



**Part I: Project Information**

**Name of Parent Program**

**GEF-7 Africa Minigrids Program**

**GEF ID**

**10834**

**Project Type**

MSP

**Type of Trust Fund**

GET

**CBIT/NGI**

**CBIT No**

**NGI No**

**Project Title**

Mali national child project under the Africa Minigrids Program

**Countries**

Mali

**Agency(ies)**

UNDP

**Other Executing Partner(s)**

Renewable Energy Agency (AER-Mali)

**Executing Partner Type**

Government

**GEF Focal Area**

Climate Change

**Sector**

Renewable Energy

**Taxonomy**

Stakeholders, Focal Areas, Climate Change, Climate Change Mitigation, Renewable Energy, Energy Efficiency, Technology Transfer, Financing, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Influencing models, Demonstrate innovative approach, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Deploy innovative financial instruments, Local Communities, Beneficiaries, Civil Society, Community Based Organization, Type of Engagement, Partnership, Information Dissemination, Consultation, Participation, Communications, Education, Public Campaigns, Behavior change, Awareness Raising, Private Sector, Large corporations, SMEs, Individuals/Entrepreneurs, Capital providers, Financial intermediaries and market facilitators, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Women groups, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Capacity Development, Participation and leadership, Capacity, Knowledge and Research, Enabling Activities, Innovation, Knowledge Exchange, Learning, Indicators to measure change, Theory of change, Adaptive management

**Rio Markers****Climate Change Mitigation**

Principal Objective 2

**Climate Change Adaptation**

No Contribution 0

**Biodiversity**

No Contribution 0

**Land Degradation**

No Contribution 0

**Submission Date**

9/30/2022

**Expected Implementation Start**

6/1/2023

**Expected Completion Date**

5/31/2027

**Duration**

48In Months

**Agency Fee(\$)**

160,603.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

| <b>Objectives/Programs</b>    | <b>Focal Area Outcomes</b>  | <b>Trust Fund</b> | <b>GEF Amount(\$)</b> | <b>Co-Fin Amount(\$)</b> |
|-------------------------------|---|-------------------|-----------------------|--------------------------|
| CCM-1-1                       | Promote innovation and technology transfer for sustainable energy breakthroughs for decentralized renewable power with energy storage | GET               | 1,784,476.00          | 148,954,219.00           |
| <b>Total Project Cost(\$)</b> |   |                   | <b>1,784,476.00</b>   | <b>148,954,219.00</b>    |

## B. Project description summary

### Project Objective

Supporting access to clean energy by increasing the financial viability, and promoting scaled-up commercial investment, in renewable energy minigrids in Mali with a focus on cost-reduction levers and innovative business models, in the Great Green Wall intervention zone

| <b>Project Component</b> | <b>Financing Type</b> | <b>Expected Outcomes</b> | <b>Expected Outputs</b> | <b>Trust Fund</b> | <b>GEF Project Financing(\$)</b> | <b>Confirmed Co-Financing(\$)</b> |
|--------------------------|-----------------------|--------------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|
|--------------------------|-----------------------|--------------------------|-------------------------|-------------------|----------------------------------|-----------------------------------|

| Project Component                   | Financing Type       | Expected Outcomes  | Expected Outputs  | Trust Fund | GEF Project Financing(\$) | Confirmed Co-Financing(\$) |
|-------------------------------------|----------------------|--|---|------------|---------------------------|----------------------------|
| Component 1 - Policy and Regulation | Technical Assistance | Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in low-carbon minigrids | <p>1.1: The national inclusive off-grid platform, currently being institutionalized/operationalized under the leadership of the DNE, is supported to identify mini-grid delivery models, clarifying priority interventions for an integrated approach to off-grid electrification</p> <p>1.2: A dialogue following the Minigrid DREI techno-economic analyses is facilitated, de-risking instruments are developed and an update of the DREI is conducted in Year 4</p> <p>1.3. An update of the Great Green Wall strategy and action plan is conducted for a better consideration of energy infrastructures in climate actions and green economy</p> <p>1.4: Capacity building is provided to public officials (agencies, regulator, ministries) specifically to support cost-reduction levers and innovative business models</p> <p>1.5.: Quality standards for solar mini-grid components are domesticated, and institutional capacity of AER Mali and the Electrotechnical Standards Committee is</p> | GET        | 284,602.00                | 8,916,879.00               |

| Project Component   | Financing Type       | Expected Outcomes   | Expected Outputs  | Trust Fund | GEF Project Financing(\$) | Confirmed Co-Financing(\$) |
|---|----------------------|---|---|------------|---------------------------|----------------------------|
| Component 2 - Business model innovation with the private sector | Investment           | Innovative business models based on cost reduction are operationalized, with strengthened private sector participation in renewable energy minigrid development | 2.1 Pilots are developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in mini-grids in the Great Green Wall zone  | GET        | 500,000.00                | 105,877,179.00             |
| Component 2 - Business model innovation with the private sector | Technical Assistance |   | 2.2 National report and technical assistance on opportunities to boost economic activities through electricity access and productive use with a particular focus on productive and green ecosystems is made available<br><br>2.3 Capacities of private minigrid developers and communities are strengthened | GET        | 368,340.00                | 10,000,000.00              |

| Project Component                    | Financing Type       | Expected Outcomes  | Expected Outputs   | Trust Fund | GEF Project Financing(\$) | Confirmed Co-Financing(\$) |
|--------------------------------------|----------------------|--|--|------------|---------------------------|----------------------------|
| Component 3 ?<br>Scaled-up financing | Technical Assistance | Financial sector actors are ready to invest in a pipeline of low-carbon minigrids and concessional financial mechanisms are in place to incentivize scaled-up investment | <p>3.1. Support to financing mechanisms in order to scale up RE minigrids investment is provided</p> <p>3.2. Domestic financial sector's capacities on business and financing models for minigrids are built</p> <p>3.3.: Replication plan (including investment plan) for scaling up rural energy access is developed</p> | GET        | 144,644.00                | 6,051,720.00               |

| Project Component                           | Financing Type       | Expected Outcomes   | Expected Outputs  | Trust Fund | GEF Project Financing(\$) | Confirmed Co-Financing(\$) |
|---|----------------------|---|---|------------|---------------------------|----------------------------|
| Component 4- Digital & Knowledge Management | Technical Assistance | Digitalization and data are mainstreamed, across stakeholders, into local minigrid market development. Increased knowledge, awareness and network opportunities in the minigrid market and among stakeholders, including benefitting from linkages to international good practice | <p>4.1. A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project</p> <p>4.2. A "Minigrids Digital and Data Management Platform" is implemented to run tenders, manage data from pilots, and support minigrids scale-up and cost-reduction</p> <p>4.3. A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots, including GHG emission reductions, is adopted and operationalized based on standardized guidance from the regional project.</p> <p>4.4. Engage with regional project, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learned</p> <p>4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (incl. intervention zones) and with the regional project</p> | GE T       | 255,296.00                | 2,585,060.00               |



| Project Component                        | Financing Type       | Expected Outcomes       | Expected Outputs   | Trust Fund          | GEF Project Financing(\$) | Confirmed Co-Financing(\$) |
|--|----------------------|-------------------------|--|---------------------|---------------------------|----------------------------|
| Component 5 ?<br>Monitoring & Evaluation | Technical Assistance | Monitoring & Evaluation | 5.1: M&E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid Term Evaluation and (iv) Terminal Evaluation | GET                 | 69,369.00                 | 638,800.00                 |
| <b>Sub Total (\$)</b>                    |                      |                         |  |                     | <b>1,622,251.00</b>       | <b>134,069,638.00</b>      |
| <b>Project Management Cost (PMC)</b>     |                      |                         |  |                     |                           |                            |
|  |                      |                         | GET  | 162,225.00          | 14,884,581.00             |                            |
|  |                      |                         | <b>Sub Total(\$)</b>   | <b>162,225.00</b>   | <b>14,884,581.00</b>      |                            |
|  |                      |                         | <b>Total Project Cost(\$)</b>  | <b>1,784,476.00</b> | <b>148,954,219.00</b>     |                            |

Please provide justification

**C. Sources of Co-financing for the Project by name and by type**

| <b>Sources of Co-financing</b> | <b>Name of Co-financier</b>                     | <b>Type of Co-financing</b> | <b>Investment Mobilized</b> | <b>Amount(\$)</b>     |
|--------------------------------|---|-----------------------------|-----------------------------|-----------------------|
| Recipient Country Government   | Renewable Energies Agency (AER-Mali)            | Grant                       | Recurrent expenditures      | 3,780,059.00          |
| Recipient Country Government   | Renewable Energies Agency (AER-Mali)            | Grant                       | Recurrent expenditures      | 36,706,745.00         |
| Recipient Country Government   | Renewable Energies Agency (AER-Mali)            | In-kind                     | Recurrent expenditures      | 122,581.00            |
| GEF Agency                     | UNDP  | Grant                       | Recurrent expenditures      | 300,000.00            |
| Recipient Country Government   | ANGMV   | Grant                       | Recurrent expenditures      | 32,000,000.00         |
| Recipient Country Government   | AMADER  | Grant                       | Recurrent expenditures      | 17,331,145.00         |
| Recipient Country Government   | AMADER  | Loans                       | Recurrent expenditures      | 56,870,778.00         |
| Donor Agency                   | African Development Bank                        | Grant                       | Recurrent expenditures      | 528,409.00            |
| Donor Agency                   | SIDA ? Swedish International Development Agency | Grant                       | Recurrent expenditures      | 38,331.00             |
| Donor Agency                   | GIZ   | Grant                       | Recurrent expenditures      | 1,276,171.00          |
| <b>Total Co-Financing(\$)</b>  |   |                             |                             | <b>148,954,219.00</b> |

**Describe how any "Investment Mobilized" was identified**

N/A

**D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds**

| <b>Agency</b>                    | <b>Trust Fund</b> | <b>Country</b> | <b>Focal Area</b> | <b>Programming of Funds</b> | <b>Amount(\$)</b>   | <b>Fee(\$)</b>    | <b>Total(\$)</b>    |
|----------------------------------|-------------------|----------------|-------------------|-----------------------------|---------------------|-------------------|---------------------|
| UNDP                             | GET               | Mali           | Climate Change    | CC STAR Allocation          | 1,784,476           | 160,603           | 1,945,079.00        |
| <b>Total Grant Resources(\$)</b> |                   |                |                   |                             | <b>1,784,476.00</b> | <b>160,603.00</b> | <b>1,945,079.00</b> |

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount (\$)**

50,000

**PPG Agency Fee (\$)**

4,500

| <b>Agency</b>                  | <b>Trust Fund</b> | <b>Country</b> | <b>Focal Area</b> | <b>Programmin<br/>g of Funds</b> | <b>Amount(\$)</b> | <b>Fee(\$)</b>  | <b>Total(\$)</b> |
|--------------------------------|-------------------|----------------|-------------------|----------------------------------|-------------------|-----------------|------------------|
| UNDP                           | GET               | Mali           | Climate<br>Change | CC STAR<br>Allocation            | 50,000            | 4,500           | <b>54,500.00</b> |
| <b>Total Project Costs(\$)</b> |                   |                |                   |                                  | <b>50,000.00</b>  | <b>4,500.00</b> | <b>54,500.00</b> |

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

| Total Target Benefit                                 | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|--|----------|----------------------|-------------------|------------------|
| Expected metric tons of CO <sub>2</sub> e (direct)   | 0        | 16929                | 0                 | 0                |
| Expected metric tons of CO <sub>2</sub> e (indirect) | 0        | 631697               | 0                 | 0                |

### Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

| Total Target Benefit                                 | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|--|----------|----------------------|-------------------|------------------|
| Expected metric tons of CO <sub>2</sub> e (direct)   |          |                      |                   |                  |
| Expected metric tons of CO <sub>2</sub> e (indirect) |          |                      |                   |                  |
| Anticipated start year of accounting                 |          |                      |                   |                  |
| Duration of accounting                               |          |                      |                   |                  |

### Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

| Total Target Benefit                                 | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|--|----------|----------------------|-------------------|------------------|
| Expected metric tons of CO <sub>2</sub> e (direct)   |          | 16,929               |                   |                  |
| Expected metric tons of CO <sub>2</sub> e (indirect) |          | 631,697              |                   |                  |
| Anticipated start year of accounting                 |          |                      |                   |                  |
| Duration of accounting                               |          |                      |                   |                  |

### Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

| Total Target Benefit     | Energy (MJ) (At PIF) | Energy (MJ) (At CEO Endorsement) | Energy (MJ) (Achieved at MTR) | Energy (MJ) (Achieved at TE) |
|--------------------------|----------------------|----------------------------------|-------------------------------|------------------------------|
| Target Energy Saved (MJ) |                      |                                  |                               |                              |

### Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

| <b>Technology</b>  | <b>Capacity (MW) (Expected at PIF)</b> | <b>Capacity (MW) (Expected at CEO Endorsement)</b> | <b>Capacity (MW) (Achieved at MTR)</b> | <b>Capacity (MW) (Achieved at TE)</b> |
|--------------------|--|--|--|---------------------------------------|
| Solar Photovoltaic |  | 0.31   |  |                                       |
| Small Hydropower   |  | 0.75   |  |                                       |

**Indicator 11 People benefiting from GEF-financed investments**

|               | <b>Number (Expected at PIF)</b> | <b>Number (Expected at CEO Endorsement)</b> | <b>Number (Achieved at MTR)</b> | <b>Number (Achieved at TE)</b> |
|---------------|---------------------------------|---|---------------------------------|--------------------------------|
| <b>Female</b> |                                 | 4,333                                       |                                 |                                |
| <b>Male</b>   |                                 | 4,332                                       |                                 |                                |
| <b>Total</b>  | 0                               | 8665  | 0                               | 0                              |

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

## Part II. Project Justification

### 1a. Project Description

Table 1 ? changes between pif and ceo endorsement document

| Outputs with GEF budget at Concept Note  |            | Outputs with GEF budget at CEO ER  |            | Change                | Justification |
|--|------------|--|------------|-----------------------|---------------|
| 1.1 An inclusive national dialogue to identify minigrid delivery models is facilitated to support the ongoing reforms in the energy sector | \$ 361,676 | <i>1.1. The national inclusive off-grid platform, currently being institutionalized/ operationalized under the leadership of the DNE, is supported to identify mini-grid delivery models, clarifying priority interventions for an integrated approach to off-grid electrification</i> | \$ 284,600 | Slight wording change |               |



| Outputs with GEF budget at Concept Note  | Outputs with GEF budget at CEO ER  | Change  | Justification  |
|--|--|---|--|
| <p>1.2. Minigrid DREI techno-economic analyses updated to propose most cost-effective basket of policy and financial derisking instruments and contribute to AMP Flagship Report on Cost Reduction</p> | <p><i>1.2: Output A following the Minigrid DREI techno-economic analyses is facilitated, de-risking instruments are developed and an update of the DREI is conducted in Year 4</i></p> | <p>Scope change as DREI analyses conducted in 2021-2022 on the "Support for rural electrification by renewable energy systems in the Liptako-Gourma region - Pilot phase" project executed by UNDP and financed by SIDA</p> | <p>The DREI analyses were conducted from November 2021 to end of September 2022 as part of the ALG project (Integrated Authority for the Development of the Liptako-Gourma, a region shared by 3 countries: Niger, Mali and Burkina Faso) executed by UNDP under SIDA financing. The derisking instruments were identified. Some of them are considered and will be implemented as part of AMP Mali. A brief assessment of the de-resking instruments considered and implemented since PPG will be conducted at project launch. A dialogue will be created to select de-risking instruments to be implemented by AMP Mali . An update of the DREI will be conducted in Year 4 with AMP Regional support.</p> |

| Outputs with GEF budget at Concept Note   |  | Outputs with GEF budget at CEO ER  |  | Change  | Justification  |
|---|--|--|--|---|--|
| 1.3. Contribution to integrated electrification planning through mapping of priority value chains in rural areas  |  | 2.2. <i>National report on opportunities to boost economic activities through electricity access and productive use with a particular focus on productive and green ecosystems is made available</i> |  | Included already in a GIS study in 2019-2020 with AMADER and World Bank<br>Partial shift into Component 2                                       | <p>A first GIS study in 2009 and an updated and more comprehensive version in 2019-2020 allowed to identify so-called development hubs. These include income generating activities, administration population, households, etc. information.</p> <p>Hence, AMP Mali will complement these GIS studies with a report on priority value chain in rural areas across the country where energy access and productive use can boost economic development. This study will consider in particular agro-sylvo-pastoral value chains in the GGW areas of Mali.</p> |
| 1.4. Capacity Building provided to public officials (regulator, ministries) specifically to design procurement/tender processes that incorporate cost-reduction levers and innovative business models |  | 1.4: <i>Capacity building is provided to public officials (agencies, regulator, ministries) specifically to support cost-reduction levers and innovative business models</i>                         |  | Slight word change to broaden the spectrum of capacities to be built based on the needs and gaps to be identified during project implementation |  |

| Outputs with GEF budget at Concept Note | Outputs with GEF budget at CEO ER  | Change               | Justification   |
|---|--|----------------------|---|
| n.a.                                    | <p><i>1.3. An update of the Great Green Wall strategy and action plan is conducted for a better consideration of energy infrastructures in climate actions and green economy</i></p> | <p>Added aspects</p> | <p>GGW</p> <p>Since PIF stage the GGW has been included to combine rural electrification and GMG market development in Mali with green and productive systems of the GGW. So far the GGW in Mali does not clearly include energy aspects, and especially low-carbon energy solutions, in its strategy and implementation. This output aims at integrating green energy and GMGs into the picture.</p> |

| Outputs with GEF budget at Concept Note | Outputs with GEF budget at CEO ER   | Change              | Justification   |
|---|---|---------------------|---|
|   | <p>1.5. <i>Quality standards for solar mini-grid components are domesticated, and institutional capacity of AER Mali and the Electrotechnical Standards Committee is strengthened</i></p> | <p>Output added</p> | <p>Some standards have been already designed around some solar equipment with AER-Mali and some equipment have arrived but not yet implemented) to create a certification lab. To ensure good quality standards for both GMG equipment and ancillary devices, it is critical to define relevant national standards and enforcement measures to ensure that meeting quality standards are respected across Mali. Enforcement could be facilitated by keeping custom duties and taxes for low quality RE equipment.</p> <p>Capacities around quality standards and certification of both AER-Mali and the Electrotechnical Standards Committee need to be strengthened.</p> |

| Outputs with GEF budget at Concept Note   |           | Outputs with GEF budget at CEO ER  | Change    | Justification  |
|---|-----------|--|-----------|--|
| 2.1. Pilots developed including productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in minigrids | \$482,235 | <i>2.1. Pilots are developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in mini-grids in the Great Green Wall zone</i> | \$868,342 | <p>More funding allocated to pilot projects as:</p> <p>? Additional total funding of around \$450k to integrate GW aspects across all components of the project. The largest share is allocated to Component 2 to implement GMG in the GW planned green and productive systems as well as Integrated Community Farms (FACI)</p> <p>? Key for the development of the early-stage green minigrid market in Mali (today mostly hybridized solutions implemented)</p> <p>? A concrete means to prove its value proposition and enabling the potential of scaling up to be unleashed.</p> |

| Outputs with GEF budget at Concept Note  |           | Outputs with GEF budget at CEO ER   |           | Change   | Justification  |
|--|-----------|---|-----------|--|--|
| 2.2. Capacity of winning tender bidders (private sector developers) strengthened to develop and implement innovative business models and cost-reduction levers |           | 2.3. <i>Capacities of private minigrid developers and communities are strengthened</i>                      |           | Changes in terms of scope of the capacity buildings efforts based on stakeholder consultations exchanges, incl. IP and RPs | <p>Capacities of local private minigrid developers (winning tender bidders are not) as well as communities will be built and/or reinforced. A modular approach based on knowledge level, needs and capacities required will be put in place for better results, adoption and application.</p> <p>Pilot projects considered in AMP Mali will be hybrid community-private sector based models (supervised by AER-Mali IP of the project) and purely private-sector based models (supervised by AMADER, RP of the project).</p> |
| 3.1. Domestic financial sector capacity on business and financing models for minigrids enhanced  | \$120,559 | 3.3. <i>Domestic financial sector's capacities on business and financing models for minigrids are built</i> | \$144,644 | Slight rewording   | n.a.   |

| Outputs with GEF budget at Concept Note  |  | Outputs with GEF budget at CEO ER  | Change  | Justification   |
|--|--|--|---|---|
| <p>3.2. Innovative financing solutions for minigrid development are identified and implemented</p> |  | <p>3.1. Support to financing mechanisms in order to scale up RE minigrids investment is provided</p> | <p>The variety of existing and potential mechanisms need to be assessed to determine which mechanisms(s) the project could support through technical assistance and should include innovative financing schemes</p> | <p>There are different financial mechanisms available in Mali (not necessarily yet specific to GMGs) and not necessarily efficient. Based on stakeholder consultations, including with RP AMADER, reviving the Rural Electrification Fund (FER) and supporting its operationalization would be welcomed. It could ensure that the identified delivery model (Component 1) is applied in practice. Other existing financing schemes for minigrids and RE, as well as other sectors in Mali on the one hand, and a benchmark of successful financing mechanisms abroad could be considered. A comprehensive study is envisaged to assess the different options suitable for Mali. AMP Mali could then select where technical assistance could be provided to scale up financing for GMG across the country.</p> <p>Innovative financing mechanisms are considered as potential financing mechanisms and will be evaluated</p> |

| Outputs with GEF budget at Concept Note  |           | Outputs with GEF budget at CEO ER  |           | Change           | Justification  |
|--|-----------|--|-----------|------------------|--|
| n.a.   |           | <i>3.3.: Replication plan (including investment plan) for scaling up rural energy access is developed</i>                                      |           | Output added     | A replication plan based on best practices and lessons learned, including from AMP Mali pilot projects as well as other GMG projects in the country, will be designed to scale-up GMG market development while leveraging well-functioning innovative business models and more. The replication plan will also include a financing plan linked to the financing mechanisms supported by the project under component 3. |
| 4.1. A digital strategy is developed and implemented, including linkages to (and following guidance from) the regional project | \$241,118 | <i>4.1 A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project</i> | \$255,296 | Slight rewording | n.a.   |



| Outputs with GEF budget at Concept Note   |             | Outputs with GEF budget at CEO ER  | Change   | Justification                            |   |
|---|-------------|--|----------|--|---|
| 4.4. M&E and Reporting, including (i) Conducting inception workshop, (ii) Ongoing M&E, (iii) Mid-term Evaluation and (iv) Terminal Evaluation | <i>n.a.</i> | <i>5.1 Monitoring and Evaluation (M&amp;E) and Reporting, including (i) Conducting Inception workshop and preparing report, (ii) Ongoing M&amp;E, (iii) Mid-Term Evaluation and (iv) Terminal Evaluation</i> | \$69,369 | Created a separate component for M&E (5) | A dedicated component on monitoring & evaluation has been added to comply with GEF and UNDP processes and facilitate potential corrective measures to achieve the expected project's results. |

| Outputs with GEF budget at Concept Note | Outputs with GEF budget at CEO ER   | Change  | Justification   |
|---|---|---|---|
| n.a.                                    | <p>4.2. A<br/> <i>Minigrids Digital and Data Management Platform? is implemented to run tenders and manage data from pilots, and to support minigrids scale-up and cost-reduction</i></p> | <p>Additional output as the digital platform is a critical aspect of the digital strategy to be implemented</p> | <p>In line with Output 4.1. as well as with the entire project's components, a minigrids data management platform suitable to Mali's rural electrification needs will be implemented. This should be covered by either World Bank or AfDB with AMADER and EdM. It shall facilitate the tendering process from A to Z, monitoring of pilot sites and other indicators, cost optimization. AMP will ensure that this platform is adapted to the requirements. The project shall complement this platform with a repository of all relevant data, studies, reports and more around rural electrification in general and minigrid in particular, at national level. Indeed, during project formulation, the lack of a centralized repository was a challenge to gather all relevant, reliable and most recent data. Stakeholder consultations confirmed this need with all actors' types (government, technical and</p> |

| Outputs with GEF budget at Concept Note |  | Outputs with GEF budget at CEO ER   | Change       | Justification   |
|---|--|---|--------------|---|
|   |  | 4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (incl. intervention zones) and with the regional project | Added output | To support visibility, adoption and minigrid market development and scale-up, targeted awareness raising campaigns at national (including political sphere and general public), and AMP regional levels will be designed and rolled out. This will include climate change risks and mitigation efforts. |

General Context:

The Republic of Mali is the eighth largest country in Africa (1.24 Mkm<sup>2</sup>)[1]<sup>1</sup> with boundaries with 7 countries. Its population should double by 2045 with a population of about 20.7 million inhabitants in 2022[2]<sup>2</sup>. This landlocked country, made of 60% of desert areas, has 45.4% of its population living in urban areas (with an urbanization rate of 4.6% per annum), mostly located in the Southern part of the country and at the border with Burkina Faso. This Least Developed Country (LDC) is one of the poorest countries in the world with 41.1% of its population living below the national poverty line in 2020 (under USD 1.15 a day). According to the World Bank, the sanitary, security, social and political crises in 2020 have increased the poverty rate by 5%[3]<sup>3</sup>. Only 58% of women (vs. 77.4% of men) are part of the active population in 2021[4]<sup>4</sup>. It has a weak economic diversification and competitiveness where agriculture accounts for 42% of its GDP - mainly subsistence farming and herding. About 80% of its population works in the agricultural sector. About 80% of Mali's export revenues are related to gold mining and agriculture (especially cotton), depending on commodity prices set abroad, according to World Bank[5]<sup>5</sup>.

Since the military coup of 2012 and the occupation of the Northern part of the country by armed groups, Mali and its population are facing multiple crises including instability, conflicts, and insecurity. There are over 400,000 internally displaced people in addition to nearly 48,000 refugees and asylum-seekers mainly living in the insecure Northern and central parts of the country[6]<sup>6</sup>.

The country, one of the hottest on the planet, is also increasingly vulnerable to natural disasters and climate change effects, including droughts, floods, and crops pests, while barely contributing to GHG

emissions globally (0.01% in 2020<sup>[7]</sup>). These climate shocks lead to a high rainfall variability and negatively impact the socio-economic situation. Water constraints, desertification, reduced agricultural yields, land deterioration, food insecurity, rising food prices, rapid population growth and increased pressure on arable lands become commonplace.

COVID-19 has further enhanced the structural fragility of the country, in addition to security and climate issues, and leading to a lower annual economic growth rate (shrinking to -1.6% in 2020 compared to 4.8% in 2019)<sup>[8]</sup>. While the economic recovery in 2021, marked by increased cotton and gold exports, have led to a positive growth rate for 2021, the 2021 coup along with the international crisis and increased inflation rate are keeping livelihoods of the population especially in rural areas at risk.

#### Energy Situation in Mali

In Mali, increased and sustainable access to energy is fundamental to the success of the recovery process underway in the country. It will support the creation of the best conditions for investments in the economic and social sectors to improve the Malians' livelihoods.

According to the World Bank, in 2020, 50% of the Malian population had access to electricity, out of which 94% in urban areas and 16% in rural areas. In other words, 10 million Malians do not yet have access to modern electricity services, including over 9 million located in rural areas<sup>[9]</sup>.

The policies developed by the Government of Mali and its partners for rural electrification development under AMADER's leadership - the rural electrification agency - have made it possible to increase the rate of access to electricity in rural areas from 3% in 2004 to 16% in 2020.

The total installed capacity for the country's electricity supply in 2020 is 1,024.92 MW<sup>[10]</sup>, broken down as follows:

- ? 835 MW for the national electricity company EDM-SA including 183.7 MW of hydroelectricity, 498.62 MW of thermal, 100 MW of imports from Côte d'Ivoire, 53 MWp of solar PV;
- ? 162 MW of self-generators, all thermal;
- ? 27 MW for AMADER's rural electrification operators from minigrids, including 19 MW thermal and 8 MWp solar PV via 300 minigrids installed by 63 different operators. About 70% of them are not really operational due to technical and operational issues. Out of the 30% operational ones, there are 49 hybridized solutions<sup>[11]</sup>.

The country's electricity production capacity is thus dominated by 66.3% thermal (diesel or fuel oil) and only about 18% hydroelectricity, 9.7% imports and 6% solar PV. In 2009, 13 years ago, the share of hydroelectricity in the country's electricity generation capacity was 51% and dropped to 18% in 2022. In the meantime, the thermal power share grew from 49% to 66.3%. The context of climate change in the country compromises the production efficiency of existing hydroelectric power plants and supports continued growth in thermal power to meet electricity demand, which is growing at a rate of 10% per year<sup>[12]</sup>.

As a result, generation investments in the country are characterized by:

- ? A sharp decline in hydroelectricity due to climate change and the dramatic rainfall decrease, with a potential of 1,150 MW, of which only about 30% is exploited;
-

- ? Sustained growth in thermal power, which increases energy dependence because oil products are totally imported in Mali;
- ? An encouraging but so far unambitious progress in solar PV power with regard to the important potential of nearly 6 kWh/m<sup>2</sup>/day with an insolation of approximately 10 hours per day.

The investments in solar energy production growing in the country and the important potential of bioenergy constitute relevant alternatives to fossil fuel-based generation as it is estimated that the import of petroleum products is about 1 billion USD per year<sup>[13]</sup><sup>13</sup>. In the offgrid settings and with the current global energy crisis, hybridized minigrid operators have to pay XOF 950 per liter of diesel (?USD 1.42) for their generators compared to XOF 300 (?USD 0.45) before. How tariffs and maintenance of such solutions are going to be impacted by this situation remains an open question.

#### Great Green Wall in Mali

The Great Green Wall (GGW) Initiative has brought together African countries and international partners in a project that aims to restore 100 million hectares of degraded land, sequester 250 million tons of carbon and create ten million jobs by 2030<sup>[14]</sup><sup>14</sup>.

Under the GGW Initiative, Mali is focusing on the development of agricultural, forestry and pastoral production systems as well as on the improvement of basic socio-economic infrastructure in order to increase wealth creation, food security and sustainable socio-economic growth. The Great Green Wall project intervention area includes 10 regions in Mali which represent 20.8% of the territory surface, and 43% of the total population in 2022 (see Annex E below).

In this area, limited resilience to climate shocks translates into increased vulnerability to poverty, food insecurity, gender inequality, conflict, political instability, and deteriorating terms of trade (continued decline in prices of agricultural exports), thus limiting the income growth of the rural population. Small farmers and poor households are particularly vulnerable given their dependence on natural resources for their livelihood. Within this framework, women and youth are disproportionately affected, which is a problem on a large scale, given that the country is also one of the youngest in the world, with 47% of youth aged 14 and under<sup>[15]</sup><sup>15</sup>.

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

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

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An opportunity is for policymakers to systematically address these investment risks, lowering financing costs and leading to competitive investment. Although there are both public and private strategies to address investment risks, the DREI framework is concerned mainly with public strategies, and identifies three central ways – often used in combination – that the public sector can improve the risk-return profile of private sector investment opportunities: (i) Reducing risk, targeting underlying barriers that create investment risk. These instruments are typically policies, such as legislation, or technical programmes (‘policy derisking’); (ii) Transferring risk, shifting risk from the private to public sector. These include instruments such as guarantees, or credit lines to commercial banks for on-lending (‘financial derisking’); and (iii) Compensating for risk, increasing the return of investments. These are typically targeted subsidies for renewable energy (‘direct financial incentives’). As RE minigrid markets mature, an opportunity also exists for diversifying risk through aggregation of multiple minigrid assets (‘portfolio derisking’).

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

Table 2 - Preliminary Conclusions of the DREI STUDY IN MALI

| Risk category   | Description/Underlying Barriers   | Risk level           | Recommended policy derisking instruments   | Recommended financial derisking instruments  |
|---|---|----------------------|--|--|
| <p><u>Market risk</u> : Risk arising from limitations and uncertainty in the energy market (off- and on-grid) regarding market outlook, access, price and competition</p> | <p>? There is no specific regulatory framework for solar mini-grids and many uncertainties remain, including regarding technical standards. Electricity sales tariffs in rural areas are free for authorizations and declarations and capped under the aegis of AMADER.</p> <p>? National grid and diesel/oil tariff subsidies are seen as threats to solar mini-grids, but cannot be reformed due to the low purchasing power of the general population.</p> | <p>High</p>          | <p>? Establish a master plan for rural electrification with well-defined renewable energy targets and technology types</p> <p>? Establish a regulatory approach with 2 coexisting regimes (light and full) for licensing, with a clear methodology for determining the rates allowed in the full regime and clear and balanced technical standards</p> <p>? Develop, communicate and update rural electrification objectives and plans</p> | <p>? Compensation system through a subsidy per kWh when connected to the national grid</p> |
| <p><u>Social acceptance risks</u> : Risks arising from lack of awareness and resistance to renewable energy and minigrids in communities</p>                              | <p>? Most rural communities want access to electricity, and if the promoter does a good preliminary job of surveying the target community and communicating, this risk is generally quite low.</p> <p>? Concern about tariffs that will be charged (if higher than national grid tariffs) and quality of service (if there has been a bad past experience with solar home systems can contribute to the likelihood and impact of this risk.</p>               | <p>Low to Medium</p> | <p>? Community impact and awareness campaigns on the benefits of solar PV mini-grids</p>   | <p>N/A</p>   |

| Risk category  | Description/Underlying Barriers  | Risk level     | Recommended policy derisking instruments  | Recommended financial derisking instruments |
|--|--|----------------|---|---|
| <p><u>Hardware risk</u> : Risk arising from limitations in the quality and availability of minigrid hardware, as well as the customs treatment of hardware</p> | <p>? There is a competitive and developed market for solar energy equipment. Standards exist only within the framework of the current tender procedure and there is no field monitoring concerning the quality of the equipment.</p> <p>? Difficulties exist in the interpretation of equipment eligible for exemptions from import taxes and VAT (Value Added Tax) and cumbersome customs procedures.</p> | Medium to High | <p>? Establish and disseminate certification standards for equipment and institutional capacity building for enforcement and market surveillance</p> <p>? Streamlining and clarifying customs procedures and equipment eligible for tax exemption</p> | N/A   |
| <p><u>Digital risk</u> : Risks arising from use of cellular networks for remote monitoring and payments; the use of software; and abuse of consumer data</p>   | <p>? Mobile network coverage in rural areas is expanding, but still insufficient. The quality of services is generally average.</p> <p>? Mobile money payment is not seen as an obstacle to recovering revenue.</p> <p>? Misuse of user data is not perceived as a relevant risk.</p> <p>Mi</p>  | Low to Medium  | <p>? Telecommunications regulation to achieve wider and good quality coverage</p> <p>? Support for the formation of industry associations to set standards and share best practice</p>  | N/A   |
| <p><u>Labour risk</u> : Risks arising from the lack of skilled and qualified potential employees</p>   | <p>? Technical training in solar energy exists, but these trainings are out of phase with the reality of the market.</p> <p>? The shortage of labor in rural areas increases the cost of operations and maintenance.</p>   | Medium         | Programmes to develop a competitive and skilled labour market in solar PV mini-grids especially in rural areas  | N/A   |



| Risk category   | Description/Underlying Barriers   | Risk level            | Recommended policy derisking instruments   | Recommended financial derisking instruments       |
|---|---|-----------------------|--|---|
| <p><u>Developer risk</u> : Risks arising from limitations in the minigrid operator's management capability, and its creditworthiness and cash flow.</p> | <p>? Promoters often have shortcomings in terms of management capacity and development of financial plans. Their cash flow is often weak.</p>   | <p>Medium to High</p> | <p>? Government support to improve information flows and network effects - technical assistance to developers.</p>   | <p>Direct public loans to mini-grid operators</p> |
| <p><u>End-user credit risk</u> : Risk arising from customers' willingness, ability, and methods of payment for electricity</p>                          | <p>? Consumers' ability to pay in rural areas is low. Agriculture is the main activity, and incomes show great fluctuations and are exposed to climatic risks (loss of crops), and can easily interrupt their electricity consumption in the event of financial difficulties or seasonal migrations.<br/>? The best way to do this is to promote productive activities that would start the socio-economic development of rural communities. The cascading effect would be a better ability to pay for electricity.</p> | <p>Medium to High</p> | <p>? Promote the productive use of electricity (training, incubator networks) to increase local socio-economic development and the payment capacity of electricity users</p> | <p>Direct public loans to mini-grid operators</p> |

| Risk category  | Description/Underlying Barriers  | Risk level | Recommended policy derisking instruments   | Recommended financial derisking instruments |
|--|--|------------|--|---|
| <p><u>Finance risk</u> : Risks arising from scarcity of domestic investor capital (debt and equity) for minigrids, and domestic investors' lack of familiarity with minigrids and appropriate financing structures</p> | <p>? The actors are unanimous on the level of this category of risk. Long-term loan offers are very limited due to the lack of long-term deposits.</p> <p>? The lack of knowledge of commercial banks, financial institutions and equity investors about solar mini-grids is also a barrier to providing affordable long-term financing.</p> <p>? Stakeholders mentioned a strong correlation with market, developer and sovereign risk.</p> | High       | <p>? Liberalise the domestic financial sector (reforms to facilitate competitive entry, new types of financing, incentives for mini-networks)</p> <p>? Strengthen the knowledge and capacity of financial institutions and investors to evaluate solar PV mini-grid projects</p> | Direct public loans to mini-grid operators  |
| <p><u>Currency risk</u> : Risks arising from currency mismatch between domestic currency revenues and hard currency financing</p>  | <p>? The local currency ? CFA Franc ? has a fixed exchange rate in relation to the Euro, which greatly limits this risk even in the event of financing in Euro. However, there is a residual risk in case of financing in USD.</p> <p>? Some actors (financial institutions) do not rule out the risk of de-linking of the FCFA/Euro exchange rate in the long term, but with a limited impact on the project.</p>                           | Low        | In the DREI study, this risk was not the subject of a definition of neither political nor financial instruments (therefore the instruments were assessed as not applicable to this risk).  |   |

| Risk category   | Description/Underlying Barriers   | Risk level | Recommended policy derisking instruments  | Recommended financial derisking instruments |
|---|---|------------|---|---|
| <p><u>Sovereign risk</u> : Risk arising from a mix of cross-cutting political, economic, institutional and social characteristics in the particular country which are not specific to minigrids</p> | <p>? The issue of insecurity and terrorism, especially in some rural areas, is cited by all stakeholders as a significant barrier to investment in minigrids. However, this risk seems to affect well-defined regions.</p>  | High       | <p>In the DREI study, this risk was not the subject of a definition of neither political nor financial instruments (therefore the instruments were assessed as not applicable to this risk).</p>          |   |
| <p><u>Gender risk</u> : Risk of harm to women and girls, failure to shrink existing gender gaps, and/or disproportionate project benefits accruing to men</p>                                       | <p>? Risk of backlash within the national policy dialogue against gender mainstreaming initiatives.</p> <p>? Risk of backlash in communities or households against perceived imposition of foreign values, changing gender norms (brought by project or by increased availability of TV/radio/cell phones), or perception that women are receiving more support, possibility of intimate partner violence.</p> <p>? Risks associated with infrastructure construction and non-local, mostly male workforce</p> <p>? Risk of male appropriation of electrified public spaces and equipment and/or profitable electricity-enabled business ventures</p> | Medium     | <p>This category of risk has not been the subject of analysis or definition of political or financial instruments within the framework of the DREI (not dealt with within the framework of the DREI).</p> |   |

**2) the baseline scenario and any associated baseline projects**

The strategy of promoting Public Private Partnership (PPP) for electricity minigrids (in particular hybrid diesel ? solar photovoltaic), solar home systems (individual or collective solar photovoltaic kits) and solar lighting (photovoltaic solar lanterns or streetlamps) contributed to reaching the current rate of electricity access in rural areas. The PPP framework exists as Build, Own, Operate and Transfer (BOOT) concession contract. As such, a company or consortium of companies finances, builds, operates and acquires a new minigrid, which reverts to the public authority after a predetermined period of time. The rural electrification agency, AMADER, grants rural electrification concessions to private sector operators through PPPs, including some support for feasibility studies. So far, about 300 rural localities were electrified thanks to partnerships with 63 private operators (out of which 49 minigrids are hybridized and operational) for an overall capacity of about 27 MW, 1,250 kilometers of distribution networks and more than 910,000 beneficiaries[16]<sup>16</sup>.

However, there are still over 10,000 non-electrified localities whose inhabitants, businesses and social institutions (schools, health centers, etc.) do not have access to modern electricity services. While Mali was a pioneer in terms of minigrids in the ECOWAS region, with diesel minigrids starting back in 2003, its delivery model has its limits in terms of financial viability and sustainability. Lessons learnt from the existing minigrids, including around capacity building of operators, OPEX and equipment replacement subsidies, better maintenance, etc. need to be considered. A number of efforts therefore remain to be made to increase private sector investment to cover the potential minigrids market size targeting nearly 4 million people in Mali[17]<sup>17</sup>.

The national, regional and international markets for renewable energy technologies, in particular solar photovoltaic with storage, are in full progress thanks to (i) the drastic reduction in costs (hardware, software, financing costs) and the increasing energy efficiency of renewable energy equipment (ii) and also the emergence of new innovative financial levers for the private sector. Mali has a significant and diversified potential of insufficiently exploited energy resources, particularly renewable (solar, hydroelectric, bioenergy, etc.).

The necessary policy and regulatory framework has been undergoing a review for some years (financed by World Bank) that aims to further support the establishment of a conducive environment for rural electrification through low-carbon solutions including green minigrids, and with private sector investment (see Table 1 below). Measures envisaged as part of this review include among others:

- To recenter the AMADER missions on rural electrification (by withdrawing the domestic energy management component);
- To replace the Rural Electrification Fund (FER) - initially created by Ordinance No. 019 of March 15, 2000 in the form of a special allocation account and which has not been operational since its creation -, with a broader fund covering the electricity sector;
- To make CREE the sole regulator of the electricity sector (on-grid and off-grid), with the perspective of exploring the standardization of electricity tariffs;
- To create a new contract model and new specifications between AMADER and rural electrification operators, and adopt a decentralized electrification approach for mini-grids based on geographic economic zones for project viability;
- To strengthen the conditions for the takeover (or buyout) of a minigrid by a network concessionaire beyond the mere conditions for takeover by EDM-SA of the minigrids on its licensed perimeter.

In addition, specific studies and programs have been recommended and are in discussion to accelerate the development of minigrids in the country:

- A study on the harmonization of electricity tariffs;
  - An investment program for electrified rural localities (2021-2040) ;
  - An investment program for unelectrified rural localities (2021-2040) ;
  - An investment program in individual solar systems (2021-2040).
-

In Mali, the GGW (see Map 1 in Annex E) aims, by 2025<sup>[18]</sup>, to develop local communities through an innovative and inclusive approach consisting of synergizing actions to combat desertification, preserve biodiversity, fight climate change and improve agriculture-forestry-livestock (agro-silvo-pastoral) production systems. Its purpose is to green Mali and to contribute to sustainable food security for the population and livestock.

However, so far, the GGW initiative does not encompass green minigrids to enhance agro-silvo-pastoral value chains and contribute to ecosystems restoration in Mali. But there are components of the GGW strategy that are particularly suitable for mini-grid development. In the Ten-Year Priority Investment Plan 2021-2030, divided into five portfolios or pillars of the GGW, three are particularly suited to the development of mini-grids. These are: (1) climate actions and green economy, (2) resilient economic development and security and (3) information, communication, marketing and advocacy.

### 3) the proposed alternative scenario with a description of outcomes and components of the project

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

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

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[1] <https://www.map24.com/top-20-des-plus-grands-pays-dafrique-par-superficie/#:~:text=8.,1%20240%20000%20kilom%C3%A8tres%20carr%C3%A9s>, visited on 1 August 2022

[2] <https://www.cia.gov/the-world-factbook/countries/mali/> visited on 22 July 2022

[3] <https://www.banquemondiales.org/fr/country/mali/overview>, visited on 1 August 2022

[4] <https://data.worldbank.org/indicator/SL.TLF.CACT.MA.NE.ZS?locations=ML-NE-BF-TD-MR>, visited on 1 August 2022

[5] <https://documents1.worldbank.org/curated/en/631411559671220398/pdf/Mali-Growth-and-Diversification.pdf>, visited on 1 August 2022

[6] <https://reporting.unhcr.org/mali?year=2022>, visited on 1 August 2022

[7] <https://ourworldindata.org/co2/country/mali>, visited on 1 August 2022

[8] <https://www.coface.com/Economic-Studies-and-Country-Risks/Mali> visited on 1 August 2022

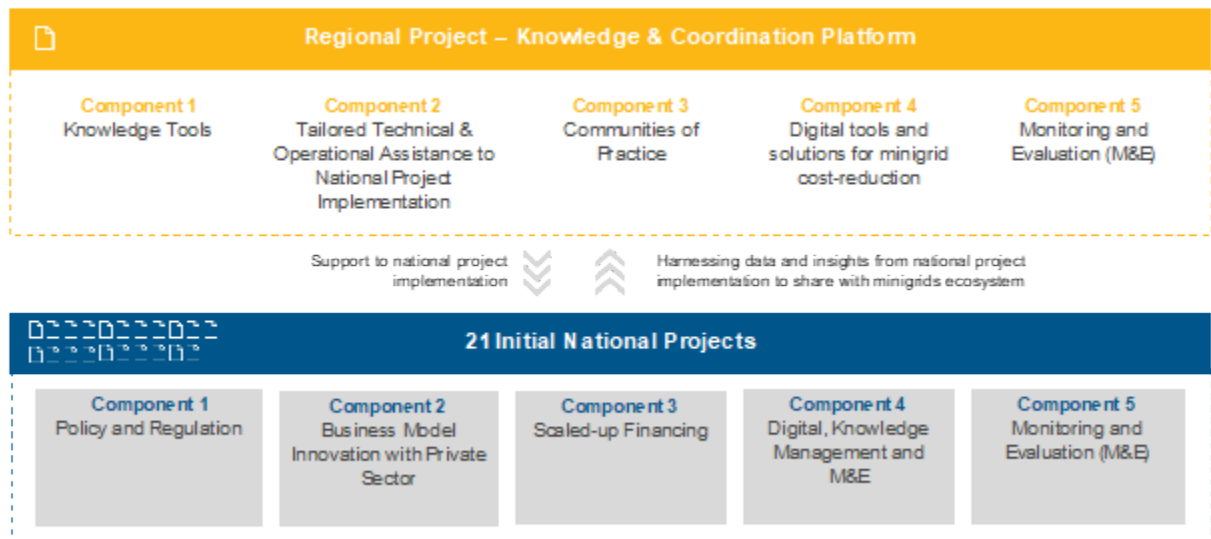
[9] <https://trackingsdg7.esmap.org/country/mali>

[10] EDM-SA 2020 Activity Report, AMADER Activity Report (including AMADER's presentation at the launch workshop of the national coordination platform - Liptako-gourma project) and Energy sector statistics directory 2020).

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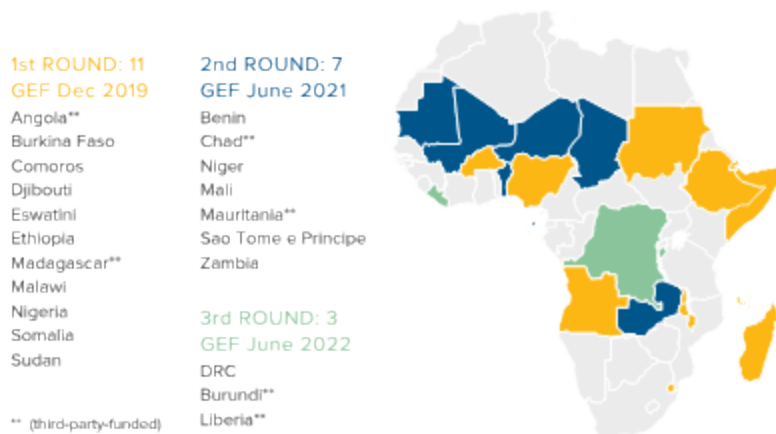
- [11] [https://atainsights.com/wp-content/uploads/2019/06/5.B.M.KANTA\\_.Mali-Rural-Electrification\\_FRENCH-1.pdf](https://atainsights.com/wp-content/uploads/2019/06/5.B.M.KANTA_.Mali-Rural-Electrification_FRENCH-1.pdf) , viewed in September 2022
- [12] SE4All Investment Prospectus for Mali, viewed in September 2022, [https://www.se4all-africa.org/fileadmin/uploads/se4all/Documents/Country\\_AAs/PI\\_SEforALL\\_MALI.pdf](https://www.se4all-africa.org/fileadmin/uploads/se4all/Documents/Country_AAs/PI_SEforALL_MALI.pdf)
- [13] Mini-Gird Market Opportunity Assessment: Mali, AfDB, SEforALL, Carbon Trust, SNV, 2019.
- [14] [https://catalogue.unccd.int/1551\\_Revised\\_French\\_Final\\_040920.pdf](https://catalogue.unccd.int/1551_Revised_French_Final_040920.pdf)
- [15] <https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS?locations=ML>
- [16] The photovoltaic solar hybridization of nearly 50 thermal power stations as part of the Rural Electrification Hybrid Systems (SHER) project began in 2014 and ends in 2023. The health, security and sociopolitical crises have contributed to significantly slowing down the execution of the project which had an initial duration of 2014 to 2020.
- [17] Mini-Gird Market Opportunity Assessment: Mali, AfDB, SEforALL, Carbon Trust, SNV, 2019.
- [18] [https://www.resad-sahel.org/content/download/17294/367195/version/5/file/Note\\_Actualit%C3%A9\\_GMV\\_Mali\\_05-2017.pdf](https://www.resad-sahel.org/content/download/17294/367195/version/5/file/Note_Actualit%C3%A9_GMV_Mali_05-2017.pdf)

Figure 1 - Africa Minigrids Program's Architecture



The program is initially supporting three rounds of national projects, totalling 21[1] in number, which together host an estimated total of **396 million people without electricity**,[2] or more than two thirds out of the 587 million total people without access to electricity in Africa. The initial AMP participating countries are show in **Figure 2** below.

Figure 2 - Africa Minigrids Program's participating countries list and map[3]



Country Strategy. Mali has been selected as one of the AMP National Projects as presented in Figure 2 above. The country is a poverty-stricken country with a large rural population (80% of total active population work in agriculture, mostly subsistence[1]). It is a Sahelian landlocked country where 60% of its area consists in desert and facing increased climate shocks (droughts and floods). It has lost 82% of its forest cover since the 1960s[2] and is losing about 4,000km<sup>2</sup> of forests per year. Political instability and increased security challenges combined with the growing climate change vulnerability are jeopardizing Mali's economy and its population's welfare. The GoM prioritizes access to energy as well as greening Mali as both contributors to socio-economic development and climate change mitigation and adaptation. While a number of efforts have already been made by the GoM and its partners towards these two objectives, renewable energy (outside of hydro) still represents only about 6% of the total power generation (excl. hydro). A considerable power mix shift occurred in the past years. While hydro used to represent about 80% of the power mix, it only represents about 18% today and thermal generation has increased to almost two third of power generation. The electrification rate reaches 50% in 2020 and less than 17% in rural areas according to the latest Tracking SDG7 data[3]. Yet, Mali has significant renewable energy sources including high and reliable solar irradiation intensity, 800MW potential hydro not yet used, and a significant opportunity for green mini-grids to play a major role in increasing electricity access. The Strategy for the Development of Renewable Energy (SDER), currently under review with World Bank's support, should have led to a 10% share for RE in the power mix in 2015 already. The current approach of hybridized minigrids across the country powered by 63 private operators is supporting the energy transition. However, private operators are still reluctant to invest in minigrids due to a lack of a clear delivery model for minigrids, tariffs that are not cost-reflective and absence of a proper/functional compensation scheme after interconnection with the national grid. Nevertheless, there is room for testing delivery and business model improvement in Mali combined with the Great Green Wall initiative and its focus on developing green and productive ecosystems in rural areas.

Program's Theory of Change (TOC). AMP Mali will follow the general AMP Theory of Change (TOC), developed in the Program Framework Document (PFD) and set out in **Figure 3** below. It will also fully integrate the Great Green Wall initiative as a cross-cutting element in all components of the project. This TOC is premised on a baseline context where, while good progress is being made, several risks and barriers are driving high financing costs (equity and debt) and reducing the competitiveness of RE minigrids with respect to fossil-fuel based alternatives. All else being equal, the need for higher returns that reflect these risks translates into higher energy prices that, in turn, adversely affect affordability for the end-user, or require larger subsidy requirements for rural electrification programs. As a result, renewable energy minigrids do not get financed and built at scale. By focusing on cost-reduction levers and innovative business models, the project can improve the financial viability of renewable energy minigrids which in turn can accelerate and scale up their adoption as part of the effort towards achieving universal energy access. When renewable energy minigrids are more competitive, private capital and commercial financing will then flow, resulting in various program benefits, including GHG emission reductions, and electrification and lower tariffs for end-users.

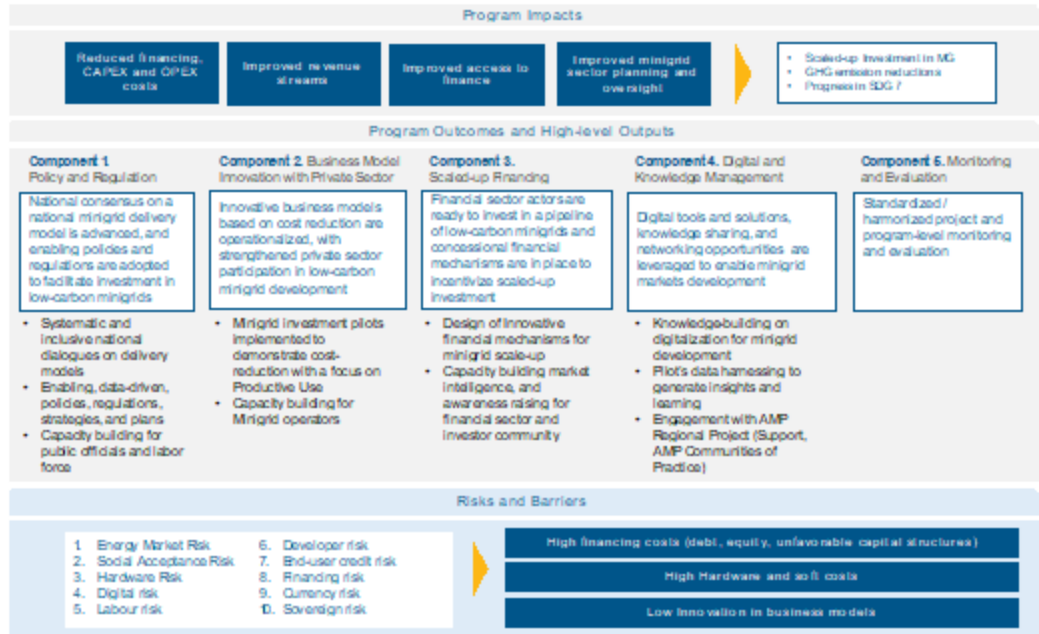
Figure 3 - Africa Minigrids Program's Theory of Change

With reduced risks and improved cost structures, access to finance at scale is unlocked for developing minigrids to their full potential.

Commercial viability of MGs is improved through reduced risks, lower costs and improved revenues.

AMP Program interventions systematically target underlying risks and barriers to reduce minigrid costs and improve revenues through public interventions in four or unity-level thematic areas (Components) with backstopping and knowledge sharing at the regional level.

Underlying risks and barriers are currently driving higher minigrid costs and inhibiting innovation, preventing scale up of renewable energy minigrids.



### Expected Results:

Five components and relevant outputs and activities have been developed to increase energy access in rural areas and stimulate the uptake of 100% renewable minigrids (including solar-based) in Mali by improving the financial viability and promoting scaled-up commercial investment in such systems. The project focuses on the cost-reduction (hardware, soft and financing costs) and innovative business models for minigrids. UNDP's derisking approach (DREI) will be adopted to catalyze private sector investments in the off-grid rural energy market. In doing so, the activities proposed under the five project outcomes will seek to:

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

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

10% of the estimated indirect GHG mitigated of this project have been removed from the project and allocated to the AMP regional project, in line with the apportioning of the overall program budget and



reflected in the PFD allocation of GHG emissions reductions across the different AMP national projects. This reflects the benefits of AMP national projects accessing the regional project's support which is expected to contribute and enhance the enabling conditions required for minigrids development across AMP countries.

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Project components, outcomes, outputs and activities:

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## **Component 1. Policy and Regulation**

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

As indicated above regarding the Malian minigrids context, a national minigrid delivery model has not yet been clearly determined and adopted. The need for a national delivery model with stakeholder ownership is crucial to support the market development with private sector involvement and investment in order to increase the viability and sustainability of renewable energy minigrids.

The entire electricity legal and regulatory framework is under revision in Mali with World Bank's support. This should include reallocating some roles & responsibilities at institutional level. Some reflections around the national delivery model for minigrids will be initiated but won't necessarily lead to a clear delivery model yet according to stakeholder consultations. Reflections include income generating activities to be at the very heart of the model for a viable and sustainable system. In terms of technology, hybrid (with thermal as backup power source) and 100% RE would be considered. At the national level, the perception is that all technologies should be accepted as soon as they are profitable and reliable.

A DREI analysis is currently ongoing and to be completed by end of September 2022. It will determine which de-risking instruments to be supported by the GoM to facilitate the uptake of green minigrids in Mali (see preliminary findings under **Table 3**).

*Output 1.1. The National Inclusive Off-grid Platform, currently being institutionalized/operationalized under the leadership of the DNE, is supported to identify minigrid delivery models, clarifying priority interventions for an integrated approach to off-grid electrification*

The ongoing DREI analysis recommends the creation of a National Inclusive Off-grid Platform under DNE's leadership. UNDP is already supporting DNE to create this platform and AMP Mali will follow with the operationalization of this multi-stakeholder platform. The latter will be a means to initiate systematic discussions that will inform the national government's identification of the optimal minigrid delivery model to meet the country's rural electrification objectives. The national dialogue will be centered around key issues regarding who finances, builds, owns and who operates and maintains the minigrids, and the related key components of a minigrid framework, including tariff structures/mechanisms and subsidy levels/mechanisms. It should lead to the official adoption of a national delivery model and a buy-in from all relevant stakeholders. Such a national dialogue has been highly welcomed by all stakeholders during the various consultations to facilitate coordination and avoid 'reinventing the wheel' and 'double work'.

This output includes the following activities:

#### **Activity 1.1.1. Support the operationalization of the national inclusive off-grid platform**

Support the establishment of the platform that includes all relevant stakeholders from Government (incl. the ANGMV), technical and financial partners, local authorities (*collectivités*), private sector, academia and vocational training centers, rural populations, civil society, local media, and others. The platform will initiate a national dialogue to identify the optimal minigrid delivery model based on the GoM's vision, the feedback from minigrids implemented in Mali (incl. non-operational ones and why) as well as lessons learned from other AMP countries and beyond. Efforts can be made to support and amplify women's and youth voices, for example, by ensuring at least 40% of participants are female and youth, and that at least one dialogue co-chair is female, that events are held at convenient times/places with childcare provided, and that communication barriers are addressed (i.e., linguistic

barriers, digital/technology barriers, norms governing speaking in front of elders and members of the opposite sex).

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

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

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

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

*Output 1.2. A dialogue following the Minigrid DREI techno-economic analyses is facilitated, de-risking instruments are developed and an update of the DREI is conducted in Year 4*

Private sector investment and involvement to support the RE minigrids market development is at the very heart of AMP. Different de-risking measures have been identified in Mali and preliminary conclusions of the DREI in Mali can be found under Table XX above.

Limits of the existing framework have been identified by many stakeholders. Some efforts have already been made by various partners to support the GoM in creating a conducive policy and regulatory framework for minigrids and especially green minigrids, with a particular focus on private sector, including AfDB and World Bank. A revision of relevant policies and regulations starting from the Electricity Code and including minigrids and private investments is planned with the support of the World Bank. A first draft of the revision should be available in Q4 2022. At the time of writing, several other initiatives and activities are planned by different stakeholders, including DNE and AMADER, as well as the possible technical assistance facility of the EU under planning phase in September 2022 and depending on the political and security situation in Mali.

As such, UNDP Mali will participate in the dialogue on these revisions prior to AMP Mali's project management unit (PMU) team being in place by mid-2023, in particular through the ongoing SIDA-funded rural electrification project in the Liptako-Gourma region being implemented by UNOPS, UNDP and ECREEE in support to the Authority of the Liptako-Gourma.

World Bank and/or AfDB should also develop an online platform for the management of private sector license applications located at AMADER and EdM. The digital platform will be used from designing to monitoring minigrid projects. This platform will be available to all relevant partners, including AMP, the IP and the RPs of the project. AMP Mali will contribute to strengthen this platform as indicated in Output 4.2.

This output includes the following activities:

**Activity 1.2.1. Conduct a brief assessment of the actions taken related to de-risking instruments and minigrid regulatory framework since project formulation, and create a dialogue to select de-risking instruments**

A rapid assessment of actions taken and planned by other stakeholders will be conducted. The results and gaps of the assessment will be shared and discussed within the national inclusive off-grid platform. AMP's activities will then be adapted, where necessary, using an adaptive management approach and in line with the minigrid delivery model identified and selected by the GoM and the national inclusive off-grid platform (Output 1.1.).

A dedicated workshop with government, private sector and other key stakeholders will be conducted to present the rapid assessment and discuss the DREI analysis conducted in 2022 and identify de-risking

instruments that will be implemented by AMP Mali. The DREI report will be shared ahead of the workshop to facilitate the discussions and the selection of relevant instruments.

### **Activity 1.2.2. Implement selected de-risking instruments**

Based on the preliminary findings of the DREI study (see Table XX), further stakeholder consultations as well as desk reviews conducted during formulation phase, the following de-risking instruments have been identified as particularly relevant for Mali. These *could* be considered for support by AMP Mali *if not covered yet at project launch* by the ongoing legal and regulatory framework revision or other initiatives and subject to the results of the de-risking instruments workshop conducted during project implementation under Activity 1.2.1:

? **Develop the tariff model and calculation tool for isolated minigrids in collaboration with CREE** (this is part of the revision as now AMADER is covering this activity) and taking the following into account:

- o Existing but not finalized RE tariffication tool used by AMADER to assess the minigrid business plan with the minigrid developer. Both parties agree on a tariff that is affordable for users and allowing operator to be profitable over the 15 years of operation (somehow between a cost-reflective and the national EDM SA tariff).

- o Results from the DREI study analysis conducted during the project preparation phase

- o Lessons learned from the implemented minigrids on national grid tariffs, business models, system sizing, CAPEX related aspects and recovery, payment capacities of end-users, types of end-users (residential, commercial, social), living/working arrangements of end-users (e.g., polygynous households, cottage businesses, child-headed households, displaced or resettled households), etc.

? **Assess the grid expansion risks and review the operationalization of compensation schemes:**

The risk of grid expansion and interconnection issues remain as the compensation schemes envisaged in the regulatory framework are often not fully paid. This represents an additional hurdle for the private sector to invest in minigrids.

**•Evaluation on the negative impacts of competing fossil-fuel and power operators? subsidies on the competitiveness of GMGs, and support to the revision of subsidies distribution in the energy sector:**

•EDM SA, the national electricity company, benefits from state subsidies on fossil fuels which are totally imported. The same subsidies are provided for AMADER's private rural electrification operators (or permit holders) but the application encounters many difficulties, thus contributing to maintaining high operating costs. Licensees using a lot of diesel for hybrid systems have seen prices per liter go from XOF 300 (?USD 0.45) to XOF 950 (?USD 1.42) in recent years. In addition, the average tariff per kWh on the national grid lies at XOF 92 (?0.14 USD) while it was XOF 250 (?USD 0.37) for private mini-grids and was reduced to XOF 150 (?USD 0.22) in 2022, which does not cover the costs of private operators. Thus, a comprehensive assessment of operating costs including fuel costs and potential related recommendations associated with other types of sustainable subsidies would help identify alternatives to control permittees' CAPEX and support a tariff reduction.

The project, including through the National Inclusive Off-grid Platform, will support the endorsement of the revision of the relevant legal texts when appropriate.

### **Activity 1.2.3. Coordinate with regional project on national DREI analysis update (Year 4)**

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

*Output 1.3. An update of the Great Green Wall Strategy and action plan is conducted for a better consideration of energy infrastructures in climate actions and green economy*

Today, the GGW national strategy and action plan of Mali is focusing on sustainable forest and natural resources management, green and productive ecosystems and livelihoods to fight against deforestation, desertification and climate change in its intervention zones. However, this document written in 2012 does not include energy aspects and especially green minigrids as a catalyst of the GGW strategy and action plan. Discussions with the ANGMV DG and his team during formulation phase led to the wish to integrate RE systems in general, and GMG in particular into the picture.

Activity 1.3.1. **Incorporate RE aspects into the strategy and support its endorsement**

The PMU will work closely with the ANGMV to incorporate RE systems into the different components of the GGW strategy and action plan of Mali. This shall encompass the strategic axes as well as the Key Performance Indicators (KPIs). The deliverable will be a revised version of the strategy and action plan. Support will be provided to ensure the validation of the revised version by the GoM and relevant entities. AMP Mali and its pilot sites (see Component 2) will be directly contributing to this revised document in practice.

*Output 1.4. Capacity building is provided to public officials (agencies, regulator, ministries) specifically to support cost-reduction levers and innovative business models*

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

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

This output includes the following activities:

Activity 1.4.1. **Analyze provided capacity building activities and identify gaps**

The following sub-activities would be conducted:

? List all capacity building activities around low-carbon and green minigrids in the past years with the support of public officials and technical & financial partners, and which ministry or agency benefited from it

? Gather all training materials to avoid reinventing the wheel and upload them on a specific platform (as part of the Community of Practice under Component 4) so all public officials and beyond can access it

? Assess the needs of targeted public institutions

? Identify gaps based on the training materials collected along with the feedback of public officials

? Draw recommendations on capacity building efforts to be provided for public officials

? Coordinate with other development partners and beyond on their planned trainings around minigrids

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

Activity 1.4.2. **Design comprehensive training materials and conduct workshops with a gender-diverse selection of public officials**

Based on Activity 1.4.1., specific comprehensive training materials supporting the understanding and ownership of the identified national minigrids delivery model(s) by public officials will be developed and rolled out. These capacity building efforts lie on multiple approaches: (i) modular whereby participants will attend trainings based on their needs and knowledge level (ii) holistic aspect taking a village with all its activities around minigrids, i.e. including representative members of households, businesses, and social institutions (schools, health centers, etc.) and their respective needs, (iii) participatory where trainings are not purely academic but with a large space left to apply the knowledge and practical exercises.

The multi-country initiative around Solar Renewable Energy Training and Certification Program implemented by Burkina Faso's 2iE institute targeting engineers and staff from Ministries and national utilities (including 20% women) should be leveraged. Mali along with other ECOWAS countries benefitted already from this program.

Activity 1.4.3. **Conduct Training of Trainers (ToT)**

A gender-sensitive training for trainers will be provided to targeted training institutions, DNE and AMADER, as well as the trainers of the Ministry of National Entrepreneurship, Employment and Vocational Training to contribute to ownership and sustainability of the various training modules. Institutional memory will hence be supported along with sharing these training materials with the national and regional knowledge practices around AMP.

*Output 1.5. Quality standards for solar mini-grid components are domesticated, and institutional capacity of AER Mali and the Electrotechnical Standards Committee is strengthened*

More specifically, in accordance with Ordinance No. 2014-012 /P-RM of October 1, 2014, which creates the AER-Mali, it is responsible for:

? Carrying out tests, quality control and labeling of renewable energy equipment for the benefit of promoters

- ? Conducting research/development activities in the field of renewable energies
- conducting studies and monitoring of the implementation of renewable energy programs and projects for the benefit of stakeholders in the sector
- ? Researching and setting up sustainable and appropriate financing mechanisms for renewable energy projects and programs within a framework of Public-Private Partnership (PPP)
- ? Contributing to the definition of national strategies for renewable energies
- ? Contributing to the development and capacity building of craftsmen, agents of State technical structures, local authorities and private individuals, as well as those of renewable energy institutions in other countries
- ? Conducting the inventory and assessing the country's potential in renewable energy resources
- ? Contributing to informing and raising awareness of promoters and users of renewable energy equipment
- ? Participating in international cooperation actions in the field of renewable energies.

Today, there are no real quality standards for solar minigrid components in Mali. A new laboratory will be installed soon (equipment already on site) for the testing of lighting equipment as part of the WAEMU regional energy efficiency program for lamps and household appliances as well as the definition of minimum energy efficiency standards in buildings. Independently of that, the testing of the photovoltaic modules (solar panels) conducted by AER-Mali based on specific protocols requires to be consolidated because of the fast technological progress faced by the sector.

This output includes the following activities:

Activity 1.5.1. **Review existing standards and identify gaps**

Together with AER-Mali, in collaboration with ECREEE, a review of existing national, regional and international standards (incl. Verasol) around GMGs will be conducted. This will also include lessons learned and best practices around compliance enforcement measures as well as staff and capacity strengthening. Gaps will be identified and clear recommendations will be drawn.

Activity 1.5.2. **Develop adapted standards in collaboration with the Electrotechnical Standards Committee**

Based on the review under Activity 1.7.1., AER-Mali, the Electrotechnical Standards Committee and the PMU, with ECREEE's and Verasol's support, will design relevant standards and a plan to enforce these standards. Thresholds could be used around quality standards based on the installed capacity, e.g., under 350kW the standards would be simplified to avoid jeopardizing local efforts to electrify. Such a double standards system has been implemented for instance in Sierra Leone since 2020.

These standards should as much as possible take environmental and social aspects into consideration through SESA.

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Activity 1.5.3. **Reinforce the capacities of AER Mali and members of the Electrotechnical Standards Committee**

**AER-Mali's mandate includes the definition of standards as well as the exclusivity for quality control of such standards. However, the capacities of AER-Mali related to standards and their enforcement remain limited.**

A workshop to present the review (Activity 1.7.1.) and standards (Activity 1.7.2) along with a training on how to reinforce these standards will be provided to AER-Mali's staff and members of the Electrotechnical Standards Committee. Relevant training materials and documentation will be provided by the project.

Activity 1.5.4. **Disseminate the adapted standards**

The project will support the dissemination of the standards to relevant stakeholders.

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## Component 2. Business Model Innovation with Private Sector

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

A focus group with private sector operators and OSER, the relevant industry association, during project formulation (PPG) led to insightful findings. All players at the table clearly agreed that overall, minigrids in Mali have failed to deliver the expected benefits so far because of the:

- ? Feasibility studies made: low quality, insufficient participation of the community during the surveys especially, wrong dimensioning of the minigrids, obsolescence as too much time between the study and the MG installation
- ? High operational costs
- ? Challenges to expand an under-dimensioned minigrid later on
- ? Hybrid minigrids are not really suitable given that fossil fuels are fully imported in Mali at high prices
- ? Harsh competition between a highly subsidized (?80%) national grid tariff, well-known by any rural population, and offered private minigrids? tariff
- ? Lack of a proper off-grid tariff scheme
- ? Lack of monitoring post-project
- ? Limited maintenance leaving equipment to end-users without any support

Given Mali's electricity, and specifically minigrids' situation, policy and regulatory framework, and without a clear national delivery model, the project aims at enabling the proof of concept of green minigrids with private sector engagement in rural areas. Thanks to innovative business models of demonstration pilots, rural communities will gain access to available, reliable, affordable and clean electricity. Lessons learned in Mali and in other countries especially LDCs, have highlighted that a minigrid can only become profitable and sustainable when applying cost-reduction levers, in particular based on productive uses of energy.

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

In terms of cost-reduction efforts, 3 main levers can be identified:

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

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

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

? Additional information to carefully select pilot sites and identify the types of pilots would need to be gathered including a significant stakeholder engagement to ensure relevance and additionality of the pilot projects

? For pilot projects led by the private sector, a competitive procurement process needs to be followed to select the private sector developers who will receive support for minigrid investments

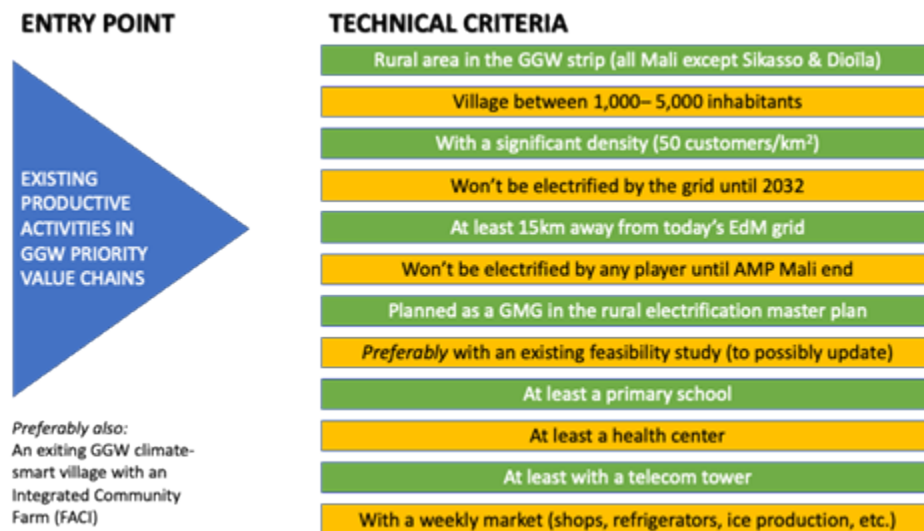
? For community-based pilot projects, the relevance will need to be reassessed, as well as the opportunities to evolve the model to include some form of private sector participation in order to alleviate some challenges met by these community models and increase their sustainability.

? Realities at PPG phase for a given site may drastically evolve (e.g., MG developed by other players, insecurity issues, etc.)

? It will be important to take into consideration the exclusion criteria for minigrid locations stated in the ESMF (see Annex L)

Nevertheless, some preliminary criteria have already been identified with the Implementation Partner (IP), AER-Mali, and the 3 responsible parties, DNE, AMADER and ANGMV, in addition to the pilot project principles stated in the previous chapter:

Figure 4- Objective selection criteria for pilot sites during AMP Mali project implementation



The security situation also needs to be considered as this can highly jeopardize the success of the GMG. Cost recovery and insurance aspects will have to be carefully investigated as otherwise private sector players might not envisage tendering.

There are 2 types of pilot sites envisaged within AMP Mali where respectively the IP (AER-Mali), and the RP AMADER are responsible.

Figure 5- 2 types of GMGs and relevant responsibilities



## 2 types of 100% RE minigrids for AMP Mali



Hybrid community-private sector model



Private sector model  
With concessional authorization granted

### **Model 1: Hybrid community/private sector model supervised by AER-Mali**

Smaller villages will be considered for hybrid community-based GMG models (private sector and communities) and supervised by AER-Mali (complying with the objective selection criteria stated above). As per mandate of AER-Mali, technologies (and relevant business models) will be tested to evaluate their relevance and scale-up potential. This fits to the "Leave no one behind" approach while ensuring the financial viability and sustainability of such minigrids via an active role of private operators.

The hybrid ownership model will rely on a close collaboration between the local community and the private developer. Typically, the private developer will build, operate and maintain the GMG while the community owns the GMG. The exact model will be further developed during implementation phase and bases on the specificities of the selected locality.

Technologies around containerized solutions with access to electricity, and accordingly also drinkable water (via reverse osmosis), internet or cold chain containerized solutions could be tested in such settings (among other technology solutions).

### **Model 2: Private sector model supervised by AMADER**

Larger villages with a higher level of income generating activities and social infrastructures that could be boosted thanks to access to GMGs (called "development hub" - *pôle de développement*) will be considered for private sector based GMG models and supervised by AMADER (complying with the objective selection criteria stated above). As per its mandate, AMADER is in charge for rural electrification. Mali and AMADER in particular have an extensive experience in private sector led minigrids across the country.

All pilots will have the productive use of energy (business and social) as the entry point (i.e. a necessary condition). While investments around PUE equipment will be supervised respectively by AER-Mali and AMADER (based on the pilot type as on Chart 2 above), technical assistance to include GGW priority value chains that can be boosted by access to GMGs will be provided by ANGMV via Output 2.2. Productive use is at the heart of the project's theory of change, where the economics of minigrids can improve in a virtuous cycle of higher loads resulting in lower LCOEs. Under Output 2.2. economic activities that could be boosted through access to an accessible, reliable, affordable and greener energy across the country will highlight such productive uses. This includes:

- ? Agricultural Loads (e.g. irrigation pumps)
- ? Productive Loads (e.g. milling, rice dehusking, oil pressing, wood/metal workshops, refrigeration)

? Commercial Loads (e.g. shops, bars, ice-makers, battery charging and renting, lantern renting, conservation)

? Anchor loads (e.g. telecom towers, mines, green-houses, hotels, loggias)

There are various manners on how productive use can support the viability and profitability of a GMG. Productive use players could pay higher tariffs and provide load during the day which supports CEMG investment feasibility. They could also pay based on kWh while households could pay a service-based fee. Social infrastructures in the village are key given the fact that Mali is facing a rampant poverty phenomenon and a relatively low level of school attendance and healthcare - exacerbated because of COVID-19. In Mali, based on stakeholders consultations, social infrastructures apparently pay their electricity bill as part of each sector's budget. However, there are often some delays - which should be considered in the financial model of the GMG. Gender mainstreaming efforts and monitoring will also cover social infrastructures whereby the latter will be asked to provide information on the gender breakdown of individuals served per year.

#### Examples of GMG business models that may be considered during project implementation

At a meeting with the IP and the RPs, potential GMG business models were discussed and all agreed on 2 potential business model types that could be envisaged during project implementation. These are just examples of GMG models that could be tested and would need to be refined at project implementation phase. The key partners validated the fact that other models could also be favored during project implementation

1. A GMG around existing rural economic centers being supported by other stakeholders, such as the ANGMV's integrated community farms (FACI), multifunctional platforms or electrified activity zones (*zones d'activites ?l?ctrifi?es -ZAE*) implemented by NGO GERES with SIDA and potentially also EU funding (for a phase II). AMP Mali could as such add the access to electricity to an existing project via the GMG and potential ancillary equipment.

? This type of GMG could also combine multiple RE sources (with or without storage) around multiple agricultural value chains : e.g., a solar MG and a pico-hydro or wind, or biogas (with for instance a more ?settled? livestock as a basis for the biodigester and where the question of security and livestock theft to take into account for pilot sites? selection)

? This model could be either a private sector or a community based delivery model. In both cases, a close collaboration between the private sector operator, the income generating activities (productive use) and the community is crucial

? The operations & maintenance of the GMG could be taken care of by GERES? recently created social businesses aimed at covering multiple ZAEs in terms of operations and maintenance (with relevant capacity building). Such a social business could be created for the operations and maintenance of the GMG solely and could encompass multiple localities with GMGs to allow the social business to be profitable.

2. A model called "Keymaker- 4th generation" where a private operator could have two roles: a) solar minigrd (production, transport and distribution of electricity) in the village with residential, commercial and social customers, b) but also an activity of conservation and agro-food transformation. This could be for example around fishing (like *Jumeme* in Tanzania around Lake Victoria) or an agricultural value chain (local rice/rice steaming; peanuts/peanut oil, poultry farming, etc.). This model requires private sector developers of a certain capacity to be able to manage both businesses (electricity and PUE) well. The assessments, consultations and capacity building activities conducted at the beginning of project implementation with project developers will allow to determine if this model could work in Mali and under which conditions.

### Minimum concessionality of GEF INV support to pilots

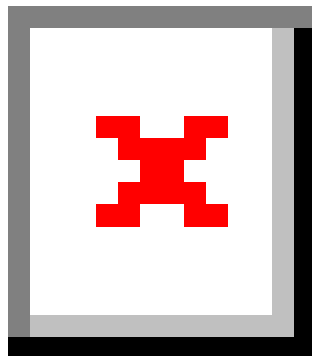
The final design of the minigrid pilots, as set out in the minigrid pilot plan (output 2.1, activity 2.1.1 below), will ensure the efficient and appropriate use of GEF donor funding to the pilots. It will set out a clear methodological basis, for example to ensure LCOE parity with a reference tariff; or based on willingness/ability to pay (determined by a study - or the update of an existing minigrid feasibility study - during implementation). Such methodological assessments will be part of an overall package of financial due diligence/assessments that will be performed during the tender process to select pilot sites/developers.

Local authorities and communities may provide in-kind contributions themselves which will be evaluated during the implementation phase. This may include land and installation labor, as well as, thanks to capacity building efforts provided by the project, local monitoring and basic maintenance (with technical expertise support of the private sector minigrid operator), and local payment collection support and greater system security. Established local women, with buy-in from their families and community leaders, are good candidates for monitoring and maintenance tasks since they are less likely to move. They may also in some cases achieve higher payment compliance or unit prepaid sales (kWh) in cases where mobile-enabled PAYGO solutions are not prevalent. Financial inputs may also come from the Malian diaspora, the private sector (productive use players of the community, KeyMaker model players, etc.), and some technical and financial partners.

### Digital data

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

Box 1 - Data sharing for minigrid pilots



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

This output includes the following activities:

Activity 1.1.1. **Develop a detailed project plan (the project's Minigrid Pilot Plan) for advancing the project's minigrid pilot(s).**

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

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

- ? Clear objective for the pilot(s)
- ? The minigrid delivery model(s) which will be demonstrated in the pilot(s)
- ? The proposed type of pilot(s), which can include: (i) greenfield minigrid pilots, including productive use, and (ii) hybridization and/or productive use overlays, on existing pilots
- ? The estimated target number of pilot(s), based on ex-ante estimates of available GEF INV and co-financing
- ? Inputs, as necessary, on site selection, including based on geo-spatial mapping, for the pilot(s)
- ? Site-specific assessments and other requirements (e.g., demand sizing, social and environmental safeguards (SES) assessments, gender assessments, e-waste disposal). Some assessments may be needed to be performed by the project ex-ante, to inform follow-up competitive tenders
- ? The use of the digital platform for competitive tendering, as necessary
- ? Ongoing data collection from mini-grid pilot(s), including data-sharing requirements from mini-grid pilot(s) (Refer to Box 5), as well as digital hardware requirements (Refer to Box 6)
- ? The project's approach to ensure minimal concessionality for the level of GEF INV support to the pilot(s) (when there are private sector beneficiaries)
- ? Review of the Implementing Partner's (IP's) modalities for transfer of GEF INV support to the pilot(s), ensuring they are aligned with UNDP's policies and financial rules
- ? If a pilot includes GEF INV support for productive use, ensuring the pilot takes a third party ownership model to productive use equipment
- ? Coordination and rationale on any associated project technical assistance activities which may benefit the minigrid pilot(s)
- ? The status of the operator of the MG to regularize especially for community-based MG sites

**Box 2 - Indicative Specifications for Minigrid Pilots' Digital Hardware and Software**

| Offering | Details |
|----------|---------|
|----------|---------|

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

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

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

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

- (i) establishing a requirement and incentives for pilots to share data with the project
- (ii) including incentives for the proposals to be gender-responsive
- (iii) including implementing the ESMP (including a requirement for environmentally-sound collection, storage and disposal of all electronic and electrical waste, including rechargeable batteries, associated with off-grid renewable energy technologies with the support of EnDev's collection and repair points for defective products in rural areas)
- (iv) considering the different aspects set above before detailing outputs and activities of Component 2.

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

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

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

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

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

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

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

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

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

Collected data should also be gender disaggregated.

*Output 2.2. National report and technical assistance on opportunities to boost economic activities through electricity access and productive use with a particular focus on productive and green ecosystems is made available*

This output includes the following activities that will be supervised by ANGMV (RP):

Activity 2.2.1. **Conduct an analysis on boosting rural economies**

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

? A mapping on primary processing opportunities in rural areas to shift the value addition from existing agricultural processing into rural areas. Much of the agricultural outputs of rural areas is, as a result of non-existent rural electricity availability, transported to, aggregated and processed in areas connected to the national grid (or even abroad).

? An analysis on the role minigrid can play in sustainable rural development. The potential opportunities to boost economic activities through electricity access and productive use will be mapped against the difference roles that can be played by:

? Developers and operators - data supports the fact that investing in productive uses increases customer ability to pay and site Average Revenue Per User (ARPU)

? National governments: stimulating productive uses in rural areas boosts the local economy, such as releasing female labor from low productivity traps into higher productivity domestic, agricultural and wage work, and as does improving the health and educational status of children and pregnant women

? Development Finance Institutions (DFIs) - supporting increased electricity demand is a ?soft subsidy? for developers and a variety of socio-economic benefits

? Investors - increased ARPU and ability to pay are key drivers of a project?s bankability. This is also critical information for due diligence and capital raising

? A benchmark of best practices around minigrid value chain support and suitable innovative CEMG business models (e.g. Jumeme?s keymaker model in Tanzania, etc.)

? A market sizing exercise to assess the financial and non-financial impacts (including environmental & social aspects) and the viability of minigrids in rural areas in Mali

Activity 2.2.2. **Disseminate findings to facilitate the green minigrids market scale-up**

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

Activity 2.2.3. **Provide technical assistance to private operators on productive use of energy for priority GGW value chains**

Technical assistance to identify, integrate and leverage productive use opportunities around priority GGW value chains will be provided to private operators installing and operating AMP pilot sites as well as other GMGs in Mali. The exact support will be based on their needs and the results of the report (activity 2.2.1.) and the workshop (activity 2.2.2.).

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

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

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

Activity 2.3.2. **Strengthen the capacities of local private sector operators**

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

In particular, capacity building and support around feasibility studies are key concerns from private developers in Mali, highlighted especially during the focus group with OSER and private sector operators and energy equipment providers. Indeed quite some MG dimensioning mistakes (downsizing) were made based on existing feasibility studies often supervised by AMADER and with the support of various partners.

Workshops and trainings will be provided to upskill developers in the best ways to carry out meaningful and accurate feasibility studies. Introductions will be made to the various tools available including survey tools, GIS mapping and site selection techniques and online platforms to support all of these. The key outcomes of these trainings will include:

? **Right-sizing minigrids:** technical over-design or actually in Mali often under-design of minigrids is a major stumbling block for financially viable minigrids. Correct demand assessment is key here.

? **Business plan writing:** longer term financial projections are key to a business plan. These, and an accurate assessment of risks and mitigation activities are, in turn, fundamentally important for creating an investible asset.

Training should also include surveys which are a key tool to create more accurate and meaningful feasibility studies. Developers will be assisted with survey design in the following ways:

? The design of questions to elicit responses that can lead to the most accurate assessment of potential demand for minigrid services

? Village level observation and surveying points. For example counting the number of diesel generators being used in the village. This provides a useful proxy for offsettable load, baseline and

projected energy demand, willingness and ability to pay for energy services and an indication of existing productive uses of energy

? How to design survey processes to avoid biases associated with gender, ethnicity or any other common biases

From these survey results, developers will be assisted with assessing the potential for various minigrid sites according to their specific characteristics and business model profiles.

Training should also be offered to local solar panel installers based in Bamako as well as in pilot project localities.

These hands-on trainings could be offered in collaboration with the Ministry of National Entrepreneurship, Employment and Vocational Training and its various vocational training centers across the country.

Activity 2.3.3. **Raise awareness of communities and create employment opportunities for youth and women to support private operators locally for operations and maintenance**

Pilot sites communities will benefit from continuous awareness raising at launch and during implementation of the project as a whole, and pilot site construction and operation in particular. This will include general benefits of the minigrid (including climate change aspects), GGW 'green & productive system', PUE and RE ancillary equipment, demand profile, forecast and stimulation, support in money collection for the provision of power, etc.

A specific training will be provided to targeted youth and women in the communities on becoming rural electricians (including power connection), on basic maintenance of the minigrid, as well as other competencies depending on the implemented business model. Private sector operators of selected AMP pilot sites will provide practical training leveraging existing modules including [Barefoot College](#) or [2iE](#) in Burkina Faso, [ProJeunes.Energie](#) in North C?te d'Ivoire, etc. and linking with academia and vocational centers having relevant programmes on renewable energy in Mali. It is worth mentioning that maintenance requiring higher technical skills will be provided by the private sector operator. These trained individuals will constitute potential local employees, freelancers and interns for private sector operators often located in Bamako or larger cities. In addition, private sector operators will play a role in knowledge transfer, capacity building and regular support of these targeted youth and women.

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### **Component 3. Scaled-up Financing**

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

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

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

This output includes the following activities:

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

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



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

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

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

#### Activity 3.1.2. **Assess the potential of aggregation of minigrid assets**

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

Aggregation can take the form of:

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

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

There are few best practice of sectoral funds in Mali such as The [National Plan of Priority Investment in the Agricultural Sector](#). In other countries energy or rural electrification funds have proven their success including Nigeria with its Rural electrification Fund and ESMAP-NEP Program both managed by the Rural Electrification Agency. The AMP Regional project could advise on the type of mechanism and approach that are in place in other AMP countries.

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

Local and international private sector players will be engaged to determine key financial barriers for the development of the MG market in Mali. The [African Minigrids Developer Association AMDA](#), AMADER, AER-Mali, OSER and any other organization with locally relevant private sector knowledge will be interviewed towards the same objective. The DREI analysis undertaken in 2021-2022 offers some de-risking measures that should be considered and implemented to overcome such financial barriers. The preliminary conclusions can be found under Table 2.

#### Activity 3.1.5. **Select relevant financing mechanisms and provide suitable technical assistance (possibly the Rural Electrification Fund - FER) and capacity building to AMADER**

Based on activities 3.1.1. to 3.1.4., AMP Mali will select 1-2 relevant financing mechanisms to benefit from technical assistance.

This could include:

? A sectoral fund as initiated in September 2004 via a [decree](#) including the creation of the Rural electrification Fund (FER). However this fund supposed to be a one-stop shop for rural electrification never really materialized and each technical and financial partner uses its own processes and energy solutions funding mechanisms. The FER should have also received funds from the State to contribute to AMADER's operations and autonomy in terms of rural electrification. Some review is undergoing within AMADER and with World Bank's support. The FER could include financing rural users connection by urban users - in the form of a fee of XOF 50/month/user. Support to the FER should also be nurtured by the existing and upcoming minigrad market initiatives financed by development partners such as World Bank, AfDB as well as the AMP Mali project (for the pilot project sites - see Component 2) and private investments. A set of potential financing schemes will be identified as part of the Facility based on the delivery model that will be more clearly defined during project implementation.

? A result-based financing mechanism approach like the model that the pilots for AMP Mali aims to promote under Component 2. Its design and governance could be informed by a gender-balanced set of stakeholders. Additional provisions may be required to ensure that women and men can access the mechanism in equitable measure (e.g., using scoring criteria, set-asides, special outreach, or offering women agency-based capacity strengthening services in parallel with the Fund's applications).

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

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

Relevant AMADER staff will be trained on the selected financing mechanisms.

### *Output 3.2. Domestic financial sector capacity-building on business and financing models for minigrads*

Some efforts have been already conducted towards financial institutions to raise their awareness on GMG, but they remain limited and do not include sufficient suitable as well as innovative financing solutions.

This output includes the following activities:

#### Activity 3.2.1. **Build the capacities of the national financial sector**

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

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

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

Links will be facilitated through dedicated workshops and a dedicated committee withing the National Off-Grid Inclusive Platform.

To ensure a good understanding and ownership of these solutions, capacity building for local financing solutions providers, local developers and energy solutions providers, government representatives, AER-Mali, AMADER, ANGMV, EdM, etc. will be provided.

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

This output includes the following activities:

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

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

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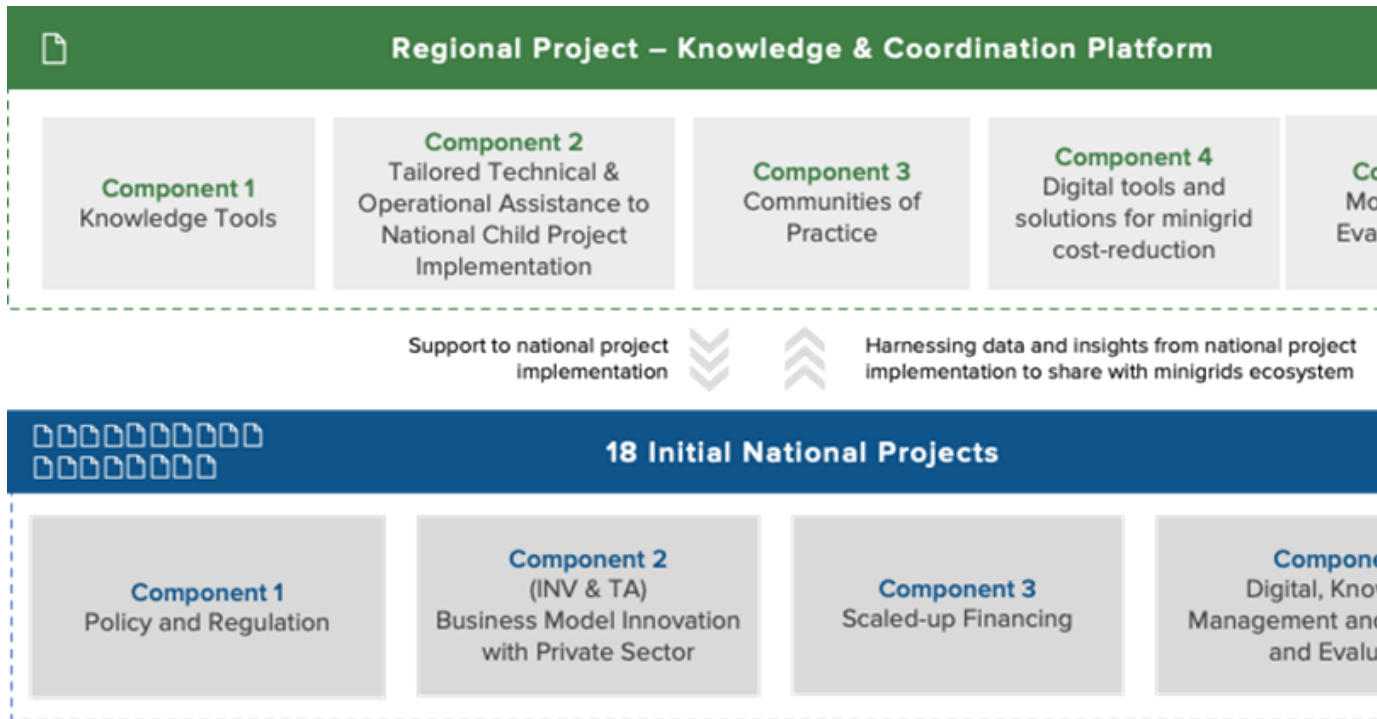
#### **Component 4. Digital and Knowledge Management**

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

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

Figure 6 - Interactions between AMP regional and national projects



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

This output includes the following activities:

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

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

- ? Payments data (via the mobile money platform provider)
- ? Energy usage behavior data (kWh consumption patterns - via the smart meter infrastructure)
- ? Generation system data (including metrics like battery voltage levels- via the smart meter infrastructure)

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

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

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

A Minigrids Digital and Data Management Platform is planned to be procured by World Bank/AfDB and implemented by AMADER. All minigrids including AMP Mali pilot sites (supervised by AER-Mali and AMADER) will be on the platform and any relevant partner could have access to it (incl. the project's IP and RPs). At project implementation launch, the PMU should work with the AMADER

and the World Bank/AfDB teams to assess the platform. Based on these, the activities under this output could be adapted.

This digital platform would serve different purposes including:

**Specifically, for minigrid investment pilots under Component 2:**

- ? Running digital tenders by which minigrid developers will be selected as beneficiaries to receive support under the project
- ? Managing all technical and financial data related to minigrid sites
- ? Provide minigrid developers - selected to implement minigrid pilots with support from the project - access to a set of best-in-industry digital tools for analyzing minigrids (e.g., demand forecasting, system optimization, distribution network design, detailed financial modeling at the site and portfolio level)
- ? Capacity building for minigrid developers and government stakeholders around the use of the minigrids data management platform

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

**For the project and minigrid sector more generally:**

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

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

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

This output includes the following activities:

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

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

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

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

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

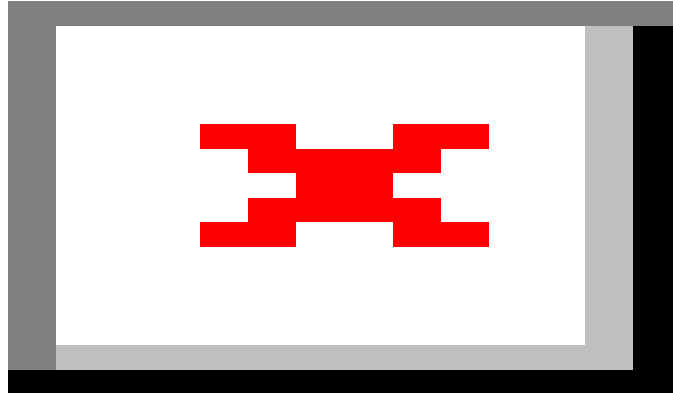
The project will ensure that the country-level minigrids digital platform enables (i) convening and capacity building for key stakeholders (public/private), (ii) collecting and managing technical and financial data related to minigrid pilot(s) based on the project's Quality Assurance and Monitoring

Framework (QAMF), including linking to the AMP Regional Project, and (iii) acting as the mechanism for running digital tenders for minigrid developers/sites.

Box 3 - Indicative Specifications for the Project's Digital Platform

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

| Functionality   | Details  |
|---|--|
| National digital convening platform for key stakeholders                      | <ul style="list-style-type: none"> <li>? Set up of a country-specific, web-based platform to manage all technical and financial data related to minigrid sites at the site and portfolio level</li> <li>? Single site register of minigrid sites, with geospatial views and technical/financial benchmarks for site assessment</li> <li>? Set of best-in-industry tools for analyzing minigrids, including demand forecasting, minigrid system design and optimization, and financial modeling</li> <li>? Capacity-building and in-depth training of key government and other stakeholders to use analytical tools and data management technologies</li> </ul>   |
| National monitoring and evaluation platform (remote monitoring & analytics)   | <ul style="list-style-type: none"> <li>? Direct integration with smart meters and remote monitoring systems for live data feeds and monitoring (with options to address lack of remote monitoring systems or other restrictions)</li> <li>? Big data analytics and customized reporting to calculate and report on standardized metrics for pilot performance, based on project QAMF</li> <li>? Quality assurance of data quality, accuracy, relevance, consistency</li> <li>? Interactive tools to analyze data, filter, and view at varying levels of granularity</li> <li>? All pilot-specific data can be rolled up into national view, and all country-specific data can be rolled-up into regional view</li> </ul> |
| Financing platform for running tenders to select minigrid pilot beneficiaries | <ul style="list-style-type: none"> <li>? Complete end-to-end management of e-tenders for mini-grids customized to specific project/pilot needs (e.g. customized technology solutions, customized workflow, customized KPIs for pilot monitoring)</li> <li>? Automated proposal analysis for quantitative proposal components</li> <li>? Remote verification of connections through smart meter integrations</li> <li>? Automated M&amp;E analytics for all RBF program indicators (connections deployed, amounts paid, gender/environmental impact metrics, etc.)</li> </ul>   |



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

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

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

This output includes the following activities:

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

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

It is expected that national project staff will provide both inputs and feedback on the development of this framework as well as on how best to operationalize the commitment to its adoption by the minigrid

operators receiving support from the national project. Concerns around data privacy or sensitive data on the part of minigrid operators will be considered and addressed in each case.

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

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

To operationalize this, the parties operating the minigrids will be supported with the installation of smart meters and/or remote monitoring equipment as appropriate. Provision will also be made to support the operators to access this data and extract potentially valuable insights on their minigrid operations.

If appropriate, provision will be made to train relevant government agency representatives (and members of the Communities of Practice) in the use of a national minigrid dashboard reporting data on all of Mali's minigrid projects.

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

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

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

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

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

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

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

Every AMP national project is expected (in the course of the four-year implementation cycle) to collaborate with regional project staff on the development of at least 1 insight brief capturing (in an accessible format) selected key highlights from a successful national project activity. The insight brief can cover any activity of the project and take the form of a written brief or video brief. The regional project has budgeted resources for the production of insight briefs (under its Component #1 Knowledge Tools), but the success of regional staff in producing insight briefs highlighting national



project activities will be dependent on content and data provided by the national project team and stakeholders.

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

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

This output includes the following activities:

Activity 4.5.1. **Design a communication strategy (incl. consultation frameworks and information and awareness caravans for the implementation of productive use activities)**

A communication strategy will be elaborated based on awareness raising campaigns and lessons learned. The awareness raising campaign experiences around sustainable energy and GGW-related green and productive ecosystems across Mali and other AMP countries will be identified and leveraged where necessary. Available communication materials will be adapted. The communication strategy should include communication towards members of the GoM as well as the political sphere (National Assembly etc.) to showcase how critical electricity in rural areas is to contribute to sustainable development. It should also cover communication campaigns for the general public and have a yearly communication work plan designed to support the PMU and UNDP Mali to monitor and implement the activities. Awareness caravans on PUE to touch and interact with a large number of people could be built other projects incl. from ANGMV.

This includes radio spots in local languages and banners. In addition, with at least 2 telecom operators, SMS campaigns will be rolled out ? 1 SMS per operator per month over the entire duration of the project. SMS content will be provided by the PMU. Digital means will also be leveraged to raise awareness for instance with the national digital promotion agency, Agence des Technologies de l'Information et de la Communication (ATIC), and some youth and women associations.

The project will develop its own website or a dedicated part in the AMP regional website.

Field visits will be organized on pilot sites to see, understand and discuss with local communities on their experience with the minigrids and energy access.

The leveraging role of schools and children will be envisaged to communicate the need to shift to renewable sources of energy and the catalyzing role of access to energy in rural areas to have access to lighting, cooking, productive use, etc.

Activity 4.5.2. **Implement and monitor the communication strategy (incl. leveraging and disseminating best practices for productive use)**

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

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**Component 5. Monitoring and Evaluation (M&E)**

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*Output 2.1. M&E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid Term Evaluation and (iv) Terminal Evaluation*

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

This output includes the following activities:

Activity 5.1.1. **Hold an inception workshop and prepare a report**

A project inception workshop held to officially launch the project and, among other aims, familiarize key stakeholders with the detailed project strategy, roles and responsibilities of the project team, and project planning instruments such as the budget (Annex R), multi-year work plan (Annex I, Monitoring Plan (Section VI), the Procurement Plan (Annex H), the communication plan, ESMF (Annex L) and the gender action plan (Annex M), among others. The national inception workshop will be carried at the beginning of project implementation (within 60 days of CEO endorsement of this project). The workshop will be organized by the PMU with support from the IP and planned with support from the AMP Regional Project staff. Staff from the AMP Regional Project PMU will participate either remotely or in-person in the Inception Workshop and will provide support to the project PMU to plan the workshop and develop materials and content that will facilitate project planning activities including the template for the Inception Workshop Report. The Inception workshop report will be prepared by the PMU and submitted to UNDP within 90 days of CEO endorsement of this project.

Activity 5.1.2. **Undertake ongoing project monitoring**

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

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

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

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

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

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

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

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

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

#### **4) Alignment with GEF focal area and/or impact program strategies**

The proposed strategy is aligned with the GEF Strategic Focal Areas CCM-1-1 "Promote innovation and technology transfer for sustainable energy breakthroughs for decentralized renewable power with energy storage", and CCM-1-3 "Promote innovation and technology transfer for sustainable energy breakthroughs for accelerating energy efficiency adoption". It also contributes to GEF-7 Programming Directions to accelerate "the speed and scale of sustainable energy investment in developing countries", to develop "innovative business models that go beyond business as usual" and to foster innovation. The overall contribution towards supporting "transformational shifts towards low emission and climate-resilient development pathways" is particularly important given access to affordable and reliable renewable energy is unavoidable for sustainable development, particularly in a context where Comoros is struggling to secure reliable energy access to off-grid communities. At the very heart of AMP lies innovation which can only unleash its potential and impact combined with a conducive environment and enabling conditions through policy and regulatory framework reforms. As renewable minigrids will be developed and operational, supported by innovative business models that can be scaled-up, the programme also aligns with the objective to focus "on the demonstration and early deployment of innovative technologies to deliver sustainable energy solutions that control, reduce or prevent GHG emissions".

In addition, the program follows GEF's advice to deliver focused interventions "through programmatic approaches or regional projects".

#### **5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing**

The business-as-usual scenario would see the persistence of the aforementioned barriers and challenges (see points 1 and 2 above). Autonomous and viable 100% RE minigrids are at their early stage as part of the solution of sustainable and universal energy access in Mali. So far, 300 localities electrified under AMADER's supervision are either diesel minigrids or hybridized solutions and only about 30% are operational.

The AMP project is a lever to test and validate the suitable proof of concept of various types of 100% RE minigrids in Mali (technology, management, costs, etc.) and to stimulate the scale-up of Mali's viable minigrids market. Stakeholder consultations including at top management level at AER-Mali, AMADER, DNE but also ANGMV paved the way for seriously considering innovative business models and reduced costs of minigrids for autonomous 100% renewable minigrids as an effective means for access to available, reliable, affordable and greener energy in rural areas of the GGW strip.

The incremental project reasoning covers various critical aspects:

- Complementing the undergoing review of the policy and regulatory framework with missing aspects to create a conducive environment for an adapted development and scaling up of renewable minigrids in Mali (Component 1), while remaining compliant with national policies, strategies and positions

- Contributing to the adoption of innovative technology solutions and business models of minigrids while leveraging cost reductions through existing and successful projects in Mali, in other countries, technology transfer, South-South cooperation and strategic partnerships, as well as supporting investment in carefully selected pilot sites during implementation (Component 2)
- Building the necessary capacities of relevant stakeholders: institutional staff, communities, project developers and operators, youth and women (across all Components)
- Promoting community engagement and private sector investment in isolated renewable minigrids, and creating the necessary linkages and contracts (Components 1 and 2)
- Supporting innovative supply and demand financing contributing to the scaling up of minigrids in the country (including ancillary renewable energy equipment) (Component 3)
- Sharing knowledge and raising awareness at large scale in the country (national awareness raising campaigns) and for targeted stakeholder through Communities of Practice sharing with other ones under the AMP umbrella and further (Component 4)

Expected contributions from co-financing

The project will work with a variety of partners and initiatives to achieve the project's objective including the global environmental benefits, many in the form of co-financing (see Annex N co-financing letters). Through their various contributions including solar power plants and grid enhancement among others, co-financiers will support access to renewable energy in rural areas.

An overview of the co-financiers, their current efforts to overcome the development challenge, their expected role in the project as well as the expected results to be achieved, can be found in the table below. It is worth mentioning that each of the partner and partner type will be represented at the National Dialogue Platform.

Total co-financing for the project is USD 148,954,219.

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

Table 3 - Identified partners for the AMP in Niger

| Partner name                               | Description and contributions  | Relevant project outputs   |
|--|--|--|
| <b>Ministry of Mines, Energy and Water</b> | The Ministry is responsible for the administration and development of the mining, energy and water sectors and the supervisory authority for the IP and most RPs of the project (AER-Mali, DNE, AMADER), as well as other agencies involved in rural electrification (ANADEB, EDM-SA). The Ministry is the main beneficiary of component 1 under its National Directorate of Energy (See below). | All outputs relevant to component 1 and even all the overall outputs of the project since the Ministry has in charge the management of the steering committee. |

| Partner name   | Description and contributions  | Relevant project outputs  |
|--|--|---|
| <b>National Directorate of Energy (DNE)</b>                        | The DNE develops the elements of the national energy policy, the coordination and the technical control of Mali's regional, sub-regional services and the attached services which contribute to the implementation of the said policy. The DNE will be involved as Responsible Party for key outputs related in particular to the national inclusive off-grid platform and the DREI in component 1.                                | Responsible Party for outputs 1.1, 1.2, 1.4 and contributing to other outputs mostly in component 1.    |
| <b>National Renewable Energies Agency (AER-Mali)</b>               | AER-Mali's mandate is to promote the large-scale use of renewable energies and to test renewable energy and home cooking equipment. AER-Mali is the implementing institution of the AMP Mali project. Hence it coordinates all the outputs.<br><br><b>AER-Mali has provided a co-financing to this project.</b>  | All outputs, given its role as IP.  |
| <b>National Rural Electrification Agency (AMADER)</b>              | Given that AMADER has a key mandate for rural electrification in Mali, this partner has been given an important role in AMP Mali as Responsible Party. It will be mostly involved in components 2, 3, 4 and 5 as responsible party of some outputs, but also participating closely to the other outputs.<br><br><b>AMADER has provided a co-financing to this project.</b>   | Responsible Party for outputs 2.1, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 5.1 and contributing to other outputs. |
| <b>National Electricity and Water Regulation Commission (CREE)</b> | CREE is an independent national regulatory body for the electricity and water sectors, placed under the authority of the Prime Minister. As explained in previous sections, the current revisions of the regulatory framework in Mali intends to give a more central role to CREE in rural electrification, especially around the question of tariffs. Therefore, CREE will be involved in components 1, 2 and 3 of the project.   | Contributes mostly to components 1, 2 and 3.  |
| <b>Energie Du Mali - SA (EDM-SA)</b>                               | EDM-SA is the national power utility in Mali and does play an important role in rural electrification through the national grid. Its role will be mostly in discussions around the improvement of the regulatory framework (component 1) and ensuring that pilot sites (?Minigrid Pilot Plan?) under Component 2 are selected outside of its planned grid extension (as indicated in the objective pilot site selection criteria). | Contributes mostly to component 1 and Output 2.1.   |

| Partner name  | Description and contributions  | Relevant project outputs   |
|---|--|--|
| <b>Ministry of Environment, Sanitation and Sustainable Development</b>  | This ministry is responsible for the administration and development of the environment, sanitation and sustainable development sectors, and is overseeing the Agency for Environment and Sustainable Development (AESD) which is working with the Ministry in charge of energy including for environmental assessments of minigrids.   | Contributes mostly to components 1 and 2.  |
| <b>Agency for Environment and Sustainable Development (AEDD)</b>  | The Agency for Environment and Sustainable Development (AESD) which is working with the Ministry in charge of energy including for environmental assessments of minigrids.   | Contributes mostly to components 1 and 2.  |
| <b>Ministry of Rural Development</b>  | The mission of the Ministry of Rural Development is to promote an attractive rural environment and sustainable agriculture, contributing significantly to accelerated growth for rural poverty reduction and ensuring food security and self-sufficiency. The Ministry is the parent entity of the ANGMV, hence will be involved in all the components of the project  | Contributes to all outputs related to the GGW through the ANGMV.   |
| <b>National Agency of the Great Green Wall (ANGMV)</b>  | <p>The ANGMV is the national structure in charge of leading the Great Green Wall (GGW) initiative in Mali. It is acting as Responsible Party for this project, and will have a cross-cutting role across the components to integrate support to the GGW initiative through AMP Mali.</p> <p><b>The ANGMV has provided a co-financing to this project.</b></p>  | Responsible Party for outputs 1.3 and 2.2, and contributing to other outputs, in particular 4.4 and 4.5. . |
| <b>National Directorate of Water and Forests</b>  | The National Directorate of Water and Forests is responsible for defining, planning and implementing national strategies and programs for the management of forest and wildlife resources.   | Contributes mostly to components 1 and 2.  |
| <b>Association for Rural Electrification Private Operators (OSER) and other non-members operating in solar energy</b> | The participation and contribution of these private operators will be decisive especially in the regulatory framework, pricing and the mobilization of financial resources. They need to be trained for feasibility study, management and operating minigrid and suitable environment and financial mechanisms schemes. Some of them might answer to the tenders for the pilot sites and some could be the winners of these tenders. | Contributes mostly to components 1, 2 and 3.   |

| Partner name  | Description and contributions   | Relevant project outputs                                     |
|---|---|--|
| <b>World Food Organization/FAO</b>                            | Supports actors in the agro- silvo-pastoral development chain, particularly in irrigation, livestock, farming, production and conservation of market garden products. In particular, the FAO is formulating the GCF-funded SURAGGWA project in the GGW areas of Mali, with a component on creating and strengthening resilient, low-emission, equitable, gender-sensitive non-timber forest product smallholder value chains. There are therefore synergies to be made as identified during PPG stage, in particular as part of component 2.  | Contributes mostly to component 2, in particular output 2.2. |
| <b>International Fund for Agricultural Development (IFAD)</b> | The International Fund for Agricultural Development is an international financial institution and a specialized agency of the United Nations that works to address poverty and hunger in rural areas of developing countries. In particular, IFAD is implementing the GCF-funded IGREENFIN project in the GGW areas of Mali which could present good opportunities for synergies, in particular as part of component 2.   | Contributes mostly to component 2, in particular output 2.2. |
| <b>African Development bank (AfDB)</b>                        | <p>AfDB is active in Mali through its Multinational Africa Mini-Grid Acceleration Programme (AMAP) which will be implemented from 2020-2024 and covers 8 countries, the Sustainable Energy Fund for Africa (SEFA) programme and the Desert-to-Power initiative.</p> <p>AfDB is also very active in supporting the government in the revisions of the policy and regulatory framework of energy currently ongoing in the country (linking with component 1), the review of financial derisking mechanisms for rural electrification (linking with component 3) and in supporting AMADER establish a digital platform (linking with component 4).</p> <p><b>AfDB has provided a co-financing to this project.</b></p> | Contributes mostly to components 1, 3 and 4.                 |

| Partner name             | Description and contributions  | Relevant project outputs                               |
|--------------------------|--|--|
| <p><b>World Bank</b></p> | <p>The World Bank is an institution that supports the government of Mali not only to set up an environmental framework favorable to the promotion of the energy sector but also in the financing of electricity access projects.</p> <p>The World Bank is funding the Syst?mes Hybrides d?Electrification Rurale (SHER) / Rural Electrification Hybrid System Project, implemented through AMADER, a USD 45M project started in 2014 that aimed at funding the reactivation or hybridization of up to 50 mini-grids. Funding covers the cost of the new solar and storage plants, with operators expected to fund as little as 5% of capital cost to connect the plant to the existing network and expand connections.</p> <p>WB has also started in 2022 the USD 200M Mali Electricity System Reinforcement and Access Expansion Project that includes <i>inter alia</i> the development of solar PV minigrids under PPP arrangement and the off-grid electrification of health, education and administration facilities, as well as households in remote communities.</p> <p>Similar to AfDB, the World Bank is also very active in supporting the government in the revisions of the policy and regulatory framework of energy currently ongoing in the country (linking with component 1), supporting the installation and operations of minigrids (hybrid and RE) potentially with different business models (component 2), the review of financial derisking mechanisms for rural electrification (linking with component 3) and in supporting AMADER establish a digital platform (linking with component 4).</p> | <p>Contributes mostly to components 1, 2, 3 and 4.</p> |



| Partner name   | Description and contributions  | Relevant project outputs                              |
|--|--|---|
| <b>French Development Agency (AFD) / European Union (EU)</b> | <p>The French Development Agency (AFD) and the European Union (EU) are involved in the PHARE project (Production Hybride et Acc?s Rural ? l?Electricit? / Hybrid Power Generation and Rural Access to Electricity Project) which was launched in 2016 and is implemented through AMADER. The project is financed by the European Union (grant, EUR 18 million), AFD (loan, EUR 20 million) and the Malian government (EUR 1 million), and aims at providing electricity to some 156,000 people through 60 hybrid PV/diesel mini-grids located in the regions of Kayes, Koulikoro, Sikasso, S?gou, Gao, Kidal, Bamako.</p> <p>AFD has put future projects, including with the EU, on hold due to the recent political situation and the relationships between the two countries.</p> <p>The EU is also on standby to launch a Technical Assistance Facility on rural electrification, provided a positive evolution of the political situation.</p> | <p>May contribute mostly to components 1, 2 and 3</p> |
| <b>West African Development Bank (BADEA)</b>                 | <p>The West African Development Bank (BADEA) is supporting the Mali solar rural electrification project. This project (2019-2025) of close to USD 40M is implemented by the West African Development Bank (BOAD) and aims at increasing the rural population?s access to electricity in 50 identified communities by installing 3.78 megawatts of isolated solar PV mini-grid systems. In addition, this project aims at strengthening the capacity of public institutions engaged in rural electrification; contributing to the regulatory framework through capacity-building and putting in place an institutional framework to further promote the deployment of renewable energy. The funding is composed of a 32 million USD loan to the government of Mali for the installation of minigrids, and the remaining as a grant for capacity building and technical assistance.</p>  | <p>May contribute mostly to components 1, 2 and 3</p> |

| Partner name                           | Description and contributions  | Relevant project outputs          |
|--|--|-----------------------------------|
| <b>German Development Agency (GIZ)</b> | <p>The German Development Agency (GIZ) is mostly active in Mali through its Energizing Development (EnDev) project which covers 25 countries including Mali, and intervenes in remote communities far from the national grid. 50 communities are benefiting so far, including with 1 minigrid, but this latter experience was, according to GIZ, paved with challenges. Since 2017, the focus is on a 'whole of energy' approach in the region of Segou. GIZ is also working on the electrification of healthcare facilities (partnering with the national federation of clinics) and on productive uses with NGOs in fragile areas (Gao, Tombouctou, Mopti).</p> <p><b>The GIZ has provided a co-financing to this project.</b></p> | Contributes mostly to component 2 |
| <b>SIDA</b>                            | <p>The Swedish Development Agency (SIDA) is supporting several relevant projects in Mali: the Support for rural electrification by renewable energy systems in the Liptako-Gourma region - Pilot Phase, the Africa Enterprise Challenge Fund - Renewable Energy and Adaptation to Climate Technologies (AECF-REACT) to support local private developers for about USD 5.75M, and the ZAE+ project implemented by GERES (USD 7.85M for this project) for which a phase 2 is under discussion with potential EU funding.</p> <p><b>SIDA has provided a co-financing to this project.</b></p>   | Contributes mostly to component 2 |

**6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)**

Regarding, global environmental benefits, the project contributes to the following GEF-7 Core Indicators:

? *Core indicator 6: Greenhouse gas emissions mitigated* captures the amount of GHG emissions expected to be avoided through the GEF project's investment in renewable energy minigrids. Mitigation benefits include:

- o *Direct emissions reductions* attributable to the investments made in the GEF-supported minigrid pilots during the project's supervised implementation period, totalled over the respective lifetime of the investments (20 years), assuming two types of pilots, a) greenfield minigrid systems (solar PV-battery), and b) PUE to minigrid overlay (solar PV-battery).
- o *Indirect emissions reductions* that could result from a broader adoption of the outcomes of a GEF project plus longer-term emission reductions from behavioural change in the post-project period. Broader adoption of a GEF project proceeds through several processes including sustaining, mainstreaming, replication, scaling-up and market change.

? *Sub-indicator 6.4: Increase in installed renewable energy capacity per technology* captures the increase in solar capacity and battery storage capacity.

? *Core indicator 11: Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment* captures the total number of direct beneficiaries including the proportion of women beneficiaries. Direct beneficiaries are all individuals receiving targeted support from the pilot project.

Table 4 ? project results and gef indicators

| Pilot #  |                     | Pilot 1   | Pilot 2   |
|--|---------------------|---|---|
| Pilot Name   |                     | Small Greenfield Minigrid(s)  | Medium Greenfield Minigrid(s)   |
| Type of Pilot  |                     | Greenfield  | Greenfield  |
|  |                     | Demonstrate hybrid community-private sector based model, containerized solutions, ? to be supervised by AER-Mali, RE promotion agency (IP)  | Demonstrate private sector-led minigrids to be supervised by AMADER, rural electrification agency (RP)  |
| Estimated number of minigrids  |                     | 2   | 2.6   |
| Technology:  |                     | Solar PV + Battery  | Solar PV + Battery  |
| System sizing assumptions  |                     | Standard Small-size MG  | Standard Medium-size MG   |
| <b>Project Budget Allocated to pilot (as CAPEX subsidy)</b>  | GEF INV (US\$)      | 124,072   | 375,928   |
|  | UNDP (US\$)         | -   | -   |
|  | <b>Total (US\$)</b> | <b>124,072</b>  | <b>375,928</b>  |
|  |                     | <b>500,000</b>  |   |
| Estimated Pilot CAPEX needs (US\$)   |                     | 275,716   | 830,981   |
| Estimated co-financing required (US\$)   |                     | 151,644   | 455,053   |
| Use of GEF INV funds   |                     | Provide CAPEX subsidies for 45% of the cost of the greenfield minigrid system.  | Provide CAPEX subsidies for 45% of the cost of the greenfield minigrid system.  |
| Greenhouse Gas Emissions Mitigated (metric tons of CO <sub>2</sub> e)  |                     | 4,072 (direct)  | 12,857 (direct)   |
| Increase in installed renewable energy capacity per technology (kW ? solar) (kWh - storage)                                      |                     | 0.078 (solar PV)<br>0.190 (storage)   | 0.231 (solar PV)<br>0.564 (storage)   |
| Number of direct beneficiaries disaggregated by gender (and customer segment) as co-benefit of GEF investment (number of people) |                     | 2,052 people<br>-----<br>2,000 people (residential)<br>16 people (social)<br>32 people (commercial/PUE)<br>-----<br>400 connections (residential)<br>4 connections (social)<br>12 connections (commercial/PUE)<br>416 connections (total) | 6,613 people<br>-----<br>6,500 people (residential)<br>20 people (social)<br>93 people (commercial/PUE)<br>-----<br>1,300 connections (residential)<br>5 connections (social)<br>31 connections (commercial/PUE)<br>1,336 connections (total) |

*Note:* Of the 8,665 beneficiaries, 50% will be women. For details on assumptions and calculation methods, the reader is referred to Annexes O1 and O2 of the CEO Endorsement Request.

As the project is national child project, the global environmental benefits as well as some adaptation benefits will be summed up and leveraged at regional AMP level. Hence, creating a multiplier effect.

## **7) Innovativeness, sustainability and potential for scaling up**

### Innovativeness

Innovation is inherent to AMP's DNA and applied in various aspects:

1. The project's rationale focuses on the cost-reduction niche of minigrids' hardware, soft and financial costs - as an efficient and effective solution to attract private investment and *in fine* to enable rural communities in Mali to have access to sustainable, reliable, affordable and greener energy.
2. A particular focus and *sine qua none* condition of minigrid projects under AMP is energy for productive use (PUE). Given the rampant poverty in Mali's rural areas, productive use is the first entry point for any pilot site. PUE is a pillar of the financial viability of minigrids in rural areas. Productive uses include both commercial (e.g., solar pumping, agricultural produce conservation and processing, telecom towers, artisans and shops) and social (e.g., health and education facilities) activities.
3. The cost optimization aspect is combined with innovative minigrid business models. The innovative aspect of business models relies on the one hand, on cleantech solutions such as the keymaker model and all-inclusive containerized solutions (see Component 2), and on a hybridized setup whereby a close collaboration between communities and private sector, as well as with the government and public sector (development, management and operations) is created.
4. Innovative suitable financing solutions targeting minigrids both for supply and demand are put forward including crowdfunding and -lending, mobile money, etc. (see Component 3).
5. A market-based intervention is applied to effectively contribute to sustainability of the minigrids. As such the private sector plays a key role from PIF and PPG phase up to implementation and post-project phase.
6. A participatory approach is applied since the preparation of the project to ensure collaboration with and between all relevant stakeholders, commitment and ownership, as well as the project's sustainability (including post-project). Adaptive project management shall be applied as several months fall between project formulation and implementation, and as some efforts impacting the minigrid environment are undergoing with other partners' support (see chapters above). In other words, some activities could be adapted and modified based on a quick assessment of the new baseline at project inception.
7. Gender mainstreaming and social and environmental safeguards are incorporated to the entire project design and implementation to ensure social inclusivity, gender equity and environmental protection.
8. The regional programmatic approach, with a regional chapeau project, facilitates access and sharing of expertise, best practices, lessons learned, training materials as south-south cooperation etc., *inter alia* through a pool of experts, AMP Communities of Practice, a regional digital platform, etc.

### Sustainability

The project sustainability is safeguarded through the active participation of the private sector to establish viable and innovative business models in the minigrid industry in Mali. By seeking durable

profitability, private sector players will ensure the activities continue well after the end of the project. The market-based approach around pilot projects (Component 2) along with technical and financial assistance provided by the GEF and its partners (including co-financiers) will highly contribute to the sustainability of the project outcomes and objective. The replicability plan (including an investment plan under Output 3.4.) developed during project implementation will further support the project's exit strategy and continuity. Hands-on capacity building (technical and managerial) of private sector players (developers, solar installers and other energy services providers as well as businesses using energy for productive uses) and communities (including youth and women rural electricians) is another lever contributing to sustainability. The financing mechanisms and its various innovative financial schemes from various financial institutions and potential donors is designed to last.

The conducive environment created by a suitable policy and regulatory framework and the relevant institutional capacities around minigrids will also support the market scale-up and durability at national level.

At institutional level, the National Inclusive Off-grid Platform should be able to sustain after the project because of its utility. The platform shall be integrated at DNE (Responsible Party of Project Component 1).

The structural anchorage of RE and electrification at lower cost and increased reliability, along with the Great Green Wall, as priorities for the GoM and its various strategies and plans at national level as well as in international conventions signed by Mali should also enable the long-term thinking and implementation of minigrids as a solution for universal, reliable, affordable and green energy access across the country.

Potential for scaling-up

Scaling-up the minigrids market, especially through private sector investment and innovative business models, is the main objective of AMP. As such the potential for scaling-up has been thought through during project formulation phase (PIF and PPG) and a holistic scaling-up plan is elaborated below.



**Figure 7 - Scaling-up approach**

? *Vertical scaling up* is envisaged in the context of actions targeting institutionalized capacity building at policy, political, legal, regulatory, and budgetary planning levels. Component 1 envisages supporting National Inclusive Off-grid Platform around minigrids and rural electrification, which will facilitate synergies and common action through a multi-stakeholder dialogue, a cross-sectoral approach as well as offering targeted needs-based capacity building. In Component 2, vertical scale-up is ensured by structuring the private sector along the RE value chain and with communities. Dissemination and advocacy will be ensured (Component 4) and will provide the necessary scale-up effect.

? *Horizontal scale-up* ? expansion/ replication ? will be fostered and promoted especially through the support to innovative and viable business models, and GMG pilot projects considering cost-reduction and energy for productive use (commercial and social) around green and productive ecosystems of the GGW. Thanks to capacity building, education and large-scale public awareness campaigns, the outreach and impact will be bigger and contribute to the expansion and replication of demonstrated business models and pilot projects in a holistic manner (energy and GGW priority rural

areas). Awareness raising, capacity building, technical and financial assistance of businesses along with the catalyzing role of the private sector will facilitate the replication of the innovative business models and pilot projects to other geographical areas and to other communities in Mali. The replication plan (output 3.3.) will crystalize and support market development and business model replication.

? *Diversification* in the scaling-up potential is also sought by the project. Business models that are evaluated to be viable would be promoted in the context of the project strategy for diversification or functional scaling-up. For example, adding energy efficiency measures and appliances was discussed. Continuous improvement and additional innovations will be further added in the context of the pilot projects' implementation (Component 2) as well as best practices and knowledge sharing with AMP Communities of Practice or any other knowledge network, trainings and community outreach activities (Component 4).

? *Spontaneous scaling-up* may also be realized as part of the direct project results and beyond, and these will be documented through the knowledge management actions under Component 4. Therefore, as part of project implementation, the scaling-up strategy and its roll-out will be drawn. The project will also support systematic monitoring of planned activities. It will, based on achieved results, document the profiles of minigrid business models combined with GGW priorities which could be promoted for scaling-up, and to be included in the replication plan (Output 3.3.).

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[1] Instat Mali

[2] <https://www.afrik21.africa/en/mali-ngos-sound-alarm-at-82-per-cent-forest-loss/> viewed on 7 September 2022

[3] <https://trackingsdg7.esmap.org/country/mali>

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

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

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

## **1b. Project Map and Coordinates**

**Please provide geo-referenced information and map where the project interventions will take place.**

The exact pilot sites (e.g. intervention zones) in rural areas of the GGW strip in Mali will be selected at implementation phase based on objective criteria validated during the validation workshop in September 2022.

## **1c. Child Project?**

**If this is a child project under a program, describe how the components contribute to the overall program impact.**

The current project is part of the ?Africa Mini-grid Programme (AMP)?, as summarized above.

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

## **2. Stakeholders**

**Please provide the Stakeholder Engagement Plan or equivalent assessment.**

See Annex K Stakeholder Engagement Plan.

The participatory and inclusive approach adopted by the project since PPG is part of its DNA. A stakeholder analysis (to be continuously updated) was conducted to identify all relevant stakeholders at the PPG phase. Extensive and numerous stakeholder consultations, one-on-one, focus groups and workshops (inception and validation) were carried out at PPG phase and will be pursued during project implementation to ensure ownership and sustainability during and after project closure. Comments, questions, requests and commitments are stimulated at every project stakeholder. Particular efforts were made since design phase and will continue during the entire project implementation phase:

? Promote effective engagement, as well as inclusive and meaningful consultation. This encompasses a two-way process between the stakeholders and the PMU, the IP, the RPs and UNDP as GEF executing agency to ensure continuous insights, feedback and involvement of project stakeholders. Sharing information and knowledge is critical and supported at PPG as well as during implementation through different specific tools and activities.

? Forge stronger partnerships, particularly with civil society, communities and the private sector. It requires continuous work, based on transparency, engagement and dialogue, outreach, awareness building, listening, and respect for the importance and contributions of all stakeholders.

? Harness the knowledge and expertise of stakeholders which includes acknowledging the fact that stakeholders are a great source of information and knowledge, and that these should be shared through various means including via knowledge management and monitoring & evaluation (Component 4).

Stakeholder engagement since PPG put a high emphasis on conducting it in an inclusive and gender responsive manner. During the PPG phase, relevant stakeholders were asked to provide inputs and comments on the project and their specific role in contributing to overcome the development challenge together. This largely contributed to nourishing the project document and adapting it to local realities and needs as much as possible. At the validation workshop and after sharing the final draft of the project document and annexes, feedback was provided by stakeholders and integrated into the final version of the document. During project implementation, stakeholders will continue to actively contribute and engage in achieving the overall goal of the project. The Stakeholder Engagement Plan in Annex K provides further details on the stakeholder groups, their roles and responsibilities.

Different actions are provided to stimulate and sustain stakeholder engagement throughout project duration (and even after):

? Inception workshop at project launch gathering all key stakeholders to present the project and the inception report to facilitate project implementation. Participants will be invited to share their insights and updates to adapt the workplan. The official project launch and main outcomes of the inception workshop will be broadcasted to a larger audience as part of the awareness raising campaign (Component 4).

? The National Inclusive Off-grid Platform (Component 1) is a powerful tool to support exchanges between project stakeholders and with the PMU on various topics (especially through sub-committees). This multi-stakeholder media is critical to effectively and efficiently contribute to the development of the GMG market in Mali. Sub-committees will be created to further facilitate implementation, ownership and engagement.

? The national Community of Practice is another means to engage with all relevant stakeholders and motivate them to be involved in the project, sharing their experience, learning, and growing (Component 4).

? Continuous stakeholder interactions and consultations through meetings, workshops, training, awareness raising campaigns, etc. will also be used to foster stakeholder engagement. This includes during preparation, construction and implementation of the pilot sites under Component 2.

? The Project Board/Steering Committee is the ultimate platform for stakeholder engagement and decision-making including beneficiary representatives, the project executive and the development



partner (see chapter on governance below). Topics such as workplan, activities and results will be debated, decisions taken together, and necessary corrective measures proposed.

South-South cooperation is particularly fostered in this project. AMP is a regional programme in Sub-Saharan Africa with a minimum of 21 countries participating. Various knowledge sharing tools among AMP countries and AMP's regional project will be provided (Component 4). Cooperation and partnerships with other initiatives and organizations promoting South-South cooperation will be offered under the AMP umbrella including RMI, AfDB, IRENA, SEforAll, AMDA, etc. Discussions with ECREEE should be developed at project launch. Cooperation with AMP Burkina Faso, Niger (and beyond) for francophone training on specific topics as well as with Senegal's successful national dialogue platform on energy will be fostered.

In addition, to bring the voice of Mali to global and regional fora, the project will explore opportunities for meaningful participation in specific events where UNDP could support engagement with the global development discourse on low carbon minigrid and rural electrification. The project will, furthermore, provide opportunities for regional cooperation with countries that are implementing initiatives on low carbon minigrids in geopolitical, social and environmental contexts relevant to the proposed project in Mali.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement.

**Select what role civil society will play in the project:**

**Consulted only;** Yes

**Member of Advisory Body; Contractor;**

**Co-financier;** Yes

**Member of project steering committee or equivalent decision-making body;** Yes

**Executor or co-executor;**

**Other (Please explain)** Yes

### **3. Gender Equality and Women's Empowerment**

**Provide the gender analysis or equivalent socio-economic assesment.**

Gender-mainstreaming is an integral aspect of the project from the design to the implementation phase. The project will ensure the benefits are equally accessible to women, girls and all vulnerable groups in the target communities; in particular, the pilot projects will focus on the development and enhancement of income-generating activities for women and youth.

The constitution of Mali recognizes equality between men and women. The country is making progress towards gender equality and women empowerment. The Government of Mali developed a National Gender Policy in 2011 and has ratified relevant international and regional laws. In particular, Mali has signed on to the ECOWAS Policy for Gender Mainstreaming in Energy Access[1] developed by ECREEE and adopted by the Authority of the Heads of States and Government. The goal of the ECOWAS Policy for Gender Mainstreaming in Energy Access is to address existing barriers that may hinder the equal participation of women and men in expanding energy access in West Africa and, by extension, the success of the SE4ALL initiative and the ECOWAS Regional Policies on Renewable Energy and Energy Efficiency.

Despite these efforts, gender equality remains a challenge in Mali. Mali ranks 155 out of 169 countries on the Gender Inequality Index[2], with only 27.3% of Parliamentary seats held by women and only 8% of the female population over 25 having at least some secondary education, versus 15.5% for men according to the same UNDP report. All of the more reason, why gender and social inclusion will be mainstreamed through project activities under components 1, 2, 3 and 4 as women are disproportionately affected by the lack of access to electricity. During PPG phase, a gender analysis followed by a gender action plan (GAP) were developed to ensure that the project actively promotes gender equality and women's empowerment. Organizations involved in addressing gender-based issues were consulted during the PPG stakeholders consultations.

Following the analysis, the main recommendations in terms of gender considerations to be taken into account in the project are as follows:

? **Component 1 (Policy and Regulation):** Efforts will be made to meaningfully include women in the national dialogue (for participation and decision-making) and training activities, especially practical, hands-on learning activities. Work on regulations and tariffs will be informed by and grounded in realities faced by women, such as widowhood, divorce, or living in polygynous arrangements. To the extent possible, gender-relevant data layers will be added to complement existing pre-feasibility studies of minigrad sites to inform design choices and appropriate levels of program support/concessionality.

? **Component 2 (Business Model Innovation with Private Sector) and Component 3 (Scaled-up Financing):** In the rural settings where the Mali minigrad program will be implemented, women and girls are central to three key electricity service delivery opportunities that can reduce gender gaps, increase human capital, and provide foundations for economic growth: Water, agriculture, and social institutions. These three spheres of opportunity?water, agriculture, social institutions?will be included as gender focus areas of Component 2 and 3, especially as it relates to demand-side solutions. Cost-reduction levers (and benefit maximization ones) are critical to these areas, and perhaps more so for women because women have less disposable income, access to finance, and decision-making power. One such lever could be a group-based and/or collaboration consumption model, with which there is already some experience in the country.

? **Component 4 (Digital and knowledge management):** The project can seek innovative ways to capture data beyond the meter. This includes understanding users (not just customers) and their behaviors and needs. Possibilities include low-cost phone-based surveys (e.g., via interactive voice recordings or SMS) or the use of female community liaisons to collect information on users, appliances, payment responsibilities, and more. Gender mainstreaming is among the topics where insights can be shared to/from the regional AMP.

? **Component 5 (Monitoring and Evaluation)** will be an important part of gender mainstreaming. The results framework in the project document includes sex-disaggregated indicators as well as specific indicators related to the gender action plan. Gender considerations will also be central to the mid-term and terminal evaluations, in alignment with UNDP's Guidance for conducting Terminal Evaluations of UNDP-supported, GEF-financed projects.

The Gender Action Plan (GAP) (Annex M) is a result of this participative process. It ensures that gender aspects are fully included in all activities of the project in terms of project target population, activities, organization, performance indicators and are fully reflected in the Project through gender-responsive indicators. The implementation and monitoring and evaluation of the GAP will be under the responsibility of the Project Coordinator.

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[1] <http://www.ecreee.org/news/member-states-endorse-ecowas-policy-gender-mainstreaming-energy-access>

[2] <http://hdr.undp.org/en/composite/GII>

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?**

Yes

**Closing gender gaps in access to and control over natural resources; Yes**

**Improving women's participation and decision making Yes**

**Generating socio-economic benefits or services or women Yes**

**Will the project's results framework or logical framework include gender-sensitive indicators?**

Yes

#### **4. Private sector engagement**

**Elaborate on private sector engagement in the project, if any**

The project formulation inception workshop held on July 26th, 2022 brought together the various stakeholders, including representatives of the private sector. The private sector was represented by the Association of Rural Electrification Operators, OSER, and some private operators and RE equipment distributors. Telecom operators and banks were also present.

Throughout the process of the Project formulation, representatives of the private sector were consulted, one-on-one and via focus groups (incl. (i) OSER, private operators and RE equipment providers and (ii) representatives of women associations of various value chains and young entrepreneurs). They welcomed this initiative very well. Thus, the stake around the project was shared with them and in return they provided very useful information which contributed to enriching the project document. This included also their specific challenges and needs.

During the project formulation validation workshop which took place on September 19th, 2022, private sector representatives were also participants. This meeting was an opportunity for the private sector to

fully appreciate the objectives and expected results of AMP Mali and above all to understand the different activities planned by component but also their expectations and their role to be played in the implementation of the project. They noted and remained hopeful that the implementation of the project will make it possible, if not to completely curb, to mitigate the negative impacts of the various obstacles, in particular the regulatory framework, financing, capacity building and dialogue between partners to promote the development of GMGs in Mali.

## 5. Risks to Achieving Project Objectives

**Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):**

The overall risk profile of the Project has been assessed as 'Substantial'. Based on the risk categorization assigned to the various country projects and the associated environmental and social risks, the following procedures for screening, assessing, and managing those risks must be undertaken during project implementation of each country project. (1) Screening of social and environmental risks and impacts and determining applicable social and environmental standards and requirements (including UNDP SES). The screening process utilizes UNDP's SESP and develops a specific screening procedure for the forthcoming type of sub-projects/activities. (2) Appropriate types of social and environmental assessment to identify, document and address potential social and environmental risks and impacts. (3) Preparing and approving time-bound action plans for avoiding, and where avoidance is not possible, reducing, mitigating, and managing adverse impacts, including development of specific management plans according to applicable policies and regulations, including UNDP's SES (i.e., Environmental and Social Management Plans which would be completed post-assessment).

Specifically, the SESP identified 15 risks, ten of which assessed as 'substantial' and five as 'moderate'. The DREI framework identifies 10 risks, 2 of which assessed as 'high', 5 as 'moderate to high', 2 as 'low to moderate' and 1 as 'low'.

Social and environmental risks are primarily linked to human rights given the challenges to secure social inclusiveness and incorporate vulnerable people. Among other root causes, underlying factors include very low-income levels of rural people living in small communities which rely on subsistence farming and collection; undefined or absence of land tenure titles and associative structures enabling people to claim their rights; demographic pressure which may lead to local movements of people as a result of electrification, potentially separating them from their food sources.

While electricity supply is a socio-economic enabler, the nexus between productive uses and electricity supply needs to be further articulated - including according to gender. To address this risk, the Project design incorporates sustained community engagement during the preparation phase of the proposed pilots. This activity will draw upon country knowledge and positive experiences in other sectors (e.g., agricultural development) to make these available to the energy sector in Mali.

For more details, reference is made to the ATLAS Risk Log, Annex P

## 6. Institutional Arrangement and Coordination

**Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.**

### Section 1: General roles and responsibilities in the projects' governance mechanism

Implementing Partner: The Implementing Partner for this project is AER-Mali.

The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document.

The Implementing Partner is responsible for executing this project. Specific tasks include:

- ? Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes and is aligned with national systems so that the data used and generated by the project supports national systems.
- ? Overseeing the management of project risks as included in this project document and new risks that may emerge during project implementation.
- ? Procurement of goods and services, including human resources.
- ? Financial management, including overseeing financial expenditures against project budgets.
- ? Approving and signing the multiyear workplan.
- ? Approving and signing the combined delivery report at the end of the year; and,
- ? Signing the financial report or the funding authorization and certificate of expenditures.

Responsible Parties:

There are 3 different responsible parties for AMP Mali:

- ? ANGMV who is responsible for specific GGW-related activities included within AMP Mali. ANGMV has the mandate to implement the strategy and action plan of the GGW in Mali, the guiding document for the GGW initiative in Mali. ANGMV reports to the Ministry of Agriculture and Rural Development.
- ? DNE who is in charge of the legal and regulatory framework aspects around energy in general and MGs in particular. DNE is part of the Ministry of Mining, Energy and Water.
- ? AMADER whose mandate is to promote and coordinate Mali's rural electrification efforts. AMADER reports to the Ministry of Mining, Energy and Water.

The coordination between the IP and RPs will be facilitated via a Coordination Committee composed of the DG and a focal point of each of these 4 partners. This committee will meet every month or two months (relevant ToRs will be developed by the PMU and validated by the IP and RPs at project inception). The Coordination Committee will report to the Project's Steering Committee and work in close collaboration with the PMU, hosted by the IP AER-Mali.

The RPs will be responsible for the implementation of selected outputs as stated in the table below. They will be in charge of mobilizing the relevant stakeholders concerned by the activities of the outputs under their responsibility. They will report on the implementation of these outputs to the IP, AER Mali, through the PMU.

The table below lists the responsibilities of the IP and all 3 RPs per output.

For each RP, a HACT can be found under Annex S.

Table 5 - Distribution of responsibilities per output between the IP and the RPs

| Output  | Responsible |
|---|-------------|
| Output 1.1: The national inclusive off-grid platform, currently being institutionalized/operationalized under the leadership of the DNE, is supported to identify mini-grid delivery models, clarifying priority interventions for an integrated approach to off-grid electrification | DNE         |

| Output  | Responsible |
|---|-------------|
| Output 1.2: A dialogue following the Minigrid DREI techno-economic analyses is facilitated, de-risking instruments are developed and an update of the DREI is conducted in Year 4   | DNE         |
| Output 1.3. An update of the Great Green Wall strategy and action plan is conducted for a better consideration of energy infrastructures in climate actions and green economy   | ANGMV       |
| Output 1.4: Capacity building is provided to public officials (agencies, regulator, ministries) specifically to support cost-reduction levers and innovative business models  | DNE         |
| Output 1.5.: Quality standards for solar mini-grid components are domesticated, and institutional capacity of AER Mali and the Electrotechnical Standards Committee is strengthened   | AER-Mali    |
| Output 2.1 Pilots are developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in mini-grids in the Great Green Wall zone   |             |
| Pilot projects ? lead for 100% RE hybrid community-private sector minigrids with productive use   | AER-Mali    |
| Pilot projects ? lead for greenfield 100% RE private-sector-led minigrids with productive use   | AMADER      |
| Output 2.2 National report and technical assistance on opportunities to boost economic activities through electricity access and productive use with a particular focus on productive and green ecosystems is made available  | ANGMV       |
| Output 2.3. Capacities of private minigrid developers and communities are strengthened  | AMADER      |
| Output 3.1. Support to financing mechanisms in order to scale up RE minigrids investment is provided  | AMADER      |
| Output 3.2. Domestic financial sector?s capacities on business and financing models for minigrids are built   | AMADER      |
| Output 3.3.: Replication plan (including investment plan) for scaling up rural energy access is developed   | AMADER      |
| Output 4.1 A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project  | AMADER      |
| Output 4.2 A ?Minigrids Digital and Data Management Platform? is implemented to run tenders, manage data from pilots, and support minigrids scale-up and cost-reduction   | AMADER      |
| Output 4.3: A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots, including GHG emission reductions, is adopted and operationalized based on standardized guidance from the regional project | AER-Mali    |

| Output   | Responsible |
|--|-------------|
| Output 4.4: Engage with regional project, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learned                             | AER-Mali    |
| Integration of GGW aspects   | ANGMV       |
| Output 4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (incl. intervention zones) and with the regional project                 | AER-Mali    |
| Integration of GGW aspects   | ANGMV       |
| Output 5.1 Monitoring and Evaluation (M&E) and Reporting, including (i) Conducting Inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid-Term Evaluation and (iv) Terminal Evaluation | AMADER      |

### Project stakeholders and target groups:

The participatory and inclusive approach adopted by the project since PPG is part of its DNA. Extensive and numerous stakeholder consultations, one-on-one, in groups and at workshops (inception and validation) were carried out at PPG phase and will be pursued during project implementation to ensure ownership and sustainability of the project after closure. Comments, questions, requests and commitments are stimulated at every project stakeholder.

During PPG phase, relevant stakeholders were asked to provide inputs and comments on the project and their specific role in contributing to overcome the development challenge together. This largely contributed to nourishing the project document and adapting it to local realities and needs as much as possible. At the validation workshop and after sharing the final draft of the project document and annexes, feedback was provided by stakeholders and integrated into the final version of the document.

During project implementation, stakeholders and target groups will continue to actively contribute and influence the decision making for the project. Different media will be used to do so:

? Inception workshop at project launch gathering all key stakeholders to present the project and the inception report to facilitate project implementation. Participants will be invited to share their insights and updates to adapt the workplan. The official project launch and main outcomes of the inception workshop will be broadcasted to a larger audience as part of the awareness raising campaign (Component 4).

? The National Inclusive Off-Grid Platform (Component 1) is a powerful tool to support exchanges between project stakeholders and with the PMU on various topics (especially through sub-committees). This multi-stakeholder media is critical to effectively and efficiently contribute to the development of a nascent minigrids market in Niger. Sub-committees will be created to further facilitate implementation and decision making.

? The Project Board/Steering Committee is the ultimate platform for decision making including beneficiary representatives, the project executive and the development partner (see below). Topics such as workplan, activities and results will be debated, decisions taken together, and necessary corrective measures proposed.

? Continuous stakeholder interactions and consultations through meetings, workshops, trainings, awareness raising campaigns, etc. will also be used to facilitate decision making based on stakeholders' insights.

Regular progress and monitoring reports that can be disseminated to specific partners and players

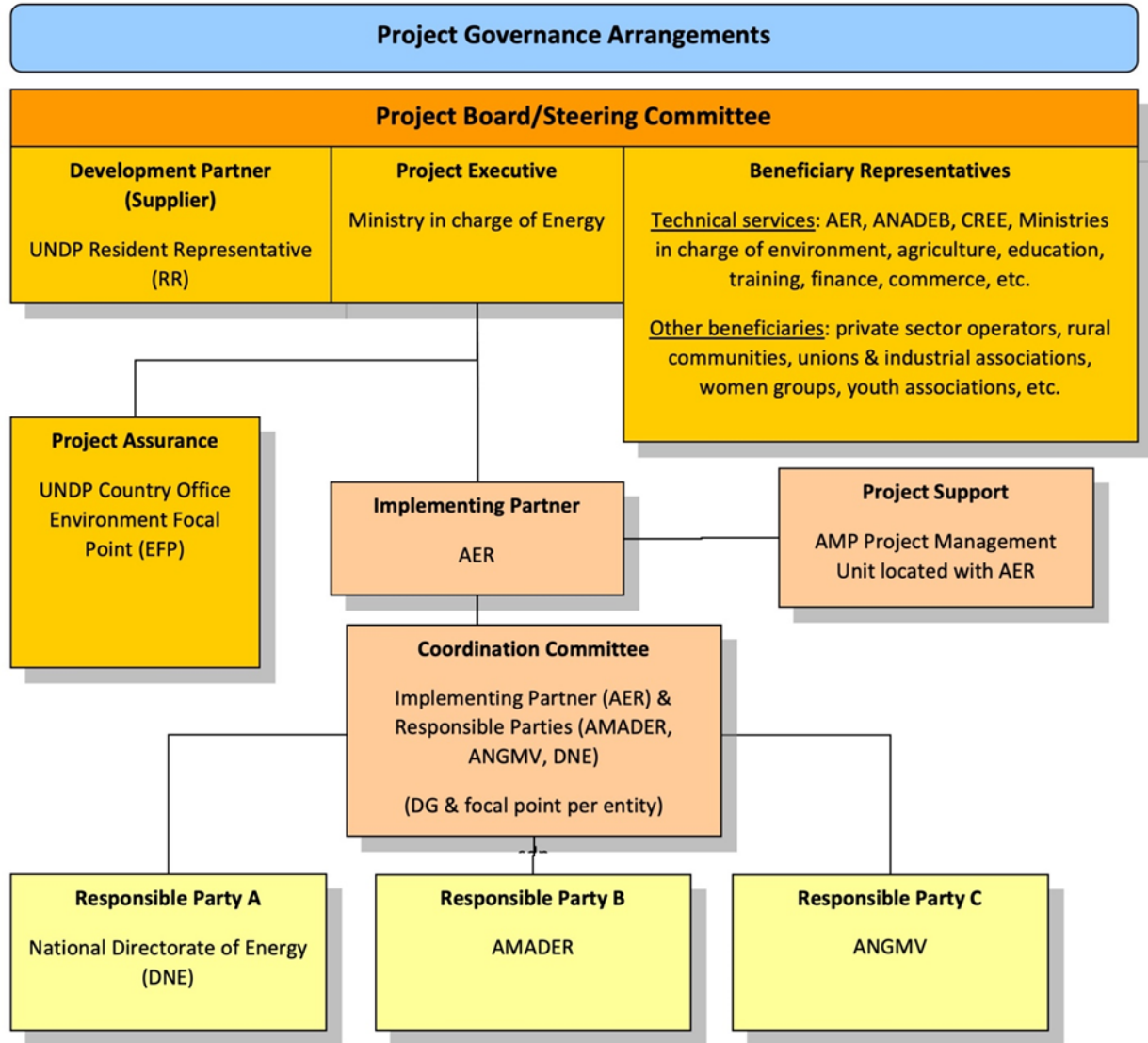
UNDP: UNDP is accountable to the GEF for the implementation of this project. This includes overseeing project execution undertaken by the Implementing Partner to ensure that the project is being carried out in accordance with UNDP and GEF policies and procedures and the standards and provisions outlined in the Delegation of Authority (DOA) letter for this project. **The UNDP GEF Executive Coordinator, in consultation with UNDP Bureaus and the Implementing Partner, retains the right to revoke the project DOA, suspend or cancel this GEF project.** UNDP is responsible for the Project Assurance function in the project governance structure and presents to the Project Board and attends Project Board meetings as a non-voting member.

A firewall will be maintained between the delivery of project oversight and quality assurance performed by UNDP and charged to the GEF Fee and any support to project execution performed by UNDP (as requested by and agreed to by both the Implementing Partner and GEF) and may be charged to the GEF project management costs (only if approved by GEF). The segregation of functions and firewall provisions for UNDP in this case is described in the next section.



## Section 2: Project governance structure

Figure 8 - Project Governance arrangements



### Second line of defense:

- ? Regional Bureau oversees RR and Country Office compliance at portfolio level.
- ? BPPS NCE RTA oversees technical quality assurance and GEF compliance. BBPS NCE PTA oversees RTA function.
- ? UNDP GEF Executive Coordination and Regional Bureau Deputy Director can revoke DOA/cancel/suspend project or provide enhanced oversight

The UNDP Resident Representative assumes full responsibility and accountability for oversight and quality assurance of this Project and ensures its timely implementation in compliance with the GEF-specific requirements and UNDP's Programme and Operations Policies and Procedures (POPP), its Financial Regulations and Rules and Internal Control Framework. A representative of the UNDP Country Office will assume the assurance role and will present assurance findings to the Project Board, and therefore attends Project Board meetings as a non-voting member.

### **Section 3: Segregation of duties and firewalls vis-?-vis UNDP representation on the project board:**

As noted in the [Minimum Fiduciary Standards for GEF Partner Agencies](#), in cases where a GEF Partner Agency (i.e. UNDP) carries out both implementation oversight and execution of a project, the GEF Partner Agency (i.e. UNDP) must separate its project implementation oversight and execution duties, and describe in the relevant project document a: 1) Satisfactory institutional arrangement for the separation of implementation oversight and executing functions in different departments of the GEF Partner Agency; and 2) Clear lines of responsibility, reporting and accountability within the GEF Partner Agency between the project implementation oversight and execution functions.

In this case, UNDP is only performing an implementation oversight role in the project vis-?-vis our role in the project board and in the project assurance function and has no execution role in the project (Full NIM project). This *de facto* ensures a full separation of project implementation oversight and execution duties.

### **Section 4: Roles and Responsibilities of the Project Organization Structure:**

**Project Board:** All UNDP projects must be governed by a multi-stakeholder board or committee established to review performance based on monitoring and evaluation, and implementation issues to ensure quality delivery of results. The Project Board (also called the Project Steering Committee) is the most senior, dedicated oversight body for a project.

The two main (mandatory) roles of the project board are as follows:

- 1) **High-level oversight of the execution of the project by the Implementing Partner** (as explained in the [?Provide Oversight?](#) section of the POPP). This is the primary function of the project board and includes annual (and as-needed) assessments of any major risks to the project, and decisions/agreements on any management actions or remedial measures to address them effectively. The Project Board reviews evidence of project performance based on monitoring, evaluation and reporting, including progress reports, evaluations, risk logs and the combined delivery report. The Project Board is responsible for taking corrective action as needed to ensure the project achieves the desired results.
- 2) **Approval of strategic project execution decisions of the Implementing Partner** with a view to assess and manage risks, monitor and ensure the overall achievement of projected results and impacts and ensure long term sustainability of project execution decisions of the Implementing Partner (as explained in the [?Manage Change?](#) section of the POPP).

#### **Requirements to serve on the Project Board:**

- ? Agree to the Terms of Reference of the Board and the rules on protocols, quorum and minuting.
- ? Meet annually; at least once.
- ? Disclose any conflict of interest in performing the functions of a Project Board member and take all measures to avoid any real or perceived conflicts of interest. This disclosure must be documented and kept on record by UNDP.
- ? Discharge the functions of the Project Board in accordance with UNDP policies and procedures.
- ? Ensure highest levels of transparency and ensure Project Board meeting minutes are recorded and shared with project stakeholders.

#### **Responsibilities of the Project Board:**

- ? Consensus decision making:

- o The project board provides overall overall guidance and direction to the project, ensuring it remains within any specified constraints, and providing overall oversight of the project implementation.
- o Review project performance based on monitoring, evaluation and reporting, including progress reports, risk logs and the combined delivery report;
- o The project board is responsible for making management decisions by consensus.
- o In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition.
- o In case consensus cannot be reached within the Board, the UNDP representative on the board will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed
- ? **Oversee project execution:**
- o Agree on project manager's tolerances as required, within the parameters outlined in the project document, and provide direction and advice for exceptional situations when the project manager's tolerances are exceeded.
- o Appraise annual work plans prepared by the Implementing Partner for the Project; review combined delivery reports prior to certification by the implementing partner.
- o Address any high-level project issues as raised by the project manager and project assurance;
- o Advise on major and minor amendments to the project within the parameters set by UNDP and the donor and refer such proposed major and minor amendments to the UNDP BPPS Nature, Climate and Energy Executive Coordinator (and the GEF, as required by GEF policies);
- o Provide high-level direction and recommendations to the project management unit to ensure that the agreed deliverables are produced satisfactorily and according to plans.
- o Track and monitor co-financed activities and realisation of co-financing amounts of this project.
- o Approve the Inception Report, GEF annual project implementation reports, mid-term review and terminal evaluation reports.
- o Ensure commitment of human resources to support project implementation, arbitrating any issues within the project.
- ? **Risk Management:**
- o Provide guidance on evolving or materialized project risks and agree on possible mitigation and management actions to address specific risks.
- o Review and update the project risk register and associated management plans based on the information prepared by the Implementing Partner. This includes risks related that can be directly managed by this project, as well as contextual risks that may affect project delivery or continued UNDP compliance and reputation but are outside of the control of the project. For example, social and environmental risks associated with co-financed activities or activities taking place in the project's area of influence that have implications for the project.
- o Address project-level grievances.
- ? **Coordination:**
- o Ensure coordination between various donor and government-funded projects and programmes.
- o Ensure coordination with various government agencies and their participation in project activities.

**Composition of the Project Board:** The composition of the Project Board must include individuals assigned to the following three roles:

1. **Project Executive:** This is an individual who represents ownership of the project and chairs (or co-chairs) the Project Board. The Executive usually is the senior national counterpart for nationally implemented projects (typically from the same entity as the Implementing Partner), and it must be UNDP for projects that are direct implementation (DIM). In exceptional cases, two individuals from different entities can co-share this role and/or co-chair the Project Board. If the project executive co-chairs the project board with representatives of another category, it typically does so with a development partner representative. The Project Executive is the General Secretary at the Ministry in charge of Energy.
2. **Beneficiary Representative(s):** Individuals or groups representing the interests of those groups of stakeholders who will ultimately benefit from the project. Their primary function within the board is to ensure the realization of project results from the perspective of project beneficiaries.

Often representatives from civil society, industry associations, or other government entities benefiting from the project can fulfil this role. There can be multiple beneficiary representatives in a Project Board. The Beneficiary representatives include (non-exclusive list that will be adapted at project launch):

- ? Representative of technical services (not participating as Responsible Parties to the project):
- ? AER, ANADEB, CREE
- ? Ministries in charge of energy, environment, agriculture, education, training, employment, economy, finance, commerce, women, child protection, etc.
- ? Other beneficiaries:
- ? Pilot communities (possibly via an association in the community and on a rotational basis)
- ? Renewable energy service providers, OSER
- ? Consumers association
- ? Women and youth associations
- ? University or high learning school delivering renewable energy courses
- ? NGOs operating in the field of minigrids & CSOs as well as the GGW
- ? Financial Institutions
- ? Technical and financial partners

3. **Development Partner(s):** Individuals or groups representing the interests of the parties concerned that provide funding, strategic guidance and/or technical expertise to the project. The Development Partner(s) is the UNDP Mali Resident Representative who will ensure the policies of UNDP and the GEF are complied with.

-

**Project Assurance:** Project assurance is the responsibility of each project board member; however, UNDP has a distinct assurance role for all UNDP projects in carrying out objective and independent project oversight and monitoring functions. UNDP performs quality assurance and supports the Project Board (and Project Management Unit) by carrying out objective and independent project oversight and monitoring functions, including compliance with the risk management and social and environmental standards of UNDP. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. Project assurance is totally independent of project execution.

A designated representative of UNDP playing the project assurance role is expected to attend all board meetings and support board processes as a non-voting representative. It should be noted that while in certain cases UNDP's project assurance role across the project may encompass activities happening at several levels (e.g. global, regional), at least one UNDP representative playing that function must, as part of their duties, specifically attend board meeting and provide board members with the required documentation required to perform their duties. The 2 UNDP representative playing the main project assurance function are the Deputy Resident Representative - representing the management side at UNDP Mali- and the CO programme officer - representing the relevant technical expertise around the project at UNDP Mali.

**Project Management ? Execution of the Project:** The Project Manager (PM) (also called project coordinator) is the senior most representative of the Project Management Unit (PMU) and is responsible for the overall day-to-day management of the project on behalf of the Implementing Partner, including the mobilization of all project inputs, supervision over project staff, responsible parties, consultants and sub-contractors. The project manager typically presents key deliverables and documents to the board for their review and approval, including progress reports, annual work plans, adjustments to tolerance levels and risk registers.

A designated representative of the PMU is expected to attend all board meetings and support board processes as a non-voting representative.

The primary PMU representative attending board meetings is the Project Manager supported where needed by the Project Coordinator or the Administrative Assistant.

The PMU will be supported by the Coordination Committee to facilitate the successful implementation of the projects as well as the coordination between the IP and the 3 RPs (see above in Section 1 of the chapter).

#### 7. Consistency with National Priorities

**Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:**

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

AMP Mali is consistent with national strategies and relevant conventions from below:

Table 6 - Policy context for renewable energy minigrids and the GGW in Mali

| Policy / planning document |   | Relevance   |
|----------------------------|---|---|
| Sector Policies            | <a href="#">Strategic Framework for Economic Recovery and Sustainable Development (2019-2023)</a> | Country Overall Development Framework Document. Acknowledgement that energy plays a critical role in economic competitiveness. Energy is a key element of the 3rd pillar to support inclusive growth and structural transformation of the economy.  |
|                            | <a href="#">National energy policy</a>  | Reference framework document for the energy sector covering 6 sub-sectors and relevant policies: 1) Traditional energies; 2) Hydrocarbons; 3) Electricity; 4) Renewable energies (including biofuels or bioenergy); 5) Nuclear energy and 6) Energy management and EE. Its specific objectives matching the AMP Mali projects are: (i) ensuring the widest possible access of the country's population to energy (ii) developing the national energy resource potential (iii) strengthening and preserve existing wood fuel resources; (iv) liberalizing the sector by mobilizing more initiatives from decentralized communities and private investors; (v) adapting the institutional framework to the requirements of the energy sector, by strengthening the State's strategic orientation and control capacities.<br>Energy access aspects will be included in the National Energy Policy after the revision to avoid having a dedicated energy access policy.<br>? Currently under review by World Bank |

| Policy / planning document | Relevance  |
|----------------------------|--|
|                            | <p><a href="#">National Environmental Protection Policy</a> (<i>La Politique Nationale de Protection de l'Environnement - PNPE</i>) - 1998</p> <p>The PNPE includes the National Environmental Action Plan (PNAE) as well as nine National Action Programs (PAN), Regional Action Programs (RAPs) and Local Action Programs (LAPs). The National Action Programs are focusing respectively on land use planning, natural resources management, water resources management, improvement of the living environment, development of new and renewable energy resources, environmental information management, environmental information, education and communication program, monitoring the implementation of conventions, research program on the fight against desertification and environmental protection. The strategies and policies on environment and the fight against desertification are mainly contained in the PNPE.</p> <p><a href="#">National Climate Change Policy</a> (<i>Politique Nationale sur les Changements Climatiques</i>) 2011</p> <p>The policy highlights several actions including:</p> <ul style="list-style-type: none"> <li>- Implementation of the national renewable energy strategy;</li> <li>- Promotion of energy efficiency (improved cookstoves, low consumption lamps, etc.)</li> <li>- Promotion of low-cost alternative energies to firewood (biogas, butane gas, briquettes)</li> <li>- Promotion of biofuels (production, transformation and local use)</li> <li>- Promotion of micro-hydroelectricity</li> <li>- Mapping of biomass, wind and solar resources</li> </ul>   |
| Strategies and Plans       | <p><a href="#">National Strategy for Access to Electricity</a> (<i>Strat?gie Nationale d'acc?s ? l'?lectricit? - SNAE</i>) ? currently under review (ToR available on demand at DNE)</p> <p>The revised strategy should define, in terms of access to electricity, the objectives, the strategic axes, the electrification concession, the investments admitted in the field of the SNAE, the clear roles of AMADER, AER and CREE, etc.<br/>? Currently under review by World Bank</p> <p><a href="#">Rural Electrification Development Strategy</a> (<i>Plan de D?veloppement de l'?lectrification Rurale - PDER</i>) - 2007</p> <p>Rural electrification is under AMADER?s mandate and supports private sector promotion for rural electrification outside of national utilities EDM-Sa?s concessions. There are 2 options: (i) <i>PPER - Programmes Prioritaires d'?lectrification Rurale</i> - Rural Electrification Priority Programmes for 10 multi-sectoral electrification areas across the country with a call for application for one operator per area and (ii) <i>PCASER - Projets de Candidature Spontan?e d'?lectrification Rurale</i> - that are spontaneous applications of smaller sizes from local communities, users groups, NGO or private investors. The plan includes an evaluation of the electricity demand in rural areas.<br/>? Currently under review by World Bank</p> <p><a href="#">Reference framework for the development of domestic energy</a> (<i>Cadre de r?f?rence pour le d?veloppement de l'?nergie domestique au Mali</i>) - 2003</p> <p>The framework clarifies the conditions and objectives for deploying renewable energy technologies or controlling domestic energy demand, reducing pressure on firewood, deforestation and desertification. Some of the levers considered include the use of natural gas and agricultural waste.</p> |

| Policy / planning document  | Relevance   |
|---|---|
| <a href="#">Strategy for the development of renewable energy</a> ( <i>Stratégie de développement des énergies renouvelables- SDER</i> ) - 2006  | SDER promotes the widespread use of Renewable Energy (RE) technologies and equipment to increase the share of RE in national electricity production from less than 1% in 2004 to 6% in 2010 and 10% in 2015.<br>? Currently under review by World Bank  |
| <a href="#">National Renewable Energy Action Plan</a> ( <i>Plan d'Action National des énergies Renouvelables du Mali-PANER</i> ) 2015-2020/2030 | This plan defines targets for the electrification of renewable energy minigrids.  |
| <a href="#">Strategy for the Development of Energy Management in Mali</a> - 2010  | Focuses on energy efficiency and mature renewable energies. It acknowledges the key role of properly managing energy in the country to ensure energy security, economic competitiveness and social stability, as well as to fight against climate change in Mali and the world.<br>? Currently under review by World Bank   |
| <a href="#">National Energy Efficiency Action Plan</a> ( <i>Plan d'Action National d'Efficacité Énergétique - PANEE</i> ) 2015-2020/2030        | This plan defines targets for solar photovoltaic lighting, efficient appliances and buildings   |
| <a href="#">National Strategy for Biofuels Development</a> ( <i>Stratégie Nationale pour le Développement des Biocarburants</i> ) - 2008        | Biofuels are considered as a sustainable alternative to 100% imported fossil fuels including for electricity generation and to support GHG emissions reduction.<br>This strategy aims to develop Mali's own biofuels to offer energy at lower costs to satisfy socio-economic needs of the country: (i) Increasing the basic crop production of biofuels (ii) Establishing artisanal and industrial infrastructures for the production, processing and distribution of biofuels (iii) Setting up an institutional, legal, organizational and financial environment for the development of biofuels.<br>? Currently under review by World Bank |
| <a href="#">Ten-Year Priority Investment Plan</a> ( <i>Plan d'Investissements Prioritaires Décennal PIPD</i> ) 2021-2030                        | The 2021-2030 PIPD is a Regional Planning, Technical and Financial Implementation Framework for the flagship actions of the GGW Programs/Projects for the next ten years.<br>It has been developed to better identify and improve the approach and the overall framework for mobilizing investment and financing needs and to facilitate the tracking and monitoring of objectives, strategic indicators, added value and sensitivity index of impact programs.   |

| Policy / planning document  | Relevance   |
|---|---|
| <p><a href="#">Strategy and Action Plan for the Great Green Wall implementation in Mali</a> (<i>Strat?gies et plan d?actions de mise en ?uvre de la grande muraille verte du Mali</i>) 2012</p>   | <p>The African Heads of State adopted, at the 7th session of the Conference of the Community of Sahel-Saharan States (CENSAD), held in June 2005 in Ouagadougou (Burkina Faso), the "Great Sahelo-Saharan Green Wall Initiative" with a view to join forces and end desertification and food insecurity. More concretely, this initiative, which is in line with the Action Plan of the Environment of the New Partnership for Africa's Development (NEPAD), aims to develop an innovative and inclusive approach, putting in synergy actions to combat desertification and the adverse effects of climate change, land restoration, biodiversity conservation, development of agricultural and pastoral production systems in order to promote the creation of wealth for the benefit of the populations.</p>        |
| <p><a href="#">Master Plan for Optimal Investments in the Electricity Sector in Mali</a> (2015-2035)</p>  | <p>This plan projects Mali's potential electricity consumption up to 2035 and derives the required energy and power production. It uses 3 electricity demand scenarios (base, worse and best) to subsequently determine optimal investment plans until 2035 with a least-cost approach.</p>   |
| <p>EDM-SA Development plan 2022-2026</p>  | <p>This plan defines the prospects for extending the national electricity grid and the objectives for integrating renewable energies.</p>   |
| <p><a href="#">Nationally Determined Contribution (NDC)</a> - 2015 updated in 2021</p>  | <p>It specifies Mali's ambitions to reduce greenhouse gas emissions in 4 sectors (forestry; energy; waste and agriculture) as well as prioritizing a green and resilient economy to combat climate change (forestry, smart agriculture and RE). It also specifies that Mali is a carbon sink.</p>   |
| <p>Laws</p> <p><a href="#">Management of forest resources</a> (Law No. 95-004/AN-RM of January 18, 1995, establishing the conditions for the management of forest resources)</p> <p><a href="#">Agricultural orientation law</a> (<i>Loi d'Orientation Agricole - LOA</i>) 2005</p> | <p>This law sets the general conditions for the conservation, protection, development, and exploitation of the forest resources of the national forestry domain. It should be recalled that the GGW Initiative is perceived in Mali as an opportunity for community and local development through the implementation of the Strategic Framework for Growth and Poverty Reduction and particularly the Agricultural Orientation Law (see below).</p> <p>The aim of this law is to promote sustainable, modern and competitive agriculture (vs. subsistence agriculture), which relies primarily on recognized and secure farms (Article 3). It also aims to guarantee food sovereignty and to make the agricultural sector the engine of the national economy in order to ensure the well-being of the population.</p> |
| <p>Dedicated regulations (minigrids)</p> <p><a href="#">Study and Notice on environmental and social impacts</a> - applicable to minigrids - 2018</p>   | <p>This decree stipulates that an environmental and social impact study (ESIA) or an environmental and social impact notice (NIES) is mandatory for energy projects. Projects are classified in 3 categories - A, B (study) or C (notice).</p>  |
| <p>Cross-cutting policy and regulation</p> <p><a href="#">Investment Code</a> 2012</p>  | <p>This document's review was in progress in 2019. The document defines the best conditions offered to private investors in the Republic of Mali without any discrimination.</p>  |



| Policy / planning document |   | Relevance  |
|----------------------------|---|--|
|                            | <a href="#">Public-Private Partnerships Law 2016</a>  | This Law offers the opportunity for local authorities to support the rapid scaling up of off-grid electrification from renewable energies.   |
|                            | <a href="#">Ordinance No. 2020-012/P-RM of March 23, 2020 exempting renewable energy equipment from VAT, import duties and taxes 2020</a> | This ordinance represents a sustainable support for scaling up mini-grids and home renewable energy systems  |
|                            | <a href="#">Agricultural Land Act - 2017</a>  | This law especially encourages the entrepreneurship of women and young people in the agricultural sectors.   |
|                            | <a href="#">National Gender Policy - 2011</a>   | This includes accelerating economic development and more equitable participation and sharing of the benefits of economic activities. No specific mention is made though around energy and the GGW. |

## 8. Knowledge Management

**Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.**

Knowledge management plays a significant role of the AMP national child project and the regional programme (among AMP countries). Component 4 is especially dedicated to knowledge development and sharing ? reflected in the name of the component ?Digitalization and Knowledge Management?. Knowledge shall be shared at different levels:

- ? Locally among the project stakeholders in Niger as well as the population at large (nation-wide awareness raising campaign)
- ? AMP level between AMP countries Community of Practices as well as the regional knowledge sharing platform
- ? Regionally and internationally through energy, renewable energy and minigrids communities, networks and platforms.

A variety of knowledge products will be developed throughout the project life and further:

- ? A minigrids digital platform to share knowledge and data around minigrids projects (incl. pilot sites of AMP from tendering to results), training and capacity-building at national level, with the support of AfDB, World Bank, AMADER and other partners
- ? A rural electrification platform to centralize all relevant studies, data, information, trainings etc. around rural electrification in Mali
- ? A Community of Practice sharing best practices, lessons learnt, trainings, etc. on rural energy access and minigrids with other Communities of Practice of other AMP countries and the larger energy and minigrids community, including the ECOWAS region and ECREEE. This shall be done mainly online through webinars or digital platforms

? Design of an 'Insight Brief' to showcase the AMP project or a specific activity via a video or pictures to be covered by the regional project and shared within Niger as well as at regional and international level

? Awareness raising efforts at community level as well as nationwide on renewable energy, minigrids, pilots projects, SDG7, GHG emission reduction, etc.

? 2 independent evaluations at mid-term and at the end of the project which constitute important data and analysis for the scaling up of the RE minigrids market in Mali

The knowledge and experience gained in the project will be carefully documented, including by the Project Management Unit and relevant consultants and contractors.

This will encompass a regular and systematic data collection at the project pilot sites which will be systematically filed and archived by PMU with easy retrieval system, smart meters and other monitoring efforts (through a Quality Assurance and Monitoring Framework).

The project will also seek two-ways knowledge sharing with other projects at national and regional level. This includes other UNDP projects e.g. the SIDA financed project in the Liptako-Gourma area with UNOPS, as well as for instance through the training on renewable energy provided by the Vocational Training Center on Renewable Energy and Climate of S'lingu?.

Evaluation reports of past and ongoing project (when available) along with close collaboration should support a steep learning curve and avoid 'reinventing the wheel?'. The National Inclusive Off-grid Platform should encompass representatives from other projects to discuss, share and leverage best practices and lessons learnt.

The learning process throughout the collection of data, analysis, assessment and reporting will also benefit the GoN in view of its desire to support access to available, reliable, affordable and greener energy and hence contributing to sustainable development in rural areas especially. The experiences of working with communities and the private sector to reduce GHG emissions, promote gainful employment as well as demonstrating the proof of concept of renewable minigrids will provide opportunities for the government and other key stakeholders to adopt them for upscaling.

The Project will also emphasize strong communications with a broader range of stakeholders. Key elements of the project's communication strategy are outlined in the table below:

Table 7 ? Knowledge management aspects of the project

| Key element   | Relevant group   | Means   | Timeframe   |
|---|--|---|---|
| <b>1. Project governance meetings; PSC meetings and its Working Group meetings</b>  | All stakeholders that are members of the PSC or its Working Groups are invited to attend   | Meetings  | Periodically, depending on PSC and Advisory Committee frequency of meetings   |
| <b>2. Seminars/workshops and training events, including the Inception workshop, and final project workshop</b>                            | National and sub-national government officials<br>Private sector; NGOs and CSOs  | Workshop, meeting, seminar, training<br>On-the-job training<br>Budget:  | Typically, workshops will be held to start up an activity and/or at the end to present results. The timeline of each activity is given in Annex 4 of the Prodoc |
| <b>3. Project documents, thematic reports and publications; Technical and other reports</b>   | Government departments and decision-makers at the national and subnational level<br>Development partners<br>Research institutes and academia; individual experts; NGOs | Direct dissemination (e.g., email or hard copy/ USB-drive)<br>Access via website to reports and documents and database and info systems | Technical reports will typically be published at the end of an assignment (see Annex 4 of the Prodoc )  |
| <b>4. Project knowledge capturing and info dissemination and two-way Knowledge Management and info exchange with regional AMP project</b> | Government officials<br>Financial and private sector<br>Development partners<br>NGOs and CSOs  | Online access;<br>Printed materials<br>Media  | Thematic reports and knowledge products are published at the end of one or more outputs to provide a summary of findings, results, and lessons learnt           |

The knowledge management approach is rolled out throughout the project duration and should be pursued post-project thanks to various tools: replication plan, data strategy and collaboration with the AMP regional platform and other projects. The tracking of key indicators at pilot site levels through digital monitoring systems at minigrid level should be pursued through the lifetime of the minigrid for increased and sustainable performance and viability. The related budget is mainly covered under Component 4.

## **9. Monitoring and Evaluation**

### **Describe the budgeted M and E plan**

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the [UNDP POPP \(including guidance on GEF project revisions\)](#) and [UNDP Evaluation Policy](#) **The UNDP Country Office is responsible for ensuring full compliance with all UNDP project M&E requirements including project monitoring, UNDP quality assurance requirements, quarterly risk management, and evaluation requirements.**

Additional mandatory GEF-specific M&E requirements will be undertaken in accordance with the [GEF Monitoring Policy](#) and the [GEF Evaluation Policy](#) and other [relevant GEF policies](#)[1]. The M&E plan and budget included below will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed ? including during the Project Inception Workshop - and will be detailed in the Inception Report.

### **Minimum project monitoring and reporting requirements as required by the GEF:**

1. Inception Workshop and Report: A project inception workshop will be held within 2 months from the First disbursement date, with the aim to:

1. Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.
2. Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.
3. Review the results framework and monitoring plan.
4. Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP and other stakeholders in project-level M&E.
5. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework (where relevant) and other safeguard

- requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.
6. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.
  7. Plan and schedule Project Board meetings and finalize the first-year annual work plan. Finalize the TOR of the Project Board.
  8. Formally launch the Project.
2. GEF Project Implementation Report (PIR): The annual GEF PIR covering the reporting period July (previous year) to June (current year) will be completed for each year of project implementation. UNDP will undertake quality assurance of the PIR before submission to the GEF. The PIR submitted to the GEF will be shared with the Project Board. UNDP will conduct a quality review of the PIR, and this quality review and feedback will be used to inform the preparation of the subsequent annual PIR.
3. GEF Core Indicators: The GEF Core indicators included as Annex F below will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to MTR and TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with MTR/TE consultants prior to required evaluation missions, so these can be used for subsequent ground truthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF [website](#).
4. Independent Mid-term Review (MTR): The terms of reference, the review process and the final MTR report will follow the standard UNDP templates and UNDP guidance for GEF-financed projects available on the [UNDP Evaluation Resource Center \(ERC\)](#). The evaluation will be "independent, impartial and rigorous". The evaluators that UNDP will hire to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project under review. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the evaluation process. Additional quality assurance support is available from the BPPS/NCE-VF Directorate. The final MTR report and MTR TOR will be publicly available in English and will be posted on the UNDP ERC by December 2023. A management response to MTR recommendations will be posted in the ERC within six weeks of the MTR report's completion.
5. Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance for GEF-financed projects available on the [UNDP Evaluation Resource Center](#). TE should be completed 3 months before the estimated operational closure date, set from the signature of the ProDoc and according to the duration of the project. Provisions should be taken to complete the TE in due time to avoid delay in project closure. Therefore, TE must start no later than 6 months to the expected date of completion of the TE (or 9 months prior to the estimated operational closure date). The evaluation will be "independent, impartial and rigorous". The evaluators that UNDP will hire to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project being evaluated. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the BPPS/NCE-VF Directorate. The final TE report and TE TOR will be publicly available in English and posted on the UNDP ERC by September 2026. A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report's completion.
6. Final Report: The project's terminal GEF PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lessons learned and opportunities for scaling up.

Table 8 - Monitoring and Evaluation Budget for project execution

| <b>Monitoring and Evaluation Budget for project execution:</b>   |  |  |
|--|--|--|
| <b>GEF M&amp;E requirements to be undertaken by Project Management Unit (PMU)</b>  | <b>Indicative costs (US\$)</b>                           | <b>Time frame</b>  |
| <b>Inception Workshop and Report</b>   | <i>4,000</i>   | Inception Workshop within 2 months of the First Disbursement |
| <b>M&amp;E required to report on progress made in reaching GEF core indicators and project results included in the project results framework</b> | <i>N/A</i>   | Annually and at mid-point and closure.                       |
| <b>Preparation of the annual GEF Project Implementation Report (PIR)</b>   | <i>N/A</i>   | Annually typically between June-August                       |
| <b>Monitoring of environmental and social risks, gender action plan, and corresponding management plans as relevant</b>                          | <i>N/A</i>   | On-going.  |
| <b>Supervision missions</b>  | <i>15,369</i>  | As needed  |
| <b>Learning missions</b>   | <i>N/A</i>   | As needed  |
| <b>Independent Mid-term Review (MTR)</b>   | <i>34,000 (covered by UNDP)</i>                          | 1 June 2025  |
| <b>Independent Terminal Evaluation (TE)</b>  | <i>54,000 (incl. USD 4,000 covered by UNDP)</i>          | 28 February 2027   |
| <b>TOTAL indicative COST</b>   | <i>107,369 (out of which USD 38,000 covered by UNDP)</i> | <i>Equivalent to TBWP component (M&amp;E)</i>                |

[1] See [https://www.thegef.org/gef/policies\\_guidelines](https://www.thegef.org/gef/policies_guidelines)

**Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?**

Socioeconomic benefits of the project are considerable as it encompasses a large part of the population by focusing on households, private sector business and cooperatives as well as public services including schools and health centers/hospitals in rural areas.

The successful implementation of the project will:

- ? Ensure access to an available, reliable, affordable and greener energy in the future pilot sites and further
- ? Potentially improve the stability of the grid as less pressure will be exerted on it through the implementation of minigrids in the medium and long run
- ? Secure existing incomes and provide additional incomes to MSMEs and cooperatives
- ? Empower women and youth by building their capacity and promoting entrepreneurial activities including as rural electrician, money collector, etc. directly related to the minigrid and adding income generating opportunities through access to energy such as food conservation, processing and selling; handicraft, services and trade; etc.
- ? Increase greater awareness on climate change and environment protection, minigrids, gender mainstreaming
- ? Grant access to better public services especially schools and health centers/hospitals
- ? Facilitate access to telecom and Internet services
- ? Improve livelihoods of vulnerable populations e.g., women, youth, people with disabilities

The socioeconomic benefits of the project are not only measurable at the local and national levels but also at the regional and global level. At regional level, through the regional AMP umbrella socio-economic benefits, lessons learnt, and best practices will be shared upon national projects. In addition, knowledge and experience sharing will be taking place within the ECOWAS region, between LDCs and various partners (IRENA, RMI, etc.). Finally at global level, environmental benefits generated by this project will support the efforts in reducing GHG emissions and thus improving livelihoods.

## 11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

### Overall Project/Program Risk Classification \*

| PIF                 | CEO<br>Endorsement/Approva<br>l | MTR | TE |
|---------------------|---------------------------------|-----|----|
| High or Substantial |                                 |     |    |

#### Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

#### Supporting Documents

Upload available ESS supporting documents.

| Title  | Module              | Submitted |
|--|---------------------|-----------|
| Annex_09_ESMF for Five UNDP AMP National Projects-Round 2_2022-09-21 clean | CEO Endorsement ESS |           |
| Annex_05_Mali_SESP-2022-09-21  | CEO Endorsement ESS |           |



**ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).**

|  |  |  |  |   |
|--|--|--|--|---|
| <p><b>This project will contribute to the following Sustainable Development Goal (s):</b></p> <ul style="list-style-type: none"> <li>? SDG7: Ensure access to affordable, reliable, sustainable and modern energy for all</li> <li>o SDG 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services</li> <li>o SDG 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix</li> <li>? SDG13: Take urgent action to combat climate change and its impacts;</li> <li>? SDG5: Achieve gender equality and empower all women and girls</li> </ul>  |  |  |  |   |
| <p><b>This project will contribute to the following country outcome (UNDAF[1]/CPD[2], RPD[3]):</b></p> <p><b>UNSDCF 2020-2024 Mali:</b></p> <ul style="list-style-type: none"> <li>? <b>Outcome 2.1:</b> The Malian population, in particular the most vulnerable, participate in the economy and benefit from a strong, inclusive and resilient growth creating decent employment.</li> <li>? <b>Outcome 2.2:</b> Communities sustainably and equitably manage their natural resources and environment and are more resilient to adverse climate change impacts.</li> </ul> <p><b>UNDP CPD 2020-2024 Mali:</b></p> <ul style="list-style-type: none"> <li>? <b>Output 2.4:</b> Vulnerable populations, especially women and youth empowered to access financial and non-financial assets to strengthen their productive capacities and benefit from sustainable livelihoods and employment.</li> <li>? <b>Output 3.3:</b> Solutions adopted to ensure universal access to clean, affordable and sustainable energy and to generate income for women and youth through innovative technologies and financing.</li> </ul> |  |  |  |   |
|  | <p><b>Objective and Outcome Indicators<br/>(no more than a total of 20 indicators)</b></p>   | <p><b>Baseline[4]</b></p>                          | <p><b>Mid-term Target[5]</b></p>                                       | <p><b>End of Project Target</b></p>                     |
| <p><b>Project Objective:</b></p>   | <p>Supporting access to clean energy by increasing the financial viability, and promoting scaled-up commercial investment, in renewable energy minigrids in Mali with a focus on cost-reduction levers and innovative business models, in the Great Green Wall intervention zone</p> |  |  |   |
|  | <p><i>Mandatory GEF Core Indicators</i><br/><b>Indicator 1:</b><br/><b>Greenhouse gas emissions mitigated</b><br/><i>Units of measure: metric tons of carbon dioxide equivalent (tCO2e)</i></p>  | <p>Zero, since the project has not yet started</p> | <p>Zero, since the project pilot(s) have not yet been commissioned</p> | <p>Direct: 16,929 tCO2e<br/>Indirect: 631,697 tCO2e</p> |

|                     |  |   |   |   |
|---------------------|--|---|---|---|
|                     | <p><b>Indicator 2: Number of direct beneficiaries benefitting from energy access via minigrids, disaggregated by gender and by customer segment (residential, social, commercial/productive use) as co-benefit of GEF investment</b><br/> <i>Units of measure: number of people</i></p>  | Zero, since the project has not yet started | Zero, since the project pilot(s) have not yet been commissioned | 8,665 people (of which 50% women)<br>-----<br>8,500 people (residential)<br>36 people (social)<br>129 people (commercial/PUE) |
|                     | <p><b>Indicator 3: Increase in installed solar PV capacity and battery storage</b><br/> <i>Units of measure: MW (solar PV) and MWh (battery storage)</i></p>   | Zero, since the project has not yet started | Zero, since the project pilot(s) have not yet been commissioned | Solar PV: 0.309 MW<br>Battery storage: 0.754 MWh  |
|                     | <p><u>Additional objective indicators</u></p> <p><b>Indicator 4:</b><br/>Number of GGW localities benefiting from GMGs<br/> <i>Units of measure: Absolute number of localities covered</i></p> <p><b>Indicator 5:</b><br/>Number of direct green jobs created in the minigrids sector and in sectors related to the GGW, disaggregated by gender, for [minigrid development, operation and productive use, GGW sectors incl. farming, livestock, agroforestry. etc.].<br/> <i>Units of measure: Absolute number of direct green jobs created</i></p> | Zero, since the project has not yet started | Zero, since the project pilot(s) have not yet been commissioned | 03 Climate-smart villages ( <i>Villages climato-intelligents - VCI</i> )  |
| Project Component 1 | Policy and Regulation  |   |   |   |

|   |   |   |  |  |
|---|---|---|--|--|
| <p>Outcome 1</p> <p>Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in low-carbon minigrids.</p> | <p><i>Indicator 6:</i> A minigrid delivery model to enable minigrid development is endorsed/adopted by the national government through a consultative process involving key stakeholders (e.g. relevant ministries, local authorities, rural populations, private sector, media, etc.)</p> <p><i>Units of measure:</i><br/>binary (1/0)</p> | <p>Zero, since the project has not yet started</p>  | <p>Multi-stakeholder, national dialogue platform on minigrid delivery models established and active.</p>   | <p>At least one minigrid delivery model is identified and endorsed by the government through the work of the multi-stakeholder platform and dialogue.</p>  |
|   | <p><i>Indicator 7:</i> Number of policy derisking instruments for minigrid investments - whose development has been supported by the project - are endorsed/adopted by the national government</p> <p><i>Units of measure:</i><br/>Absolute number of policy derisking instruments</p>  | <p>DREI analysis finalized in September 2022 hence no derisking instruments implemented yet</p> | <p>3 policy derisking instrument(s)</p> <p>-----</p> <p>Promotion of productive use of energy<br/>National MG delivery model and relevant conducive legal &amp; regulatory framework<br/>Technical assistance provided to financial institutions</p> | <p>6 policy derisking instrument(s)</p> <p>-----</p> <p>Promotion of productive use of energy<br/>National MG delivery model and relevant conducive legal &amp; regulatory framework<br/>Technical assistance provided to financial institutions<br/>Public awareness around nexus GMGs &amp; GGW<br/>Standards developed for MG<br/>Access to finance for end-users (ancillary products etc.)</p> |

|   |   |  |   |   |
|---|---|--|---|---|
| <p>Outputs to achieve Outcome 1</p>   | <p>Output 1.1: The national inclusive off-grid platform, currently being institutionalized/operationalized under the leadership of the DNE, is supported to identify mini-grid delivery models, clarifying priority interventions for an integrated approach to off-grid electrification</p> <p>Output 1.2: A dialogue following the Minigrad DREI techno-economic analyses is facilitated, de-risking instruments are developed and an update of the DREI is conducted in Year 4</p> <p>Output 1.3. An update of the Great Green Wall strategy and action plan is conducted for a better consideration of energy infrastructures in climate actions and green economy</p> <p>Output 1.4: Capacity building is provided to public officials (agencies, regulator, ministries) specifically to support cost-reduction levers and innovative business models</p> <p>Output 1.5.: Quality standards for solar mini-grid components are domesticated, and institutional capacity of AER Mali and the Electrotechnical Standards Committee is strengthened</p> |  |   |   |
| <p><b>Project Component 2</b></p>   | <p><b>Business Model Innovation with Private Sector</b></p>   |  |   |   |
| <p>Outcome 2</p> <p>Innovative business models based on cost reduction are operationalized, with strengthened private sector participation in renewable energy minigrad development</p> | <p><i>Indicator 8:</i> Minigrad pilots implemented in GGW intervention zones that demonstrate a delivery model, cost-reduction measure(s) and/or productive use of electricity</p> <p><i>Units of measure:</i><br/>binary (1/0)</p>   | <p>Not applicable, since the project has not yet started</p> | <p>The project's detailed design plan (the 'Minigrad Pilot Plan') for advancing the minigrad pilots is developed and cleared by UNDP and the Project Board. (1)</p> <p>Any project tendering process, as applicable, for minigrad pilots is launched. (1)</p> | <p>100% of the planned minigrad pilots, as identified in the project's Minigrad Pilot Plan, are commissioned. (1)</p>   |
|   | <p><i>Indicator 9: Technical assistance provided on supporting productive use of energy through RE minigrads.</i></p> <p><i>Units of measure:</i><br/>binary (1/0)</p>  | <p>Not applicable since the project has not yet started</p>  | <p>National report on boosting economic activities through PUE is completed as planned in Year 1 (1)</p>  | <p>All AMP Mali pilots planned under the 'Minigrad Pilot Plan' received technical assistance on integrating &amp; leveraging PUE and at least 2 other GMG projects in Mali (outside of AMP Mali) benefitted from this technical assistance too.</p> |

|                                     |   |  |  |   |
|-------------------------------------|---|--|--|---|
|                                     | <p><i>Indicator 10: Capacity of minigrid developers and/or operators is enhanced</i></p> <p><i>Units of measure: binary (1/0)</i></p>   | <p>Some capacity building efforts have been undertaken with some local minigrid developers and operators, but some capacities need to be reinforced and additional ones are lacking (e.g. operations, maintenance)</p> | <p>Planned capacity building activities for year 1 and 2 are implemented. (1)</p> <p>The capacity of targeted recipients is assessed by survey towards the end of year 2. On a scale of 1 to 5, an average score of at least 2 is achieved.</p> <ul style="list-style-type: none"> <li>- 1 represents a low level of capacity</li> <li>- 5 represents a strong capacity to understand relevant issues and apply knowledge and skills to find effective solutions. (1)</li> </ul> | <p>Planned capacity building activities for year 3 and 4 are implemented. (1)</p> <p>The capacity of targeted recipients is assessed by survey towards the end of the project. On a scale of 1 to 5, an average score of at least 4 is achieved.</p> <ul style="list-style-type: none"> <li>- 1 represents a low level of capacity</li> <li>- 5 represents a strong capacity to understand relevant issues and apply knowledge and skills to find effective solutions. (1)</li> </ul> |
| <p>Outputs to achieve Outcome 2</p> | <p>Output 2.1 Pilots are developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in mini-grids in the Great Green Wall zone</p> <p>Output 2.2 National report and technical assistance on opportunities to boost economic activities through electricity access and productive use with a particular focus on productive and green ecosystems is made available</p> <p>Output 2.3 Capacities of private minigrid developers and communities are strengthened</p> |  |  |   |
| <p><b>Project Component 3</b></p>   | <p><b>Scaled-up Financing</b></p>   |  |  |   |

|   |   |   |   |  |
|---|---|---|---|--|
| <p>Outcome 3</p> <p>Financial sector actors are ready to invest in a pipeline of low-carbon minigrids and concessional financial mechanisms are in place to incentivize scaled-up investment.</p> | <p><i>Indicator 11:</i> Capacity of financial institutions is enhanced through training, knowledge sharing, and/or awareness raising events aimed at increasing the financial sector's capacity to evaluate investments in minigrids.<br/><i>Units of measure:</i> binary (1/0)</p>   | <p>Local financial institutions barely benefited so far from capacity building to better understand and invest in MGs</p> | <p>Planned capacity building activities for year 1 and 2 are implemented. (1)</p> <p>The capacity of targeted recipients is assessed by survey towards the end of year 2. On a scale of 1 to 5, an average score of at least 2 is achieved.<br/>- 1 represents a low level of capacity<br/>- 5 represents a strong capacity to understand relevant issues and apply knowledge and skills to find effective solutions. (1)</p> | <p>Planned capacity building activities for year 3 and 4 are implemented. (1)</p> <p>The capacity of targeted recipients is assessed by survey towards the end of the project. On a scale of 1 to 5, an average score of at least 4 is achieved.<br/>- 1 represents a low level of capacity<br/>- 5 represents a strong capacity to understand relevant issues and apply knowledge and skills to find effective solutions. (1)</p> |
|   | <p><i>Indicator 12:</i> Number of government- or impact investor-supported financing mechanisms offering concessional finance for low-carbon minigrids<br/><i>Units of measure:</i> binary (1/0)</p>  | <p>Zero, since the project has not yet started</p>  | <p>At least one complementary funding instrument is designed. (1)</p>   | <p>At least one complementary funding instrument is designed and operational. (1)</p>  |
| <p>Outputs to achieve Outcome 3</p>   | <p>Output 3.1. Support to financing mechanisms in order to scale up RE minigrids investment is provided<br/>Output 3.2. Domestic financial sector's capacities on business and financing models for minigrids are built<br/>Output 3.3.: Replication plan (including investment plan) for scaling up rural energy access is developed</p> |   |   |  |
| <p><b>Project Component 4</b></p>   | <p><b>Digital and Knowledge Management</b></p>  |   |   |  |

|   |   |  |  |   |
|---|---|--|--|---|
| <p>Outcome 4</p> <p>Digitalization and data mainstreamed, across stakeholders, into local minigrid market development. Increased knowledge, awareness and network opportunities in the minigrid market and among stakeholders, including benefitting from linkages to international good practice</p> | <p><i>Indicator 13: A project digital strategy is prepared and implemented by the PMU to contribute to project implementation and local minigrid market development.</i><br/><i>Units of measure: binary (1/0)</i></p>  | <p>Not applicable, since the project has not yet started</p> | <p>The project digital strategy is developed and being implemented. (1)</p>  | <p>The project digital strategy is implemented. (1)</p> <p>Recommendations for rolling out digital solutions for minigrids at national level have been shared with key national stakeholders. (1)</p> |
|   | <p><i>Indicator 14: Number of minigrid pilots sharing data on minigrid performance with the regional project and other stakeholders following best practices and received from the AMP Regional Project.</i><br/><i>Units of measure: Relative number of GMG pilots sharing data</i></p>  | <p>0% since the project has not yet started</p>              | <p>The project's ?Minigrids Digital and Data Management Platform? is procured and operational, ready for data collection from the project's mini-grid pilot(s), and for data sharing with the AMP regional project's digital platform. (1)</p> | <p>100% of the planned minigrid pilots, as identified in the project's Minigrid Pilot Plan, are collecting and sharing data with the project's digital platform (1)</p>                               |
| <p>Outputs to achieve Outcome 4</p>   | <p>Output 4.1. A project digital strategy is developed and implemented, including linkages to and following guidance from the AMP Regional Project</p> <p>Output 4.2. A ?Minigrids Digital and Data Management Platform? is implemented to run tenders, manage data from pilots, and support minigrids scale-up and cost-reduction</p> <p>Output 4.3. A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of all minigrids pilots, including GHG emission reductions, is adopted and operationalized based on standardized guidance from the regional project</p> <p>Output 4.4. Engage with regional project, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learned</p> <p>Output 4.5. Awareness raising campaigns, including lessons learned, are developed and disseminated at all levels nationally (incl. intervention zones) and with the regional project</p> |  |  |   |
| <p><b>Project Component 5</b></p>   | <p><b><i>Monitoring and Evaluation</i></b></p>  |  |  |   |
| <p>Outputs under Component 5</p>  | <p>Output 5.1: M&amp;E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&amp;E, (iii) Mid Term Evaluation and (iv) Terminal Evaluation</p>  |  |  |   |

[1] United Nations Development Assistance Frameworks (UNDAF)

[2] Country Programme Document (CPD)

[3] Regional Programme Document (RPD)

[4] *Baseline, mid-term and end of project target levels must be expressed in the same neutral unit of analysis as the corresponding indicator. Baseline is the current/original status or condition and needs to be quantified. The baseline can be zero when appropriate given the project has not started. The baseline must be established before the project document is submitted to the GEF for final approval. The baseline values will be used to measure the success of the project through implementation monitoring and evaluation.*

[5] *Target is the change in the baseline value that will be achieved by the mid-term review and then again by the terminal evaluation.*

## **ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).**

| <b>Council Member Comment</b>  | <b>Response</b>  |
|--|--|
| <b>France</b>  |  |
| <p>This program targets the same topic and the same geographical areas as some AFD projects in Burkina Faso, Madagascar, Mali, and Niger.</p> <ul style="list-style-type: none"><li>•Coordination with AFD would be necessary in the countries where AFD has projects on this theme (with links to the EU and other donors): Mali, Niger, Burkina Faso (Madagascar: project under preparation).</li></ul> <p>There are some interesting points on data collection and on the capitalization of lessons learnt and practical experience</p> | <p>A key objective of AMP is to align and complement with the support of existing development actors in minigrids. AFD's activities in minigrids are well-noted, and AMP national projects will benefit from lessons learnt in countries where AFD has provided support.</p> <p>Specifically in Mali, AFD PHARE's project with EU co-financing, supports hybridized minigrids solutions in rural areas in Mali to provide access to electricity to about 156,000 people. On the other hand, two other projects in the pipeline ? one on a high voltage line and one with two solar power plants that would be co-financed by the EU- were put on hold due to the political situation in Mali. AFD will be part of the National Inclusive Off-Grid Platform supported by the project.</p> |



|   |   |
|---|---|
| <p>The proposal covers countries in very different contexts, without an analysis of the specific situation and needs of each country. It is therefore a very wide range of subjects that are proposed to be tackled:</p> <ul style="list-style-type: none"> <li>● Technical assistance on regulations, tariffs, risk analysis, geospatial planning, techno-eco modeling, prefeasibility, formulation of rural electricity strategies, issues with subsidies of fossil fuel, derisking instruments, institutional reform, capacity building, quality standards, customs procedures, waste management, digitalization, professional training, design support, market intelligence, etc.</li> <li>● Investments: Development of pilots (especially on productive uses)</li> </ul> <p>Even if these different points are indeed subjects which require technical assistance and grant financing, the formulation of the project raises some questions: there does not seem to be any will. It would be relevant to analyze the successes and gaps of certain countries, for example the successes of Kenya on its regulations, in order to replicate the approach. It would also be necessary to identify relevant public actors in each country (utility vs rural electricity agency) as the approaches to recommend will be very different depending on the case.</p> | <p>The AMP's PFD includes a menu representing a wide-range of possible outputs that AMP national projects may select from. The early-stage concepts included in the PFD Addendum in turn reflected an initial selection of these outputs.</p> <p>Now at the CEO ER stage, the outputs selected in Mali, reflect further detailed consultations and stakeholder engagement, and are expressly tailored to national objectives, country context and a baseline analysis of the specific barriers and risks in Mali.</p> <p>World Bank is supporting the National Electricity Directorate at the Ministry of Mining, Energy and Water in reviewing its electricity legal and regulatory framework. Various partners are working especially with the rural electrification agency AMADER and the renewable energy agency AER-Mali to support the development of minigrids for rural electrification. Other partners, such as GIZ, provided some feasibility studies but won't support the installation of such minigrids. Therefore, AMP Mali decided to adopt an adaptative management approach as validated by the relevant stakeholders during PPG consultations and the validation workshop. This includes conducting initial activities to reassess the current situation at project launch in order to ensure the additionality and avoid duplication of efforts, leveraging existing minigrids feasibility studies where no minigrids has been implemented and updating the study if necessary prior to installing a minigrid (if the locality complies with the objective selection criteria validated by all stakeholders during the validation workshop) as well as benchmarking and knowledge sharing within AMP countries and beyond.</p> |
| <p>The funding is focused on a few countries: Benin with MCC and SE4All (total \$ 58M), Zambia (GCF and EU, \$ 53M), Mali (UNDP, SIDA: \$ 2.6M). Elsewhere, funding seems too small to induce the structural changes envisaged.</p> <ul style="list-style-type: none"> <li>● It seems difficult to imagine that such a program will be effective outside of the 3 countries with the most funding..</li> </ul>  | <p>In Mali, the co-financing situation (almost USD 150M) is conducive as a large range of initiatives supported by various donors (GCF, World Bank, AfDB, SIDA, AFD, BADEA, IsDB, etc.) are in the pipeline and ongoing to promote the development of the minigrids market in Mali.</p> <p>In addition, AMP Mali supports the Great Green Wall initiative by promoting the development of green and productive ecosystems thanks to 100% RE minigrids and productive user of RE.</p>  |
| <p>Finally, the added value of UNDP on access to energy in rural areas, through mini-grids, should have been made more explicit in the selection of implementing agency</p>   | <p>Each agency's selection as implementation agency is decided by the GEF OFP's. UNDP has a considerable historical track-record in supporting off-grid electrification, and through the AMP is currently GEF implementation agency to 19 countries on solar-battery mini-grids.</p>  |
| <p><b>Germany</b></p>   |   |

|  |   |
|--|---|
| <p>Germany approves the following PIF in the work program but asks that the following comments are taken into account:</p> <p>Suggestions for improvements to be made during the drafting of the final project proposal:</p> <ul style="list-style-type: none"> <li>● In order to avoid duplication of efforts and leverage synergies, Germany strongly recommends (to continue) coordinating with the following local country offices of GIZ during project preparation as well as implementation: Benin, Mali and Zambia.</li> </ul> | <p>A key objective of AMP is to align and complement with the support of existing development actors in minigrids.</p> <p>Specifically in Mali, coordination with GIZ at the design stage included a consultation meeting with the Director of EnDev Mali and her team on synergies between EnDev Mali and AMP Mali on minigrids, PUE and capacity building efforts for relevant stakeholders at national and local levels. This coordination will continue as the AMP project moves into implementation and as GIZ will work on a new phase of EnDev as the ongoing phase ends in June 2023. GIZ will be part of the National Inclusive Off-Grid Platform supported by the project, and has provided a letter of cofinancing for this project.</p> |
|--|---|

**ANNEX C: Status of Utilization of Project Preparation Grant (PPG).**  
**(Provide detailed funding amount of the PPG activities financing status in the table below:**

| <i>Project Preparation Activities Implemented</i>   | <i>GEF/LDCF/SCCF Amount (\$)</i> |                             |                         |
|---|----------------------------------|-----------------------------|-------------------------|
|   | <i>Budgeted Amount</i>           | <i>Amount Spent To date</i> | <i>Amount Committed</i> |
| Preparatory Technical Studies & Reviews. Formulation of the UNDP-GEF Project Document, CEO Endorsement Request, and Mandatory, Project Specific Annexes,<br><br><i>The project document package was prepared by a team of national and international consultants.</i> | 44,100                           | 13,975.00                   | 30,125                  |
| Travel  | 5,900                            | 0                           | 5,900                   |
| <b>Total</b>  | 50,000                           | 13,975.00                   | 36,025                  |

**ANNEX D: Project Map(s) and Coordinates**

**Please attach the geographical location of the project area, if possible.**

Figure below highlights the coverage of the Great Green Wall area in Mali<sup>[1]</sup>.

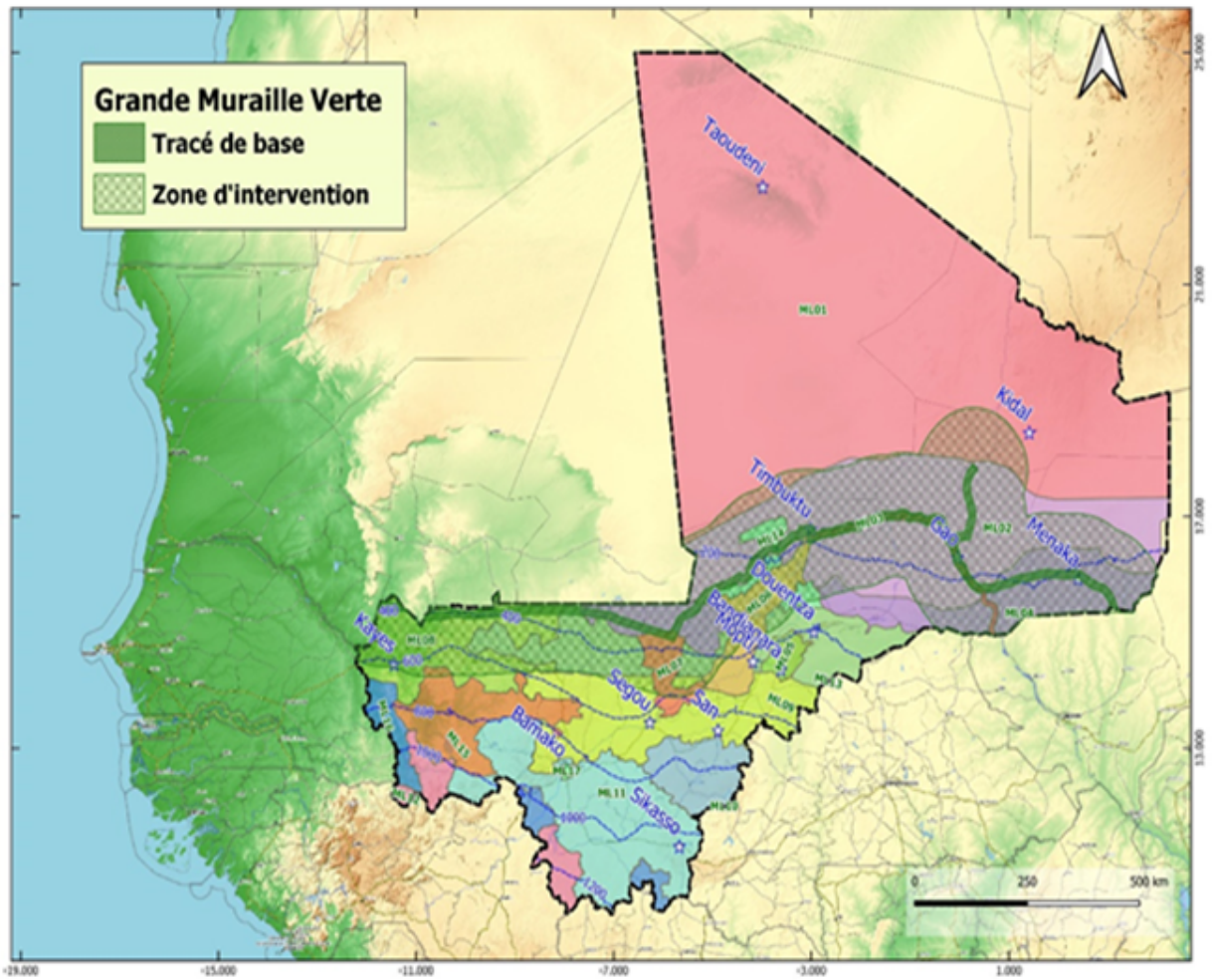


Table 1: List of regions, circles, communes and and projected population included in the Great Green Wall area in Mali in 2022[1]

|                    | PROJECTION DE POPULATION EN 2022 |           |           | R?gion | Cercle | Communes |
|--------------------|----------------------------------|-----------|-----------|--------|--------|----------|
|                    | HOMME                            | FEMME     | TOTAL     |        |        |          |
| ESPACE GMV DU MALI | 4 657 572                        | 4 752 003 | 9 409 575 | 10     | 26     | 204      |

| REGION | CERCLE | COMMUNE          | POPULATION EN 2009 |        |          | PROJECTION DE LA POPULATION EN 2022 |        |          |
|--------|--------|------------------|--------------------|--------|----------|-------------------------------------|--------|----------|
|        |        |                  | HOMME              | FEMME  | ENSEMBLE | HOMME                               | FEMME  | ENSEMBLE |
| KAYES  |        |                  | 368366             | 375657 | 744023   | 583386                              | 594933 | 1178320  |
|        | KAYES  |                  | 223348             | 220684 | 444032   | 353719                              | 349500 | 703220   |
|        |        | COM. KAYES       | 65135              | 61184  | 126319   | 103155                              | 96898  | 200053   |
|        |        | COM. BANGASSI    | 6123               | 5974   | 12097    | 9697                                | 9461   | 19158    |
|        |        | COM. COLIMBINE   | 6144               | 6353   | 12497    | 9730                                | 10061  | 19792    |
|        |        | COM. DIAMOU      | 7115               | 7015   | 14130    | 11268                               | 11110  | 22378    |
|        |        | COM. DJELEBOU    | 11466              | 12091  | 23557    | 18159                               | 19149  | 37308    |
|        |        | COM. FALEME      | 5141               | 5017   | 10158    | 8142                                | 7945   | 16087    |
|        |        | COM. FEGUI       | 1999               | 1934   | 3933     | 3166                                | 3063   | 6229     |
|        |        | COM. GORY GOPELE | 3939               | 3927   | 7866     | 6238                                | 6219   | 12457    |
|        |        | COM. GOURMA      | 1918               | 1903   | 3821     | 3038                                | 3014   | 6051     |

|  |  |   |       |       |       |       |       |       |
|--|--|---|-------|-------|-------|-------|-------|-------|
|  |  | <b>COM.<br/>GUIDIMAKAN<br/>KERI KAFFO</b> | 9798  | 10234 | 20032 | 15517 | 16208 | 31725 |
|  |  | <b>COM. HAWA<br/>DEMBAYA</b>              | 3406  | 3445  | 6851  | 5394  | 5456  | 10850 |
|  |  | <b>COM.<br/>KARAKORO</b>                  | 7436  | 7770  | 15206 | 11776 | 12305 | 24082 |
|  |  | <b>COM.<br/>KEMENE<br/>TAMBO</b>          | 8381  | 8574  | 16955 | 13273 | 13579 | 26852 |
|  |  | <b>COM.<br/>KHOULOUM</b>                  | 9734  | 9260  | 18994 | 15416 | 14665 | 30081 |
|  |  | <b>COM.<br/>LIBERTE<br/>DEMBAYA</b>       | 7487  | 6879  | 14366 | 11857 | 10894 | 22752 |
|  |  | <b>COM. LOGO</b>                          | 6022  | 5967  | 11989 | 9537  | 9450  | 18987 |
|  |  | <b>COM.<br/>MARENA<br/>DIOMBOUGOU</b>     | 8996  | 9676  | 18672 | 14247 | 15324 | 29571 |
|  |  | <b>COM.<br/>MARINTOUMA<br/>NIA</b>        | 4001  | 4060  | 8061  | 6336  | 6430  | 12766 |
|  |  | <b>COM. SAHEL</b>                         | 6038  | 6189  | 12227 | 9562  | 9802  | 19364 |
|  |  | <b>COM. SAME<br/>DAMGOMA</b>              | 6245  | 6166  | 12411 | 9890  | 9765  | 19655 |
|  |  | <b>COM. SEGALA</b>                        | 12882 | 12921 | 25803 | 20401 | 20463 | 40865 |
|  |  | <b>COM. SERO<br/>DIAMANOU</b>             | 11612 | 11727 | 23339 | 18390 | 18572 | 36962 |

|  |                   |                               |               |               |               |                    |                    |                    |
|--|-------------------|-------------------------------|---------------|---------------|---------------|--------------------|--------------------|--------------------|
|  |                   | <b>COMMUNE DE SOUMANKIDY</b>  | <b>3357</b>   | <b>3558</b>   | <b>6915</b>   | <b>5317</b>        | <b>5635</b>        | <b>10951</b>       |
|  |                   | <b>COM. SONY</b>              | <b>4339</b>   | <b>4368</b>   | <b>8707</b>   | <b>6872</b>        | <b>6918</b>        | <b>13789</b>       |
|  |                   | <b>COM. TAFACIRGA</b>         | <b>4634</b>   | <b>4492</b>   | <b>9126</b>   | <b>7339</b>        | <b>7114</b>        | <b>14453</b>       |
|  | <b>BAFOULA BE</b> |                               | <b>42528</b>  | <b>45691</b>  | <b>88219</b>  | <b>67352,19898</b> | <b>72361,48711</b> | <b>139713,6861</b> |
|  |                   | <b>COM. DIAKON</b>            | <b>16056</b>  | <b>17700</b>  | <b>33756</b>  | <b>25428</b>       | <b>28032</b>       | <b>53460</b>       |
|  |                   | <b>COM. DIALLAN</b>           | <b>7285</b>   | <b>7410</b>   | <b>14695</b>  | <b>11537</b>       | <b>11735</b>       | <b>23273</b>       |
|  |                   | <b>COM. SIDIBELA</b>          | <b>3603</b>   | <b>3954</b>   | <b>7557</b>   | <b>5706</b>        | <b>6262</b>        | <b>11968</b>       |
|  |                   | <b>COM. TOMORA</b>            | <b>15584</b>  | <b>16627</b>  | <b>32211</b>  | <b>24681</b>       | <b>26332</b>       | <b>51013</b>       |
|  | <b>DIEMA</b>      |                               | <b>102490</b> | <b>109282</b> | <b>211772</b> | <b>162314,8719</b> | <b>173071,459</b>  | <b>335386,331</b>  |
|  |                   | <b>COM. DIEMA</b>             | <b>15079</b>  | <b>15391</b>  | <b>30470</b>  | <b>23881</b>       | <b>24375</b>       | <b>48256</b>       |
|  |                   | <b>COM. BEMA</b>              | <b>12326</b>  | <b>13103</b>  | <b>25429</b>  | <b>19521</b>       | <b>20751</b>       | <b>40272</b>       |
|  |                   | <b>COM. DIANGOUNTE CAMARA</b> | <b>13541</b>  | <b>14926</b>  | <b>28467</b>  | <b>21445</b>       | <b>23639</b>       | <b>45084</b>       |
|  |                   | <b>COM. DIANGUIRDE</b>        | <b>5862</b>   | <b>6126</b>   | <b>11988</b>  | <b>9284</b>        | <b>9702</b>        | <b>18986</b>       |
|  |                   | <b>COM. DIEOURA</b>           | <b>5508</b>   | <b>6253</b>   | <b>11761</b>  | <b>8723</b>        | <b>9903</b>        | <b>18626</b>       |

|   |             |                                       |              |              |              |              |              |               |
|---|-------------|---------------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|
|   |             | <b>COM.<br/>DIOUMARA<br/>KOUSSATA</b> | <b>8003</b>  | <b>8277</b>  | <b>16280</b> | <b>12674</b> | <b>13108</b> | <b>25783</b>  |
|   |             | <b>COM.<br/>FASSOUDEBE</b>            | <b>2663</b>  | <b>2807</b>  | <b>5470</b>  | <b>4217</b>  | <b>4445</b>  | <b>8663</b>   |
|   |             | <b>COM. FATAO</b>                     | <b>3848</b>  | <b>4491</b>  | <b>8339</b>  | <b>6094</b>  | <b>7112</b>  | <b>13207</b>  |
|   |             | <b>COM.<br/>GOMITRADO<br/>GOU</b>     | <b>3638</b>  | <b>3658</b>  | <b>7296</b>  | <b>5762</b>  | <b>5793</b>  | <b>11555</b>  |
|   |             | <b>COM.<br/>GROUMERA</b>              | <b>8007</b>  | <b>8601</b>  | <b>16608</b> | <b>12681</b> | <b>13622</b> | <b>26302</b>  |
|   |             | <b>COM.<br/>LAKAMANE</b>              | <b>7855</b>  | <b>8109</b>  | <b>15964</b> | <b>12440</b> | <b>12842</b> | <b>25282</b>  |
|   |             | <b>COM.<br/>LAMBIDOU</b>              | <b>7030</b>  | <b>7761</b>  | <b>14791</b> | <b>11134</b> | <b>12291</b> | <b>23425</b>  |
|   |             | <b>COM. MADIGA<br/>SACKO</b>          | <b>6695</b>  | <b>7241</b>  | <b>13936</b> | <b>10603</b> | <b>11468</b> | <b>22071</b>  |
|   |             | <b>COM.<br/>SANSANKIDE</b>            | <b>2435</b>  | <b>2538</b>  | <b>4973</b>  | <b>3856</b>  | <b>4019</b>  | <b>7876</b>   |
| <b>REGION DE KITA<br/>(nouvelle r?gion)</b> |             |                                       | <b>36833</b> | <b>39897</b> | <b>76730</b> | <b>58333</b> | <b>63185</b> | <b>121518</b> |
|   | <b>KITA</b> |                                       | <b>21129</b> | <b>23015</b> | <b>44144</b> | <b>33462</b> | <b>36449</b> | <b>69911</b>  |
|   |             | <b>COM.<br/>DJOUGOUN</b>              | <b>4012</b>  | <b>4420</b>  | <b>8432</b>  | <b>6354</b>  | <b>7000</b>  | <b>13354</b>  |
|   |             | <b>COM.<br/>GUEMOUKOU<br/>RABA</b>    | <b>4816</b>  | <b>5313</b>  | <b>10129</b> | <b>7627</b>  | <b>8414</b>  | <b>16041</b>  |
|   |             | <b>COM. MADINA</b>                    | <b>6876</b>  | <b>7149</b>  | <b>14025</b> | <b>10890</b> | <b>11322</b> | <b>22212</b>  |

|  |              |                                    |                     |                     |                |                         |                         |                         |
|--|--------------|------------------------------------|---------------------|---------------------|----------------|-------------------------|-------------------------|-------------------------|
|  |              | <b>COM. SEFETO<br/>NORD</b>        | <b>5425</b>         | <b>6133</b>         | <b>11558</b>   | <b>8592</b>             | <b>9713</b>             | <b>18305</b>            |
| <b>NIORO<br/>(nouvelle<br/>r?gion)</b> |              |                                    | <b>10831<br/>61</b> | <b>11169<br/>17</b> | <b>2200078</b> | <b>1715417<br/>,494</b> | <b>1768877<br/>,352</b> | <b>3484294,<br/>847</b> |
|  | <b>NIORO</b> |                                    | <b>10868<br/>8</b>  | <b>11312<br/>2</b>  | <b>221810</b>  | <b>172130,<br/>7328</b> | <b>179152,<br/>9217</b> | <b>351283,6<br/>545</b> |
|  |              | <b>COM. NIORO</b>                  | <b>17258</b>        | <b>16433</b>        | <b>33691</b>   | <b>27331,7<br/>4027</b> | <b>26025,1<br/>7602</b> | <b>53356,91<br/>629</b> |
|  |              | <b>COM.<br/>BANIERE<br/>KORE</b>   | <b>2836</b>         | <b>2825</b>         | <b>5661</b>    | <b>4491</b>             | <b>4474</b>             | <b>8965</b>             |
|  |              | <b>COM.<br/>DIABIGUE</b>           | <b>4492</b>         | <b>4916</b>         | <b>9408</b>    | <b>7114</b>             | <b>7786</b>             | <b>14900</b>            |
|  |              | <b>COM. DIARRA</b>                 | <b>3424</b>         | <b>3713</b>         | <b>7137</b>    | <b>5423</b>             | <b>5880</b>             | <b>11303</b>            |
|  |              | <b>COM. DIAYE<br/>COURA</b>        | <b>6556</b>         | <b>7161</b>         | <b>13717</b>   | <b>10383</b>            | <b>11341</b>            | <b>21724</b>            |
|  |              | <b>COM.<br/>GAVINANE</b>           | <b>7676</b>         | <b>8003</b>         | <b>15679</b>   | <b>12157</b>            | <b>12674</b>            | <b>24831</b>            |
|  |              | <b>COM. GOGUI</b>                  | <b>6186</b>         | <b>6761</b>         | <b>12947</b>   | <b>9797</b>             | <b>10707</b>            | <b>20504</b>            |
|  |              | <b>COM.<br/>GUETEMA</b>            | <b>4484</b>         | <b>4848</b>         | <b>9332</b>    | <b>7101</b>             | <b>7678</b>             | <b>14779</b>            |
|  |              | <b>COM.<br/>KADIABA<br/>KADIEL</b> | <b>4982</b>         | <b>4944</b>         | <b>9926</b>    | <b>7890</b>             | <b>7830</b>             | <b>15720</b>            |
|  |              | <b>COM. KORERA<br/>KORE</b>        | <b>9453</b>         | <b>9974</b>         | <b>19427</b>   | <b>14971</b>            | <b>15796</b>            | <b>30767</b>            |



|  |                      |  |                    |                     |                |                         |                        |                         |
|--|----------------------|--|--------------------|---------------------|----------------|-------------------------|------------------------|-------------------------|
|  |                      | <b>COM. NIORO<br/>TOUGOUNE<br/>RANGABE</b> | <b>6410</b>        | <b>6791</b>         | <b>13201</b>   | <b>10152</b>            | <b>10755</b>           | <b>20907</b>            |
|  |                      | <b>COM.<br/>SANDARE</b>                    | <b>12597</b>       | <b>13019</b>        | <b>25616</b>   | <b>19950</b>            | <b>20618</b>           | <b>40568</b>            |
|  |                      | <b>COM. SIMBI</b>                          | <b>9786</b>        | <b>10307</b>        | <b>20093</b>   | <b>15498</b>            | <b>16323</b>           | <b>31822</b>            |
|  |                      | <b>COM.<br/>TROUNGOUM<br/>BE</b>           | <b>5981</b>        | <b>6507</b>         | <b>12488</b>   | <b>9472</b>             | <b>10305</b>           | <b>19777</b>            |
|  |                      | <b>COM.<br/>YERERE</b>                     | <b>6567</b>        | <b>6920</b>         | <b>13487</b>   | <b>10400</b>            | <b>10959</b>           | <b>21360</b>            |
|  | <b>YELIMAN<br/>E</b> |  | <b>97447<br/>3</b> | <b>10037<br/>95</b> | <b>1978268</b> | <b>1543286<br/>,762</b> | <b>1589724<br/>,43</b> | <b>3133011,<br/>192</b> |
|  |                      | <b>COM.<br/>GUIDIME</b>                    | <b>19403</b>       | <b>20420</b>        | <b>39823</b>   | <b>30729</b>            | <b>32339</b>           | <b>63068</b>            |
|  |                      | <b>COM.<br/>DIAFOUNOU<br/>DIONGAGA</b>     | <b>4663</b>        | <b>5015</b>         | <b>9678</b>    | <b>7385</b>             | <b>7942</b>            | <b>15327</b>            |
|  |                      | <b>COM.<br/>DIAFOUNOU<br/>GORY</b>         | <b>9659</b>        | <b>10591</b>        | <b>20250</b>   | <b>15297</b>            | <b>16773</b>           | <b>32070</b>            |
|  |                      | <b>COM. FANGA</b>                          | <b>3862</b>        | <b>4071</b>         | <b>7933</b>    | <b>6116</b>             | <b>6447</b>            | <b>12564</b>            |
|  |                      | <b>COM. GORY</b>                           | <b>6131</b>        | <b>6470</b>         | <b>12601</b>   | <b>9710</b>             | <b>10247</b>           | <b>19956</b>            |
|  |                      | <b>COM. KIRANE<br/>KANIAGA</b>             | <b>16863</b>       | <b>18034</b>        | <b>34897</b>   | <b>26706</b>            | <b>28561</b>           | <b>55267</b>            |
|  |                      | <b>COM.<br/>KONSIGA</b>                    | <b>2308</b>        | <b>2620</b>         | <b>4928</b>    | <b>3655</b>             | <b>4149</b>            | <b>7805</b>             |
|  |                      | <b>COM. KREMIS</b>                         | <b>5473</b>        | <b>5571</b>         | <b>11044</b>   | <b>8668</b>             | <b>8823</b>            | <b>17491</b>            |

|                             |                   |                       |               |               |               |                    |                    |                    |
|-----------------------------|-------------------|-----------------------|---------------|---------------|---------------|--------------------|--------------------|--------------------|
|                             |                   | <b>COM. MAREKAFO</b>  | <b>2501</b>   | <b>2823</b>   | <b>5324</b>   | <b>3961</b>        | <b>4471</b>        | <b>8432</b>        |
|                             |                   | <b>COM. SOUMPOU</b>   | <b>2364</b>   | <b>2489</b>   | <b>4853</b>   | <b>3744</b>        | <b>3942</b>        | <b>7686</b>        |
|                             |                   | <b>COM. TOYA</b>      | <b>5953</b>   | <b>6691</b>   | <b>12644</b>  | <b>9428</b>        | <b>10597</b>       | <b>20024</b>       |
|                             |                   | <b>COM. TRINGA</b>    | <b>5966</b>   | <b>6576</b>   | <b>12542</b>  | <b>9448</b>        | <b>10415</b>       | <b>19863</b>       |
| <b>REGION DE KOULIKO RO</b> |                   |                       | <b>376069</b> | <b>385784</b> | <b>761853</b> | <b>595585,8286</b> | <b>610971,6124</b> | <b>1206557,441</b> |
|                             | <b>KOULIKO RO</b> |                       | <b>256629</b> | <b>263320</b> | <b>519949</b> | <b>406427,0004</b> | <b>417023,6323</b> | <b>823450,6327</b> |
|                             |                   | <b>COM. SEBETE</b>    | <b>2015</b>   | <b>2045</b>   | <b>4060</b>   | <b>3191</b>        | <b>3239</b>        | <b>6430</b>        |
|                             |                   | <b>COM. TOUBACORO</b> | <b>7118</b>   | <b>7256</b>   | <b>14374</b>  | <b>11273</b>       | <b>11491</b>       | <b>22764</b>       |
|                             |                   | <b>COM. SAGABALA</b>  | <b>8616</b>   | <b>9091</b>   | <b>17 707</b> | <b>13645,28185</b> | <b>14397,54611</b> | <b>28 043</b>      |
|                             | <b>NARA</b>       |                       | <b>119440</b> | <b>122464</b> | <b>241904</b> | <b>189159</b>      | <b>193948</b>      | <b>383107</b>      |
|                             |                   | <b>COM. NARA</b>      | <b>14581</b>  | <b>15021</b>  | <b>29602</b>  | <b>23092</b>       | <b>23789</b>       | <b>46881</b>       |
|                             |                   | <b>COM. ALLAHINA</b>  | <b>5574</b>   | <b>6018</b>   | <b>11592</b>  | <b>8828</b>        | <b>9531</b>        | <b>18358</b>       |
|                             |                   | <b>COM. DABO</b>      | <b>5531</b>   | <b>6093</b>   | <b>11624</b>  | <b>8760</b>        | <b>9650</b>        | <b>18409</b>       |
|                             |                   | <b>COM. DILLY</b>     | <b>19296</b>  | <b>19153</b>  | <b>38449</b>  | <b>30559</b>       | <b>30333</b>       | <b>60892</b>       |
|                             |                   | <b>COM. DOGOFRY</b>   | <b>16892</b>  | <b>17763</b>  | <b>34655</b>  | <b>26752</b>       | <b>28132</b>       | <b>54884</b>       |

|                 |        |                      |            |            |        |        |        |        |
|-----------------|--------|----------------------|------------|------------|--------|--------|--------|--------|
|                 |        | COM. FALLOU          | 14841      | 15194      | 30035  | 23504  | 24063  | 47567  |
|                 |        | COM. GUENEIBE        | 4421       | 4330       | 8751   | 7002   | 6857   | 13859  |
|                 |        | COM. GUIRE           | 10037      | 9838       | 19875  | 15896  | 15581  | 31476  |
|                 |        | COM. KORONGA         | 5535       | 5476       | 11011  | 8766   | 8672   | 17438  |
|                 |        | COM. NIAMANA         | 13830      | 14250      | 28080  | 21903  | 22568  | 44471  |
|                 |        | COM. OUAGADOU        | 8902       | 9328       | 18230  | 14098  | 14773  | 28871  |
| REGION DE SEGOU |        |                      | 25921<br>2 | 26351<br>6 | 522728 | 410518 | 417334 | 827852 |
|                 | SEGOU  |                      | 10342      | 10229      | 20571  | 16379  | 16200  | 32579  |
|                 |        | COM. BELLEN          | 3514       | 3401       | 6915   | 5565   | 5386   | 10951  |
|                 |        | COM. N'KOUMANDO UGOU | 6828       | 6828       | 13656  | 10814  | 10814  | 21627  |
|                 | MACINA |                      | 67495      | 69791      | 137286 | 106893 | 110529 | 217422 |
|                 |        | COM. MACINA          | 17721      | 18551      | 36272  | 28065  | 29379  | 57444  |
|                 |        | COM. BOKY WERE       | 7745       | 7657       | 15402  | 12266  | 12126  | 24392  |
|                 |        | COM. KOKRY CENTRE    | 8781       | 8703       | 17484  | 13907  | 13783  | 27690  |
|                 |        | COM. KOLONGO         | 16552      | 17622      | 34174  | 26214  | 27908  | 54122  |

|  |              |                                     |                    |                    |               |                         |                         |                         |
|--|--------------|-------------------------------------|--------------------|--------------------|---------------|-------------------------|-------------------------|-------------------------|
|  |              | <b>COM.<br/>MONIMPEBOU<br/>GOU</b>  | <b>16696</b>       | <b>17258</b>       | <b>33954</b>  | <b>26442</b>            | <b>27332</b>            | <b>53773</b>            |
|  | <b>NIONO</b> |                                     | <b>18137<br/>5</b> | <b>18349<br/>6</b> | <b>364871</b> | <b>287246,<br/>1694</b> | <b>290605,<br/>2273</b> | <b>577851,3<br/>966</b> |
|  |              | <b>COM. NIONO</b>                   | <b>40469</b>       | <b>41174</b>       | <b>81643</b>  | <b>64091</b>            | <b>65208</b>            | <b>129299</b>           |
|  |              | <b>COM.<br/>DIABALY</b>             | <b>17222</b>       | <b>17102</b>       | <b>34324</b>  | <b>27275</b>            | <b>27085</b>            | <b>54359</b>            |
|  |              | <b>COM.<br/>DOGOFRY</b>             | <b>16904</b>       | <b>17109</b>       | <b>34013</b>  | <b>26771</b>            | <b>27096</b>            | <b>53867</b>            |
|  |              | <b>COM. KALA<br/>SIGUIDA</b>        | <b>10582</b>       | <b>10761</b>       | <b>21343</b>  | <b>16759</b>            | <b>17042</b>            | <b>33801</b>            |
|  |              | <b>COM. MARIKO</b>                  | <b>11795</b>       | <b>11518</b>       | <b>23313</b>  | <b>18680</b>            | <b>18241</b>            | <b>36921</b>            |
|  |              | <b>COM.<br/>NAMPALARI</b>           | <b>5571</b>        | <b>5533</b>        | <b>11104</b>  | <b>8823</b>             | <b>8763</b>             | <b>17586</b>            |
|  |              | <b>COM. POGO</b>                    | <b>8143</b>        | <b>8182</b>        | <b>16325</b>  | <b>12896</b>            | <b>12958</b>            | <b>25854</b>            |
|  |              | <b>COM.<br/>SIRIBALA</b>            | <b>19101</b>       | <b>18665</b>       | <b>37766</b>  | <b>30251</b>            | <b>29560</b>            | <b>59811</b>            |
|  |              | <b>COM.<br/>SIRIFILA<br/>BOUNDY</b> | <b>16195</b>       | <b>16720</b>       | <b>32915</b>  | <b>25648</b>            | <b>26480</b>            | <b>52128</b>            |
|  |              | <b>COM. SOKOLO</b>                  | <b>12521</b>       | <b>12528</b>       | <b>25049</b>  | <b>19830</b>            | <b>19841</b>            | <b>39670</b>            |
|  |              | <b>COM.<br/>TORIDAGA KO</b>         | <b>14351</b>       | <b>15415</b>       | <b>29766</b>  | <b>22728</b>            | <b>24413</b>            | <b>47141</b>            |
|  |              | <b>COM.<br/>YEREDON<br/>SANIONA</b> | <b>8521</b>        | <b>8789</b>        | <b>17310</b>  | <b>13495</b>            | <b>13919</b>            | <b>27414</b>            |

|                    |              |                          |            |            |        |                 |                 |                 |
|--------------------|--------------|--------------------------|------------|------------|--------|-----------------|-----------------|-----------------|
| REGION<br>DE MOPTI |              |                          | 20773<br>5 | 21125<br>8 | 418993 | 328993          | 334572          | 663565          |
|                    | MOPTI        |                          | 54216      | 55487      | 109703 | 85863           | 87876           | 173738          |
|                    |              | COM.<br>DIALLOUBE        | 15212      | 15736      | 30 948 | 24091,4<br>6094 | 24921,3<br>272  | 49 013          |
|                    |              | COM. KONNA               | 18308      | 18482      | 36 790 | 28994,6<br>4021 | 29270,2<br>0649 | 58 265          |
|                    |              | COM.<br>KOROMBANA        | 14516      | 15225      | 29 741 | 22989,1<br>9583 | 24112,0<br>4923 | 47 101          |
|                    |              | COM.<br>OUROUBE<br>DOUDE | 6180       | 6044       | 12 224 | 9787,35<br>3972 | 9571,96<br>8836 | 19 359          |
|                    | DOUENTZ<br>A |                          | 31556      | 31216      | 62772  | 49975,6<br>864  | 49437,2<br>2356 | 99412,90<br>996 |
|                    |              | COM.<br>DANGOL-<br>BORE  | 13202      | 13338      | 26540  | 20908           | 21124           | 42032           |
|                    |              | COM.<br>DJAPTODJI        | 18354      | 17878      | 36232  | 29067           | 28314           | 57381           |
|                    | TENEKOU      |                          | 67965      | 70030      | 137995 | 107637,<br>138  | 110907,<br>5079 | 218544,6<br>459 |
|                    |              | COM.<br>DIAFARABE        | 7423       | 7484       | 14 907 | 11755,9<br>1077 | 11852,5<br>1733 | 23 608          |
|                    |              | COM. DIAKA               | 9652       | 9828       | 19 480 | 15286,0<br>098  | 15564,7<br>435  | 30 851          |
|                    |              | COM.<br>DIONDIORI        | 10117      | 10375      | 20 492 | 16022,4<br>3691 | 16431,0<br>3519 | 32 453          |

|  |                      |                                     |              |              |               |                         |                         |                         |
|--|----------------------|-------------------------------------|--------------|--------------|---------------|-------------------------|-------------------------|-------------------------|
|  |                      | <b>COM. KARERI</b>                  | <b>13950</b> | <b>13853</b> | <b>27 803</b> | <b>22092,8<br/>1358</b> | <b>21939,1<br/>933</b>  | <b>44 032</b>           |
|  |                      | <b>COM. OURO<br/>ARDO</b>           | <b>4987</b>  | <b>5354</b>  | <b>10 341</b> | <b>7897,98<br/>289</b>  | <b>8479,20<br/>6014</b> | <b>16 377</b>           |
|  |                      | <b>COM. OURO<br/>GUIRE</b>          | <b>3942</b>  | <b>4200</b>  | <b>8 142</b>  | <b>6243,00<br/>1514</b> | <b>6651,59<br/>9787</b> | <b>12 895</b>           |
|  |                      | <b>COM.<br/>SOUGOULBE</b>           | <b>4372</b>  | <b>4883</b>  | <b>9 255</b>  | <b>6923,99<br/>8635</b> | <b>7733,27<br/>6609</b> | <b>14 657</b>           |
|  |                      | <b>COM.<br/>TOGUERE-<br/>COUMBE</b> | <b>13522</b> | <b>14053</b> | <b>27 575</b> | <b>21414,9<br/>8388</b> | <b>22255,9<br/>3614</b> | <b>43 671</b>           |
|  | <b>YOUWAR<br/>OU</b> |                                     | <b>53998</b> | <b>54525</b> | <b>108523</b> | <b>85517,4<br/>0126</b> | <b>86352,0<br/>1866</b> | <b>171869,4<br/>199</b> |
|  |                      | <b>COM.<br/>YOUWAROU</b>            | <b>11577</b> | <b>11736</b> | <b>23313</b>  | <b>18335</b>            | <b>18586</b>            | <b>36921</b>            |
|  |                      | <b>COM.<br/>BIMBERE<br/>TAMA</b>    | <b>3990</b>  | <b>4249</b>  | <b>8239</b>   | <b>6319</b>             | <b>6729</b>             | <b>13048</b>            |
|  |                      | <b>COM. DEBOYE</b>                  | <b>11537</b> | <b>11615</b> | <b>23152</b>  | <b>18271</b>            | <b>18395</b>            | <b>36666</b>            |
|  |                      | <b>COM. DIRMA</b>                   | <b>4045</b>  | <b>4073</b>  | <b>8118</b>   | <b>6406</b>             | <b>6450</b>             | <b>12857</b>            |
|  |                      | <b>COM. DONGO</b>                   | <b>5687</b>  | <b>5789</b>  | <b>11476</b>  | <b>9007</b>             | <b>9168</b>             | <b>18175</b>            |
|  |                      | <b>COM.<br/>FARIMAKE</b>            | <b>6035</b>  | <b>5881</b>  | <b>11916</b>  | <b>9558</b>             | <b>9314</b>             | <b>18872</b>            |
|  |                      | <b>COM.<br/>N'DODJIGA</b>           | <b>11127</b> | <b>11182</b> | <b>22309</b>  | <b>17622</b>            | <b>17709</b>            | <b>35331</b>            |

|                              |                   |                              |               |               |               |                    |                    |                    |
|------------------------------|-------------------|------------------------------|---------------|---------------|---------------|--------------------|--------------------|--------------------|
| <b>REGION DE TOMBOUC TOU</b> |                   |                              | <b>331347</b> | <b>330860</b> | <b>662207</b> | <b>524758,9606</b> | <b>523987,6918</b> | <b>1048746,652</b> |
|                              | <b>TOUBOUCTOU</b> |                              | <b>65201</b>  | <b>62127</b>  | <b>127328</b> | <b>103259,7518</b> | <b>98391,41427</b> | <b>201651,1661</b> |
|                              |                   | <b>COM. TOMBOUCTOU</b>       | <b>27915</b>  | <b>26714</b>  | <b>54629</b>  | <b>44209,38287</b> | <b>42307,34207</b> | <b>86516,72494</b> |
|                              |                   | <b>COM. ALAFIA</b>           | <b>6362</b>   | <b>6550</b>   | <b>12912</b>  | <b>10076</b>       | <b>10373</b>       | <b>20449</b>       |
|                              |                   | <b>COM. BER</b>              | <b>9950</b>   | <b>9017</b>   | <b>18967</b>  | <b>15758</b>       | <b>14280</b>       | <b>30038</b>       |
|                              |                   | <b>COM. BOUREM-INALY</b>     | <b>5462</b>   | <b>6142</b>   | <b>11604</b>  | <b>8650</b>        | <b>9727</b>        | <b>18377</b>       |
|                              |                   | <b>COM. LAFIA</b>            | <b>3807</b>   | <b>3947</b>   | <b>7754</b>   | <b>6029</b>        | <b>6251</b>        | <b>12280</b>       |
|                              |                   | <b>COM. SALAM</b>            | <b>11705</b>  | <b>9757</b>   | <b>21462</b>  | <b>18537</b>       | <b>15452</b>       | <b>33990</b>       |
|                              | <b>DIRE</b>       |                              | <b>54578</b>  | <b>55083</b>  | <b>109661</b> | <b>86435,95551</b> | <b>87235,7312</b>  | <b>173671,6867</b> |
|                              |                   | <b>COM. DIRE</b>             | <b>10193</b>  | <b>10144</b>  | <b>20337</b>  | <b>16143</b>       | <b>16065</b>       | <b>32208</b>       |
|                              |                   | <b>COM. ARHAM</b>            | <b>1358</b>   | <b>1461</b>   | <b>2819</b>   | <b>2151</b>        | <b>2314</b>        | <b>4464</b>        |
|                              |                   | <b>COM. BINGA</b>            | <b>2499</b>   | <b>2616</b>   | <b>5115</b>   | <b>3958</b>        | <b>4143</b>        | <b>8101</b>        |
|                              |                   | <b>COM. BOUREM SIDI AMAR</b> | <b>4066</b>   | <b>4489</b>   | <b>8555</b>   | <b>6439</b>        | <b>7109</b>        | <b>13549</b>       |
|                              |                   | <b>COM. DANGHA</b>           | <b>6426</b>   | <b>6479</b>   | <b>12905</b>  | <b>10177</b>       | <b>10261</b>       | <b>20438</b>       |

|  |                     |                                   |              |              |               |                         |                         |                         |
|--|---------------------|-----------------------------------|--------------|--------------|---------------|-------------------------|-------------------------|-------------------------|
|  |                     | <b>COM.<br/>GARBAKOIRA</b>        | <b>2960</b>  | <b>2691</b>  | <b>5651</b>   | <b>4688</b>             | <b>4262</b>             | <b>8950</b>             |
|  |                     | <b>COM.<br/>HAIBONGO</b>          | <b>7110</b>  | <b>7147</b>  | <b>14257</b>  | <b>11260</b>            | <b>11319</b>            | <b>22579</b>            |
|  |                     | <b>COM.<br/>KIRCHAMBA</b>         | <b>2090</b>  | <b>2030</b>  | <b>4120</b>   | <b>3310</b>             | <b>3215</b>             | <b>6525</b>             |
|  |                     | <b>COM. KONDI</b>                 | <b>1548</b>  | <b>1503</b>  | <b>3051</b>   | <b>2452</b>             | <b>2380</b>             | <b>4832</b>             |
|  |                     | <b>COM.<br/>SAREYAMOU</b>         | <b>8417</b>  | <b>8529</b>  | <b>16946</b>  | <b>13330</b>            | <b>13507</b>            | <b>26838</b>            |
|  |                     | <b>COM.<br/>TIENKOUR</b>          | <b>3248</b>  | <b>3279</b>  | <b>6527</b>   | <b>5144</b>             | <b>5193</b>             | <b>10337</b>            |
|  |                     | <b>COM.<br/>TINDIRMA</b>          | <b>3208</b>  | <b>3269</b>  | <b>6477</b>   | <b>5081</b>             | <b>5177</b>             | <b>10258</b>            |
|  |                     | <b>COM.<br/>TINGUEREGUI<br/>F</b> | <b>1455</b>  | <b>1446</b>  | <b>2901</b>   | <b>2304</b>             | <b>2290</b>             | <b>4594</b>             |
|  | <b>GOUNDA<br/>M</b> |                                   | <b>69073</b> | <b>69670</b> | <b>138743</b> | <b>109391,<br/>8934</b> | <b>110337,<br/>3707</b> | <b>219729,2<br/>641</b> |
|  |                     | <b>COM.<br/>ALZOUNOUB</b>         | <b>2399</b>  | <b>2078</b>  | <b>4477</b>   | <b>3799</b>             | <b>3291</b>             | <b>7090</b>             |
|  |                     | <b>COM.<br/>BINTAGOUNG<br/>OU</b> | <b>4065</b>  | <b>4248</b>  | <b>8313</b>   | <b>6438</b>             | <b>6728</b>             | <b>13165</b>            |
|  |                     | <b>COM.<br/>ADARMALANE</b>        | <b>463</b>   | <b>492</b>   | <b>955</b>    | <b>733</b>              | <b>779</b>              | <b>1512</b>             |
|  |                     | <b>COM.<br/>DOUEKIRE</b>          | <b>8999</b>  | <b>9096</b>  | <b>18095</b>  | <b>14252</b>            | <b>14405</b>            | <b>28657</b>            |



|  |                            |                                    |       |       |        |                 |                 |                 |
|--|----------------------------|------------------------------------|-------|-------|--------|-----------------|-----------------|-----------------|
|  |                            | <b>COM.<br/>DOUKOURIA</b>          | 1468  | 1297  | 2765   | 2325            | 2054            | 4379            |
|  |                            | <b>COM.<br/>ESSAKANE</b>           | 5825  | 5533  | 11358  | 9225            | 8763            | 17988           |
|  |                            | <b>COM.<br/>GARGANDO</b>           | 4405  | 4117  | 8522   | 6976            | 6520            | 13496           |
|  |                            | <b>COM. ISSA<br/>BERY</b>          | 1989  | 2137  | 4126   | 3150            | 3384            | 6534            |
|  |                            | <b>COM. KANEYE</b>                 | 1167  | 1165  | 2332   | 1848            | 1845            | 3693            |
|  |                            | <b>COM.<br/>M'BOUNA</b>            | 1894  | 1937  | 3831   | 3000            | 3068            | 6067            |
|  |                            | <b>COM. RAZ-EL-<br/>MA</b>         | 2322  | 2076  | 4398   | 3677            | 3288            | 6965            |
|  |                            | <b>COM. TELE</b>                   | 2959  | 2967  | 5926   | 4686            | 4699            | 9385            |
|  |                            | <b>COM. TILEMSI</b>                | 3917  | 3475  | 7392   | 6203            | 5503            | 11707           |
|  |                            | <b>COM. TIN<br/>AICHA</b>          | 1503  | 1474  | 2977   | 2380            | 2334            | 4715            |
|  |                            | <b>COM. TONKA</b>                  | 25698 | 27578 | 53276  | 40698           | 43676           | 84374           |
|  | <b>GOURMA-<br/>RHAROUS</b> |                                    | 54526 | 56507 | 111033 | 86353,6<br>0237 | 89490,9<br>4027 | 175844,5<br>426 |
|  |                            | <b>COM.<br/>RHAROUS</b>            | 12646 | 13641 | 26287  | 20028           | 21603           | 41631           |
|  |                            | <b>COM.<br/>BAMBARA<br/>MAOUDE</b> | 8315  | 8170  | 16485  | 13169           | 12939           | 26108           |

|  |                      |                              |              |              |               |                         |                         |                         |
|--|----------------------|------------------------------|--------------|--------------|---------------|-------------------------|-------------------------|-------------------------|
|  |                      | <b>COM. BANIKANE</b>         | <b>4519</b>  | <b>4930</b>  | <b>9449</b>   | <b>7157</b>             | <b>7808</b>             | <b>14965</b>            |
|  |                      | <b>COM. GOSSI</b>            | <b>11677</b> | <b>12388</b> | <b>24065</b>  | <b>18493</b>            | <b>19619</b>            | <b>38112</b>            |
|  |                      | <b>COM. HANZAKOMA</b>        | <b>4475</b>  | <b>4609</b>  | <b>9084</b>   | <b>7087</b>             | <b>7299</b>             | <b>14386</b>            |
|  |                      | <b>COM. HARIBOMO</b>         | <b>3716</b>  | <b>3655</b>  | <b>7371</b>   | <b>5885</b>             | <b>5788</b>             | <b>11674</b>            |
|  |                      | <b>COM. INADIATAFANE</b>     | <b>1851</b>  | <b>1706</b>  | <b>3557</b>   | <b>2931</b>             | <b>2702</b>             | <b>5633</b>             |
|  |                      | <b>COM. OUINERDEN</b>        | <b>3081</b>  | <b>3020</b>  | <b>6101</b>   | <b>4879</b>             | <b>4783</b>             | <b>9662</b>             |
|  |                      | <b>COM. SERERE</b>           | <b>4246</b>  | <b>4388</b>  | <b>8634</b>   | <b>6724</b>             | <b>6949</b>             | <b>13674</b>            |
|  | <b>NIAFUNK<br/>E</b> |                              | <b>87969</b> | <b>87473</b> | <b>175442</b> | <b>139317,<br/>7575</b> | <b>138532,<br/>2353</b> | <b>277849,9<br/>928</b> |
|  |                      | <b>COM. SOBOUNDOU</b>        | <b>20201</b> | <b>20224</b> | <b>40425</b>  | <b>31993</b>            | <b>32029</b>            | <b>64022</b>            |
|  |                      | <b>COM. BANIKANE NARHAWA</b> | <b>10719</b> | <b>10554</b> | <b>21273</b>  | <b>16976</b>            | <b>16715</b>            | <b>33690</b>            |
|  |                      | <b>COM. DIANKE</b>           | <b>5171</b>  | <b>5276</b>  | <b>10447</b>  | <b>8189</b>             | <b>8356</b>             | <b>16545</b>            |
|  |                      | <b>COM. FITTOUGA</b>         | <b>15014</b> | <b>15083</b> | <b>30097</b>  | <b>23778</b>            | <b>23887</b>            | <b>47665</b>            |
|  |                      | <b>COM. KOUMAIRA</b>         | <b>7296</b>  | <b>7135</b>  | <b>14431</b>  | <b>11555</b>            | <b>11300</b>            | <b>22855</b>            |
|  |                      | <b>COM. LERE</b>             | <b>8640</b>  | <b>8792</b>  | <b>17432</b>  | <b>13683</b>            | <b>13924</b>            | <b>27607</b>            |

|                      |                |                         |        |        |        |             |             |             |
|----------------------|----------------|-------------------------|--------|--------|--------|-------------|-------------|-------------|
|                      |                | <b>COM. N'GORKOU</b>    | 12381  | 12008  | 24389  | 19608       | 19017       | 38625       |
|                      |                | <b>COM. SOUMPI</b>      | 8547   | 8401   | 16948  | 13536       | 13305       | 26841       |
| <b>REGION DE GAO</b> |                |                         | 242837 | 245011 | 487848 | 384584,4137 | 388027,4084 | 772611,8221 |
|                      | <b>GAO</b>     |                         | 120026 | 119509 | 239535 | 190086,8848 | 189268,1045 | 379354,9893 |
|                      |                | <b>COM. GAO</b>         | 43593  | 42760  | 86353  | 69039       | 67720       | 136758      |
|                      |                | <b>COM. ANCHAWADI</b>   | 10714  | 9845   | 20559  | 16968       | 15592       | 32560       |
|                      |                | <b>COMP. GABERO</b>     | 12179  | 13442  | 25621  | 19288       | 21288       | 40576       |
|                      |                | <b>COM. GOUNZOUREYE</b> | 13445  | 13804  | 27249  | 21293       | 21862       | 43155       |
|                      |                | <b>COM. N'TILLIT</b>    | 11396  | 10889  | 22285  | 18048       | 17245       | 35293       |
|                      |                | <b>COM. SONY ALIBER</b> | 23472  | 24146  | 47618  | 37173       | 38240       | 75413       |
|                      |                | <b>COM. TILEMSI</b>     | 5227   | 4623   | 9850   | 8278        | 7322        | 15600       |
|                      | <b>ANSONGO</b> |                         | 66208  | 65745  | 131953 | 104854,5521 | 104121,2924 | 208975,8444 |
|                      |                | <b>COM. ANSONGO</b>     | 14707  | 15384  | 30091  | 23292       | 24364       | 47656       |
|                      |                | <b>COM. BARA</b>        | 7264   | 7828   | 15092  | 11504       | 12397       | 23901       |
|                      |                | <b>COM. BOURRA</b>      | 9397   | 9329   | 18726  | 14882       | 14774       | 29657       |

|   |               |                                     |              |              |               |                         |                         |                         |
|---|---------------|-------------------------------------|--------------|--------------|---------------|-------------------------|-------------------------|-------------------------|
|   |               | <b>COM.<br/>OUATTAGOUN<br/>A</b>    | <b>15153</b> | <b>15110</b> | <b>30263</b>  | <b>23998</b>            | <b>23930</b>            | <b>47928</b>            |
|   |               | <b>COM.<br/>TALATAYE</b>            | <b>7398</b>  | <b>6625</b>  | <b>14023</b>  | <b>11716</b>            | <b>10492</b>            | <b>22208</b>            |
|   |               | <b>COM. TESSIT</b>                  | <b>7142</b>  | <b>6624</b>  | <b>13766</b>  | <b>11311</b>            | <b>10491</b>            | <b>21801</b>            |
|   |               | <b>COM. TIN-<br/>HAMA</b>           | <b>5147</b>  | <b>4845</b>  | <b>9992</b>   | <b>8151</b>             | <b>7673</b>             | <b>15824</b>            |
|   | <b>BOUREM</b> |                                     | <b>56603</b> | <b>59757</b> | <b>116360</b> | <b>89642,9<br/>7684</b> | <b>94638,0<br/>1154</b> | <b>184280,9<br/>884</b> |
|   |               | <b>COM.<br/>BOUREM</b>              | <b>13106</b> | <b>14382</b> | <b>27488</b>  | <b>20756</b>            | <b>22777</b>            | <b>43533</b>            |
|   |               | <b>COM. BAMBA</b>                   | <b>13474</b> | <b>15142</b> | <b>28616</b>  | <b>21339</b>            | <b>23981</b>            | <b>45320</b>            |
|   |               | <b>COM. TABOYE</b>                  | <b>9853</b>  | <b>10788</b> | <b>20641</b>  | <b>15604</b>            | <b>17085</b>            | <b>32689</b>            |
|   |               | <b>COM.<br/>TARKINT</b>             | <b>10241</b> | <b>8858</b>  | <b>19099</b>  | <b>16219</b>            | <b>14029</b>            | <b>30247</b>            |
|   |               | <b>COM. TEMERA</b>                  | <b>9929</b>  | <b>10587</b> | <b>20516</b>  | <b>15725</b>            | <b>16767</b>            | <b>32491</b>            |
| <b>MENAKA<br/>(nouvelle<br/>r?gion)</b> |               |                                     | <b>27185</b> | <b>24415</b> | <b>51600</b>  | <b>43053</b>            | <b>38666</b>            | <b>81720</b>            |
|   | <b>MENAKA</b> |                                     | <b>27185</b> | <b>24415</b> | <b>51600</b>  | <b>43053,2<br/>7148</b> | <b>38666,3<br/>8305</b> | <b>81719,65<br/>452</b> |
|   |               | <b>COM.<br/>MENAKA</b>              | <b>11828</b> | <b>10831</b> | <b>22659</b>  | <b>18732</b>            | <b>17153</b>            | <b>35885</b>            |
|   |               | <b>COM.<br/>ANDERAMBO<br/>UKANE</b> | <b>9493</b>  | <b>8597</b>  | <b>18090</b>  | <b>15034</b>            | <b>13615</b>            | <b>28649</b>            |

|                 |                 |                |      |      |       |                 |                 |                 |
|-----------------|-----------------|----------------|------|------|-------|-----------------|-----------------|-----------------|
|                 |                 | COM. INEKAR    | 2906 | 2515 | 5421  | 4602            | 3983            | 8585            |
|                 |                 | COM. TIDERMENE | 2958 | 2472 | 5430  | 4685            | 3915            | 8600            |
| REGION DE KIDAL |                 |                | 8172 | 7228 | 15400 | 12942,1<br>1273 | 11447,0<br>8649 | 24389,19<br>922 |
|                 | CERCLE DE KIDAL |                | 4033 | 3464 | 7497  | 6387,11<br>951  | 5485,98<br>611  | 11873,10<br>562 |
|                 |                 | COM. ANEFIF    | 2744 | 2375 | 5119  | 4346            | 3761            | 8107            |
|                 |                 | COM. ESSOUK    | 1289 | 1089 | 2378  | 2041            | 1725            | 3766            |
|                 | TESSALIT        | COM. ADJELHOC  | 4139 | 3764 | 7 903 | 6554,99<br>3218 | 5961,10<br>038  | 12 516          |

[1] INSAT-Mali (2022). *Population projetée selon la résidence et par région ? Mali*. <https://instat-mali.org/fr/publications/recensement-general-de-la-population-et-de-lhabitat-rgph>

[1] Prepared on the basis of data extracted from : Pan African Agency for the Great Green Wall (2021). <https://www.grandemurailleverte.org/>

## ANNEX E: Project Budget Table

Please attach a project budget table.

| Expenditure Category | Detailed Description | Component (USDeq.) | Responsible Entity |
|----------------------|----------------------|--------------------|--------------------|
|----------------------|----------------------|--------------------|--------------------|

| y |   | Component 1 | Component 2 | Component 3 | Component 4 | M&E | Sub-Total | PM C | Total (USD eq.) | (Executing Entity receiving funds from the GEF Agency)[1]                            |
|---|---|-------------|-------------|-------------|-------------|-----|-----------|------|-----------------|--|
|   | 1.5. Y2: Various training equipment incl. solar PV panels etc. for USD 4,581 total.   | 4,581       |             |             |             |     | 4,581     |      | 4,581           | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |
|   | 2.1. Y2: CAPEX subsidies for the 100% RE greefield pilot sites at USD 350,000 total. Y3: Same for USD 150,000 total.2.3. Y1: Various training equipment incl. solar PV panels etc. at USD 6,000 total. Y3: Same at USD 2,000 total. |             | 508,000     |             |             |     | 508,000   |      | 508,000         | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |
|   | 2.3. Y1: IT hardware and software useful for trainings, USD 3,000 total. Y3: the same for USD 800 total.  |             | 3,800       |             |             |     | 3,800     |      | 3,800           | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |

|  |  |        |  |  |  |  |  |  |  |  |   |   |
|--|--|--------|--|--|--|--|--|--|--|--|---|---|
| <b>Equipm<br/>ent</b>                                  | 4.2. Y1:<br>Server,<br>domain name<br>and other<br>costs for rural<br>electrification<br>platform for<br>USD 2,500.<br>Y2 to Y4:<br>Same for USD<br>1,000 per<br>year.   |        |  |  |  |  |  |  |  |  | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |   |
| <b>Equipm<br/>ent</b>                                  | Y1: Laptops,<br>printers,<br>software, etc.<br>for USD 8,000<br>total. Y3:<br>Renewing/upg<br>rading some<br>equipment for<br>USD 2,500.   |        |  |  |  |  |  |  |  |  |   | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |
| <b>Equipm<br/>ent</b>                                  | Y2 to Y4:<br>Maintenance<br>costs for the 3<br>vehicles for<br>the project<br>(USD 3,000<br>per year for 3<br>years)   |        |  |  |  |  |  |  |  |  |   | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |
| <b>Contrac<br/>tual<br/>services-<br/>Compan<br/>y</b> | 1.1. Y1 to Y4:<br>1 training each<br>year in Y1 to<br>Y4 (4<br>trainings in<br>total) at USD<br>1,250<br>each.1.5. Y2:<br>Communicatio<br>n company for<br>USD 6,000 to<br>support the<br>dissemination<br>of the<br>standards to<br>relevant<br>stakeholders<br>(incl. general<br>public) | 11,000 |  |  |  |  |  |  |  |  |   | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |

|  |  |                |  |  |                |  |                |  |
|--|--|----------------|--|--|----------------|--|----------------|--|
| <p><b>Contractual services-Company</b></p> | <p>2.1. Y1: Consulting firm for USD 30,000 total to develop the Minigrad Pilot Plan, support the design of the tendering process on the digital platform, contributing to tender execution and contracting of selected pilot beneficiaries with AER-Mali, AMADER and the PMU. Y2: A local consulting firm for USD 41,000 total to support update (or development) of feasibility study for each pilot site.2.2. Y1: Analysis on key national rural economic outputs and their value chains, and social activities incl. field visits on key value chains and stakeholder consultations 1 mission to Mali for the study, field visits inside the country for USD 36,000 total.2.3. Y4: Provision for additional capacity building needed for communities/local private sector developers &amp; operators at</p> | <p>116,000</p> |  |  | <p>116,000</p> |  | <p>116,000</p> | <p>Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali)</p> |
|--|--|----------------|--|--|----------------|--|----------------|--|



|                                     |  |        |        |        |  |
|-------------------------------------|--|--------|--------|--------|--|
| <b>Contractual services-Company</b> | 3.1. Y1: USD 40,586 for the first part of a consultancy for benchmarking of existing financial products supporting access and use of energy in Mali and abroad, and other industries, Identify innovative financing schemes that are relevant and applicable to support the development of the minigrid market in Mali. Y2: USD 32,793 for the second part of the consultancy started in Y1. | 73,379 | 73,379 | 73,379 | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |
|-------------------------------------|--|--------|--------|--------|--|



|   |  |               |  |  |  |  |               |  |               |  |
|---|--|---------------|--|--|--|--|---------------|--|---------------|--|
| <p><b>International Consultants</b></p> | <p>1.1. Y1: Senegalese delegation of 2 consultants paid at USD 500/day each for 7 days to provide training and advisory for the national dialogue platform.1.2. Y1: 45 days of 1 international consultant at USD 600/day for necessary studies &amp; tools based on short assessment under activity 1.2.1. Y2: 15 days of the same.1.4. Y1: 33 days of 1 international consultant at USD 600/day for knowledge gap analysis, developing comprehensive modular training materials, conducting training and ToT. Y2: 17 days of the same.1.5. Y2: 30 days of 1 international consultant at USD 600/day to conduct a review (and benchmark) and to develop the relevant standards incl. 5 days for the preparation &amp; holding of the workshop.</p> | <p>91,000</p> |  |  |  |  | <p>91,000</p> |  | <p>91,000</p> | <p>Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali)</p> |
|---|--|---------------|--|--|--|--|---------------|--|---------------|--|

|   |   |  |               |  |  |  |               |  |               |  |
|---|---|--|---------------|--|--|--|---------------|--|---------------|--|
| <p><b>International Consultants</b></p> | <p>2.3. Y1: 30 days of 1 international consultant at USD 600/day for private operators: Pedagogical engineering, Training and ToT on feasibility studies, surveys, dimensioning of minigrids, business models, cost-reduction levers, new technologies, remote monitoring, GGW, PUE, etc. all services - several modules ; and knowledge transfer. Y2: 10 days of the same.</p> |  | <p>24,000</p> |  |  |  | <p>24,000</p> |  | <p>24,000</p> | <p>Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali)</p> |
|---|---|--|---------------|--|--|--|---------------|--|---------------|--|

|                                  |  |  |  |        |  |        |        |        |  |
|----------------------------------|--|--|--|--------|--|--------|--------|--------|--|
| <b>International Consultants</b> | 3.2. Y1: 17 days of 1 international consultant at USD 600/day to develop and conduct relevant training on business models and innovative finance solutions for national financial institutions. Y2 and Y3: 9 days of the same each year.3.3. Y4: 15 days of 1 international consultant at USD 600/day to work remotely on replication plan |  |  | 30,000 |  |        | 30,000 | 30,000 | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |
| <b>International Consultants</b> | Y4: Terminal Evaluation: Costs including lump sum for travels (international & national), USD 30,000 total.  |  |  |        |  | 30,000 | 30,000 | 30,000 | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |

|                                 |   |               |  |  |  |  |               |          |               |  |
|---------------------------------|---|---------------|--|--|--|--|---------------|----------|---------------|--|
| <p><b>Local Consultants</b></p> | <p>1.1. Y1 to Y4: National coordinator for the National Inclusive Off-grid Platform: 5 meetings per year from Y1 to Y4 at USD 300 per meeting (20 meetings in total).1.2. Y1: National consultant for 15 days at USD 300/day for brief assessment of actions taken related to de-risking instruments and selection of DREI instruments to be covered by AMP. National consultant for 67 days at USD 300/day for necessary studies, tools and implementation of selected de-risking instruments based on short assessment under activity 1.2.1. Y2: National consultant for 23 days at USD 300/day for necessary studies, tools and implementation of selected de-risking instruments based on short assessment under activity 1.2.1.1.3. Y1: National consultant for 30 days at USD 300/day</p> | <p>78,000</p> |  |  |  |  | <p>78,000</p> | <p>0</p> | <p>78,000</p> | <p>Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali)</p> |
|---------------------------------|---|---------------|--|--|--|--|---------------|----------|---------------|--|

|                                 |   |                |  |  |  |                |                |  |
|---------------------------------|---|----------------|--|--|--|----------------|----------------|--|
| <p><b>Local Consultants</b></p> | <p>2.1. Y1 to Y4: USD 14,199 a year for 50% of Project Assistant/Coordinator of the PMU.2.2. Y2: 80 days of 1 national consultant at USD 300/day for technical assistance provided to private operators on PUE for priority GGW value chains analyzed under Activity 2.2.1. Y3: 80 days of the same. Y4: 60 days of the same.2.3. Y1: 40 days of 1 national consultant at USD 300/day for technical assistance provided to private operators on PUE for priority GGW value chains analyzed under Activity 2.2.1. Y2 to Y4: 20 days of the same each year.</p> | <p>152,796</p> |  |  |  | <p>152,796</p> | <p>152,796</p> | <p>Mali Renewable Energy Agency / Agence des ?nergies Renouvelables du Mali (AER-Mali)</p> |
|---------------------------------|---|----------------|--|--|--|----------------|----------------|--|

|                          |  |  |  |        |  |  |        |        |   |
|--------------------------|--|--|--|--------|--|--|--------|--------|---|
| <b>Local Consultants</b> | 3.3. Y4: 40 days of 1 national consultant at USD 300/day with field visits incl. pilot sites and some eligible communities   |  |  | 12,000 |  |  | 12,000 | 12,000 | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
| <b>Local Consultants</b> | 4.3. Y1 to Y4: 2 national consultants (1 SES and 1 Gender) 29 days per year per consultant at USD 300/day/person for 4 years in charge of monitoring and recommending corrective measures where needed |  |  | 69,600 |  |  | 69,600 | 69,600 | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |



|                          |   |  |  |  |        |        |        |        |        |   |
|--------------------------|---|--|--|--|--------|--------|--------|--------|--------|---|
| <b>Local Consultants</b> | Y2 and Y3: Provision for external support for PMU at USD 2,000 per year. Y4: PMU - full time Project Manager (USD 38,730 according to Mali NSPA table for 2023), USD 14,200 a year for 50% Project Assistant/Coordinator (other 50% under component 2), Administrative Assistant at USD 15,442 and Driver at USD 7,150. |  |  |  |        |        |        | 79,522 | 79,522 | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
| <b>Local Consultants</b> | Y4: Terminal Evaluation: Costs including lump sum for travels (national), USD 20,000 total.   |  |  |  | 20,000 | 20,000 |        | 20,000 | 20,000 | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
| <b>Staff Costs</b>       | Y1 to Y3: 1 full time UNV for 3 years at USD 15,000 per year  |  |  |  |        |        | 45,000 | 45,000 | 45,000 | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |

|   |   |        |  |  |  |        |   |        |   |   |
|---|---|--------|--|--|--|--------|---|--------|---|---|
| <b>Training<br/>,<br/>Worksh<br/>ops,<br/>Meeting<br/>s</b> | 1.1. Y1:<br>Workshop<br>with<br>Senegalese<br>delegation for<br>2 days at USD<br>3,700 total. 3<br>meetings of<br>the National<br>Inclusive Of-<br>grid Platform<br>members at<br>USD 900 per<br>meeting. Y2 to<br>Y4: 5<br>meetings per<br>year of the<br>National<br>Inclusive Of-<br>grid Platform<br>members at<br>USD 900 per<br>meeting.1.2.<br>Y1: 2<br>Workshops on<br>the regulatory<br>framework &<br>de-risking<br>instruments at<br>USD 2,500<br>each. Y2: 1<br>Workshop on<br>the regulatory<br>framework &<br>de-risking<br>instruments at<br>USD<br>2,500.1.4. Y1<br>and Y2: 1<br>training<br>session incl.<br>ToT each year<br>at USD 4,000<br>per<br>training.1.5.<br>Y2: 2<br>workshops<br>around<br>standards at<br>USD 1,500<br>each. | 38,400 |  |  |  | 38,400 | 0 | 38,400 | 0 | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |
|---|---|--------|--|--|--|--------|---|--------|---|---|

|   |  |        |        |        |   |
|---|--|--------|--------|--------|---|
| <b>Training<br/>,<br/>Worksh<br/>ops,<br/>Meeting<br/>s</b> | 2.2. Y1: Half day workshop on the analysis and recommendations to boost economic and social activities through electricity access and productive use at USD 2,000. 2.3. Y1: Trainings and ToT sessions for communities & local private sector developers & operators at USD 5,000 total. Y2: Same at USD 2,500 total. Y3 and Y4: Same at USD 1,000 per year. | 11,500 | 11,500 | 11,500 | Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali) |
|---|--|--------|--------|--------|---|

|   |  |  |  |        |  |       |        |       |        |  |
|---|--|--|--|--------|--|-------|--------|-------|--------|--|
| <b>Training<br/>,<br/>Worksh<br/>ops,<br/>Meeting<br/>s</b> | 3.1. Y1: USD 6,667 lumpsum to conduct workshops related to the study and its findings & recommendations, and on the technical assistance provided to the selected financing mechanism targeting institutional, private and financial institutions.<br>Y2: Same for USD 3,333.<br>3.2. Y1 to Y3: Venue and related costs for the 1 training session per year over 3 year at USD 1,500 each.<br>3.3. Y4: Replication plan validation workshop at USD 2,500 |  |  | 17,000 |  |       | 17,000 |       | 17,000 | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |
| <b>Training<br/>,<br/>Worksh<br/>ops,<br/>Meeting<br/>s</b> | 4.1. Y1: Data Strategy validation workshop for USD 2,500.  |  |  | 2,500  |  | 2,500 |        | 2,500 |        | Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali) |

|   |   |  |  |  |  |           |       |  |       |   |
|---|---|--|--|--|--|-----------|-------|--|-------|---|
| <b>Training<br/>,<br/>Worksh<br/>ops,<br/>Meeting<br/>s</b> | Y1: Inception<br>workshop at<br>USD 3,000.<br>Y4: Project<br>closure<br>workshop at<br>USD 5,256. |  |  |  |  | 8,2<br>56 | 8,256 |  | 8,256 | Mali<br>Renewab<br>le Energy<br>Agency /<br>Agence<br>des<br>?nergies<br>Renouvel<br>ables du<br>Mali<br>(AER-<br>Mali) |
|---|---|--|--|--|--|-----------|-------|--|-------|---|

|                      |  |               |  |  |  |               |          |               |   |
|----------------------|--|---------------|--|--|--|---------------|----------|---------------|---|
| <p><b>Travel</b></p> | <p>1.1. Y1: One Exchange visit with Senegal's successful national dialogue platform, involving 2 people with 1 flight Dakar-Bamako at USD 800 each and 7 days DSA at USD 203/day [Mali rate in September 2022] each; Y1 to Y4: Each year for 4 years, local travel costs (DSA at USD 203/day/person) for participants outside of Bamako to attend the meetings &amp; workshops (5 meetings per year, 8 participants)1.<br/> 2. Y1: 10 day-mission for 1 international consultant involving 1 flight at USD 1,500 and 10 days DSA at USD 203/day.1.4. Y1: 1 mission to Mali for initial phase and ToT for 1 international consultant including 1 flight at USD 1,500 and 8 days DSA at USD 203/day. Local travels for participants from public officials outside of Bamako (2 days for 12</p> | <p>56,821</p> |  |  |  | <p>56,821</p> | <p>1</p> | <p>56,821</p> | <p>1<br/> Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali)</p> |
|----------------------|--|---------------|--|--|--|---------------|----------|---------------|---|

|                      |  |               |  |  |  |               |               |  |
|----------------------|--|---------------|--|--|--|---------------|---------------|--|
| <p><b>Travel</b></p> | <p>2.1. Y1 to Y3: Travel costs for pilot project visits at USD 4,000 per year<br/> 2.2. Y1: Travel costs for participants outside of Bamako, 2 days with 20 participants each at USD 203/day/person; Y2 to Y4: field trips of local consultants to pilot sites to provide technical assistance on the ground (lump sum of USD 6,000 per year)<br/> 2.3. Y1: 1 mission to Mali involving 1 flight at USD 1,500 and 8 days DSA at USD 203/day; Y1 to Y4: local travels on pilot sites at USD 2,000 per year for 4 years.</p> | <p>49,244</p> |  |  |  | <p>49,244</p> | <p>49,244</p> | <p>Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali)</p> |
|----------------------|--|---------------|--|--|--|---------------|---------------|--|

|                      |   |  |  |               |  |               |  |               |   |
|----------------------|---|--|--|---------------|--|---------------|--|---------------|---|
| <p><b>Travel</b></p> | <p>3.2. Y1: 1 mission in Mali for 1 training including 1 flight at USD 1,500 and 8 days DSA at USD 203/day. Y2: 1 mission in Mali for 1 training including 1 flight at USD 1,500 and 6 days DSA at USD 203/day. Y3: 1 mission in Mali for 1 training including 1 flight at USD 1,500 and 6 days DSA at USD 203/day.3.3. Y4: Field visits over 15 days incl. vehicle with driver and gas (USD 247/day)</p> |  |  | <p>12,265</p> |  | <p>12,265</p> |  | <p>12,265</p> | <p>Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali)</p> |
| <p><b>Travel</b></p> | <p>4.3. Y1 to Y4: Field visits and stakeholder consultations, 2 missions with 2 national consultants per pilot site for 4 pilot sites per year, for USD 314/day/person.4.4. Y2 to Y4: Regional AMP workshops, meetings or training events for USD 15,000 per year.</p>  |  |  | <p>65,096</p> |  | <p>65,096</p> |  | <p>65,096</p> | <p>Mali Renewable Energy Agency / Agence des ?nergies Renouvel ables du Mali (AER-Mali)</p> |



|                              |   |       |  |  |  |  |       |       |        |   |   |
|------------------------------|---|-------|--|--|--|--|-------|-------|--------|---|---|
| <b>Travel</b>                | Y1: Travel for PMU for M&E related activities at USD 1,113.<br>Y2 to Y4: Same for USD 2,000 per year.   |       |  |  |  |  | 7,113 | 7,113 | 7,113  | Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali) |   |
| <b>Office Supplies</b>       | Y1: PMU Office supplies for USD 1,553.<br>Y2 to Y4: same for USD 1,550 per year.  |       |  |  |  |  |       | -     | 6,203  | 6,203   | Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali) |
| <b>Other Operating Costs</b> | Y1 to Y4: Audit costs (USD 3,000 per year for 4 years)  |       |  |  |  |  |       | -     | 12,000 | 12,000  | Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali) |
| <b>Other Operating Costs</b> | 1.4. Y1 and Y2: Printing training materials for USD 800 per year.<br>1.5. Y2: Printing training materials & infographics/leaflets on quality standards for users for USD 3,200 total. | 4,800 |  |  |  |  |       | 4,800 | 4,800  | 4,800   | Mali Renewable Energy Agency / Agence des Energies Renouvelables du Mali (AER-Mali) |

|                              |   |                |                |                |                |               |                  |                |                  |   |
|------------------------------|---|----------------|----------------|----------------|----------------|---------------|------------------|----------------|------------------|---|
| <b>Other Operating Costs</b> | 2.2. Y1: Printing of the report executive summary for USD 500.2.3. Y1: Printing training materials at USD 1,500 total. Y3: Same at USD 1,000 total.                                   |                | 3,000          |                |                |               | 3,000            |                | 3,000            | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
| <b>Other Operating Costs</b> | 4.5. Y1: Communication materials for the GoM & political sphere for USD 3,000. Y1 to Y4: National promotion campaign for the entire project duration (4 years) at USD 3,000 per year. |                |                |                | 15,000         |               | 15,000           |                | 15,000           | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
| <b>Other Operating Costs</b> | Y1 to Y4: Monitoring & Evaluation related printing costs at USD 1,000 per year.   |                |                |                |                | 4,000         | 4,000            |                | 4,000            | Mali Renewable Energy Agency / Agence des Énergies Renouvelables du Mali (AER-Mali) |
|                              | <b>Total</b>  | <b>284,602</b> | <b>868,340</b> | <b>144,644</b> | <b>255,296</b> | <b>69,369</b> | <b>1,622,251</b> | <b>162,225</b> | <b>1,784,476</b> |   |

#### ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).