation of the institutional ESS requirements is described in the ESIA. It lists the entities that are responsible for execution and supervision regarding the formulation of environmental and social conditionality criteria for each project, validation of environmental and social cross-compliance criteria, integration of environmental and social provisions in the tender and work execution documents (which will be executed by ASER), and the execution of environmental works and site-specific environmental and social management plans including monitoring by the respective companies.

37. **Stakeholder engagement.** The project conducted consultations with various stakeholders during the project planning phase (identification and preparation). Further, the project provides for stakeholder engagement in its implementation phase (technical execution of activities) including in its commissioning phase (infrastructure operation). Plans for consultation and engagement with stakeholders are provided in the ESIA.

38. **Grievance redress mechanism.** The AE has an established grievance redress mechanism which will be supplemented by project-level mechanisms as provided for in the ESIA. The grievance redress mechanism includes procedures for receiving, handling and following up complaints and grievances, which include the preparation of complaints booklets to be made available at the local level (village chief or town hall) so that complaints can be registered and resolved. In line with the GCF Indigenous Peoples Policy, the GCF Independent Redress Mechanism and the Secretariat's indigenous peoples focal point will also be available for affected local communities. At the company level, a health, safety and environmental manager will be responsible for processing grievances.

4.2 Gender policy

39. The AE through the EE has provided a gender assessment and gender action plan therefore complies with the requirements of the Gender Policy of the GCF.

40. The AE, as per the gender assessment undertaken by the EE, provides information on the enabling environment for gender equality and women's empowerment. Senegal has ratified international treaties on gender equality, such as the Convention on the Elimination of All Forms of Discrimination against Women, while at the country level various plans and strategies have been put in place, including establishing a Ministry of Gender. The plans and strategies that take gender into account are described in the national strategy (SNEEG), which serves as a reference document on gender, and the National Action Plan for Women, which takes into account the practical needs of women, such as the use of improved cookstoves by rural women.

41. Despite the existence of an enabling environment in general, there is limited mainstreaming of gender issues in policies and programmes, and inadequate sex-disaggregated data at all levels. Further, gender-related considerations are taken into account to a very limited extent in the energy sector. Efforts by the sector to address gender issues have not developed based on critical assessment; instead they have been done without in-depth analysis (e.g. simply mentioning the use of improved cookstoves by rural women in the strategy document). Gender mainstreaming was not taken into consideration during the design of the national rural electrification programme, which is a programme that is meant to cover all forms of electrification. For example, the intervention on the use of butane gas for cooking had benefits and was used by communities, but the uptake was skewed towards urban populations, whereas the rural areas – where use of wood and charcoal predominate – would have benefited from increase uptake of butane, to reduce continued exposure to smoke and hazards.

42. Throughout its assessment, the EE indicates that women in the country are affected disproportionately by higher levels of poverty, poor health, lower levels of education, training and literacy, lack of access to finance and employment, lack of access to land and means of production, among other things. In addition, women face various obstacles to equitable access to efficient and affordable energy. In rural Senegal, given the prevailing gender-based family roles, women are mainly involved in cooking and use of motive power. Wood collection and its use for cooking is their exclusive domain and the use of wood and other forms of biomass for cooking has adverse effects on women's health and that of their children. Based on the assessment, there is evidence that women are at risk of abortion and are exposed to fumes from the use of wood, cow dung, crop residues and other alternatives, affecting their health and well-being. The energy needs of women and men are not the same because their roles in society are different. Women are generally focused on domestic roles such as the management of the

household, cooking, fetching water, looking after and educating children, maintaining the home, health, and participating as labourers in agricultural production, and have minimal roles in decision-making. The underlying reasons for this are the prevailing sociocultural, religious, legal and political beliefs that justify and maintain the unequal position of women and men in the society and limiting women's ability to access and benefit, equally. Women heads of households may also be disproportionately affected by the lack of access to energy, given the lack of understanding of their particular interests, needs and priorities, as well as the need for them to assume productive roles which might render them more vulnerable. Access to energy for women-headed household in particular can be further hindered by their location, levels of income, employment, age, number of dependents, financial support by family members to name a few.

43. Despite what is described above, women have active roles in the productive sectors, albeit in the small market economy and the informal sector. They play a significant role in the agricultural value chain and they are found in the processing industries, organized in groups or enterprises and in small-scale trading. Within enterprises, women still face challenges in accessing energy resources, which limits their ability to invest in growing their trade (e.g. through engaging in transformative activities, storage of raw materials, conservation and packaging of finished products) including the high cost of energy.

44. Although the assessment identified various issues relating to energy access by women as individuals, women who head households and women who belong to groups and enterprises, the assessment also mentions the importance of carrying out consultations with communities in order to better integrate women and young people in the governance of the project. It also sees the importance of managing possible disputes arising from the provision of energy via mini-grids, through a complaints mechanism, in order to correct any gender inequalities that might arise as a result of project interventions.

45. The AE, through the EE submission of the gender action plan, has fulfilled the requirements of the Gender Policy of the GCF in that it has provided a gender action plan. The gender action plan includes activities that are aimed at improving access to clean energy from solar mini-grids to meet the differentiated energy uses of men and women in the target villages and to increase their resilience. The activities have corresponding baselines, indicators, targets, budget and a timeline. Some targets will be determined after the consultation at the community level and will be put in place by year one. The activities in the action plan include capacity-building initiatives targeted at ASER and other project entities, men, women and young people, and management committees and women's umbrella organizations with a bid to sensitize, and raise awareness of gender and energy, and gender institutionalization issues. It also describes the existing energy potential and productive uses of mini-grids that can meet gender and community infrastructure demands, and gender-differentiated and preferential tariffs for households based on needs. The action plan also contains activities that will provide meters for poor women-headed households to help manage costs; and, for young people, provides training in various trades and provides subsidies for adequate equipment for economic activities. The plan also provides business opportunities for energy efficiency enterprises owned by women's groups with agro-processing units, as well as providing subsidies for solar kits and equipment to the groups.

4.3 Risks

4.3.1 Overall proposal assessment (medium risk)

46. GCF is requested to provide a 40-year sovereign loan of EUR 71.1 million and a grant of EUR 3.7 million to support the development of solar photovoltaic mini-grids, providing a total of 32 MW across 1,000 villages in Senegal. The AE is co-financing a 10-year loan of EUR 15.3

million. Of the other co-financiers, KfW will provide a loan of EUR 102 million and the Government of Senegal will contribute EUR 5.6 million. The concession agreements will be signed between the Government and private-sector operators for operation and maintenance of the mini-grids.

47. The success of the project depends on the capacity of the AE and EE to select suitable mini-grid construction companies and the quality of the concessions. The project includes training and technical assistance for the tender and procurement process, environmental and social safeguards and gender under component 1 (grant) and support for productive use of electricity under component 3 (grant).

4.3.2. **Accredited entity/executing entity capability to execute the current programme (medium risk)**

48. BOAD, as a direct access entity, has been operating in the West African region for 40 years and has experience in financing solar-based rural electrification projects in Senegal, and in Mali, the Niger and Togo since 2015. The AE has a team of engineers and specialists with expertise relevant to implementing the project, and has been building a track record in the energy sector by managing an energy development fund. BOAD has an ongoing financing relationship with the Government of Senegal, and made available a total sum of 12.22 billion Communauté financière africaine francs (CFAF) (USD 22.00 million) through longer-term loans. The AE has gained GCF approval for a proposal with a similar structure in Mali (approved at the twenty-second meeting of the Board).

49. ASER is the EE for this project: it was formally created in 1999 with the sole aim of promoting rural electrification. ASER is autonomous; however, it functions under the auspices of the Ministry for Energy and the Ministry of Finance. In its role as EE, ASER will supervise the project from procurement and construction of all mini-grids until the installations are transferred to concessionaires (end-beneficiaries).

4.3.3. **Programme-specific risks (medium risk)**

50. **Construction and technical risk.** In terms of the technical risk, the procurement of high-quality materials and using a proven technology will be critical, as will the quality of the contractors. It is recommended that the AE require the use of an independent engineer to report on installations to ensure quality. The AE and EE are important for overseeing procedures and providing the technical assurance of the connections to the end users.

51. **Operations and maintenance risk.** Underperformance would reduce the impact of the projects, as well as the financial viability of the project for the concession holders. The latter could influence the long-term viability of the project. Concession holders are expected to reinvest in the grid. It is recommended that cash flows for such investments be placed in a separate account and that the concessions be granted for a minimum of 15 years.

52. **Credit risk and foreign exchange risk.** GCF will provide a sovereign loan to the Government of Senegal to be provided and repaid in euros. The source of the repayment of the loan is the Government treasury and not the cash flow from the subprojects. Senegal is currently rated Ba3 by Moody's. The CFAF is pegged to the euro, thus helping the Government of Senegal to mitigate the currency fluctuation risk related to GCF financing.

53. **Affordability.** The financial model expects the concession-holder tariff to be around EUR 0.30/kWh (in CFAF equivalent) but the end user will benefit from a lower tariff based on the harmonized tariffs of CFAF 91–97 (EUR 0.14–0.15) per kWh. The difference is the result of a subsidy by the Government. GCF financing is expected to help reduce the subsidy over time because GCF financing could allow for lower concession-holder tariffs. The feasibility study notes that an analysis of households' ability to pay was conducted, and concluded that the

assumption of a penetration rate of 85 per cent of households living in the target villages was reasonable for the project's coverage.

4.3.4. Project viability and concessionality

54. The viability of the project depends on the quality of the construction and concessions. Without GCF financing, the Government of Senegal would have to take loans at market rates, which will increase the cost of the project. The AE and the Government are requested to pass on GCF concessionality to end-beneficiaries through a reduced tariff.

55. The financial analysis shows that with concession holders will pay 5 per cent up front of CAPEX for the concession but are obliged to make reinvestments for inverters, batteries and panels. The IRR is expected to be 12.6 per cent at the subsidized tariff level. It should be noted that the IRR is determined for a horizon longer than the 15-year concession and is heavily influenced by the reinvestment costs. Without those reinvestments the IRR for would more than double for the concession holders. Additionally, reinvestment costs are assumed to remain stable, although costs of batteries, inverters and solar panels show a declining trend.

4.3.5. GCF portfolio concentration risk (low risk)

56. In case of approval, the impact of this proposal on the GCF portfolio concentration in terms of results areas and single proposal is not material.

4.3.6. Compliance risk (medium risk)

57. Regarding due diligence checks for money laundering, terrorist financing or prohibited practices, the AE has developed a Financial Security Policy (2016) which constitutes the general framework of the control system covering all BOAD activities relating to the prevention, surveillance and management of money laundering and terrorist financing risks.

58. BOAD has indicated that its Financial Security Policy incorporates international standards defined by the United Nations, the Organisation for Economic Cooperation and Development, the recommendations issued by the Financial Action Task Force (FATF) and the provisions of directive 02/2015/CM/UEMOA of 2 July 2015 on the fight against money laundering and terrorist financing in the member States of the West African Economic and Monetary Union (UEMOA). The policy requires the disclosure of information about its clients' transactions to the relevant authorities in cases where international rules and local laws require regulated financial institutions to do so, including cases of money laundering. Under its due diligence, BOAD will assess against its civil/criminal and regulatory antecedents and sanctions lists. BOAD also conducts administrative investigations into corruption, fraud, coercion, collisions and inconvenient practices, and make use of the relevant national authorities for necessary criminal investigations. BOAD integrates measures to combat illicit financial flows, money laundering and financing of terrorism throughout the internal operations of the BOAD Group.

59. In the context of this project, concerning money laundering/financing of terrorism, the concerned stakeholder will:

- (a) Ensure that the funds financing the project are not of illicit origin and, in particular, are not related to fraud against Senegal's financial interests, or to corruption, organized criminal activities, terrorism or drug trafficking; and without delay forward to BOAD any information raising suspicions as to the unlawfulness of the sums invested in the company and in the project, or notify BOAD of any information indicating the illicit origin of all or part of the funds of the structure; and

- (b) Not enter into a business relationship, directly or indirectly, with persons or entities on the lists established by the United Nations Security Council or its committees pursuant to Security Council resolutions, by the Council of the European Union in application of its Common Positions and/or by the African Union as well as on any other relative or complementary resolution and any act of implementation thereof in connection with the fight against money laundering and the financing of terrorism.
- (c) The AE has further indicated that its “know-your-customer” standard-compliant due diligence process, including anti-money laundering and other evaluations of sponsors, is followed thoroughly.
60. Based on this information, compliance risk assessment is rated as Medium.

4.3.7. Recommendation

61. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment		Rationale
Overall programme	Medium	Projects are exposed to construction and operation and maintenance risk. The quality of materials used, the contractor and the concession holders will drive project success. The Government of Senegal (rated Ba3 by Moody’s) will be the borrower of GCF funds
Accredited entity/executing entity capability to implement this programme	Medium	
Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

4.4 Fiduciary

62. The AE for the project is BOAD which will be responsible for the overall management of this project, including (i) all aspects of project appraisal; (ii) administrative, financial and technical oversight and supervision throughout project implementation; (iii) ensuring funds are effectively managed to deliver results and achieve objectives; (iv) ensuring the quality of project monitoring, as well as the timeliness and quality of reporting to the GCF; and (v) project closure and evaluation.

63. The EE is the ASER. In its role as EE, ASER will ensure the operational supervision of the project from procurement and construction of all mini-grids until end-beneficiary installations.

64. The project implementation unit will be integrated at ASER general management level, with a Project Coordinator acting under the supervision of a Steering Committee (Comité de Pilotage – CP). The project implementation unit will be complemented by other coordination functions such as the: (i) the Technical Monitoring Committee (CTS) which will support the coordination and monitoring of the project work implementation; and (ii) the operational structures (management units) of ASER General Management which will be responsible for the implementation of the project. The ASER Project Management Unit will be comprised of the following professionals: Project Coordinator, Expert Engineer in the Renewable Energies (Solar), Financial Analyst, UN Procurement Specialist, a person in charge of Monitoring and Evaluation and an Environmental and Social Safety Officer.

65. Financial management and procurement under this project will be guided by relevant BOAD rules and regulations, as well as relevant provisions in the Accreditation Master Agreement (AMA) signed by BOAD and the GCF as part of BOAD’s accreditation to the GCF. The provision of the BOAD loan will be made to ASER through the Ministry of Finance (Senegal Treasury) as per the Fund Flow Diagram described in the FP, and subject to a reimbursement

plan to be agreed. BOAD will carry out financial transfers in accordance with its own policies, procedures and rules for which it has been accredited for.

66. Audits will be undertaken in accordance with BOAD Guidelines for Financial Reporting and Auditing of Projects. The Financial Agreement with Senegal will require the submission of Audited Financial Statements to BOAD within four months after each year-end. An independent external auditor will be recruited based on Terms of Reference acceptable to the Bank (not later than four months after effectiveness) for the entire duration of the project.

67. The Financial Statements will be audited in accordance with international auditing standards. Furthermore, BOAD will prepare a Management Letter to provide observations, comments, and recommendations for improvements in accounting records, systems, controls and compliance with financial covenants in the Financial Agreements. The cost of the audit will be met from project resources.

4.5 Results monitoring and reporting

68. As a mitigation project, the intervention expects to reduce or avoid 1,127,447 tCO₂eq for the lifespan of the asset, and it will provide co-benefits to 344,040 beneficiaries of which 172,208 are women.

69. Overall the funding proposal and logical framework sufficiently apply GCF fund-level (impact and outcome) results management framework/performance measurement framework indicators, and the project has built in baselines and data collection that can inform progress reporting on expected results. At the project performance level, as a technical assistance/training-based grant project, measurements for behavioural change have been integrated that are essential to deliver the expected project results.

70. Regarding section E.1-E.6 of the funding proposal, overall the logical framework complies with GCF standards, and it has been cleared through Secretariat review.

71. The funding proposal theory of change could benefit in implementation from further details reflecting on the causal pathways at the project level and in relation to the climate rationale (which ideally are tested in implementation either with project performance management indicators or impact data/evidence generated to attribute changes to GCF investment).

72. Under section E.7 of the funding proposal, and as complemented by the information in the monitoring and evaluation plan (annex 5 of the FP), information for implementation has been provided with initial information on data collection, evidence generation and assessments, not only of quantitative metrics, but also of the behavioural changes necessary for the quantitative results to be realized. As a good practice the project will apply an innovative approach in assessing result trends through the timing of the final evaluation to increase the meaningfulness and utilization of the evaluation. This will enable the project to assess not only general evaluation criteria but also the accuracy of results achieved against the results expected, as calculated using the methodology from the funding proposal, and in relationship to the results as reported at the project completion to verify if the assumptions of the forecasted trend have been realized.

4.6 Legal assessment

73. The AMA was signed with the AE on 3 April 2017 and it became effective on 31 August 2017.

74. The AE has not provided a legal opinion/certificate confirming that it has obtained all its internal approvals and it has the capacity and authority to implement the project. It is

recommended that, prior to submission of the funding proposal to the Board (1) the AE has obtained all its internal approvals and (2) the GCF has received a certificate or legal opinion from the AE in form and substance satisfactory to the GCF confirming that all final internal approvals by the AE have been obtained and that the entity has the authority and capacity to implement the project.

75. The proposed project will be implemented in Senegal, a country in which GCF is not provided with privileged and immunities. This means that, among other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed. The Secretariat submitted a draft of the privileges and immunities agreement to the Government of the Republic of Senegal on 30 September 2015. On 16 February 2017 the Government of the Republic of Senegal sent a communication to the GCF stating that the draft privileges and immunities agreement was under review by its Ministry of Foreign Affairs. No further communication has been received by the GCF Secretariat to date.

76. The Heads of the Independent Redress Mechanism and Independent Integrity Unit have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where the GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by the GCF are made only after the GCF has obtained satisfactory protection against litigation and expropriation in the country, or has been provided with appropriate privileges and immunities.

77. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

- (a) Delivery by the AE to the GCF of a certificate or legal opinion confirming that it has obtained all its internal approvals within 120 days of the Board approval;
- (b) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days from the date of Board approval, or the date on which the AE has provided a certificate or legal opinion confirming that it has obtained all internal approvals, whichever is later; and
- (c) Completion of legal due diligence to the satisfaction of the Secretariat.

Independent Technical Advisory Panel's assessment of FP138

Proposal name:	ASER Solar Rural Electrification Project
Accredited entity:	West African Development Bank (BOAD)
Project/programme size:	Medium

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential

Scale: High

1. In a 2017 publication, the World Bank reported that 61.7 per cent of the population of Senegal, on average, had access to electricity. This national average masks the differences in access between the urban and rural areas and between different rural areas in the country. In the same World Bank report, the average rural electricity access in 2017 was quoted as 35.4 per cent, while the urban area average was as high as 91.7 per cent in the same year.¹ The percentage quoted in the funding proposal reviewed from a recent year showed that rural access in Senegal has improved very slightly in the last few years to an average of about 42 per cent. This current average rural access percentage hides the disparity between different rural areas. For example, it was stated in the funding proposal that electricity access in rural areas like Médina Yoro Foula, Ranérou, Salémata and Saraya are each less than 10 per cent. The slight improvement in access to electricity in rural Senegal in recent years reflects the aggressive effort of the Government of Senegal to improve electricity access in rural areas in its effort to stay on its declared path to universal access by 2025.

2. In the last few years, the Government of Senegal has pursued an aggressive rural electrification strategy through its Senegalese Agency for Rural Electrification (*Agence Sénégalaise d'Électrification Rurale*) (ASER). ASER is aimed at improving the low level of rural access to electricity, especially after the country joined the United Nations Sustainable Energy for All (SE4All) initiative, which actually catalysed Senegal to pursue the path of 100 per cent electrification of at least 90 per cent of rural households by 2025. The electricity access results obtained so far were achieved via a combination of implementing grid extension projects to selected rural communities; building isolated secondary and regional power plants that are operated with diesel fuel; and developing solar photovoltaic/diesel generation-based microgrids in selected rural villages. Key achievements of ASER to date (2005–2019) can be summarized as follows: delivery of 174 mini-grids and 12 grid extension projects, enabling the electrification of 3,000 rural villages. These achievements fall short of what is expected to put Senegal on a path towards its SE4ALL electricity access objectives. The unsustainable operations and maintenance (O&M) costs of these rural electrification facilities have been identified as the key reason why the pace of the programme has not been as fast as expected. Non-reflective tariffs, grids of a suboptimal size and a lack of metering have been identified as common problems. The national harmonization of tariffs between the rural consumers and those in the urban parts of Senegal as well as aggressive consumer metering were introduced to ameliorate these problems; however, these responses created a fiscal-financial burden for the Government of Senegal, necessitating alternative strategies.

¹ See <[Data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=SN](https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=SN)>.

3. From experience gathered in recent years, if the declared intention of universal access by 2025 is to be met, efforts will need to be ramped up. Apart from the reasons adduced for the unsustainable O&M of the rural electrification projects in Senegal, the inadequate availability of domestic funds (public and private) to accelerate the efforts has been noted as a key barrier to achieving universal access by 2025. The Government of Senegal is highly aware of the need to remove these barriers in order to realize the direct and indirect benefits of improving electricity access. These benefits include the direct benefit of improving the quality of life of consumers connected to the electricity access facilities; improving the productivity of these consumers; and, when renewable energy generation is utilized in the rural energy access facility instead of the fossil fuel-fired facility, delivering additional benefits apart from reduced greenhouse gas (GHG) emissions, including improved reliability of the electricity supply facility, reduced emissions of noxious gases and particulates, and a reduced import bill for fossil fuels for a net fossil fuel importer country like Senegal. In addition, the intervention may deliver improved resilience of the power facility to extreme events, which may affect alternative power sources as co-benefits of the intervention. Therefore, the strategy of the conditional intervention in Senegal's nationally determined contribution (NDC), which requires external financing to support the efforts of the Government of Senegal, is considered to be a good way forward.

4. Further to its expressed commitment to address the low access to electricity of rural communities in Senegal through ASER, the Government of Senegal conceptualized this proposed intervention. The main goal of the proposed project is to uphold the renewable share of Senegal's ambition to reach universal energy access by 2025 by fostering solar-powered mini-grid development in isolated villages that are not connected to the national electricity grid. The aims of the project can be summarized as follows:

- (a) Develop of off-grid renewable energy mini-grids to reduce carbon dioxide emissions from the Senegalese power sector;
- (b) Contribute to achieving Senegal's electricity access objectives;
- (c) Promote gender balance in the promotion of balanced rural economic growth;
- (d) Catalyse, expand and strengthen the participation of the private sector in financing the electricity access programme;
- (e) Develop the capacities of key stakeholders and institutions in Senegal needed to grow the electricity access programme of the country through a de-risking of the investment platform; and
- (f) Create an enabling environment in Senegal that will energize the country's journey on its path towards universal electricity access.

5. The proposed project has been conceptualized, designed and organized to be implemented with the following components, outputs and activities.

6. **Component 1:** Technical assistance for solar rural electrification stakeholders:

- (a) **Output 1.1:** Capacity-building of rural electrification stakeholders:
 - (i) Activity 1.1.1: Trainings on procurement procedures, project management and GCF requirements; and
 - (ii) Activity 1.1.2: Seminars, trips and workshops (technology watch, public consultations, conferences, sharing of experiences, etc.);
- (b) **Output 1.2:** Implementation of the gender action plan:
 - (i) Activity 1.2.1: Gender-relevant mapping and tutoring of community organizations;

- (ii) Activity 1.2.2: Gender stakeholders training for the project management unit (PMU), local operators and community organizations; and
- (iii) Activity 1.2.3: Gender-oriented communication campaign; and
- (c) **Output 1.3:** Environmental and social downstream activities:
 - (i) Activity 1.3.1: Implementation and monitoring of environmental and social measures; and
 - (ii) Activity 1.3.2: Establishment of Recycling unit for batteries and other waste (compact fluorescent lamps, other electronics).
- 7. **Component 2:** Procurement and installation of solar powered mini-grids:
 - (a) **Output 2.1:** Preparation of detailed engineering studies;
 - (i) Activity 2.1.1: Site selection, engineering studies and specific environmental and social analyses for each site;
 - (b) **Output 2.2:** Supply, installation and commissioning of equipment;
 - (i) Activity 2.2.1: Solar photovoltaic (PV) power plant construction and minigrid deployment; and
 - (ii) Activity 2.2.2: Smart metre installation and miscellaneous;
 - (c) **Output 2.3:** Modern public lighting;
 - (i) Activity 2.3.1: Deployment of solar street lighting; and
 - (d) **Output 2.4:** Control and supervision of work;
 - (i) Activity 2.4.1: Control and supervision of work
- 8. **Component 3:** Incentives for social and productive use of electricity:
 - (a) **Output 3.1:** Gender and social connections;
 - (i) Activity 3.1.1: Connection of eligible social services and women and youth entrepreneurs to the PV mini-grids; and
 - (b) **Output 3.2:** Microfinanced productive equipment credit guarantees;
 - (i) Activity 3.2.1: Implementation of a mechanism to facilitate access to productive equipment financing through microfinance.
- 9. The total financing requested (GCF financing plus co-financing) for this project is EUR 198.692 million. This is expected to be contributed as follows:
 - (a) **GCF:** EUR 75.445 million, made up of:
 - (i) Senior loans: EUR 73.623 million with a 40-year tenor, 10-year grace period and a concessional interest rate of 0.0 per cent per annum; and
 - (ii) Grants: EUR 1.822 million;
 - (b) **Co-financing:** EUR 123.247 million, made up of:

- (i) A senior loan **from the West African Development Bank (BOAD)**: EUR 15.245 million with a 10-year tenor, 3-year grace period and an annual fixed interest rate² of 7.6 per cent;³
- (ii) A senior loan **from KfW**: EUR 102.396 million with a 10-year tenor, 0.5-year grace period and an annual interest rate of 6.14 per cent; and
- (iii) A contribution from the Government of Senegal: EUR 5.606 million.

10. Table 1 below provides information on the plan for the appropriation of the funds presented above for the different activities of this project.

Table 1: Financing by component

Component	Indicative cost in EUR million	GCF financing		Co-financing		
		Amount in EUR million	Financial instrument	Amount in EUR million	Financial instrument	Institution names
1. Technical assistance to the solar rural electrification stakeholders	3.33	1.17	Grants	2.16	Loan/contribution	BOAD/ Government of Senegal
2. Procurement and installation of solar powered mini-grids	192.23	71.68	Loan	120.55	Loan/contribution	KfW, BOAD/ Government of Senegal
3. Incentives for social and productive use of electricity	2.33	2.33	Loan/grants	-		
Project management cost	0.39	0.09	Grants	0.30	Contribution	Government of Senegal
Indicative total cost (EUR)		198,692,182		75,445,176		123,247,006

Abbreviations: BOAD = West African Development Bank

11. The potential mitigation benefits and co-benefits that will be delivered by this project are described below:

- (a) The proposed project will involve the implementation of renewable energy-based rural electrification projects that will displace the baseline facilities, which may include energy supplies in a village without existing microgrid connections and/or villages connected to existing microgrids with electricity supplies coming from fossil fuel-fired power plants. The United Nations Framework Convention on Climate Change approved baseline and monitoring methodology AMS-III.BL (integrated methodology for electrification of communities),⁴ which was utilized to estimate GHG emission

² Fixed interest rate, on top of which a commitment fee (0.5 per cent) and a service fee (1.0 per cent) are due.

³ As the cost of West African Development Bank resources is higher, the request for GCF concessional resources is meant to reduce the project's weighted average cost of capital (for the Government of Senegal, which is the borrower, and divide the project's debt servicing into smaller instalments to improve viability.

⁴ Nota bene: under this clean development mechanism methodology's eligibility requirements, at least 75 per cent (by number) of the project consumers shall be households.

reductions that will emanate from this kind of project, is applicable for the project circumstances in the targeted rural villages in Senegal. When the proposed project is implemented, it will deliver renewable energy microgrids in about 1,000 villages, which will lead to emission reductions of about 1.13 million tonnes of carbon dioxide equivalent by 2045;

- (b) The funding proposal also contained convincing arguments that adaptation co-benefits of the proposed project will contribute to fostering resilience and sustainable development in the following ways:
- (i) The increased access to electricity that will be delivered by this project intervention will promote equalized gender roles for women and enhance access to education and information for school children at all levels in the remote rural communities where the proposed project will be implemented. The cause-effect argument of the impact of climate change and variability on gender and children may be difficult to make analytically for Senegal, however, these kinds of impacts have been reported in other regions of the world, where the most vulnerable people are women and children. Therefore, this co-benefit may be delivered;
 - (ii) The implementation of this project as proposed will deliver decentralized power systems to these villages, which will mitigate the pre-project weakness, characterized by: scattered consumers (due to the geography of the settlements); fuel supply systems, that is usually at risk during extreme weather events; and at risk from unstable international prices of crude oil (which affects negatively the price of diesel, when fuel-based technology is utilized. All these which will not be the case when the infrastructure of the proposed project is delivered;
 - (iii) Climate-resilient productive assets will be provided to selected consumers that will be connected to the microgrid and whose loan facilities are already at concessional levels, will also have revolving guarantees of up to 40 per cent of nominal loans of an average duration of three years will improve the reliability of water and food chains, as well as services in health, education and social institutions, farmers, entrepreneurs, schools and clinics lacking electricity; and
 - (iv) The following arguments were also convincingly made in the funding proposal about the resilience-strengthening co-benefit of the project intervention: the project will provide employment opportunities and support the economic growth of the rural areas; and affordable renewable electricity will further strengthen the economic resilience of rural households as it will improve community income levels and reduce migration patterns; and
- (c) These co-benefits, which are likely to be delivered in addition to the estimated GHG emission reduction of this project, and the fact that a total of about 344,000 people will directly benefit from the successful implementation of this project. Furthermore, not only will the project enhance the capacity of local private concessionaires who will be contracted under an O&M agreement to run these microgrid facilities, it will also create an enabling environment and capacity for the local financing of the future replication of the projects. This will ensure Senegal is on a path towards universal energy access for the rural part of the country.

12. With these observations from the review of the project, the independent Technical Advisory Panel (TAP) came to the conclusion that this project intervention will deliver high climate impact potential.

1.2 Paradigm shift potential

Scale: High

1.2.1. Comprehensiveness

13. In the absence of this project intervention, energy access projects in many of the smallest and most remote vulnerable villages where grid extension is not feasible in Senegal would continue to be dominated by the fossil-fuelled microgrid. This traditional energy pathway would otherwise continue to make Senegal dependent on imported fossil fuels.⁵ The proposed project, when compared to this baseline strategy, will deliver faster penetration of cleaner energy, thus reducing the need for imports of diesel fuel.

14. The project will deliver a progressive, sustainable, low carbon and decentralized power system that will replace the status quo ante strategy described above. This will be a paradigm shift in that the structure of the intervention will produce an enabling environment for the success of the project as well as develop in-country capabilities for the technical delivery of the project under a strengthened institutional framework. This will facilitate the replication of the idea in similar villages in the country that are not covered by this proposed project.

15. In the absence of the proposed project, the status quo ante situation with the electricity access programme of the country, which has been adjudged as not proceeding at a pace sufficient to enable the achievement of universal access by 2025, will continue. The success of the proposed project will not only put Senegal on a low-carbon pathway, but it will also contribute to reducing the fossil fuel dependence of Senegal and assure the acceleration of the access programme towards the national objective of the Government of Senegal to achieve the SE4ALL access by 2025. This will deliver the needed paradigm shift.

16. In the status quo ante situation, Senegal's domestic private financial sector had limited know-how on clean energy investments, particularly when it comes to decentralized power generation, as most of the systems successfully implemented were fossil fuel-based microgrids. In addition, these local financial institutions had prohibitively expensive financing packages, which rendered such projects infeasible, especially the more capital-intensive renewable energy alternatives. The result is that private sector investors were discouraged from investing. The proposed financing package offers a solution to incentivize the participation of the private sector by increasing investor confidence through the offer of concessional finance and grant funding. The proposed funding structure for these private sector investors will facilitate their contribution to the required concession fee required for financial closure. When this is coupled with strong capacity-building activities on operating and maintaining these assets, it will establish a business environment that will ensure the success of this proposed intervention in a cost-effective and sustainable manner. This will catalyse the effective replication of the concept in the remaining villages not covered by the current intervention, resulting in the effective crowding-in of private sector investment and expertise at a level much higher than in the status quo ante. This will deliver a significant paradigm shift.

17. For many renewable energy microgrid investments in developing countries, the ability to attract productive-use consumers to the service area of the mini-grid is often a necessary condition for success. Like many such projects in developing countries, earlier efforts in Senegal also accentuated the need to include strategies in the scheme to enhance the development of such consumers with these planned microgrids. Therefore, another convincing argument offered by the accredited entity (AE) in the document reviewed by the independent TAP is the importance of the technical assistance component of the proposed intervention, which is expected to generate a powerful trickle-down effect on the national economy. It is argued in the funding proposal that this will be delivered through the focus on the design and implementation of productive use de-risking tools that are expected to satisfy the capacities of the final

⁵ Senegal imported 655 kilotonnes of oil equivalent in 2015 and used 305 kilotonnes of oil equivalent to generate electricity, according to the African Energy Commission.

beneficiaries and reflect the needs of private sector operators. This will be a strong co-benefit that will also support the high paradigm shift characteristics of this proposed project.

18. In the status quo ante, the economy of the rural areas where these micro-grids will be implemented are rudimentary and far from modern, with very low productivity in the main economic activity of agriculture. In most African countries, a substantial percentage of rural dwellers are farmers who practice subsistence agriculture. For many of these rural dwellers, electricity is not available, or, when it is available, it is not reliable for providing energy for their productive venture, which is farming. These smallholder farmers often don't have access to electricity or to reliable electricity to power electrical appliances, which would help them increase their yields through access to water irrigation and to clean portable water sources that will enhance their health situation and sanitation. This pre-project situation will be changed very significantly with the success of the proposed project, which will deliver improvements in community assets through cheaper provision of services (health, education, water and agriculture); improvements in quality of life; and enhancement in the adaptive capacity of the communities. Thus, the project will deliver a more modernized rural economy compared to the status quo ante.

1.2.2. Innovation

19. Innovation is partially delivered when changes are made to the way things are done in the status quo with a value creation, and the ultimate creation of a better way of doing what is failing and its survival with better delivery of results. The status quo situation of electricity access in rural Senegal before this proposed intervention was conceptualized has not been yielding the expected results, which will facilitate the plan of Senegal to achieve universal electricity access by the year 2025. The successful implementation of the proposed project is, however, likely to accelerate the process of bringing electricity access to these rural villages as many of the barriers discussed in the funding proposal – fund scarcity; high cost of funds when they are available from private sources in the country; a weak institutional base to ensure the success of the intervention; etc. – are ameliorated by the proposed intervention. These barriers will be positively addressed through the interventions built into the proposed project via grant funding that will build the skills of pertinent stakeholders (technical, planning, management, policy and regulatory frameworks) that are usually needed to deliver such changes to the business-as-usual situation. Thus, the proposed project structure is expected to change the status quo in which decentralized, rural electrification projects are being carried out. Key changes that will be delivered will include:

- (a) The concessional GCF funding will crowd in more public and private funds at much higher levels than at the status quo, thus making the financial feasibility of renewable energy projects more favourable, accelerating the implementation of such lower-carbon generation assets for the rural microgrids;
- (b) The proposed project through the financial tools and mechanisms built into the concept, especially the grant funding available for financing the capacity building for some relevant stakeholders (activities in components 1 and 3), ensure that key skills necessary to deliver the success of these microgrid projects in the many rural villages are successfully delivered to these stakeholders. This will ensure the successful delivery of decentralized microgrids in these villages and allow them to utilize clean solar PV technologies at an implementation speed that could not have been achieved by the status quo ante strategies while also achieving reductions in carbon emissions. This will deliver a very innovative paradigm shift in Senegal;
- (c) In the status quo programme in Senegal, it was observed that a key consumer type that were scarce in many of the villages was anchor loads. The proposed project will utilize some of the financial tools to facilitate the uptake of productive applications to serve as

anchor loads, thus making the project more viable than the situation in the baseline. This will contribute to the feasibility of the proposed strategy and hence deliver an innovative paradigm shift; and

- (d) The success of the proposed project will catalyse the replication of the idea in other villages in Senegal, which are not included in this target batch (about 1,000 in number), thus improving the quality of the project through learning by doing and, when this is replicated in other countries, further expanding the paradigm shift capacity of the project.

1.2.3. Enabling environment/sustainability of outcomes

20. The AE for this project, the regional development bank BOAD, will provide co-financing for part of the systems that will be implemented in components 1 and 2. The setup of a PMU for this project will be covered by grant funding from GCF and a contribution from Government of Senegal. The capacities of relevant staff members of the PMU will be built through some of the capacity-building activities of component 1. Some of these capacity-building activities will be focused on developing the technical understanding of the PMU and the ability of its members to operate and maintain the solar PV microgrid facilities. The capacities thus built at the level of all relevant stakeholders, especially for ASER, which will spearhead the implementation of the proposed project, and they will eventually create an enabling environment for the sustainable success of this concept. BOAD already has an ongoing financing relationship with the Government of Senegal, which, coupled with the capacity of ASER (which will be strengthened by the various capacity-building activities in component 1) should reduce any inherent weaknesses in the abilities of the critical stakeholders. The independent TAP is therefore of the opinion that the project will create an enabling environment for the sustainable planning and implementation of this project and its replication in other parts of Senegal and beyond.

1.2.4. Replicability and scalability/knowledge and learning

21. Currently, according to information provided in the funding proposal, of the 14 regions of Senegal, 9 have an electrical coverage rate of less than 60 per cent. All of these regions with lower electricity access have localities that are yet to be electrified at all. It has been reported in the funding proposal that over 14,000 localities remain to be electrified, with a population of 3,372,458 to be covered by 2025. Thus, if the objective of the Government of Senegal to achieve universal electricity access in the country by 2025⁶ is to be achieved, then the status quo ante speed of the national rural electrification programme must be accelerated. The entire package of this BOAD proposal will put in place a sound platform that will ensure the following availability of local financing – bolstered through this project by the concessional GCF loan –; domestic capacity that will include technical design, planning, and management of mini-grid systems; and create very informed stakeholders, including electricity consumers. These will altogether boost the success of the proposed project and its replication to the several thousand localities in the country yet to be electrified. The capacity-building programme, the documentation of its accomplishments and its knowledge base of information that can then be disseminated in Senegal and the subregion will catalyse the replication of this proof of concept in other countries in the subregion. Although there is no information in the funding proposal or the annexes on information dissemination beyond Senegal on the successes of this concept, information on the performance of this proof of concept should be internationally disseminated during and after the project to facilitate replication beyond Senegal.

22. The proposed project will deliver a comprehensive and innovative paradigm shift as discussed above. It will also create an enabling environment that will make the tangible

⁶ According to its SE4ALL objective.

outcomes of this intervention sustainable while also enhancing the replicability of the proof of concept to other parts of Senegal. Therefore, the independent TAP has concluded that the paradigm shift potential of this project is high.

1.3 Sustainable development potential *Scale: High*

1.3.1. Alignment with the Sustainable Development Goals

23. The project will directly contribute to the following Sustainable Development Goals (SDGs):

- (a) SDG 7: Affordable and clean energy – ensure access to affordable, reliable, sustainable and modern energy for all. By increasing electricity access and enabling Senegal to achieve universal access by the target date of 2025;
- (b) SDG 1: No poverty – end poverty in all its forms everywhere. By increasing the income of rural dwellers through increased access to electricity, which will enable the financial capacity of rural income, including farm-level incomes, and by reducing out-migration from rural areas due to loss of livelihoods dependent on agriculture and other productive activities that need electricity to thrive;
- (c) SDG 3: Good health and well-being – ensure healthy lives and promote well-being for all at all ages. Improved electricity access in the rural areas will gradually erase the use of diesel/kerosene/paraffin, which poses health hazards to the people in such communities due to emissions of noxious gases and particulates from the combustion of the fuels for energy in the baseline scenario. Health will also be improved in these villages, as rural health provision will become more effective with the availability of electricity;
- (d) SDG 5: Gender equality – achieve gender equality and empower all women and girls. By means of a gender action plan that has been put in place and that is targeted at the inclusion of women in the capacity-building programme as well as the provision of financial and technical support to women artisans and other stakeholders;
- (e) SDG 6: Clean water and sanitation – ensure availability and sustainable management of water and sanitation for all. Although not a directly delivered benefit of this project, the availability of electricity in the villages will eventually lead to better quality sources of potable water from, for example, cleaner aquifers compared to, in many cases, polluted surface water in the status quo ante. This will also improve the sanitation situation in these rural communities; and
- (f) SDG 8: Decent work and economic growth – promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Improved electricity access will also lead to the introduction of tangible business ventures that will provide decent work for village communities. This will enhance the economic growth of the rural communities.

1.3.2. Economic co-benefits

24. The project will enable the productive uses of electricity and income-generating activities through the improved reliability of the power supply. The project will also contribute to improving the country's energy security budget deficit, which is negatively impacted by the import of fossil fuels into the country. The availability of electricity in these rural areas to be covered by this project will contribute to reduced operating costs of consumers, including clinics and schools that will reduce or eliminate their dependence on diesel. The construction, operation and maintenance of the microgrid of this rural electrification programme will deliver

direct employment in these rural areas where the decentralized facilities will be implemented. Indirect employment opportunities will also be created by businesses that will provide services as a result of the proposed project, (for example, entrepreneurs who will commence the manufacture or import of new technologies that can be powered by electricity).

1.3.3. Social co-benefits

25. Social co-benefits that will be delivered by this project will include: improved health conditions, as renewable energy-powered lights will reduce the use of kerosene lamps and eliminate indoor air pollution, which causes eye irritation and lung injury; better conditions for students in the community thanks to available and reliable lights, which will provide a better environment for longer periods of learning, thus enhancing education and social institutions; and income generation that will be catalysed by greater access to electricity, which will also contribute to poverty reduction. The project will also improve access to potable water and water pumping for crop irrigation.

1.3.4. Environmental co-benefits

26. Key environmental co-benefits that are likely to be delivered by this proposed electricity access project will result specifically from the complete elimination of the use of fossil fuel for electricity generation in the microgrid compared to the baseline situation. Key environmental co-benefits will include reducing the risk of groundwater contamination caused by leaking diesel generators and reducing local air pollution and noise disturbances in local communities by eliminating the use of diesel-generated electricity.

1.3.5. Gender-related co-benefits

27. Gender-related co-benefits will include increasing access to electricity in (remote) rural areas, which will ensure that men and women benefit equally from the initiative. In addition, ASER will offer special support to promote equal opportunities arising from the rural electrification project through the technical assistance component for both men and women. The project will also free up time for women (previously allocated to household tasks) through the use of mills and the provision of access to drinking water supplies, among other things, and for children (increasing light time available at night) to engage in productive and educational activities that improve income generation and strengthen social standing. The project plan includes preferential support for women-owned microenterprises through the training of target groups in trades, the design of business plans around activities identified beforehand, access to microfinancing for equipment, the provision of connection coupons to the most vulnerable, and support in the organizational and institutional structuring of women's organizations.

28. In view of the above-mentioned contributions to various elements of sustainable development, the independent TAP has concluded that the project will generate significant sustainable development potential as about 344,000 people will directly benefit from the successful implementation of this project. Therefore, the sustainable development potential is deemed to be "high".

1.4 Needs of the recipient

Scale: High

1.4.1. Needs of the country and the rural populace

29. About 55 per cent of the population of Senegal lives in the rural part of the country. According to the information available in the funding proposal and its annexes, rural access to modern electricity is as low as under 10 per cent in some areas, and national rural electricity

access is currently averaging 42 per cent. As discussed in several parts of this evaluation report, low access to electricity in these rural parts of the country has been known to cause and continuously contribute to poverty, cause poor health among rural inhabitants, present barriers to the economic development of the areas, and result in many other issues that do not foster the welfare of rural inhabitants. The Government of Senegal recognizes the negative impacts of poor access to modern electricity and its debilitating impact on the welfare of people and the economy of the nation, especially in rural Senegal, where access is still very low. This is why the country very aggressively pursued the policy of achieving universal access by 2025. Unfortunately, the first phase of these efforts, if the course is not changed, is likely to fall short and result in the continuation of fossil fuel generation, which is bad for the environment and the climate. Not only will this strategy cause higher environmental pollution, it will also not deliver universal electricity access. Therefore, the proposed project will satisfy the needs of the country while also delivering improved access to the rural populace.

1.4.2. Economic and financial needs of the country

30. Senegal incurs a remarkably high cost in its fiscal budget annually for the importation of fossil fuel to satisfy consumer energy needs. A significant portion of this import cost goes to diesel for the generation of power, especially for the thousands of generators connected to microgrids serving off-grid communities and for some of the generation assets supplying electricity to the national grid. The estimated cost reduction from the diversification from imported fossil fuels through the introduction of renewable power generation will reduce the cost of grid-based rural electrification and free public resources that will be redirected to rural electrification. In the medium-term, this will result in improved public debt conditions and lower the cost at which Senegalese entities (both public and private) will be able to secure debt. Lowered cost of capital will, in turn, strengthen the case for investment in the domestic renewable energy sector, mobilizing private sector capital. The proposed project's financing origination includes very concessional debt from GCF, which is expected to crowd in some funds from BOAD and from the private sector, thus ameliorating the financial barrier that usually exists for infrastructure projects in the country, by developing the capacities of local project financiers for this project and hence creating an enabling environment for the financing of projects in other sectors of the economy. Thus, the project, if successfully implemented, will provide a proof of concept that will contribute to the satisfaction of the economic and financial needs of Senegal. Reducing the financial needs of the country to import diesel fuel will also help contribute to reducing the country's public debt, which currently stands at about USD 7.5 billion, representing 57 per cent of the country's gross domestic product.

1.4.3. Strengthening the local capital market

31. The concessional loan from GCF is expected to crowd in other financing from other sources, in addition to grant funding from GCF, to build various capacities. This strengthening of the financial market will be essential for changing the baseline situation, in which pricing risks and the lack of a track record for similar projects in the country made local financial institutions unwilling to provide affordable financing solutions to project developers. For the few projects that were implemented in the rural off-grid market, the high costs of capital forced project developers to charge excessive electricity tariffs, denting the demand for and sustainability of the investments. Thus, a shift from the baseline situation, which was promoting fossil-fueled microgrids and at an inadequate speed to deliver the required pathway to universal access to a concessional financial model will accelerate the speed to universal access in Senegal. This model, will offer local financial lenders a de-risked proposition that will help the sector mobilize private sector finance sustainably to ensure that the country will firmly be on the universal access pathway that will be delivered by the target time. This will be very crucial for the replication of this proof of concept in other rural villages not included in this current project.

1.4.4. Institutional needs

32. The baseline institutional capacities in both the public and private sectors of Senegal are still insufficient to lay the foundation for an enabling environment, despite the aggressive rural electrification programme that was being pursued by the Government of Senegal. Under this programme, the recent liberalization of the national energy market that allowed IPPs to compete with SENELEC, especially in the rural off-grid market, in spite of institutional support for the programme, did not deliver an acceptable performance, hence the need for this proposed project. Technical support to strengthen the technical and gender capacity of the PMU, implementing partners, private concessionaires and community beneficiaries with a focus on gender mainstreaming throughout the project cycle will be financed by the grant funding that will be made available by GCF. This will build the necessary private and public institutions needed to guarantee the success of the proposed project. Furthermore, outreach (also to be funded by the grant) to national and regional commercial financiers will help to optimize efforts to replicate the potentials of the project in neighbouring countries.

33. The various needs of the country and especially those of the rural dwellers regarding access to modern electricity will be positively promoted by the success of this project as discussed above. In addition to the successful implementation of this project and its replication in other rural villages not covered by the proposed intervention, will contribute to some of the economic and financial buoyancy of Senegal, while the capacity-building portion of the intervention, facilitated through grant funding from GCF, will contribute to institutional strengthening, especially of public and private institutions that are relevant to the electricity access of Senegal. All the metrics discussed in sub-sections 1.4.1 – 1.4.4 above indicate that the needs of the recipient country, its people and institutions will be very well met by the successful implementation of this project, and TAP thus scores this metric as “high”.

1.5 Country ownership

Scale: High

1.5.1. High-level government support

34. The first key indication of country ownership of this project is the willing support that a key public sector agency of the Government of Senegal gave to this project. BOAD (the AE of this project, which will also act as the as Trustee for the sovereign loan and grants from GCF) and ASER (the government-owned entity set up to plan, develop and manage the rural electrification activities of Senegal) have both obtained the endorsement of the Ministry of Energy and Petroleum, which will exercise direct oversight for this project, and the Ministry of Economy and Finance, which will provide co-financing for the project on behalf of the Government of Senegal. In addition, the Ministry of Environment and Sustainable Development (national designated authority) has been following the preparation of this project since its inception and has assured BOAD and ASER of its willingness to support this GCF funding application due to its clear alignment with some key national strategies and development plans of Senegal. This is robust evidence of the support of the Government of Senegal for this project and an indication of strong country ownership.

35. Alignment of the project with relevant national strategies: some of the key national plans and policies that this project is aligned with can be summarized as follows:

- (a) The Senegalese NDC submitted to the United Nations Framework Convention on Climate Change in September 2015 has rural electrification as a key component of its contribution to international efforts to mitigate climate change. Through its NDC, Senegal pledged that it will unconditionally implement 392 mini-grid systems utilizing domestic/national funds. The NDC document also communicated Senegal’s intention to connect up to 5,000 villages to solar PV mini-grids if it can get external support

- (conditional target).⁷ This proposed project is in alignment with the conditional pledge in the country's NDC;
- (b) Following the declaration of the United Nations General Assembly, which considered 2012 “The International Year of Sustainable Energy for All (SE4ALL)”, the United Nations launched an initiative called “global access to sustainable energy for all by 2030” in collaboration with several development partners. Senegal joined this initiative and worked to achieve appreciable results in terms of access to electricity: a 64 per cent national access rate and a 33.2 per cent rural access rate in 2016. Although this programme’s plan was to achieve a rural electricity access rate of 60 per cent by 2019, the current estimate stands at 42 per cent, indicating that the protocol put together under the country’s SE4ALL programme is not on target to deliver Senegal’s goal of universal access by 2025. It is expected that the proposed project, by mitigating the various barriers that has made this target look as if it would be impossible to meet, will set this goal back on course;
 - (c) The National Strategy for Economic and Social Development adopted in 2012, in which the government committed to increase access to electricity in rural areas in an affordable and equitable way, will also be promoted by the implementation of this proposed project;
 - (d) Universal access to energy in rural areas is considered in the “*Plan Sénégal Émergent*” as a fundamental factor for economic development and the fight against poverty. The main objective of the plan is the emergence of Senegal to promote economic growth as significant leverage for human development; and
 - (e) The “*Plan Sénégal Émergent*” also aims to reduce the cost of generation to a value of between FCFA 60 and 70/kilowatt-hour (EUR 0.09–0.11/kilowatt-hour) in the long term. Investment in renewable energy generation will reduce the government’s dependence on fossil fuels, which are expensive to import.

1.5.2. Implementation capacity of the accredited entity

36. BOAD, a regional development bank, will act as the AE for the proposed project. BOAD will also act as the Trustee for the sovereign loan and grants from GCF. BOAD, in its role as AE, will be responsible for the overall management of this project, including: (i) all aspects of project appraisal; (ii) administrative, financial and technical oversight and supervision throughout project implementation; (iii) ensuring funds are effectively managed to deliver results and achieve objectives; (iv) ensuring the quality of project monitoring, as well as the timeliness and quality of reporting to GCF; and (v) project closure and evaluation. This AE is well suited and prepared for these roles. BOAD has been active in Senegal since its inception and has cooperated with both the Senegalese Ministry of Economy and Finance and the ASER programme (ASER rural electrification program – grid extensions, solar home systems and distinct mini-grids – that is clearly demarked from the proposed GCF project, being already registered under the Clean Development Mechanism (CDM),⁸) for a long time. As of December 2019, BOAD has a total of XOF 128.8 billion in public sector loans in Senegal, supporting 191 projects and initiatives. BOAD is also closely engaged in the Senegalese energy market, managing an aggregate amount of XOF 239.9 billion in loans to the sector, equivalent to 23.3 per cent of all outstanding loans to the Senegalese Government. From this information, it can be

⁷ United Nations Framework Convention on Climate Change (2015) Contribution Prévüe Déterminée au Niveau National.

⁸ UNFCCC (2018) *Senegal Rural Electrification Program*. CDM programme documentation is available [here](#). Note that none of the grids to be developed under this project will be included in the CDM PoA.

concluded that it is equipped, prepared and has the experience to perform the roles earmarked for it in this proposed project.

1.5.3. Executing capacity of the executing entity

37. The executing entity for this project will be ASER, an agency of the Government of Senegal. ASER was formally created by decree in 1999 as an autonomous body with the sole aim of promoting rural electrification in Senegal. The agency functions under the oversight of the Ministry of Petroleum and Energy and the Ministry of Economy and Finance while also reporting to the Senegalese Electricity Sector Regulatory Commission (CRSE). During the period 2005–2019, ASER coordinated about 174 mini-grids in Senegal, which were mostly funded by bilateral donors. During the period 2000–2019, ASER was responsible for more than 12 grid extension projects that enabled the electrification of more than 3,000 villages. Many of the mini-grid projects, whose implementations were managed by ASER during the period mentioned above, used fossil fuel (diesel). ASER can therefore be said to have demonstrated competency in the planning and management of mini-grids supplied electricity by diesel fuel, but it does not have much experience when the generation asset of a mini-grid is dominated by solar PV. This weakness will, however, be ameliorated through carefully designed capacity-building measures that will involve key personnel from ASER, who will eventually serve as the PMU of this planned project. This PMU will be an important department in ASER at the end of the implementation of this project.

38. The project has been designed through a consultative process involving state and federal government agencies, non-government organizations, representatives of trade organizations and professional bodies, and a host of local-level stakeholders, including women, representing the target communities where the mini-grids will be implemented. The gender-specific interventions in the project are a mere reflection of thorough consultations that have been organized at the grassroots level. The federal-level stakeholders who participated from the early conceptualization of this project will consist of personnel representing several key ministries, who will ensure that the project is provided with the right institutional guidance and government counterpart funding as and when needed. This is also a strong indication of country ownership.

39. The national designated authority, the Ministry of Environment and Sustainable Development, sent a no-objection letter to the Secretariat to convey that the Government of Senegal supports the project to the highest extent on 27 March 2020. This is more strong evidence of country ownership.

40. Based on the above analysis, the independent TAP considers the country ownership of the project to be “high”.

1.6 Efficiency and effectiveness

Scale: Moderately high

1.6.1. Financial structure

41. The project seeks debt and grant financing from GCF to implement mini-grid facilities in about 1,000 rural communities in Senegal as part of the country’s electricity access activities, and to carry out capacity-building activities at the institutional and stakeholder levels. The GCF concessional debt contribution request will be combined with co-financing from KfW and BOAD at a co-financing ratio of 1:1.60, considering only the debt portion. The total funding for this project of EUR 198.692 million is expected to be provided by GCF and co-financing from KfW, BOAD and the Government of Senegal. The breakdown of funding contributions from these sources, the types of funding and the total that will be provided for the project are presented in table 2.

Table 2: Project funding details

S/N	Source	Type of fund	Amount (EUR million)
1.	GCF	Loan	73.623
		Grant	1.822
2.	KfW	Loan	102.396
3.	West African Development Bank	Loan	15.245
4.	Government of Senegal	Contribution	5.606
TOTAL			198.692

42. About 37 per cent of the total funding of the project is requested from GCF as a senior loan (EUR 73.623 million) while about 1 per cent (EUR 1.822 million) is required for grant funding. The senior loan from GCF will come with a 40-year tenor, a 10-year grace period and a concessional interest rate of 0.0 per cent per annum. The required grant funding (EUR 1.822 million, slightly <1 per cent of the total project fund) has been earmarked to build the capacity of stakeholders in the country, which is expected to serve as one of the several actions that will be delivered by the project intervention to mitigate many of the barriers identified earlier as the cause of the sluggish delivery of electricity access in the status quo. The capacity built by this proposed project will help create an enabling environment in-country to plan and implement more electricity access minigrids in the country in the future.

1.6.2. Co-financing/leveraging

43. The effectiveness of the concessional loan from GCF can be measured by the fact that each EUR 1.0 from GCF will crowd in about EUR 1.6 of co-financing. The co-financing that will be crowded in will include: a senior loan (EUR 102.396 million) with a 10-year tenor, a 0.5-year grace period and an annual interest rate of 6.14 per cent; and another senior loan (EUR 15.245 million) with a 10-year tenor, a 3-year grace period and an annual fixed interest rate of 7.6 per cent. The counterpart funding contribution of about 3 per cent the total project cost from the Government of Senegal is tangible evidence of its support for the project.

44. The successful implementation of this proposed project will benefit all the consumers currently connected to the mini-grids and those who will be connected after the commissioning of the project. It will also establish a platform for the replication of the proven concept (engineering, financing and management) in other villages in Senegal that are not included in this project.

1.6.3. Financial viability and best practices

45. The financial viability of the project during and beyond GCF support has been designed around the proper implementation of the infrastructure of the mini-grids and the building of the capacities needed in-country for different aspects of project planning and implementation. These capacities will include:

- (a) ASER (PMU): the ability to finance, plan and implement such projects, which is expected to be built into the capabilities of the professionals who will form the core of the PMU. The continuity of their work is expected to be enhanced by their becoming a special project unit within ASER at the close of this GCF support. It is expected that best

practices in project financing and execution will be acquired by these PMU professionals during the implementation of the microgrid systems at each of the sites covered by this intervention; and

- (b) ASER and the concessionaires: these will be funded through a loan from the blended financing to implement the solar PV microgrid system and carry out O&M duties in close collaboration with and supervised by the PMU under a well structured O&M contract with ASER, the entity with national mandate for the development of baseline off-grid/rural electrification projects in Senegal.

46. The capacity of ASER to design, build and implement the solar PV system – probably through the PMU – will also be part of the capacity-building programme for this proposed project. The training that professionals from ASER/PMU will receive during component 1 of this project will include international best practices in all aspects of their work. The now better trained, financially stronger and more technically equipped concessionaires – thanks to the financial support incorporated into this GCF-led funding under a better structured O&M contract with the Government of Senegal through ASER – will be contracted to operate and maintain the minigrid systems that will inject clean electricity into the minigrid facility in each of the covered villages and dispatch it to connected consumers. The independent TAP believes that this setup will deliver effective and efficient minigrid facilities in each of the villages. Lessons learned from this practical proof of concept will, if properly documented and disseminated, play a role in fostering the replicability of the concept for other villages not covered under this project in Senegal. It will also play a role in the replication of the project in other countries in the subregion.

47. The interconnected structure of working together described above, the capacity-building activities that will be carried out as part of this proposed project, and the fact that international best practices will be followed in all the activities will ensure that the project, as planned and presented in the funding proposal, will deliver the targeted objectives. The independent TAP therefore concludes that the efficiency and effectiveness of this proposed project implementation will be “high”.

II. Overall remarks from the independent Technical Advisory Panel

48. The independent TAP recommends that the Board approve the project.

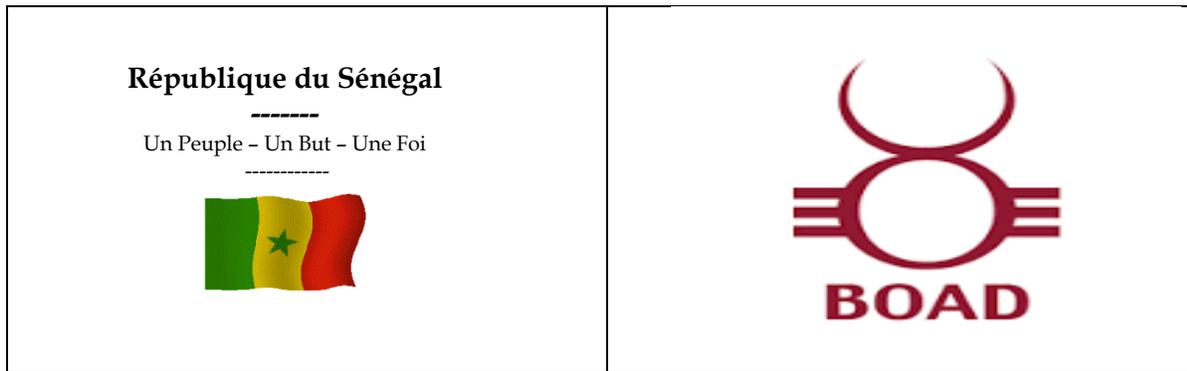
49. The independent TAP recommends that the Secretariat include in the funded activity agreement with the AE the requirement:

- (a) For the AE to report to the GCF in the annual performance reports (APRs) on the lessons learned by the key stakeholders who will be involved and/or carry out all project activities, in order to ensure that the lessons learned can be applied during the implementation of this project as well as in any subsequent replication of the project in Senegal or outside Senegal;
- (b) For the AE to report annually to the GCF on the GHG emission reductions (ER) achieved by the operating project covering the duration of the project lifetime. This ER reporting should cover:
- (i) Project parameters monitored by name, value and confidence interval;
 - (ii) ER calculation methodologies utilized;
 - (iii) The procedures used to achieve the; and
 - (iv) The quality assurance/quality control methods used in preparing and reporting the data and the emission reduction calculations.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP138)

Proposal name:	ASER Rural Electrification Project
Accredited entity:	West African Development Bank (BOAD)
Country/(ies):	Senegal
Project/programme size:	Medium

Impact potential
Thank you for this assessment
Paradigm shift potential
Thank you for this assessment
Sustainable development potential
Thank you for this assessment
Needs of the recipient
Thank you for this assessment
Country ownership
Thank you for this assessment
Efficiency and effectiveness
Thank you for this assessment
Overall remarks from the independent Technical Advisory Panel:
Thanks for the remarks.



ASER Solar Rural Electrification Project

Rural Electrification Project by Mini-grids of 1000 villages in seven (07) regions of SENEGAL.

Fatick, Kaffrine, Kaolack, Kolda, Kédougou, Tambacounda and Saint-Louis

Gender Action Plan

Revised Version

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March 2020

**AGENCE SENEGALAISE D'ELECTRIFICATION RURALE
SENEGALESE AGENCY FOR RURAL ELECTRIFICATION
(ASER)**

**Incorporating the gender dimension into
ASER Solar Rural Electrification Project**



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I. Introduction

Senegal's National Rural Electrification Programme (PNER), piloted by ASER, aims to make electricity an instrument in the fight against poverty through the creation of wealth and jobs in rural areas. To achieve this, it wants to adopt a dynamic strategy, particularly with regard to alternative energies to hydrocarbons, which have an invaluable potential.

Statistics show that the share of renewable energy in Senegal's total energy production is still very low: **10.66% in 2017, with a target of 40% in 2030**. In a context of climate change, it is important to develop strategies including the installation of mini-solar networks for the benefit, in particular, of vulnerable groups that tend to take more wood resources than nature is capable of regenerating.

However, when formulating the programme, ASER did not take into account from the outset a differentiation between groups of men and women and their needs, taking as a reference the neutrality of energy policy. Projects have been designed specifically for women's groups to respond to the lightening of work, without this being part of a gender mainstreaming logic.

To remedy this, ASER, following a diagnosis of the level of gender mainstreaming in the PNER, recently decided to systematize gender mainstreaming in all its projects and programmes.

To this end, an action plan for the integration of gender in the national rural electrification programme using mini-solar grids has been drawn up accordingly.

For ASER, gender mainstreaming is a means of contributing to the achievement of sustainable development objectives by Senegal, through the PES, which considers rural electrification among its priority programmes.

II. Reminder of the context of gender mainstreaming in energy development policies and strategies in Senegal

II.1 The policy framework

Energy occupies a central place in the national development strategy up to 2035 and electricity is one of the most effective factors of production for reducing poverty among the population.

Senegal, like the international community, has committed itself to a new agenda setting out the SDGs (Sustainable Development Goals) towards 2030 after the evaluation of the MDGs in 2015. These SDGs cover all the development issues, including climate change, biodiversity, energy, water, poverty, gender equality, etc. There are 17 SDGs, all of which are well articulated with the three strategic axes of the Emerging Senegal Plan (ESP).

SDGs 5 and 7 converge in terms of a good management of gender and energy aspects.

In addition, Senegal has ratified international treaties on gender equality, namely the United Nations Convention on the Elimination of All Forms of Discrimination against

Women. Thus, several legislative and regulatory provisions have been adopted to punish gender-based violence, the most recent of which relating to the criminalization of rape and paedophilia was passed by the National Assembly in December 2019 and the promulgation decree was signed on 10 January 2020.

As for the empowerment of women, a number of prerequisites for the fulfilment of needs must be met in order to achieve this. Four types of needs exist: (i) practical needs, the satisfaction of which contributes to domestic well-being; the provision of mini-solar kits could well contribute to the improvement of women's living conditions; (ii) social needs, which refer to education, health, transport and training; (iii) productive needs which contribute to the integration of the target groups into the economic fabric, generally through income-generating activities such as product processing. For these three types of needs, energy can prove to be more than a service but a factor of production and development entering the process of the value chain; it ensures the operation of cold chains by guaranteeing the quality required for their good start-up; (iv) the fourth type of need is strategic because it is inherent to decision-making, participation in the life of associations or environmental protection. In our case, management committees of women and young people could be set up in the target villages of our project for a co-management of the solar networks. Several studies carried out in Senegal have shown the primordial place of women in the governance of natural resources based on the concept of gender and development.

II.2 The operationalization of policies

To operationalize the orientations and policies, the State of Senegal has developed framework documents (PSE 1 and 2; SNEEG 1 and 2) and LPSDs (sectoral development policy letters).

The challenge is to understand that energy in all its forms offers a wide choice to the population in terms of the technologies to be used and that its absence reinforces inequalities between men and women.

Currently, there is a timidity in taking gender into account in the energy sector. Admittedly, practical needs were taken into account in the National Action Plan for Women (PANAF 1997 - 2001), but it is with its evaluation in 2003 that the recommendations of Beijing (1995) were recorded in the national strategy: the SNEEG which today serves as a reference document on gender (SNEEG 1 and 2).

In this platform - PANAF 1997-2001, adopted as part of the implementation of the 9th Economic and Social Development Plan (PODES 1996-2001), whose Strategic Orientation No. 9 took the gender dimension into account - the use of improved cookstoves by rural women was mentioned instead. Performance was also achieved in the use of butane gas for cooking, but it was found that this programme had benefited urban rather than rural populations that use traditional energy (wood and charcoal), which greatly increases their vulnerability by exposing them to health problems related to smoke that is harmful to women and their children.

Ultimately, the concerns of men and women in vulnerable communities to access reliable, low-cost energy services and productive uses of energy are compounded by the lack of gender mainstreaming in the design, planning and implementation of most projects. (Example: Local Rural Electrification Plan of the concession of "Matam - Ranerou -Bakel", Project of Sustainable Development through Renewable Energies - South East Senegal - DPER-SE Senegal).

ASER wants to take up the challenge of gender and energy issues by proposing a programme including mini-solar grids for the benefit of 1000 villages far from existing power lines. This programme aims to reach 340,000 men and women disadvantaged by their isolation and affected by poverty by improving their living conditions through productive uses of electricity managed by women and young people.

III. Gender analysis

III.1 Gender situation in Senegal

III.1.1 The vision and institutional mechanisms

By signing international conventions, Senegal has committed to incorporate the gender dimension into policies, standards and programmes. The aim is to recognise gender mainstreaming as a cross-cutting issue at the institutional level. A Ministry of Gender¹ was created for the first time in 2010 and during the same year,² the law instituting absolute parity in the totally- or partially-elective assemblies was adopted. This law was tested for the first time during the elections for the deputies on 1 July 2012, during which there was a high representation of women. From 22% (33 deputies) for the 2007-2012 legislature, the number of women deputies increased to 43.3% (64 deputies) for the 2012-2017 legislature.

The institutionalization of the gender dimension in public policies is effective through Decree No. 2017-313 of 13 February 2017 which creates and attaches gender units to the General Secretariat of each ministry. Moreover, in 2016, a gender-sensitive budget document will be annexed to the Initial Finance Act. In 2017, 12 sectoral ministries adopted the gender-sensitive budget, compared to 4 ministries in 2016.

However, despite these highly political decisions, women are still affected by inequality at all levels and gender issues affect poverty, health, education, access to finance, employment, access to land and means of production among others. Women are active in the productive sectors, the small market economy and the informal sector. Any action aimed at supporting them in these sectors has an impact on their economic power, their participation at the strategic level and the well-being of the family. Access to electricity can therefore be an important input, but also a bulwark against the constraints that affect gender relations.

¹ Within the same government, three ministries were in charge of women's issues: the Ministry of Gender; the Ministry of Family, Women's Groups and Child Protection; and the Ministry of Women's Entrepreneurship and Microfinance. However, the multiplicity of mechanisms has not always been conducive to decision-making on women's expectations and gender.

² 14 May 2010

III.1.2 Gender inequalities in Senegal

Senegal has made great strides in mainstreaming gender in the various development sectors, but there is still a long way to go, particularly in terms of translating intentions into practice.

Nevertheless, it must be noted that some achievements have been made, particularly with the adoption of the National Strategy for Gender Equity and Equality (SNEEG), which has seen many programmes initiated with a view to contributing to the alleviation of women's work. For example, in terms of women's access to modern energy services, the Multifunctional Platform Programme in Senegal, launched in 2002 for the period up to 2015, has helped to strengthen women's The programme has also supported them in the economic management of a processing unit. During the pilot phase started in 2001, 40 units were installed throughout the regions of Kédougou, Tambacounda and Thiès.

To this end, women have been able to benefit from the allowance: (i) equipment for processing agricultural products (millet mills, rice huskers, threshers, oil presses and groundnut paste mills); (ii) hydraulic equipment (motor pump units, sinking and rehabilitation of wells, water supply, boreholes, water towers, standpipes and electric pumps); (iii) equipment to support income-generating activities (sewing machines, carts and equipment, market gardening equipment). In parallel with these initiatives, access to land, credit, information, capacity-building, economic promotion, etc., have been strengthened through other partners such as NGOs. These initiatives have helped to strengthen women's participation in sustainable development.

Notwithstanding these improvements, it must be recognized that some approaches are still the concern of development partners, rather than a well-thought-out, well-considered national strategy integrated into the process of implementing a coherent policy. Gender mainstreaming as well as the march towards women's empowerment still suffer from certain constraints, in particular:

- weak gender mainstreaming in policies and programmes ;
- the inadequacy of sex-disaggregated data at all levels of activity for the development of indicators;
- the weak involvement of the private sector and professional associations in the advancement of women;
- the low level of education, training and literacy among women;
- high maternal mortality and morbidity;
- the high vulnerability of women and adolescent girls to STIs/HIV/AIDS.

The table below provides an overview of gender disparities in Senegal with respect to several socio-economic variables relating to the productive sectors, basic social services, well-being and quality of life.

Determinants	Women (%)	Men (%)
Access to property	13,40	86,60 ³
Agricultural exploitation	21	79
Rural activities (agriculture, livestock farming, fishing)	82,6	79,4

³ Senegal - FAO, National agricultural census 1998-99

Literacy rate 15-24 y/o	48,8	65,7 ⁴
Net attendance rate in primary school	56,1	52,3
Gross primary school enrolment rate	83,30 (2011)	80,50
Completion rate in primary school	58,5 (2011)	60,2
Unemployment rate	28,2 - 13,3 (2011)	17 - 7,7 (2011)
Working population	45	54,91
Employer positions	0,7	1,2
Female employees in the non-agricultural sectors	21,6 (2001) - 26,5 (2005)	-
Maternal mortality rate (‰)	401 (2005)	-
HIV-AIDS prevalence rate (15-49 y/o)	0,8	0,5 (National)
Members of Parliament	19,2 (2005) - 42,6 (2012)	80,8 - 57,3 (2012) ⁵

Source: OMD II and OMD 2011, ESPS 2005, Labo genre-Unifem

III.2 Gender mainstreaming in energy policy

Senegal's energy policy considers the population as a whole and it uses as references the indicators relating to the rates of access, service and rural electrification. The household is the basic reference that unites gender and energy as it is the first level of collection and use of energy data and the first level of gender analysis.

The proportion of the population with access to electricity has changed significantly; in 2017 - 2018, it is 68% (88% in urban areas and 38% in rural areas) against 62% in 2015 and 26% in 1990. Important steps have been taken with the implementation of concessionaires that have made it possible to connect 14941 rural households by the end of 2017.

In spite of the lack of proven attention to gender, the government has adopted the strategy of linking economic growth, human development and poverty alleviation through increased access to modern forms of energy, in particular electricity.

In addition, with the Emerging Senegal Plan, particular emphasis has been placed on increasing human capital through job creation and reducing inequalities through the potential of individuals, grassroots communities and regions. Connecting the target villages to solar grids would open up job opportunities for young people in various electricity using trades such as metal carpentry and electrical repairs.

For rural women, cooking and motive power remain the main gender issues in the energy sector. Wood collection is their exclusive domain and the use of biomass has adverse effects on their health and that of children, hence measures to modernize cooking fuels. As for electricity, its weight in mitigating gender inequalities is important because of the opportunities in access to modern energy services against the use of motive power. The programme would pave the way for productive uses of energy based on the gender-specific needs of households; it will no longer be a question of simple access to electricity for lighting but rather of a dynamic of individual and community development associated with improved energy efficiency.

III.3 Gender mainstreaming in the National Rural Electrification Programme (PNER)

⁴ OMD Indicators, EDS-MICS Senegal 2010-2011

⁵ Legislative elections, July 2012

Gender mainstreaming was not taken into consideration in the design of the national rural electrification programme, which provides for all forms of electrification (grid and off-grid). Energy documents have remained silent on the issue and individuals, both men and women, are not cited. At the institutional level, gender and social issues are not integrated into the more technically- and financially-oriented missions of ASER, something confirmed by indicators⁶ that do not provide information on the real impacts of the programme in communities and households. Moreover, it is not discussed in the course of the activities and there is no defined strategy on the participation of target groups. These groups are considered as passive beneficiaries who therefore do not contribute to the decision-making process on the setting up of projects. The organisation and its implementing partners (concessionaires) do not have sufficient expertise to take gender mainstreaming into account in its action strategy. ASER's staff is very unbalanced according to gender, with twice as many men as women and very few women in decision-making positions.

The table above provides an overview of the distribution of ASER staff by status in relation to gender issues.

Breakdown of staff by status as of 31 December 2012

Status of staff with a permanent contract	Men	Women	Total
Employees	24	03	27
Supervisors	06	14	20
Executives	28	06	34
TOTAL	58	23	81

Source: ASER

III.4 The socio-cultural underpinnings of gender inequalities in the energy sector, discriminatory factors and their socio-economic implications

III.4.1 Access to energy in the face of socio-cultural realities

There is a very strong inequality in access to energy because the needs of men and women are not the same and the roles are not the same either. The sexual division of labour by society assigns women different social roles from those of men. Thus, women are confined to the reproductive role, i.e. the management of the household: cooking, fetching water, looking after and educating children, maintaining the home, health, and participating as labourers in agricultural production. In community life, she rarely occupies decision-making positions. And it is influential factors such as socio-cultural, religious, legal and political beliefs that justify this state of affairs. There is also the economic dimension: if we look at the profile of access and control, we notice that women, given the roles assigned to them, have very little access to energy in a global way and to productive energy in a specific way.

In other words, men and women use energy differently because their roles, needs and responsibilities in society are different. Also, depending on whether one is in the rural or peri-urban or urban environment, the production factor "energy" does not intervene in the same way in the functions that men and women occupy; men have more of an economic role which allows them to access and control resources, in this case energy; they determine the allocation of energy

⁶ Rural electrification rate, coverage rate and geographical coverage rate, calculated on the basis of the number of electrified households, households in electrified rural localities and households in rural localities. (Mission letter of the ASER Director General 2007-2012.)

which, more than a production factor, is a development factor in the implementation of activities. Men's activities are generally remunerative (in Senegal, men are present in the production of cash crops: groundnuts, market gardening, fruit trees: mangoes, while women are in the domestic sphere and engage in arduous and low-valued tasks.

A specific category is made up of women heads of households who, apart from their traditional functions linked to their social status and the role assigned to women in society, in relation to the sexual division of labour, may find themselves assuming productive functions for the upkeep of the household, which makes them more vulnerable. However, there may be differences between them in terms of access to energy, which may arise from their location (town/country; whether they are connected to the electrification grid or not), levels of income, employment, age, dependents, financial support by family members or relatives, etc.

III.4.2 Socio-economic and environmental impacts

- Socially:

In terms of socio-economic consequences, the first constraint for women is the lack of time to carry out heavy and repetitive tasks using only their muscular strength. Thus, they devote themselves successively to milling cereals, collecting firewood, fetching water, working in the fields, preparing meals, etc., for 13 to 16 hours during the day. These tasks are unpaid and contribute to the lack of balance between the activities of men and women in society.

In the absence of services to facilitate these activities, women completely lack autonomy. The only alternative for them remains the support of their daughters who accompany them in carrying out these tasks. Girls are no longer able to attend school regularly, if they are enrolled, and thus find themselves in a situation of dropping out of school.

The heavy workload of women's activities leads to real health problems in a context where the health needs of the population are still very poorly met. Women are at risk of abortion and are exposed to fumes from the use of wood, cow dung, crop residues and other alternatives, at a time when the use of gas is widespread in urban centres.

The lack of time and services to facilitate women's activities leads to their exclusion from local decision-making spheres and obscures the development of productive activities to enable them in the long run to acquire income. However, the trend is evolving positively due to the gender dynamic.

- On the economic level :

In Senegal, women are very active in the agricultural value chain, as shown in Table 1, and increasingly, they are found in the processing and petty trade segments. In the processing chain, they are organized into women's promotion groups (GPF) or economic interest groups (GIE) or micro enterprises to jointly address the challenges and issues of empowerment. They face many constraints, especially those related to the correct supply of inputs and other factors of production such as energy.

This poor access to productive energy limits their activities of transformation, storage of raw materials, conservation and packaging of finished products.

There is interference or even complementarity between the different sectors and the high cost of energy is a burden on the operating accounts of many women's microenterprises, which inevitably limits their market share.

- On the environmental front:

The predominance of biomass in the satisfaction of household energy needs cannot evolve without consequences on the environment, whose regeneration capacities have been largely hampered by a number of factors, including: large forest extraction, successive droughts, soil degradation, reduced rainfall and the unsustainable practices of populations.

III.5 Gender mainstreaming in the implementation at the household and community levels

Gender mainstreaming is not taken into consideration in rural electrification concessions, which are characterized by a diversity of electrification modes and managed by private operators. Here, the beneficiaries' preference is for continuous electricity service guaranteed by the grid. The needs for electricity services are varied and huge.

In the places selected by our study, the process of rural electrification raises specific gender issues, notably on:

- the priority given to technical aspects in household access to electricity;
- the difficulties encountered in accessing electricity to stimulate regional development at the productive, economic, entrepreneurial and social levels;
- the lack of electricity for certain services and infrastructure in electrified localities;
- difficulties in accessing finance to strengthen the economic capacities of women and men through electricity;
- the lack of participation of the beneficiary populations in the electrification process due to the lack of a predefined role, with women feeling less concerned because they assume that men should take care of electricity-related issues;
- the privileged position of men to be the interlocutors of technicians and their decision-making power on taking out subscriptions because of their status as heads of the households;
- the very limited number of women heads of households and their economic situation, a parameter to be considered when it comes to connecting households and payment of bills;
- the travel made by women to electrified villages to meet the needs for milling, sewing, ice, etc., and the arrival of men because of the establishment of their professional activities (metallurgy, carpentry, vulcanization, etc.);
- the need for capacity building of men, women and youth, interested in the maintenance of indoor facilities, participation in infrastructure management, and the role of the focal point to ensure proximity between ASER and the beneficiaries;
- the pricing of electricity in off-grid areas, considered expensive by the beneficiaries because of the discontinuity of the service and the very low level of development of services and economic activities;
- the scope of ASER's actions limited to access to electricity for the population without taking into account paramount needs not related to electricity such as domestic fuel for women;

- the incomplete coverage of some villages by the network, which does not reach outlying neighbourhoods.

Therefore, a good key to the distribution of productive uses of energy among men, women, young people and even communities needs to be defined. Within the framework of the project, positive discrimination should be made against women's microenterprises by setting up mechanisms to take better advantage of the energy opportunities that will arise: training of target groups in trades, design of business plans around activities identified beforehand and search for financing (credits, subsidies), capacity building in equipment and provision of connection coupons to the most vulnerable, support for a good organizational and institutional structuring of women's organizations.

In addition, in view of the energy issues contained in the SDGs, the guidelines of the PES (Senegal Emerging Plan) and the letters of the Sectoral Policy for the Development of the Energy Sector (LPDSE), several measures have been taken since 2013 to improve the performance of the energy sector at lower cost, even though households still consider energy to be too expensive. In the rural world, faced with the problem of deforestation, several strategies have been designed with the popularisation of improved stoves, solar cookers or bio-digesters through programmes such as biogas or with the support of NGOs. The prepayment meters (commonly called Woyofal) instituted in recent years are working towards a good rationalization of electricity charges. If household members want to engage in economic activities, they usually use this option to better manage their electricity consumption and thus avoid resorting to loans that can be costly or to moratoria on bill payments.

Furthermore, taking into account current issues such as sustainable development, climate change, and gender issues related to energy in a dynamic of poverty reduction, it is important in energy communities to increase the resilience of women and girls. They must access and control energy services to better play their part in economic and social development. Hence the opportunity to study the multisectoral nature of energy with a cross-cutting approach that would consist in meeting both the practical needs related to the tedious nature of certain works and strategies (health, education/training/learning, business development, access to credit, transport, product marketing, leadership etc.).

Local energy communities have emerged all over the world both technically (use of renewable energy) and organisationally (definition of a mode of governance of the resource) involving all households in energy production; the motivations are both economic and environmental. It is a trend towards energy transition that facilitates local cooperation and the involvement of all citizens in the fight against climate change. In our project, the technologies based on mini-solar grids, once implemented and operational, will make the price per kWh produced competitive. And women grouped in micro enterprises should make important investments in order to reduce costs and risks and to add value to local products.

A reinforcement of the capacities of the system that will be put in place and will include :

- Energy networks; in our case, it will be mini-solar networks interconnected by cables;
- A system of governance in which women and girls will play a key role; their specific needs listed above will be prioritized and the card will be played of optimization in the productive uses of

energy. With such a model, energy communities will expect to improve living conditions by meeting productive needs.

In addition, it would be advisable before the intervention of the project to carry out popular consultations in order to better integrate women and young people in the governance of this project. Like the local natural resource management committees that define the different uses of wood in the communities and where rural women have an important role to play, within the framework of this project, inequalities in terms of access to and control of energy must be discussed so that :

- Men and women no longer resort to abusive wood cutting (timber and firewood) and that this renewable energy is the right alternative ;

- All gender-specific needs are taken care of and met.

As a strategy, much emphasis will have to be placed on advocacy, awareness-raising/communication and training on gender issues in particular:

- Advocacy by administrative (governors, prefects, sub-prefects) and local (mayors) authorities in favour of the most vulnerable groups for a good distribution of energy is necessary;
- Awareness raising of the men and women concerned by the project on the differences, the position of people in relation to decision-making bodies, the roles and potential impacts of project interventions on the lives of populations in general. In a gender mainstreaming dynamic, for each category of resources likely to be concerned and on which inequalities of access such as factors of production (including modern energy) weigh, awareness sessions on equitable distribution will be conducted. Also, in order to better manage possible disputes arising from the provision of this modern type of energy, a complaints management mechanism will have to be put in place; this is a relevant tool for correcting gender inequalities;
- Technical training on the different types of economic activities listed should be provided to women, as well as training on gender & development, gender & energy issues.

Finally, it should be noted that Senegalese society has been hit hard in recent years by recurrent acts of violence perpetrated against women and girls. Women who are victims of violence are very weakened psychologically. As such, both families and society should support them and help them to meet the challenges at all levels. However, it should be noted that, given the socio-cultural realities, these cases of violence are very rarely known to the public when they do not reach a certain level of seriousness. Consequently, it would be advisable to establish a complaints management mechanism that would make it possible to identify this category and to include it in awareness-raising programmes, in order to ensure positive discrimination in favour of these persons.

However, the intervention of the project could have advantages related to :

- education of children;
- lighting and security in public and private spaces;

- the promotion of economic activities of women's groups and consequently the strengthening of their leadership/participation in decision-making bodies;
- a proper water supply for the population (rural hydraulics) and other social actions that could be taken care of (electricity supply for health centres: maternity, paediatrics, etc.).

IV. Constraints and opportunities to incorporate gender considerations

Prior to the conduct of the analysis of gender mainstreaming in the national rural electrification programme, ASER was part of the audit of gender mainstreaming in energy policies and programmes conducted in 2005-2007. The audit exercise was initiated by the International Network on Gender and Sustainable Energy (ENERGIA) in 5 pilot countries for the adoption of a more gender-oriented approach in the energy sector, which is known for its high degree of neutrality. Previously, two of its executives had been involved in discussions and all activities on gender and energy at the national level. After several attempts to develop a framework for monitoring programme impacts, a gender-sensitive manual to strengthen the results-based management of electrification programmes was produced in 2012. It is also a good opportunity for the institutionalization of gender in the agency.

The appropriate tool is the web that allows, from a diagnosis of the problems of a target group, to make a declination of gender management at the macro, meso and micro social levels taking into account the different spheres of influence.

From the perspective of our programme, ASER must use this tool (the gender institutionalization web). In our case, it will be necessary to question the gender roles of men and women who will be impacted by the connection to the mini-grids; To this end, ASER must ask itself a certain number of questions in this case: with the change that will take place, how will the situations of men and women evolve and how will the various actors in the villages concerned interfere? Faced with the stakes, what will be the pressure groups at the community level in relation to access and control of the electricity generated?

Also, at the household level, what will be the price to be paid to be able to widen the range of priority activities born of the opportunity (energy) offered? These are all sensitive gender issues that will challenge ASER and to which solutions must be sought by strengthening the intervention teams in terms of gender.

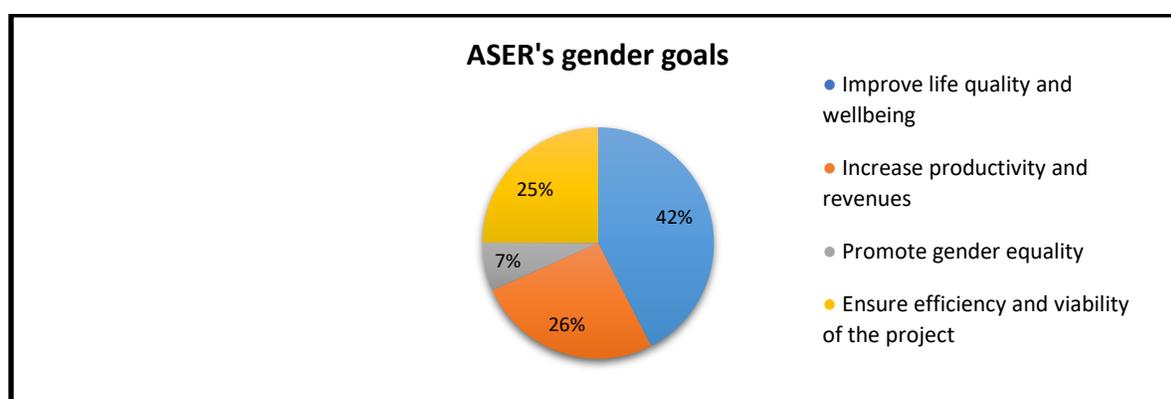
In addition, it should be noted that the ASER has recently (in 2019) completed its Strategic Development Plan (SDP) 2020-2023 where gender mainstreaming becomes a reality in the formulation of planned intervention axes.

However, many factors still prevent ASER from achieving effective gender mainstreaming. These include the following:

- lack of sustained collaboration between ASER and the institutions in charge of gender issues; At this level, it is important to create a synergy of actions between ASER, the programme's implementing agency, and the projects initiated by the Ministry of Family and Gender and the Ministry of Agriculture (women and young people are very present in agricultural production, artisanal dairy and fisheries processing and throughout the value chain).

- lack of means of the beneficiaries for the initial investment necessary to start up professional activities and IGAs; the pooling of means between the various stakeholders is necessary.
- electricity pricing that does not include special tariffs for women and the poor;
- lack of energy services for an optimized use of electricity at the productive and professional level.

During workshop which presented the initial results of the analysis to the ASER management and technical staff⁷, a gender target identification exercise was carried out. The exercise was carried out in groups using defined indicators⁸ correlated to ASER's implementation tools.⁹ Compared to the missions of the agency, it emerged that the achievement of the well-being of the populations, which obtained the score of 42%, constitutes a primary objective to be achieved through access to electricity. Moreover, the increase in productivity (26%) and the efficiency of the project (25%) clearly raise more concern than promotion of gender equality, which only obtained 7% of the scores.



V. Challenges to incorporating gender mainstreaming into ASER's energy projects

ASER will focus on the effects and impacts of electrification on households, groups and the community at large. Significant imbalances still exist in gender relations, particularly in terms of access to work opportunities, employment and access to electricity. The process of gender mainstreaming poses several challenges to ASER:

- Collaborate closely with institutions (decentralized and deconcentrated) support and advisory structures; Producer Organizations, men and women, CSAs, resource persons, local NGOs in charge of gender issues for an overall vision of the gender roles and needs of women, men and vulnerable groups in relation to energy, for a local approach to development sensitive to priorities.
- Increasing women's leadership as a prerequisite for women's socio-economic empowerment.

⁷ The workshop was attended by 17 people, including 10 executives from ASER and the Director.

⁸ Practical Handbook, Volume 2: Resource Pack. Elizabeth Cecelsky and Soma Dutta, ENERGIA International Network on Gender and Sustainable Energy. Draft May 2010.

⁹ Local initiative electrification projects (ERILs), priority rural electrification programmes (PPER), multisectoral projects (PREMs) and the State Emergency Programme (PUE).

- Strengthen the gender capacity of ASER staff, implementing partners, CIMES members, focal points, and social organizations with a focus on gender mainstreaming throughout the project cycle and gender-sensitive indicators.
- Strengthen the communication strategy in the different stages of project implementation and identify a contact or focal point, intermediary between ASER and rural populations for continuous information of actors with appropriate supports (in local languages using community radio).
- Collect and appropriately use disaggregated statistics (gender, age, income) on men, women and youth in all areas.
- Put into practice the monitoring framework and gender-sensitive indicators with a disaggregated database and reconsider each time the unsatisfied demand in electrified localities;
- Manage from upstream to downstream the entire technical process up to the indoor installations for household access to electricity by respecting the programming for the rapid promotion of productive uses at the community level in order to accelerate the changes that can eradicate poverty and give added value to electricity.
- Create multi-stakeholder committees responsible for supervision in the management of the networks.
- Promote energy sectors according to the economic potential of each region and support the establishment of a mechanism for access to microcredit for the development of productive activities.

Based on the identified constraints and challenges, a gender action plan for the rural electrification programme using solar mini-grids was developed. It will focus on three main outputs for which a series of actions to be implemented were identified: (i) gender is institutionalized in ASER; (ii) the energy needs of men and women are understood and met; (iii) access to finance for the development of economic and professional activities for access to income is supported. The implementation of this action plan calls for the active involvement of ASER and a synergy between all development partners and actors.

VI. Gender Action Plan for the solar mini-grids programme

- **General objective**

Improve access to clean energy from mini-solar grids to meet the differentiated productive use needs of men and women in the target villages and increase their resilience.

- **Results**

R1: Capacity building with the following activities on the technical, organizational and managerial levels:

- ✓ Training and sensitization of ASER and other project entities on Gender & Development, Gender & Energy and gender institutionalization issues.
- ✓ Elaboration of a gender sensitive communication strategy with emphasis on information and sensitization campaigns;
- ✓ Sensitization of men, women and young people on the existing energy potential, on the existing opportunities for : (i) meet the gender needs of different groups and the community, (ii) set up preferential tariffs for households below the poverty line, (iii)

support the introduction of easy metering and payment systems, (iv) raise awareness among the public on security issues related to the risks of tampering with lines (or batteries) or fraud.

- ✓ Sensitization of management committees and women's umbrella organizations on all cross-cutting issues such as gender, local governance of electricity services, climate change in order to achieve productive uses of mini-grids that can meet gender and community infrastructure demands.

R2: the Community's energy needs, in particular :

- ✓ health centres with the induced effects of reducing maternal and infant mortality and population morbidity;
- ✓ schools impacting on the education of boys and girls, training ;
- ✓ water works such as boreholes and households are satisfied.

R3: the energy needs of vulnerable men and women are understood and met :

- ✓ Installation of meters for poor female-headed households and for young people exposed to clandestine emigration: provide them with training, trainers in trades such as food processing, metal carpentry, silk-screen printing etc.; provide them with subsidies for adequate equipment for economic and professional activities
- ✓ Improved business opportunities for X energy efficiency enterprises owned by women's groups with agro-processing units; provide subsidies for solar kits and equipment to encourage them to increase their production and market share.

The implementation of this action plan calls for the active involvement of ASER and synergy between all partners and development actors (*see action plan in the form of a logical framework in the Excel table*).

R4: A program management unit is set up and is functional, namely :

- ✓ Updating the ASER monitoring and evaluation system and integrating and monitoring the project's gender indicators;
- ✓ To carry out the follow-up of the implementation of the gender action plan;
- ✓ Carry out an evaluation of the project's gender action plan.

Gender Action Plan

Components	Results	Activities	Indicators	Baseline	Target	Calendar	Roles	Budget
<p>the solar rural electrification project using mini-grids targets a total of 1,000 villages remote from existing power lines where mini-grids will be installed to provide access to electricity to 344,000 persons among which 50.2% {ANSD, 2017} of women disadvantaged by their isolation and affected by poverty. 3,739 productive uses managed by women will have access to electricity (including boreholes, schools and health infrastructures), thus improving the living conditions of women and young people.</p>								
<p>Gender results:</p> <ul style="list-style-type: none"> * Gender is institutionalized in ASER and other implementing entities of the programme * the energy needs of men and women are understood and taken into account in the dimensioning of equipment * access to facilitated financing for the development of economic and professional activities 								
Capacity Building	The capacities of ASER and its partners are strengthened	Establish a sectoral committee headed by a focal point responsible for monitoring all activities related to gender mainstreaming	Memorandum establishing committee	0	1	2020, T1	ASER	10 000
		- Targeting women and girls as a priority, during training sessions in the trades proposed by the Project's capacity building programme, in order to enable them to apply for	At least half of the enrolments per region in the vocational training programmes offered as part of capacity-building are women and girls.	0		2020, T4	ASER/Local stakeholders (local authorities, administrative authorities, beneficiaries' associations)	-

	<p>jobs, during works and commissioning.</p> <ul style="list-style-type: none"> - To set up a recruitment mechanism favouring young people and women ; - Representation of women and youth in local recruitment committees ; 						
	<ul style="list-style-type: none"> - Identify and support CBOs managed by women and young people in the villages targeted by the program. - Set up management committees of women and young people in the target villages or local structures with a strong focus on women and young people, in line with the 	<ul style="list-style-type: none"> - List of CBOs identified by village - 100% of the communes have local committees or structures that give a large place to women and young people, created among the target villages and their operability. 	0	TBD	2020, T4	ASER	85 000

		organizational and operational mechanism defined in the stakeholder engagement plan, in which vulnerability aspects are given special attention.					
		A training programme for all stakeholders (ASER, operators, CBOs, etc.) is developed and implemented.	Training programme and number of people trained	0	TBD	durant le projet	132 000
		Develop and implement a gender-sensitive communication campaign on the project and its various components.	Communication strategy and number of campaigns carried out	0	TBD	durant le projet	50 000
Detail engineering study (execution)	The Community's energy needs for improved access to basic social services are	Gender-sensitive survey forms are used for demand analysis A detailed preliminary	- Standard Gender Mainstreaming Form - Gender mainstreaming in the technical design and implementation modalities of the project	0	2	2020, T4	-
						ASER, UGP	

	understood , taken into account and met.	design and specifications for the creation of 1,000 mini-solar arrays, integrating gender-specific needs is produced						
		Mini solar power plants and LV networks are designed to meet the energy needs of households and productive and socio-community uses.	Planned plant capacity vs. demand	0	TBD	2020, T4	Consultant, Aser	-
Carrying out the work and connecting customers	Realization of 1,000 mini-grids and connection of 39,000 households, and 4,500 productive and social uses	In the targeted households, men and women are consulted during the construction of indoor facilities and the subscription	The number of positively impacted female heads of household subscribing	0	TBD	2021, 2022	opérateur, Aser	-
		A mechanism to facilitate the subscription of productive	The number of connected productive users	0	TBD	2021, 2022	opérateur, Aser	-

		uses managed by women is set up (Coupon system).						
		An easy access to financing allowing productive users to acquire production equipment is set up and operational with the MFIs.	Number of productive users benefiting, 60% of whom are women and young people.	0	TBD	2021, 2022	Aser, IMF	225 000
Programme management, monitoring and evaluation	A programme management unit is set up and is operational	The ASER monitoring and evaluation system is updated and the programme's gender indicators are integrated and monitored.	ASER Monitoring & Evaluation System is updated - Existence of a performance framework	0	1	2021, T1	ASER	-
		Monitoring of the implementation of the gender action plan is being carried out	Periodic monitoring reports - Updated Performance Framework	0	6	2021, 2022	ASER	43 000
		A gender action plan evaluation of	Program evaluation report	0	1	2023	ASER Consultants	70 000

the
programme is
carried out.