National child project under the GEF Africa Mini-grids Program Malawi

Part I: Project Information

Name of Parent Program
GEF-7 Africa Minigrids Program

GEF ID
10475

Project Type
MSP

Type of Trust Fund
GET

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
National child project under the GEF Africa Mini-grids Program Malawi

Countries
Malawi

Agency(ies)
UNDP

Other Executing Partner(s)
Department of Energy Affairs, Ministry of Natural Resources, Energy and Mining

Executing Partner Type
Government

GEF Focal Area
Climate Change

Taxonomy

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

Rio Markers

Climate Change Mitigation

Climate Change Mitigation 2

Climate Change Adaptation

Climate Change Adaptation 0

Submission Date

6/19/2021

Expected Implementation Start

2/1/2022

Expected Completion Date

1/31/2026

Duration

48In Months

Agency Fee($)

35,651.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCM-1-1	Promote innovation and technology transfer for sustainable energy breakthroughs for de-centralized renewable power with energy storage	GET	396,125.00	3,344,395.00
		Total Project Cost($)	**396,125.00**	**3,344,395.00**

B. Project description summary

Project Objective

Supporting access to clean energy by increasing the financial viability and promoting scaled-up commercial investment in minigrids in Malawi.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)

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 mini-grid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in renewable minigrids.	1.1 Geospatial, techno-economic modelling of least-cost off-grid renewable electricity technologies (minigrids, grid expansion, solar home systems). 1.2 Minigrid Derisking Renewable Energy Investments (DREI) techno-economic analyses carried out to assess progress and propose most cost-effective basket of policy and financial derisking instruments. 1.3 An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying prio rity interventions for an integrated approach to off-grid electrification	GET	80,000.00	924,500.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 2. Project and Business Model Innovation with Private Sector Engagement	Investment	Innovative business models based on cost reduction operationalized, with strengthened private sector participation in renewable energy mini-grid development.	2.1: Extension of two minigrid pilots with productive uses to identify a business model suitable to small minigrid operations.	GET	135,000.00	951,362.00
Component 2. Project and Business Model Innovation with Private Sector Engagement	Technical Assistance	Innovative business models based on cost reduction operationalized, with strengthened private sector participation in renewable energy mini-grid development.	2.2: An online ?One Stop Information Centre? established with practicable guidance to developers for navigating unfamiliar and/or evolving regulatory processes from concept to commissioning.	GET	24,834.00	65,166.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 3. Digital, Knowledge Management and Monitoring and Evaluation	Technical Assistance	Data and digitalization are mainstreamed, across stakeholders, into local mini-grid market development. Increased knowledge, awareness and network opportunities in the mini-grid market and among stakeholders, including benefitting from linkages to international good practice.	3.1: 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. 3.2: A Project Digital Strategy is developed and implemented, including linkages to and following guidance from the regional project with smart metering data aggregated, analyzed and disseminated. 3.3: Minigrids digital platform implemented to manage data from pilots, and to support minigrids scale-up and cost-reduction. 3.4: Active interface with regional	GET	132,291.00	927,066.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
				Sub Total ($)	**372,125.00**	**2,868,094.00**
Project Management Cost (PMC)						
				GET	24,000.00	476,301.00
				Sub Total($)	**24,000.00**	**476,301.00**
				Total Project Cost($)	**396,125.00**	**3,344,395.00**

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Energy (MNRE)	In-kind	Recurrent expenditures	906,903.00
GEF Agency	UNDP	Grant	Investment mobilized	1,000,000.00
Donor Agency	UNCDF	In-kind	Recurrent expenditures	644,000.00
Donor Agency	Scottish Government	Grant	Investment mobilized	793,492.00
			Total Co-Financing($)	**3,344,395.00**

Describe how any "Investment Mobilized" was identified

The Investment Mobilized reflects a portion of the funding committed by the Scottish Government under the EASE project that targets, among others, the development of four minigrid pilot projects in Malawi. Co-financing corresponds with the planned activities during 2022 and 2023 including the investment in two solar PV battery minigrids that will provide the basis infrastructure for the AMP PUE Overlay pilots. The opportunity for co-finance was identified during stakeholder consultation completed as part of the PPG phase, presenting a chance to work in parallel with and build on the investment by the Scottish Government. The two minigrids ? one already commissioned and the second expected to be commissioned by the end of 2021 ? are implemented by the University of Strathclyde and United Purpose Malawi. The EASE investment in the generation and distribution infrastructure allows the AMP to focus on the PUE additions and mixture of interventions, aiming to identify and achieve the critical revenue needed for a self-sufficient minigrid business model. Co-financing from the UNDP will also be deployed for contractual services related to the complementary activities to support the small businesses and the analysis and modelling to develop a ?blueprint? business model. The UNDP co-finance was committed by the Malawi Country Office to build on past and ongoing work to establish minigrids in Malawi and to complement the AMP GEF objectives. This co-finance was identified during concept phase and confirmed during detail project design.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)
UNDP	GET	Malawi	Climate Change	CC STAR Allocation	396,125	35,651
				Total Grant Resources($)	**396,125.00**	**35,651.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

10,000

PPG Agency Fee ($)

900

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)
UNDP	GET	Malawi	Climate Change	CC STAR Allocation	10,000	900
				Total Project Costs($)	**10,000.00**	**900.00**

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?e (direct)	0	1068	0	0
Expected metric tons of CO?e (indirect)	0	2043000	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?e (direct)				
Expected metric tons of CO?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?e (direct)		1,068		
Expected metric tons of CO?e (indirect)		2,043,000		
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)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female		389		
Male		374		
Total	0	763	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

1) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed

To limit global warming to between 1.5 and 2.0 degrees Celsius, in line with the Paris Agreement, the world?s greenhouse gas (GHG) emissions must decline to net zero by 2050 and become negative in the second half of this century. Achieving this target will require a rapid and systemic transformation of the energy sector, starting with energy conservation and efficiency and the progressive replacement of fossil fuels with renewable energy.

At the same time, the world is targeting universal access to affordable, reliable and modern energy services by 2030, requiring clean energy solutions to reach almost 760 million people currently without access. Critical to achieving both these targets is widespread deployment of low-carbon energy solutions and technologies. Such deployment face several obstacles. The investment requirements in technologies and infrastructure are high ? typically in countries without the means to afford it ? and the utilisation, and resulting revenue and business case, is most often low. Deployment also requires governments to create policies that enables and encourages investment and adoption, with the knock-on effect of displacing fossil-fuel based technologies, industries, and potentially a multitude of economic and political linkages. These are among the most significant barriers to the adoption of low-carbon energy technology by developing countries.

2) Baseline scenario and any associated baseline projects

Malawi is a small, landlocked country covering 118,484 km2. The country is home to an estimated population of 18.6 million (2019), which is expected to double by 2038[1][1]. The average population density of 203 people per km2 is high compared to the average of 45 for Africa. Census[2][2] data in 2018 showed 84% of the population lives in rural areas.

The formal economy in the country produces approximately USD 399[3][3] in gross domestic product (GDP) per person, placing Malawi among the five countries in the world with the lowest GDP per capita. The economy is largely agro-based accounting for 30 ? 40% of the GDP and employing approximately 80% of the country?s workforce. This heavy reliance on agriculture makes the country particularly vulnerable to climatic shocks.

The 2017 Integrated Household Survey[4][4] found that 39.5% of households had inadequate income to meet expenses. An analysis of the data also showed that a large majority of Malawians feel poor or very poor when they assess themselves, with 74% declaring themselves to be poor or very poor. The national incidence of poverty, at the national poverty line for Malawi is estimated at 50.7%, with rural areas worst affected (57%). When using the international poverty line of USD 1.90 per person per day, the poverty rate is around 70%[5][5]. Income inequality has also remained stubbornly high with an estimated Gini coefficient of 37.3% (2016)[6][6].

Energy is regarded as a critical input resource for economic growth and development and is key to poverty alleviation. The provision of sustainable and reliable energy is expected to catalyze industrialization and modernization of the Malawian economy through supporting rapid growth of the productive sectors such as agriculture, manufacturing, mining and the service sector.

Currently, power supply in Malawi is largely dependent on hydro, which is vulnerable to drought and seasonality. The total installed capacity for electricity stands at 362.8 MW from hydro plants and 126.2 MW from diesel generators. Hydropower resources supply 80% of the country?s power needs, with diesel generators used mainly for emergency or stand-by generation. Electricity demand is expected to reach 1,859 MW by 2030[7][7]. Both generation and transmission capacity need to be expanded significantly to meet this requirement.

The Government of Malawi has implemented comprehensive power sector reforms including unbundling of the national utility company and opening the market for independent power producer (IPP) participation. By opening up the market, it is expected that private sector players will contribute to increasing the generation capacity. The 2018 updated National Energy Policy recognizes the role that off-grid and minigrid systems can play in reducing or closing the electricity supply deficit in the country.

Droughts have severely impacted the availability of supply with load shedding (rotational outages) implemented for 12 to 16 hours a day for several months in 2017/18, equivalent to a tier 2 against the ESMAP / SE4All multi-tier standard for household access to grid-supplied electricity.

While the existing capacity struggles to meet the needs of already connected consumers, this customer base represents only a small percentage of the total population. Malawi has one of the lowest electrification rates with access to electricity at just 18%[8][8]. Grid electricity contributes 11.4% while off grid solar PV accounts for the remaining 6.6%. The access rate for electricity in rural areas is even lower at 10%[9][9]. Least cost electricity planning[10][10] shows grid electrification to be the dominant

least cost electrification technology option for the country. Malawi set the target to electrify 80% of the rural population and reach universal modern energy access by 2030 and is exploring both on-grid and off-grid solutions[11][11]. However, given the enormous backlog and realistic delivery timelines, implementing minigrids with the intention to integrate into the electricity grid provides an interim measure to accelerate access to modern energy.

Tariffs for grid-electricity are regulated with current tariffs to residential consumers below USD 0.09/kWh[12][12]. Electricity tariffs are not cost-reflective, therefore implicitly subsidized. Even at these low tariffs, data suggests that 65% of the adult population[13][13] (60% of households) is unable to afford a Standard Consumption Package (SCP) of 365 kWh per annum. Challenges related to affordability are also reflected in the low electricity usage among electrified consumers, with only 9.5% of the adult population using electricity for lighting[14][14] ? traditionally one of the first uses of available electricity. A typical Malawian household spends around USD 5 (MWK 3,690) per month[15][15] on lighting and phone charging. Research also suggested that even among those able to pay, the willingness to pay for electricity if alternative energy options perceived to be less expensive are available, is low. This perception bias is echoed by the typical expenditure on lighting and phone charging of USD 5 compared to the SCP that would cost approximately USD 3. Correspondingly, Malawi?s energy consumption pattern shows a continued heavy dependence on primary energy (biomass).

This strongly suggests that the viability of minigrid systems will be directly dependent on concurrent and active development of economic activity and productive use of energy[16][16] (PUE).

Interestingly, considering the low electrification rate, especially in rural areas, 26% of MSMEs report having access to electricity (18% supplied by the grid and 9% with access to solar or diesel generator power). As suggested by the electrification numbers, electricity access is however predominant among urban based MSMEs (51%) compared to rural areas (9%). Male-owned (typically larger businesses) also have higher access (25%) compared to women-owned businesses (11%). With access to electricity above that of the national average, it would suggest that MSMEs are dependent on electricity supply. Yet, only 6.5% of MSMEs indicated electricity as a barrier to operations when selecting barriers from a list of options[17][17]. Small, rural-based MSMEs found lack of electricity a more significant barrier than larger and urban-based counterparts (small 13% vs medium 1%, rural 7% vs urban 4%).

This suggests that rural electrification can support small business development while small business development can support the viability of clean energy minigrids, collectively contributing to transformation of the rural economy.

Minigrids have already been recognized as a key part of a portfolio of interventions to improve electrification rates, particularly in areas that will not be reached by the national grid in the near future. Accordingly, the country has set a target of 50 minigrid systems to be in place by 2025.

The context for and expected contribution from renewable energy minigrids is reflected in several key policy and planning documents. While there may be further enhancements possible, the overall legal framework in the country adequately allows for the planning, development, operation, maintenance and utilization of minigrids in Malawi. The addition of a Minigrid Regulatory Framework, published mid 2020 after extensive consultation, created a firm foundation for minigrid development as well as private sector participation in developing this sector.

The country has seen a number of minigrid pilot installations, including very small projects, containerized systems, community led projects and hydro minigrid projects. Over the years, there have been several case studies, many failures and lessons learnt and several role players who have contributed to the emerging sector. Past failures have mainly been ascribed to (i) lack of funding for sustained operations and maintenance of systems, (ii) quality of equipment or installations and (iii) limited community ownership. Past experience has contributed significant learnings to more recent minigrid developments, with at least three[18][18] current minigrids operating with business models focused on sustainability and achieving revenue positive operations. Experience across all these pilot systems has contributed valuable lessons to the sector in Malawi. The introduction of comprehensive metering and remote monitoring infrastructure at recent minigrids are collecting detail generation and consumption data that could be useful to further enhance designs, business models and operations.

For the moment, the minigrid industry remains small, but with significant potential to grow. Ten formal systems are currently known to be operating with an additional 10 systems in different stages of planning[19][19]. In recognition of the important role minigrids will play in achieving universal access to energy and the remaining challenges for development, several development partners are actively supporting minigrid developments and/or the enabling environment for minigrids in Malawi. Among these is the UNDP-funded Access to Clean and Renewable Energy (ACRE) Project[20][20], that builds on the GEF funded Increasing Access to Clean and Affordable Decentralised Energy Services in Selected Vulnerable Areas of Malawi project that concluded in 2019. The ACRE project is led by the Ministry of Energy with funding and support from UNDP Malawi. The goal of the Access to Clean and Renewable Energy (ACRE) Project is to increase access to clean, affordable, reliable, and modern energy by enhancing the sustainability, efficiency and cost-effectiveness of energy technologies.

Other concurrent and related initiatives summarized below Table 1.

Table 1: Baseline initiatives

Partner name	**Related project scope**

Partner name	Related project scope
World Bank	The World Bank funded Malawi Electricity Access Project, effective from January 2020, aims to increase access to electricity in Malawi. It supports ?the rapid scale up of access to electricity through on-grid and off-grid supply solutions that will more than double the existing electrification rate?. While most of the $150 million (credit and grant) funding is earmarked to support grid expansion ($105 million), the project?s off-grid market development fund ($30 million) will have a minigrid window for minigrid developers, prioritizing agriculture loads, schools, health facilities and enterprises in peri-urban and rural areas. The overall technical assistance part of the project ($15 million) will support development of (1) bankable minigrid projects, (2) business model, and (3) regulatory framework. Within this scope, assistance to the Ministry of Energy ($10 million) includes (a) minigrid development including technical studies for up to 10 minigrid locations and transaction advisory to design a tender process; (b) technical assistance for off-grid market development such as policy and regulation, quality assurance and gender-informed consumer awareness, (c) sector studies and training. It also includes Technical Assistance for finance institutions and institutional design of a semiautonomous Rural Electrification Agency and Fund with a focus on minigrids. At the time of consultations for the AMP project development, the World Bank focus was on supporting the MoE with pre-feasibility studies and preparation for mini-grid system development, expected to be procured through a competitive bidding process. This support was expected to continue and be directed by the needs arising from the preparation process. the Bank anticipated making financing available to minigrid developers, with the format informed by the technical studies and preparatory work. A Geospatial Least-cost Electrification Plan implemented by ESMAP (World Bank) helped identify minigrid locations for investment. Discussions with the ESMAP team highlighted opportunities for additional information overlays to enrich the planning and mapping data specific for minigrids. The Malawi Energy Access Project includes aspects related to mapping and there may be potential for further collaboration during implementation.
GIZ?s EnDev programme in Malawi	GIZ?s EnDev programme in Malawi works to enhance a financially sustainable market for improved cookstoves in urban and peri-urban areas. At the same time, it has implemented a pico PV component. In the future, the project seeks to increasingly support the pro-poor social cash transfer scheme of its improved cookstove component. It has also initiated a project to encourage the availability of affordable, high quality technologies/solutions for productive use in Malawi. The current focus is on the supply chain of PUE equipment. The project was at an early stage and likely to be shaped by subsequent planning cycles. There are likely to be synergies and potentially also opportunities to collaborate or demonstrate some of the benefits of PUEs that might transpire during pilot implementation. Another opportunity for collaboration or synergy may exist under the appliance survey to identify the available and distribution of energy efficient appliances in the country. This is noted as a potential touch point for follow up in the multi-year workplan.
Southern African Centre for Renewable Energy and Energy Efficiency (SACREEE)	As part of SACREEE?s overall scope to support clean energy development in the region, it is aiming to establish a Coordinator to support Distributed Renewable Energy (DRE) for Productive Use for member states that includes Malawi. It is expected to have this function in place from early in 2021 for a period of at least two years.

Partner name	Related project scope
United Nations International Children?s Emergency Fund (UNICEF)-Malawi	UNICEF works in over 190 countries and territories to save children?s lives, to defend their rights, and to help them fulfil their potential, from early childhood through adolescence. In Malawi, UNICEF works with the Government of Malawi in support of its commitment to respect, protect and fulfil children?s rights in line with international conventions and standards. UNICEF-Malawi employs an innovative country programme design focusing on the life cycle approach and service delivery platforms. It takes into consideration the risks associated with climate change and uses renewable energy to provide sustainable access to safe water for schools, healthcare facilities and communities in rural areas in Malawi. These touchpoints may present a shared interest in communities where minigrids can provide electricity for such social or community services. In particular, opportunities to collaborate in combatting the impact of COVID-19 may arise relating to energy for healthcare facilities, access to clean water in pilot communities, maintaining social distancing in educational settings using communication and IT infrastructure, among others.
U.S. Agency for International Development (USAID), Power Africa and Beyond the Grid Initiative	USAID/Malawi is currently developing its next five-year strategy. Power Africa is one of the USAID-managed programs active in Malawi. Beyond the Grid, a Power Africa initiative, is accelerating off-grid electricity access, focusing on two strategic priorities ? household solar and micro-grids. In the light of the COVID-19 pandemic, USAID has provided grant funding to electrify 9 clinics using off-grid solutions in Malawi. The intention is to invest ?in a series of pilot projects that demonstrate how health centre electrification can be delivered in a commercially sustainable manner with strong private sector participation?. A strong focus In Malawi is on promoting enabling policies and regulations that encourage private sector investments. Obvious touchpoints exist in the operationalization of the minigrid framework and the development of the One Stop Information Shop with opportunities for collaboration and alignment to be investigated when the next five year strategy has been finalized.
Academia	A number of the universities in Malawi have been actively conducting research, data collection and analysis related to minigrids, renewable energy technologies and value chains, including those embedded in agriculture. Among these academic institutions are Malawi University of Science and Technology (Malawi Industrial Research and Development Centre), Lilongwe University of Agriculture and Natural Resources Science Technology and Malawi Polytechnic. Several international research centres, thinks tanks and academic institutions focused on renewable energy, sustainable development and compact or off-grid power systems have also been working in the country and the region. Opportunities exist to collaborate with these institutions for data collection, mining, analysis and interpretation to develop policy and technical findings and recommendations.

Most commonly, formal minigrid developments have been led by development partners using international suppliers and developers. Local companies have typically provided EPC services or in-country operations and maintenance services for these installations. Preliminary indications are that both interst and capacity exist within the country for local businesses to be established and to grow to participate in the design, build and operate minigrids as the minigrid market matures, thereby creating a new subsector of economic activity.

Malawi has gained invaluable experience in the development and operations of minigrids with lessons informing greater innovation in delivery models, tariff designs and productive uses, among others.

Despite advances in the regulatory environment and the business model innovations and refinements already demonstrated, none of the minigrid operations have achieved self-sustainability and system capacity remains significantly underutilized for all systems. Electricity tariffs for residential customers connected to the national power network are relatively low, less than $0.10/kWh. Among rural communities, affordability and willingness to pay have also remained low, restricting the tariffs realistically possible despite the new regulatory framework making provision for cost reflective tariffs. As expected, private sector participation in minigrid development and operation have remained limited, mainly confined to EPC contracts.

Addressing some of these barriers could help accelerate the adoption of clean energy minigrids, open the market for private sector participation in the sector and create opportunities for minigrids to meaningfully contribute to rural electrification.

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

Technology advances and cost reductions in the most recent decade have made RE, most notably solar PV, the most affordable source of energy available[21][21] when developed at utility scale. Coupled with the flexibility and modularity offered by RE systems, solar PV increasingly also offers affordable, clean energy solutions for electrification of more remote, rural communities and activities. Accordingly, low carbon[22][22] and specifically solar PV minigrids have been recognized as a key part of the portfolio of options available to countries towards achieving universal access to clean, modern and affordable energy.

Minigrids lie at the nexus between rural electrification, climate resilience and sustainable development. The African Mini-Grid Community of Practice (AMG-CoP)[23][23] ? a collaborative network of 16 African country governments including Malawi ? identified minigrids as a central element of developing a decarbonized, climate-resilient energy services sector for the millions of people in Africa who lack access to affordable, safe and clean energy. Green minigrids deliver climate change mitigation and resilience, while also advancing economic and social development benefits. A 2020 EEP Africa study of the climate co-benefits from clean energy projects[24][24], highlighted the significant potential for resilience co-benefits[25][25] offered to communities by off-grid solar home systems (SHS), minigrids and powering productive uses. It also pointed to the importance of initial, small-scale risk-taking, through clean energy innovation, business model testing, and demonstration projects, for assessing long-term viability.

While technology advances and downward cost trends have markedly improved the business case for RE minigrids, in many countries, they are not yet competitive with fossil-fuel based alternatives. The overall AMP Theory of Change (TOC) is premised on the understanding that the high costs of RE minigrids are partly attributed to a range of risks[26][26], each of which contributes a premium to the development costs of minigrid systems.

The hypothesis follows that by significantly reducing the investment risks for RE minigrids in a partner country, the levelized cost of electricity (LCOE) can be reduced, which in turn will accelerate and scale up the adoption of RE minigrids as part of the effort towards achieving universal energy access in the country and the broader region. Accelerating the adoption of clean energy also contributes greater GHG emission reductions.

The AMP has adopted a common architecture of four key components, a combination of enabling policy and regulations, business model innovation with private sector involvement, innovative financing and digital innovation as the levers to lower investment risks, thereby reducing financing, hardware and soft costs while increasing revenues and improving system efficiencies. Within this architecture, AMP will emphasize - and seek to develop comparative advantages - in three ?key areas of opportunity? (national dialogues on delivery models; productive use; digital). This approach, illustrated below in Figure 1, is structured to advance the program objectives of cost-reduction and innovation for minigrids and give effect to the TOC.

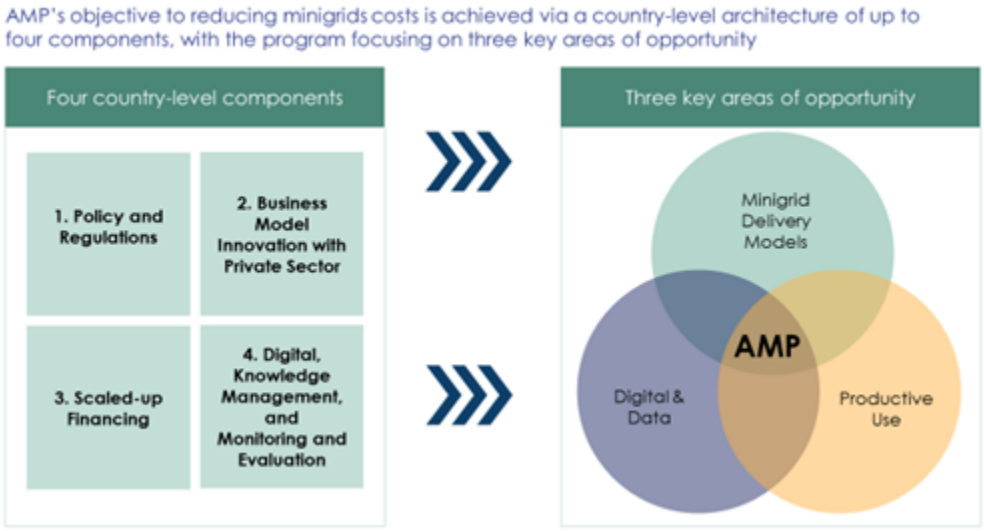

Figure 1: AMP?s objective, architecture and areas of opportunity

The TOC draws on the Derisking of Renewable Energy Investment (DREI)[1] methodology and standard categories of risk. As noted earlier, these risks have been shown to translate into higher development costs that in turn increases the cost of electricity to the consumer and/or discourages investment in the sector. Various cost reduction levers across the themes of policy and regulation,

business model innovation and private sector as well as innovative finance can be employed to reduce risk (e.g. policy derisking), compensate for risk (e.g. financial incentives) or transfer risk (e.g. financial derisking). Less risk contributes to simplified feasibility assessments, lower development costs and lower financing costs, improved revenues and system efficiencies, among others. This, in turn creates a more attractive investment environment conducive to scaled up investment in the sector.

De-risking the investment environment and attracting and leveraging private and public-sector resources to increase energy access, promote RE and energy efficient appliances in a manner that is inclusive and responsive to the needs of different sectors of the population, will support the Government of Malawi in its transition to sustainable energy systems in line with its stated ambitions and the aspirations of Sustainable Development Goal 7. Access to clean energy is also expected to play a critical role in combatting the COVID-19 pandemic and catalyzing an economic recovery in its wake, particularly in African countries[2]. At a project level, this understanding is expected to shape the review of the investment risks and policy instruments (Outputs 1.2 and 1.3). Power to healthcare facilities, supply of clean water for essential hygiene, enabling communications and IT services for education or more broadly connect people while maintaining social distancing, have been noted as potential opportunities to adapt and respond to the pandemic. These have been recognized as preferred interventions at pilot sites (Output 2.1), as appropriate. Preliminary investigations for partnership opportunities related to these services were also initiated and captured (refer Partnerships under Section IV of th Project Document). Furthermore, in collecting and analyzing data for the planned GIS-based modelling there will be an opportunity to capture metrics highlighting the availability of equipment, services and relative ?situational? vulnerability of a given location (Output 1.1).

Within the framework provided by the generic AMP TOC, the AMP in Malawi will focus on a selection of activities that build on the foundation already established by previous projects and policy developments in the country and that complements the ongoing activities of other role-players in the market. By harnessing the wealth of data and experience, the AMP can contribute to consolidating country and regional knowledge resources, in support of all future developments.

Given the relatively small AMP GEF allocation, the approach will necessarily be targeted and confined to a handful of interventions aimed at making a significant contribution to lower risks and development costs for minigrids in Malawi. It has also aligned closely with the UNDP-funded Access to Clean and Renewable Energy (ACRE) Project[3], sharing project management resources and capacity established within the MoE for the implementation of ACRE. In particular, the AMP activities will align with 3 of the 4 ACRE strategic areas, namely:

? Developing and strengthening clean energy minigrids that promote productive uses of energy for rural economic transformation (see: AMP Outputs 1.1 and 2.1)
? Accelerating and de-risking the clean energy transition in the country (see: AMP Outputs 1.1, 1.2, 2.2, and all outputs under Component 3)
? Enhancing power sector coordination, building institutional capacity and conducting research and development (see: AMP Outputs 1.1, 2.2 and all outputs under Component 3)

Within the broader framework of the AMP TOC, this specific focus for Malawi is illustrated in a national Theory of Change (Figure 2).

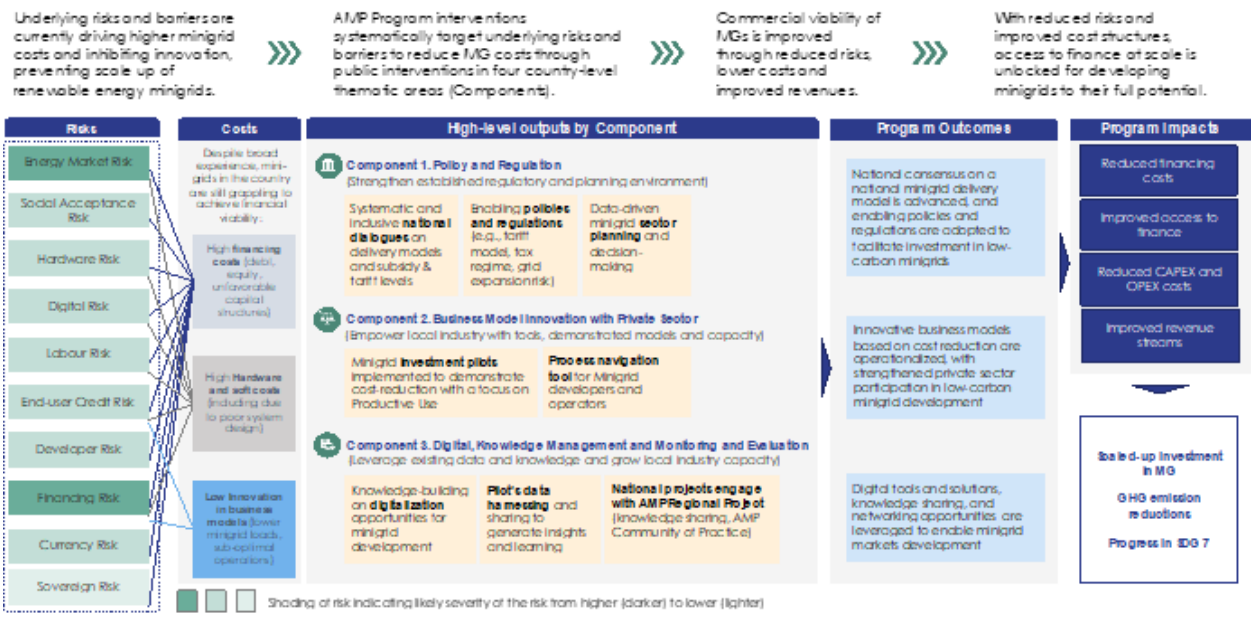

Figure 2: Malawi AMP Theory of Change

An adaptive approach has been used during PPG to redesign the Malawi AMP project proposed at the concept note stage, reflecting the guidance provided by survey feedback, broader stakeholder consultation, the deeper understanding of the country contextand recent regulatory and sector developments and guidance provided by the Regional Project. Accordingly, the AMP in Malawi will focus on a selection of interventions intended to lower risks and reduce the costs for all future minigrid developments in the country. These interventions have been structured according to the thematic areas described by the AMP TOC (Figure 2). The envisaged contributions from these interventions are summarized for the three project components and unpacked in greater detail in Section IV. Results and Partnerships of the Project Document. Amendments made to the project components and outputs since the Concept Note have been set out in the table at the end of this section.

Table 1: Overview of Project Components

Project component	**Project outcomes**	**Outputs**

Project component	Project outcomes	Outputs
1. Policy and Regulation	Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in RE minigrids.	1.1 Geospatial, techno-economic modelling of least-cost off-grid renewable electricity technologies (minigrids, grid expansion, solar home systems) Energyscaping, Micro-, Small- and Medium Sized Enterprises and productive uses data digitized, mapped and shared on a suitable open access, online platform. 1.2 Minigrid DREI techno-economic analyses carried out to assess progress and propose most cost-effective basket of policy and financial derisking instruments. 1.3 An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying priority interventions for an integrated approach to off-grid electrification.
2. Business Model Innovation with Private Sector Engagement	Innovative business models based on cost reduction operationalized, with strengthened private sector participation in RE minigrid development.	2.1: Extension of two minigrid pilots with productive uses to identify a business model suitable to small minigrid operations. 2.2: An online ?One Stop Information Centre? established with practicable guidance to developers for navigating unfamiliar and/or evolving regulatory processes from concept to commissioning.
3. Digital, Knowledge Management and Monitoring and Evaluation	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	3.1: 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. 3.2: A Project Digital strategy is developed and implemented, including linkages to and following guidance from the regional project with smart metering data aggregated, analyzed and disseminated. 3.3 Minigrids digital platform implemented to manage data from pilots, and to support minigrids scale-up and cost-reduction. 3.4: Active interface with regional project established, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learnt. 3.5: Industry association strengthened to advocate for and actively engage Government on behalf of private sector minigrid developers and operators. 3.6: M&E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid Term Evaluation and (iv) Terminal Evaluation

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

The Africa Minigrid Program is intended to contribute towards the GEF-7 Climate Focal Area?s stated Objective 1 to ?Promote innovation and technology transfer for sustainable energy breakthroughs? and more specifically to mitigate climate change as defined under Objective CCM1-1, to "Promote innovation and technology transfer for sustainable energy breakthroughs for de-centralized renewable power with energy storage".

These objectives are stated in response to the urgent need to curb greenhouse gas emission while also addressing the developmental need for improved energy access in developing countries. The program therefore also aligns with Sustainable Development Goal 7 that aims to ?Ensure access to affordable, reliable, sustainable and modern energy for all? as well as Sustainable Development Goal 13 i.e. ?Take urgent action to combat climate change and its impacts?.

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

The GEF-7 Trust Fund allocation for the Malawi AMP project is USD 396,125. USD 1,000,000 has been committed from UNDP TRAC resources as cash co-finance for the project. A further USD 2,344,395 in co-finance have been committed by a range of sources as detailed in the co-finance table (Table C) in Part I of this document. In addition to implementing the project scope already described, the combined project finance of USD 3,740,520 will unlock the global environmental benefits described below (Point 6).

In terms of minigrids, Malawi?s immediate priority is reaching the target of 50 minigrids operational by 2030. In pursuing this target, the specific technology and busines models have not been primary considerations.

For Malawi, the focus of the AMP will therefore be on using the wealth of experience from within the country, combined with the knowledge resources available from the regional project, to enhance feasibility and business model innovation. For the pilot projects, it will invest in finding a self-sustainable business and operating model for solar PV with battery storage minigrid systems with the aim to (i) help ensure the sustainability of RE minigrids in the country, (ii) encourage private and public sector investment and participation in RE minigrids, and (iii) developing a ?blueprint? business model(s), suitable to different crops, agro-processing and value chain applications and other, diverse off-taker requirements, that can serve the country as well as other minigrid developments in the region. In this way it can catalyse investment in RE minigrids and ensure the energy services and co-benefits, including climate change mitigation, are secured.

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

Emission reductions (tCO_2): The lifetime global environmental benefits that will accrue from the adoption of off-grid solar technologies is estimated at 1,068 tCO2e. Indirect emission reductions amounting to 2,043,000 tCO2e are expected due to investments in minigrids completed during the 10-year influence period following project completion, predominantly through the replication of the sustainable technology value chain. The project yields a GEF abatement cost of 199.5 USD/tCO2e.

Number of direct beneficiaries targets (Energy access via minigrids): The number of direct project beneficiaries is expected to be around 763 persons, of whom approximately 389 women. This reflects the 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.

7) Innovativeness, sustainability and potential for scaling up. ?

All activities under the AMP have a long-term focus, intended to enhance the overall context for minigrid development in the country. The project has been designed to build on and leverage from the existing knowledge base and policy framework in Malawi, targeting remaining barriers that hamper accelerated adoption of RE minigrids. Component 1 is intended to enhance the policy and regulatory environment, using the findings of the DREI analysis to inform further policy and regulatory refinements that will continue to progress the enabling environment for minigrids in the country. With the focus on identifying perceived risks that translate into higher system costs, findings from the DREI analysis will inform the most pertinent policy interventions needed to mitigate investment risks and achieve costs reductions, benefitting all future developments beyond the AMP implementation period.

Sustainability will be further targeted by empowering the industry association (Output 3.3) to actively engage government on behalf of developers and the private sector. A strong, constructive interface between private and public sector that recognizes and coordinates across a range of shared objectives, will contribute to growing and strengthening the local sector that will endure after the AMP has concluded. Recognising that funding of the industry association depends on memberships, the AMP will support growing the value offering of the industry association more broadly and will also support the establishment of an online, ?one stop information centre? (Output 2.2) to guide developers through the process of planning and authorisations, hosted by the industry association. The interface between the industry association and the regional project will also contribute capacity building to grow the strength of their voice and the knowledge contribution that can be offered to the country and industry.

Output 1.1 focuses on augmenting planning and mapping data with additional details pertinent to minigrid development and planning, intending to serve both the public and private sector and uniformly reduce the scope and costs of prefeasibility assessments and site selections. Once developed, this resource will be integrated into the national platform, hosted by government, to ensure sustainability and open access. The value of the data to planners and developers and the speed of change in the market will determine the frequency of updates, likely to coincide with updates to the least cost electrification planning.

The pilot projects (Output 2.1), that aim to explore innovative business models and interventions to enhance the financial viability of a minigrid system, are intended to inform blueprint business model(s)

that can be used to shape future system design, development and operations. The pilot projects also link to Component 3, where (i) metering data will contribute, alongside other local minigrid projects, to building a central database for the country, and (ii) monitoring of a range of indicators, including metered data, will contribute to grow the understanding of the impact and potential of minigrids, build knowledge resources and lessons learned and from where, learnings from the pilot can be disseminated to inform both the policy and regulatory environment as well technical capacity building. The entire scope of Component 3 is focused on converting data, findings, lessons and case studies into useful resources for the benefit of future developments, both nationally and in the region.

The combined impact of enhanced planning data, an enabling policy and regulatory framework incorporating (or working towards incorporating) any enhancements identified by the DREI, a business friendly investment / developer environment supported by an active industry association that encourages private sector participation and investment in minigrids in the country, coupled with rich knowledge resources that includes regional and country specific experience, is intended to significantly strengthen the platform for minigrid developments in Malawi.

Outputs with budget at Concept Note	Outputs with budget at CEO ER	Change	Justification

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
The **objective** in Concept Note: Supporting access to clean energy by increasing the financial viability and promoting scaled-up commercial investment in minigrids in Malawi.	-	Supporting access to clean energy by increasing the financial viability, and promoting scaled up commercial investment, in renewable energy minigrids in Malawi, with a focus on cost-reduction levers and innovative business models.	-	The objective statement and the wording of components, outcomes, and indicators have been updated by the AMP Regional Project for all countries participating in the programme.	UNDP has developed a revised Harmonized Results Framework for AMP National Child Projects based on the set of components, outcomes and outputs included in the Program Framework Document (PFD) and national child project Concepts approved by the GEF Council in December 2019. The AMP Harmonized Results Framework (AMP) is an evolution from the PFD/Concept phase results framework and reflects the most updated thinking and guidance provided to national project design teams during the Project Preparation Grant (PPG) Phase for 1st round national child projects (Jan 2020 ? Jun 2021). All changes are explained in further below. However, the basic thinking around these changes is explained as follows: Objective: the objective has been adjusted to better reflect the program?s focus on cost-reduction. ? Component 1. Changes made to emphasize on the importance of having governments make an informed (and sufficiently socialized) decision as to the Delivery Model they will pursue for the development of their local minigrid market, as well as the need for developing a certain set of regulations in accordance with a given delivery model. ? Component 2. Changes made to emphasize opportunity, in working with MG developers, for AMP to in particular include a focus on supporting inclusivity,

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
Outcome 1. Appropriate policies and regulations are in place that address policy, institutional, regulatory and technical barriers to facilitate investment in renewable energy minigrids (?minigrids?)	$ 78,433	Outcome 1. Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in renewable energy minigrids.	$ 80,000	Outcome wording adjusted	Stakeholder ownership in a national minigrid delivery model is expected as a result of project activities. Namely, project activities that support an inclusive and sustained national dialogue aimed at deciding on the most appropriate delivery model for a country to develop its minigrid sector.

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
1.1. Strengthening minigrid policy and regulatory framework, including development of quality standards for minigrid components and formulation of the Rural Electrification Act (in collaboration with the Malawi Electricity Access Project)		1.1 Geospatial, techno-economic modelling of least-cost off-grid renewable electricity technologies (minigrids, grid expansion, solar home systems)		Strengthening of the policy and regulatory framework have been replaced with mapping mini-grid potential for the country.	Malawi has made significant progress with minigrids. This is recognized and embedded in policy, regulatory and planning documentation that includes provision for import tax waivers, inclusion in a least cost rural electrification plan, provision for a subsidy, and the regulatory framework for minigrids published in July 2020. The option to support implementation of the newly introduced minigrid framework was explored with the Regulator, but was not deemed feasible by MERA. The World Bank is also currently providing technical assistance to the Government under the Malawi Electricity Access Project to support the regulatory framework. Within this context, strengthening of the policy and regulatory framework under the AMP has been approached in two ways. Both aim to facilitate an active interface between industry and government, providing a feedback mechanism that can inform iterative refinements to the policy environment towards the shared aspiration of a thriving minigrid sector. The first approach aims to strengthen the industry association to lead the conversation around policy and regulatory matters with government on behalf of private sector developers and operators (refer Output 3.4). The second focuses on creating resources for industry to facilitate

Outputs with budget at Concept Note	Outputs with budget at CEO ER	Change	Justification
1.2 Streamlining customs process, and developing an effective market surveillance for minigrid components	-	Removed.	Narrowing of the focus to better utilize the available budget. An empowered industry association (Output 3.4) will be well placed to lead discussions related to this and other supporting legislation, regulations and processes.
1.3 Minigrid DREI techno-economic analyses carried out to propose most cost-effective basket of policy and financial derisking instruments to accelerate minigrid development	1.2 Minigrid DREI techno-economic analyses carried out to propose most cost-effective basket of policy and financial derisking instruments and contribute to AMP Flagship Report on Cost Reduction	Output wording adjusted and renumbered.	This output has been adjusted to better reflect the linkages between this output and activities for a proposed flagship AMP report under Component 1 (Knowledge Tools) of the AMP Regional Child Project. These activities have been identified in the PPG Phase of the Regional Child Project. The change aims to strengthen and emphasize the role of DREI in AMP, where the Regional Project will now produce a key flagship report on cost-reduction using the DREI methodology drawing from DREI analyses and content generated across all AMP national Child Projects.
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	-	Removed.	Narrowing of the focus to better utilize the available budget. The World Bank funded Malawi Electricity Access Project includes a technical assistance component to support development of (1) bankable minigrid projects, (2) business model, and (3) regulatory framework.

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
N.A.		1.3 An inclusive national dialogue to identify minigrid delivery models is facilitated		New output created	This is one of the key changes made to the menu of possible outputs and activities for national child projects. Support for sustained and inclusive national dialogues will be provided in order to build a national consensus on minigrid delivery models on the basis of which large-scale deployment of minigrids can be accelerated and have a sustainable impact. The decision-making process governments undertake to select the most suitable minigrid delivery model(s) and define the policy and regulatory frameworks is complex and should ideally be done in the form of a national debate involving all relevant stakeholders to varying degrees (different ministries such as energy, finance, health and environment, local authorities, the public, the media, the beneficiary communities, utilities, the private sector, and other key stakeholders).
Component 2? Business Model Innovation and Private Sector	-	Component 2? Business Model Innovation with Private Sector	-	Slight wording adjustment	The change was made to better signal the importance of private sector engagement for business model innovation. Usually, the delivery model determined for a country will be a blend of government and private sector engagement. The exact mix will be locally dependent but some degree of private sector participation is expected to develop minigrid pilots under Component 2.

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
Outcome 2. Innovative business models based on cost reduction operationalized to support and strengthen private participation in minigrid development	-	Outcome 2. Innovative business models based on cost reduction are operationalized, with strengthened private sector participation in renewable energy minigrid development	-	Slight wording adjustment	The change was made to emphasize the importance of engaging private sector participation to operationalize innovative business models.

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
2.1 Productive-use 100 kW solar PV-battery minigrid pilot developed using innovative business models	(INV) $ 128,380	2.1 Extension of two minigrid pilots with productive uses to identify a business model suitable to small minigrid operations.	(INV) $ 135,000	Focus shifted from a greenfields minigrid to identifying scalable and replicable business models of minigrids implementing PUE in multiple agricultural value chains as an enabler and accelerator for minigrids in Malawi.	Noting the continued challenges with achieving self-sustainable minigrid operations in the country, the project aims to pilot an innovative business model that can help in the planning and design of future minigrid developments. AMP will concentrate on finding a business model suited to small minigrids, below 50 kW in size. The dispersed population density in Malawi suggests a larger market exists for smaller scale systems. Therefore, the expectation is that there will be numerous sites within the country that are more suited to small minigrid systems that can be rolled out quickly in support of the government targets to bring electricity to more communities. If the operational model can be solved at this scale, these learnings will be equally relevant to larger systems that already benefit from economies of scale. The intention is also to formulate a solution that is equally relevant to different crops, agro-processing and value chain applications and other, diverse off-taker requirements. Building on two existing minigrid systems, pilots are structured to take a dynamic, progressive approach to growing the system utilization and shaping the business model in response to feedback from concurrent data monitoring, analysis and modelling. The new output will include business model(s) for social enterprises operating minigrids at different

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
2.2 Capacity of potential tender bidders (private sector developers) strengthened to consider innovative business models and cost-reduction levers	(TA) $ 28,521	2.2 An online ?One Stop Information Centre? established with practicable guidance to developers for navigating unfamiliar and/or evolving regulatory processes from concept to commissioning.	(TA) $ 24,834	Capacity building of potential and winning tender bidders replaced with an online ?One Stop Information Centre? with How To guidance for navigating regulatory processes and approvals.	Much of the originally anticipated scope is already incorporated under The World Bank funded Malawi Electricity Access Project that includes a technical assistance component to support development of (1) bankable minigrid projects, (2) business model, and (3) regulatory framework. Data for the region have shown the significant cost impact, even on experienced developers, of entering a new, unfamiliar

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
2.3 Capacity of winning tender bidders (private sector developers) strengthened to develop and implement innovative business models and cost-reduction levers					market. Minigrid developers in Malawi have echoed this experience, noting the time and costs impacts of not being acquainted with authorization requirements and processes. Further support to the private sector is therefore envisaged as an online ?One Stop Information Centre?, to practically guide developers through the requirements of the Malawi policy and regulatory environment, further contributing to a business-friendly environment. The ?One Stop Information Centre? will leverage the practical experience gained by minigrid developments in the country to help streamline minigrid development/approval process from conceptualization to commissioning, aiming to reduce the time and costs associated with the pre-commissioning stages for all future developments. This will also serve to strengthen the value offering of the industry association to the private sector. The one stop information centre is intended as practical support to the industry and as a complementary service to other existing information portals.

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
3.1 Design support, including development of operational guidance, provided for MG Funding Facility (MFF, or equivalent financial mechanism) under the Rural Electrification Fund.	$ 121,067	N/A	$ 0	Removed	Narrowing of the focus to better utilize the available budget. Though financing is acknowledged as one of the significant barriers, the need to confine the project focus and recognizing the parallel efforts on innovative finance under ACRE, led to Component 3 on Innovative Finance not being retained for the AMP in Malawi.
3.2 Innovative financing solutions for mini-grid development are identified and implemented through the MFF (or equivalent) with supporting human and institutional strengthening.		N/A		Removed	
3.3 General market intelligence study on minigrids prepared and disseminated amongst public officials and finance community.		N/A		Removed	
3.4 Feasibility study support provided to mini-grid developers, creating a pipeline of investible assets.		N/A		Removed	

Outputs with budget at Concept Note		Outputs with budget at CEO ER		Change	Justification
Component 3 (Originally Component 4 in the Concept Note) Data, Knowledge Management and Monitoring and Evaluation	$ 71,303	Digital, Knowledge Management and Monitoring and Evaluation	$ 132,291	Slight wording change and renumbered	Updated to reflect the expanded focus on digital and data digitization as enabler for minigrid cost reduction and scaling. Renumbered because the original Component 3 was removed for Malawi.
4.1 Lessons learned captured and disseminated at the national level	-	Output 3.4. Active interface with regional project established, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learnt at national and regional level.	-	Renumbered and expanded to incorporate both lessons learnt and Communities of Practice as part of the critical interface with the regional project.	This entire Component has been significantly bolstered to leverage the available data and knowledge both within the country and the regional project as an important lever in the reduction of investment risks. Lessons learnt and Communities of Practice have been combined into one Output and the link to the regional project reinforced to ensure the country benefits from the wealth of knowledge resources and information sharing among all AMP participating countries across the continent. The change was made to establish a clear link via an output between the national child projects and the regional child project.
4.2 Replication plan (including investment plan) for scaling up rural energy access developed		N/A		Replaced with digitization focus (refer Outputs 3.2 and 3.3)	Common challenges among minigrids throughout the region has underscored the importance of data to inform planning and knowledge sharing to propel the sector past repeat pitfalls of over-sizing, underutilization of capacity, and predominantly non-productive consumer base, among others. Accordingly, the AMP has intensified the focus on data and digitization as a key enabler for scaling.

4.3 Knowledge network / Community of Practice established to promote MG development / rural energy access		3.5: Industry association strengthened to advocate for and actively engage Government on behalf of private sector minigrid developers and operators.		Partly incorporated under Output 3.3 and partly amended to focus on strengthening of the industry association	Increased knowledge, awareness and network opportunities in the minigrid market and among stakeholders are being addressed simultaneously in Output 3.3 and Output 3.4, as follows: The original concept of a Community of Practice has been incorporated under Output 3.3, with key stakeholders representing the country at the regional forum, hosting knowledge events in the country for all stakeholders. Guided by the harmonized framework, the in-country focus has shifted to strengthening the industry association to serve as a focal point and unified voice to lead the conversation with government, particularly as it relates to policy refinements and remaining barriers. Experience in other countries for all scales of RE development, have underscored the importance of a business-friendly approach to attracting private sector participation and investment. An active conversation between government and industry will contribute to such an environment and provide for a feedback mechanism necessary to enable the iterative refinements to the policy environment.

4.4 A Quality Assurance and Monitoring Framework for measuring, reporting and verification of the sustainable development impacts of MGs, including GHG emission reductions is developed and operationalized		3.1 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.		Renumbered and amended to include: ??based on standardized guidance from the regional project.?	Wording of this output has been amended in recognition of the linkage to the regional project and harmonization across all national projects. The change was made to establish a clear link via an output between the national child projects and the regional child project. The latter will provide support for standardizing the Quality Assurance and Monitoring Framework (QAMF) that national ?child? project pilots will use to report back on relevant performance indicators ? providing visibility for program-wide AMP results and case studies and contributing to close knowledge gaps in the sector.
N/A		3.2 A Digital Strategy is developed and implemented, including linkages to and following guidance from the regional project		New output created	The change was made to establish a clear link via an output between the national child projects and the regional child project. At the same time, this output was created to reflect the importance of each national child project developing, with support from the regional project, a strategy to harness the opportunities around digitalization in the minigrids sector.
N/A		3.3 Minigrids digital platform implemented to run tenders and manage data from pilots, and to support minigrids scale-up and cost-reduction		New output created	Change made to include a digital platform which will provide key functionality for the projects 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.

N/A		3.6: M&E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid Term Evaluation and (iv) Terminal Evaluation		New output created	Introduced to ensure compliance with M&E requirements and plans and to ensure progress is tracked and reported on. This change was made following UNDP guidance to reflect M&E activities in the Results Framework.

The preliminary indications of co-financing at Concept Note stage have also been updated to reflect the following confirmed commitments:

Sources of Co-financing at Concept Note	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount ($)	Changes in Co-financing at CEO ER	Justification
Recipient Country Government	Ministry of Energy (MoE) (previously Ministry of Natural Resources, Energy and Environment)	Grant	Investment mobilized	5,000,000	Amended to 906,903 in kind contribution	Aligning with the newly defined project outputs and reflecting critical support to day-to-day implementation.
GEF Agency	UNDP	Grant	Investment mobilized	1,000,000	1,000,000 Confirmed as a Grant	-
Donor Agency	World Bank	Loan	Investment mobilized	250,000	No commitment	Synergies in activities in the country identified, but not committed as co-finance.
Donor Agency	USAID	Grant	Investment mobilized	300,000	No commitment	No relevant parallel activity
Donor Agency	Scottish Government (EASE)	Grant	Investment mobilized	-	New 793,492	Additional co-finance committed during PPG phase
Donor Agency	UNCDF	In-kind	Recurrent expenditures	-	New 644,000	Additional co-finance committed during PPG phase
Total Co-financing				6,550,000	Amended total 3,344,395	

[1] UNDP & ETH Zurich (2018). Derisking Renewable Energy Investment: Off-Grid Electrification. United Nations Development Programme, New York, NY and ETH Zurich, Energy Politics Group, Zurich, Switzerland.

[2] Multiple sources including: https://www.seforall.org/covid-19-response and https://ecdpm.org/events/green-gender-driven-covid-19-recovery-africa/

[3] Implementation period from 2020 ? 2023,

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[1] World Bank https://www.worldbank.org/en/country/malawi/overview

[2] 2018, Malawi Population and Housing Census. Main report. National Statistical Office, May 2019.

[3] International Monetary Fund, World Economic Outlook October 2020.

[4] Fourth Integrated Household Survey 2016-2017 and AfDB, 2018 African Economic Outlook, Malawi.

[5] World Development Indicators Database (WDI). 2016, 2017, and 2018. Washington D.C.: World Bank.

[6] https://knoema.com/atlas/Malawi/Poverty-rate-at-national-poverty-line.

[7] Integrated Resources Plan, Malawi (2015 ? 2035). May 2017.

[8] World Bank, Sustainable Energy for All (SEforALL) database from the SE4ALL Global Tracking Framework led jointly by the World Bank, International Energy Agency, and the Energy Sector Management Assistance Program.

[9] World Bank, Sustainable Energy for All (SEforALL) database, 2018 data.

[10] World Bank (ESMAP) Geospatial Least-cost Electrification Plan.

[11] Government of Malawi (2018) National Energy Policy 2018, available at https://energy.gov.mw/index.php/resource-centre/documents/policies-strategies - accessed 5 September 2019.

[12] Residential, prepaid tariff USD 0.09/kWh and lifeline tariff USD 0.07/kWh.

[13] Where the SCP represents more than 20% of income.

[14] FinScope Consumer Survey data showed the majority of Malawians relying on battery-powered torches for lighting (66%), with some use of paraffin (11%) and candles (7%). Only 1.3% of adults reported their source of energy for lighting as solar.

[15] As of 1 May 2021, 1 U.S. dollar (USD) = 791 Malawi Kwacha (MWK).

[16] PUE can be found in: agriculture (e.g. irrigation, grain milling, electric fencing), manufacturing (e.g. carpentry, tailoring, welding, and looming), and the service sector (e.g. bars and restaurants using electric lights, sound systems, refrigerators, charging stations for mobile phones). Common use applications include electricity used for potable water, public lighting, education, health (e.g. refrigeration of vaccines and anti-venom).

[17] Major barriers were identified as sourcing money (53%), lack of customers (31%), selling prices lower than expected (26%) and transportation of stock (24%). Most of these are likely to also impact minigrid operations.

[18] Mulanje Electricity Generation Agency (MEGA) project in Mount Mulanje, UNDP-GEF project in Sitolo Village in Mchinji District, and University of Strathclyde & United Purpose project in Mthembanji Village in Dedza

[19] Corresponding to 10 planned minigrid developments noted during stakeholder interviews.

[20] Implementation period from 2020 ? 2023,

[21] Lazard Levelized Cost of Energy Analysis, version 14. October 2020.

[22] Although the AMP contribution is expected to benefit all low carbon minigrids, it has a deliberate Solar PV technology focus leveraging recent technology advances, cost reductions and potential economies of scale as well as the consistently high solar radiation resource throughout the continent (i.e. solar potential is largely location independent).

[23] https://africaledspartnership.org/2019/01/30/african-mini-grids-community-of-practice-amg-cop/

[24] EEP Africa. 2020. Energising Resilience, Climate Co-Benefits from Clean Energy Projects.

[25] Co-benefits including local value chains and diverse livelihoods, Self-reliance including food and energy security, and resilient infrastructure such as health care.

[26] Based on risks identified in consultation with numerous stakeholders in the Derisking of Renewable Energy Investment studies conducted for utility scale and off grid solutions in a range of markets.

1b. Project Map and Coordinates

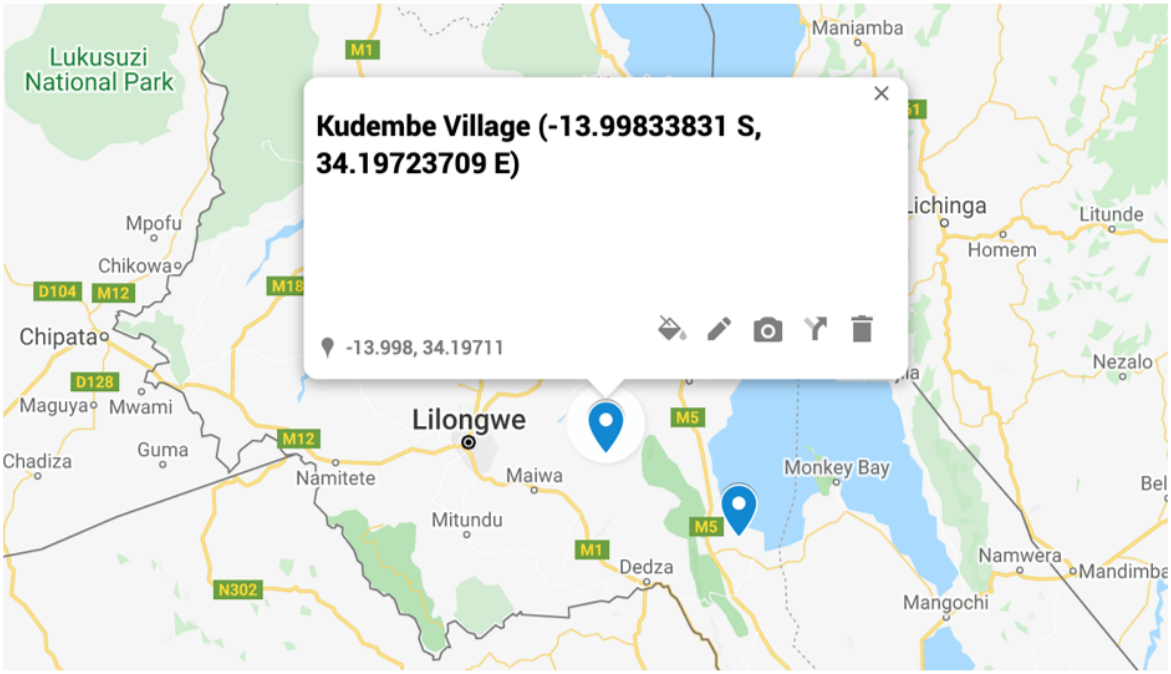
Please provide geo-referenced information and map where the project interventions will take place.

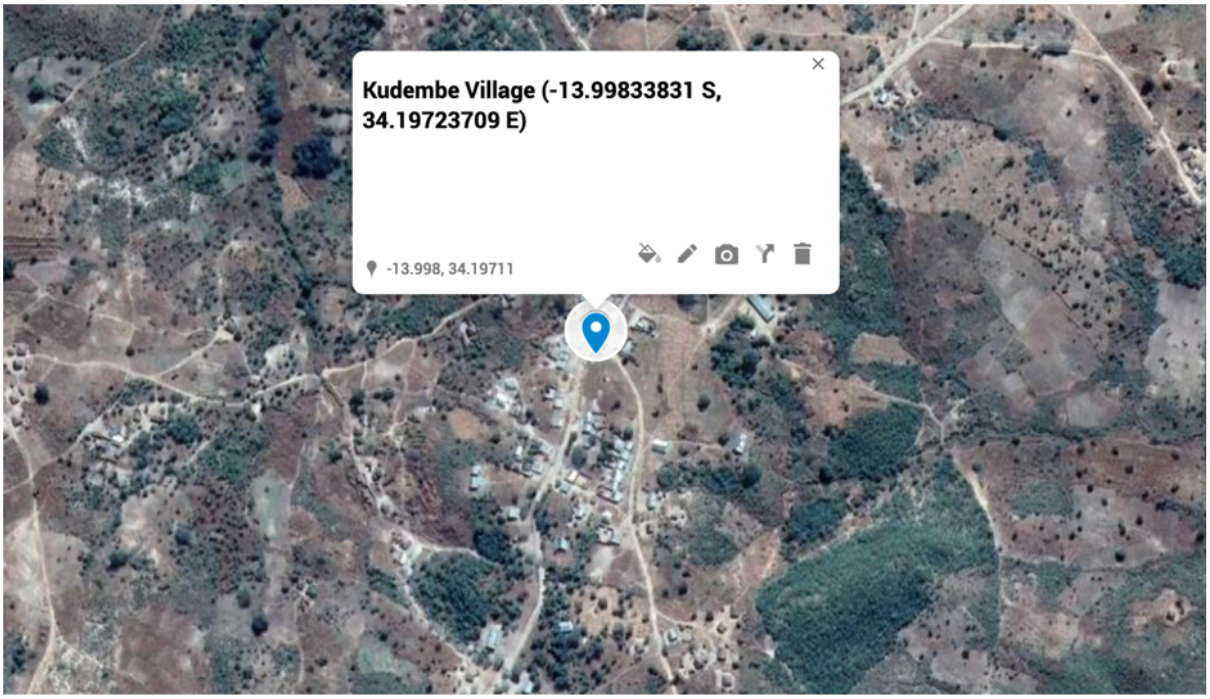
Two project sites are identified for the PUE overlay pilot project under Component 2, Output 2.1 with the relative locations shown below.

The Mthembanji village is located in Katchindamoto Traditional Authority in Dedza district, relatively close to Lake Malawi. The GPS coordinates for the site are -14.246680 S, 34.605612 E.


Methanbanji Village (14.246680 S, 34.605612 E)
-14.2466, 34.60504

Kudembe is also located in Katchindamoto Traditional Authority in Dedza district relatively closer to Lilongwe than Mthembanji. The GPS coordinates for the site are -13.99833831 S, 34.19723709 E.


Kudembe Village (-13.99833831 S, 34.19723709 E)
-13.998, 34.19711
Lukusuzi National Park
Maniamba
Mpofu
Chikowa
Chipata
Maguya
Mwami
Chadiza
Guma
Namitete
Lilongwe
Maiwa
Mitundu
Dedza
Monkey Bay
Litunde
Homem
Nezalo
Namwera
Mandimba
Mangochi
M1
M5
M12
M18
D104
D128
N302


Kudembe Village (-13.99833831 S, 34.19723709 E)
-13.998, 34.19711

1c. Child Project?

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

The programmatic approach aims to achieve greater impact by creating new minigrid markets across the continent, which, in aggregate, will create scale and momentum, attracting private sector interest and investment. The programmatic approach will also allow for a broader sharing of good practice and create economies of scale in providing program services.

The Africa Minigrids Program (AMP) has been designed to reduce the risks and therefore the costs of developing minigrids by targeting four components i.e. (i) policy and regulation, (ii) innovative business models, (iii) innovative finance and (iv) digital, knowledge management and monitoring and evaluation. In Malawi, the focus will be on supporting the policy and regulatory environment, demonstrating innovative business models and building and sharing of knowledge resources. To achieve a program-wide impact, the project components and results framework have been harmonized to achieve cost reductions at a national level, while also contributing to the collective outcomes of reduced costs and improved market attractiveness across the continent. Accordingly, the Malawi child project will feed into multiple program level indicators. Most importantly, the experience and knowledge gained at a national level, will be aggregated at regional level across the diverse group of countries participating in the AMP and in turn shared more broadly to encourage the development of RE minigrids beyond the scope of the AMP.

2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The Stakeholder Engagement Plan (SEP) is available as Annex 9 in the Project Document that provides *further* information 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.

A number of engagement methods and communication mediums will be employed to ensure active engagement with stakeholders and to overcome any remaining COVID-19 restrictions and social distancing recommendations that may still be in place. These include:

1. In-person meetings, where relevant, taking the form of, among others, (i) consultation workshops, (ii) interviews and focus groups, and (iii) community-based consultations and focus groups.

2. Written communications in the form of (i) emails, (ii) letters, (iii) survey forms, and (iv) Project brochures and manuals.

3. Online meetings and phone calls. Where relevant to the stakeholder group, virtual communication may still be preferred since it is quicker and easier compared with email and letters, and a viable alternative to in-person meetings. The project website and other online platforms will also allow for engagement.

4. Capacity development and training. The pilot project will engage community stakeholders through training and capacity development. Capacity building is also intrinsically part of the engagement with policy and decision-makers through the Community of Practice, knowledge sharing events as well as the renewable industry in the country, region and regional project.

5. Other engagement activities are expected to include status quo and needs assessments among pilot project communities and community consultation.

Although the mode of communication may vary according to task and participants, all consultations and engagement activities will be undertaken with the goal of ensuring full participation of relevant stakeholders, whereby all participants will be provided sufficient notice to prepare well and provide input for the project. Moreover, the AMP in Malawi project will also use all possible opportunities, i.e., workshops, meetings, trainings and awareness events, to promote diversity and gender balance. Balanced representation of relevant stakeholders will be ensured by reaching out to both men and women and different groups through appropriate communication means and encouraging their participation, noting the most socially and culturally acceptable method of communication and language and consultations for each group of stakeholders.

The frequency, means and timing of engagements per stakeholder group are described as part of the SEP, Table 10, Page 144. Given the relatively small budget for the project, separate funds were not allocated for stakeholder engagement. Stakeholder activities are however incorporated into related outputs, notably the interfacing for training with the regional program, Community of Practice, stakeholder consultation for pilot projects and extensive data collection for the monitoring of impacts

under Component 1, 2 and 3. Provision has also been made for a stakeholder Engagement Specialist to support the project on a part time basis (5.5 weeks) over the course of implementation.

In implementing the SEP, the following requirements will apply:

? All communication will be available in English, the official language and official medium of instruction in Malawi. English will be used to facilitate a common and broader project understanding outside of the country borders.

? Despite English being the official language, the 2008 Census reported that only 26% of the population above the age of 14 is able to speak English. At the discretion of the Project team, translations of printed material, written and spoken communication will be available in the relevant vernacular. At the very least, communications to impacted communities i.e., beneficiaries of the pilot project, must be available in both English and a language most relevant to the local community, if not English.

? The COVID-19 pandemic has had an impact on stakeholder engagement, limiting engagement to online channels and excluding communities with limited or no access to online facilities. The extent to which this will continue into the implementation phase is uncertain, but should it persist, alternate opportunities to allow for information flow and ensure participation must be implemented. Examples may include delivery of information through the local radio, paper posts on key local community places, word to mouth through local leaders, among others.

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;

Member of Advisory Body; Contractor;

Co-financier;

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

Executor or co-executor;

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

A comprehensive gender analysis was completed for Malawi that considered the context and gender situation in the country. It found that Malawi possesses a generally robust legal framework for gender rights and significant progress has been made in improving women?s access to health and educational services and economic opportunities. Women and men still, however, do not operate on totally equal footing due to cultural norms and accumulated historical legacies of discrimination. Its civil system offers comprehensive gender protections, though they may not always be respected in practice due to widespread patriarchal normative practice. There is considerable geographic variation between systems of matri- and patri- lineality and locality, which exert influences over patterns of landholding and marriage customs, though women face some degree of disadvantage under both systems. Conflicts between civil and customary law may be best managed on a site-specific basis, where the project may emphasize its coherence with civil statutes as well as make the ?business case? for greater inclusion and equality in planning and execution. Vulnerable groups of special concern identified are the following: widows, divorced women, single mothers, child brides, teen mothers, child-headed households, orphans, and households with members living with disabilities.

As such, men could be expected to benefit relatively more from a mini-grid programme unless specifically targeted interventions are included to shed light on women?s unique circumstances, constraints and opportunities. In particular, the rice, soybean, groundnut and fish value chains, several of which may represent intervention areas for the programme, when investigated were found to exhibit problematic gender dynamics (e.g., men dominate in mechanized dry milling, fish trading can be sexually exploitative, and increasing commercialization of soybeans and groundnuts leads to women being crowded out of the sector).

The analysis noted that 78% of micro-, small and medium enterprises are located in rural areas and 84% of micro-enterprises are female owned. These enterprises represent a key resource for potentially improving the demand profile of mini-grid installations.

Conversely, women?s overrepresentation among micro-enterprise owners also means there is an opportunity to help women?s businesses grow, formalize, and eventually reach parity with male-led businesses. The provision of electricity via mini-grids, alongside other complementary inputs like credit, can play a key role in this transformation.

Furthermore, evidence from Malawi suggests that gender inclusion at the heart of community infrastructure and energy access projects, in addition to being a moral imperative, is also correlated with greater success rates; that is, gender inclusion itself may constitute a de-risking approach. Based on the results on the gender assessment, a gender action plan was prepared to provide a ?gender lens? over the project, ensuring equitable participation and benefit incidence among women and men across the various program components. It seeks to cultivate gender-relevant data within nascent national mini-grid frameworks, within monitoring systems, de-risking analysis, and opportunity maps to shore

up the foundation for more informed decision-making that reflects the realities of the full populace. The other main component of the gender action plan is to ensure equal participation and benefits for community men and women involved in the productive use pilots. This will be achieved through targeted outreach, specialized training, credit and empowerment support, and the exploration, also, of other productive use opportunities beyond rice mills. Finally, activities supporting the industry association will be geared to increase female participation and influence in the sector.

The plan suggests gender actions that correspond with each of the components of the AMP Malawi. Within the scope of this project, the focus on will be on three gaps in particular: 1) lack of good information and data tracking of gender topics, 2) slower PUE uptake by women-led businesses and cooperatives, and 3) lower participation of women in minigrid supply, governance and enabling environment. Most of the project?s gender actions are aimed at addressing the first gap?Gender data and know-how?but including women in the PUE pilot activities and conducting outreach to women professionals in the minigrids or an adjacent sector are also the subject of dedicated activities. Complete details of the plan is available in Annex 11 of the Project Document.

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;

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

Private sector (developers, supply chain, investors, financial intermediaries, etc.) involvement in mini-grid cost-reduction is central to the program?s approach. Reducing risks and achieving cost reductions are key to attract private sector participation in the development of RE minigrids. Accordingly, a range of activities have been included to encourage, engage and support the private sector. Support activities under Component 1 have been prioritized with a focus on the private sector and developers. This includes producing data overlays to traditional planning data with geospatial data of particular interest for the selection of minigrid sites. This is expected to support site selection, pre-feasibility studies, save costs and encourage investments from the private sector. The DREI techno-economic study draws on industry feedback to identify the most pertinent policy interventions and instruments to augment the enabling / policy environment. Self-sustainability has eluded the most sophisticated minigrid

development and operations in the country, discouraging participation by private sector players in the sector. Component 2 targets the interest of private sector players with the aim to identify scalable and replicable business models of minigrids implementing PUE in multiple agricultural value chains as an enabler and accelerator for minigrids in Malawi.

A strong industry association provides the private sector with a peer-to-peer network and a voice that in turn creates a platform for the sector to grow and flourish. A strong collective custodian and voice for the industry can contribute to removing barriers to entry and sector growth, promote public and private sector coordination towards cost optimization and localization of the mini-grid industry and towards climate change, sustainable development and other national objectives. A strong industry association is however dependent on paying membership numbers and membership is grown around a strong value proposition. Two interventions are proposed with the intention of strengthening the industry association. The first, included under Component 2, is housing of the online ?One Stop Information Centre? with How-To guides offering practical guidance for industry / developers regarding the approvals and processes from conception to licensing and commissioning. The second, under Component 3, is focused on strengthening the industry association to advocate for and actively engage Government on behalf of private sector mini-grid developers and operators. Engagement between the public and private sector should be constructive if private sector participation and investment are to be encouraged. Component 3 also includes different mechanisms for data, and learnings from various outputs will be captured and developed into lessons, case studies, communication and training material to inform future minigrid developments by all role-players.

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 most significant risks (including climate change, potential social and environmental risks) that might prevent the project objectives from being achieved and the proposed measures that address these risks at the time of project implementation, were identified during the project design as:

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Strategic Risk		

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Failure to achieve a financially viable business model for small-scale minigrids. If the pilot project fails to demonstrate or achieve a fully financially viable business model for small minigrids, the objectives of encouraging private sector participation and accelerating minigrid uptake will not be achieved.	Moderate (I = 3, L = 3)	Even if not fully achieving a viable business model at this scale, the project should have made significant progress towards demonstrating improved financial viability and will be well placed to recommend additional measures or amendments needed towards this goal. Findings should also provide valuable guidance of interest to larger scale systems. Should this be the case, the most promising business model and suite of initiatives will be defined detailing findings and recommendations from the pilot experience as it relates to tariffs, revenue collection, share and types of PUEs, grid utilization, operational costs and efficiencies, value addition, significance and scope of small business development support, Microfinance for small businesses, and/or any other aspect of significance in developing a viable minigrid business model. It will also document learnings to serve as input into future developments as well as planning and policy development.
Regulatory risk		
An iterative process has proven critical to shape the minigrid regulatory framework. Failure to incorporate lessons and experiences from pilot projects, any other developments in the country as well as industry feedback, might limit the contribution from minigrids towards the targeted outcomes for the country.	Substantial (I = 4, L = 3)	Nominations by the Steering Committee for representatives from key institutions to participate in the regional CoP with structured feedback will support active knowledge exchange. The project makes provision for key stakeholders to actively engage with the outputs of the DREI study and use findings and inputs from the study (and other resources and sources) to inform the formulation of an action plan for further inclusion or refinement of policy instruments. The AMP/ACRE Project Steering Committee and the Technical Advisory Committee will facilitate a feedback loop of data and findings to policy and decision-makers. The Industry Association and linkages to the regional Community of Practice will facilitate engagement laterally and with government. The strong focus on data analysis and knowledge management in Component 3 should serve as valuable input to the Steering Committee and key stakeholders to inform planning and policy direction.
Operational Risk		
Restructuring within the newly created Ministry of Energy, coupled with capacity constraints and cumbersome procurement processes will present a challenge for delivery under a full National Implementation Modality.	Substantial (I = 5, L = 3)	Project management activities for the AMP will be incorporated under the ACRE project unit, located within the Ministry of Energy, with support from a UN Volunteer funded under the TRAC co-finance allocation. Participation by the Ministry of Energy and other key stakeholders in the Community of Practice will support capacity building. Where necessary, additional consultants with technical and procurement expertise will be brought in to support the Ministry with procurement.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Under the GEF allocation, the cash budget available to fund dedicated project team resources is severely limited and inadequate to support a dedicated Project Manager and Administrative/Finance Associate. Without these people, delivery of the project scope within the given timeframe will not be possible.	Substantial (I = 5, L = 3)	As above, the project management function for the AMP will be incorporated under the ACRE project with support from an UN Volunteer to alleviate the additional pressure on the existing ACRE project team. Government will assign officers who will dedicate part of their time to the day-to-day operation of the Project. Two responsible parties have been identified for the AMP in Malawi to lead the delivery of defined Outputs. Additional opportunities to contract suitable qualified responsible parties for the delivery of defined Outputs should be sought during implementation. TRAC funding has been allocated to extend the services of the ACRE PM to oversee delivery during the last two years of AMP.
A delayed start to the AMP will impact the opportunity for synergies with parallel projects. Alignment with the ACRE and EASE projects as well as coordinated activities across the regional project (e.g. DREI) means the earliest possible starting date should be targeted for the AMP in Malawi to optimally utilize the window period during which all resources are fully available.	Substantial (I = 5, L = 3)	For the pilot projects, budget has been allocated to retain some capacity/availability from the team to ensure monitoring, evaluation and continued support during the last two years. Significant preparation work (meetings, planning discussion, activity planning) has been done to ensure activities and project partners are ready to start. In support of an early and efficient start, a detailed workplan has been developed for the most critical outputs of the project. The workplan has also been frontloaded to encourage and facilitate implementation in such a way as to maximise the first two years of implementation that coincides with the ACRE and EASE projects. The DREI analysis has been scheduled to start in parallel with the other AMP countries and accordingly, resources (TORs for consultants, implementation guidelines, a list of qualified DREI practitioners, etc.) have already been prepared at the regional project level.
Given the digital platform?s central importance to the project?s functioning, successfully procuring the digital platform will be a critical activity, which may otherwise result in significant detrimental delays to project implementation.	Moderate (I = 4, L = 2)	Procurement of the platform should be performed as a priority in the first half of year 1. This has been incorporated into all relevant documentation, including the workplan and procurement plans. Procurement will be done by the ACRE Project unit that is already established and operational, therefore well placed to proceed without delay. Additionally, a generic set of specifications has been developed for the digital platform as initial guidance for the TOR during implementation and hence facilitate the procurement process. The regional project will also provide updated guidance on TORs during implementation.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Reliance on ACRE project infrastructure past its implementation period. The ACRE project is currently scheduled to conclude in December 2023. As noted above, AMP project implementation will be incorporated under the ACRE project to optimally utilize and share resources. This presents a risk for implementation structures during the last two years of AMP implementation.	Substantial (I = 5, L = 3)	UNDP is committed to energy up to the year 2030. The Country Office has indicated their expectation that additional TRAC resources will be allocated to support the AMP PMU for the remaining implementation period. Budget from the TRAC funding has been allocated to extend the contract of the ACRE PM to oversee, with the continued support of the UN Volunteer, the delivery of the AMP outputs after ACRE concludes at the end of 2023. The budget allocation for a UN Volunteer to support project implementation has been made for 4 years. As noted above, the Ministry has also indicated Government?s intent to assign officers who will dedicate part of their time to the day-to-day operation of the Project. The workplan and outputs have furthermore been frontloaded, with delivery of more involved activities scheduled during the first half of the four-year implementation period, with maintenance, monitoring (incorporating automation where possible), analysis, training and dissemination of findings and learnings scheduled for the latter half of implementation. Provision has also been made to ensure continued support from the Responsible Party for the pilot project for the 4-year AMP implementation period. Thereafter, the pilot is anticipated to continue operations as a self-sustainable social enterprise, with data interfaces fully automated. The identification and contracting of responsible parties for delivery of further aspects of the project can serve as an additional mitigation and delivery support measure.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
The COVID-19 pandemic is, at the time of writing, at a point of inflection. Variants and second/third waves of infections are emerging worldwide with concomitant reactions from authorities, ranging from mild restrictions on movement and curfews, to strict lockdowns and strict domestic travel restrictions. The most robust forms of restrictions could negatively impact activities requiring the physical presence of team members and stakeholders. At the pilot level, risks could relate to: - Supply chain delays or disruptions. Delays with importing or local availability of material and equipment due to reduced manufacturing capacity impacting planned delivery timelines. - Availability of construction teams. Increased absenteeism of resources due to sickness, the need to care for others, or restrictions on travel may impact project efficiency or progress. - Time	Moderate (I = 4, L = 2)	Scheduling of activities such as site development and on-site training that may require physical presence in certain localities has been front-loaded, allowing for a buffer in case the sanitary situation deteriorates to the point of preventing the swift realization of these activities. Online communication and teleconferencing options will be investigated and given preference to facilitate social distancing, where needed. Development at pilot sites will benefit from: - Performing a schedule assessment or time-impact analysis, including examining the status of material procurement on projects. Identifying most critical materials, equipment, products for procurement and engaging suppliers to prioritize and expose key vulnerabilities. - Identifying key resources and skills and possible alternatives in case of absences. - Prioritizing and facilitating vaccinations of workers if possible. - Assessing cost impacts of enhanced cleaning, reduced workforce, and other modifications. Assessing what services can be continued offsite to limit schedule delays.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Financial		
If co-financing is not realized as anticipated, it will significantly limit the contribution of the AMP.	Substantial (I = 5, L = 3)	Co-financing commitments from the UNDP TRAC funding, EASE project and Ministry of Energy are confirmed. The UNDP Country Office is responsible for tracking and reporting of co-financing commitments throughout project implementation. Additional co-financing and collaboration opportunities will be sought and leveraged during the implementation phase.
Social and Environmental (including climate)		
As an ?add on? to the Mthembanji and Kudembe pilot projects, there is a risk that inadequate measures have been put in place to safeguard social and environmental impacts of the projects or that safeguards are inconsistent with the requirements of the AMP and GEF. Without adequate safeguards, the project could have adverse impacts on the community, environment and minigrid industry more broadly.	Substantial (I = 5, L = 3)	The Mthembanji pilot project has complied with all national requirements with respect to social and environmental safeguards (SES). The Kudembe project is in the process of obtaining all approvals, following the same process and commitments. As part of this process, potential environmental and social impacts that could arise from the project were identified using various methodologies to assess any potential physical, biological and social impacts. The overall project was shown to contribute significant net positive social and environmental impacts for Mthembanji community. Where potentially negative impacts were identified, mitigation measures were proposed to reduce the impact of any unintended consequences and limit the risk of negative social or environmental impacts. These are encapsulated in the comprehensive Environmental and Social Management Plan (ESMP) for the project. A similar plan will be developed for the Kudembe site and will be completed prior to commissioning which is planned for end 2021. All documentation for this site will be available for review at the start of the AMP project. The Mthembanji ESMP was subject to review by the SES specialist during the design phase and no obvious gaps were identified. Should any concerns arise during the course of implementation, the ESMPs can be updated or expanded to incorporate additional or UNDP / GEF specific requirements.
Irresponsible handling of battery waste at pilot projects and future developments may present a risk to the social and environmental sustainability of minigrids.	Substantial (I = 5, L = 3)	As indicated above, the Mthembanji pilot project is subject to an ESMP that includes scheduled replacement and responsible disposal of batteries. The same approach will apply for Kudembe and reflected in the ESMP. A battery return scheme by Tesvolt is operational in the country that accepts old batteries for recycling at end of life. The technical designs have estimated a 10-year battery life, after which it will be returned to Tesvolt under the return scheme offered to the project. Under the ESMP, agreements are in place to ensure that the supplier engaged for replacement of batteries partakes in the recycling scheme offered by Tesvolt.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Minigrid system, structures and operation would be vulnerable to the climate hazards and risks associated with extreme and changing weather conditions.	Moderate (I = 4, L = 2)	Climate risk has been considered and mitigation measures incorporated into the planning, design, structure and operations of the pilot sites. Details of the specific mitigation measures are included in Annex 17 of this document.
External environmental factors, like for example the effects of climate change (such as the volume and quality of rainfall, rising temperatures, floods, droughts, violent winds, earthquakes, landslides, severe winds, storm surges, etc.) could lead to delay or abandonment of the project.	Moderate (I = 4, L = 1)[2]	This is an external risk to the project that will be mitigated in the context of a variety of other third-party activities by the Government. Furthermore, external environmental factors likely to be a risk has been considered as part of the feasibility/assessment studies established in the ESMF for each site. These use conservative assumptions to successfully operate. Specifically at the two pilot sites, the generation systems are housed in containers, allowing for systems to be transported and deployed in other areas if the population leaves due to climate impacts or if there is damage to the distribution system for example.
Potential negative environmental impacts resulting from the project, either routine or non-routine based, could lead to adverse local, regional, and/or transboundary impacts causing a delay or abandonment of the project.	Moderate (I = 3, L = 3)	During project preparation, similar project activities have been visited and/or consulted by the team of experts to evaluate the risks. Principal environmental risks have been framed at this stage (Project Preparation Grant, PPG) and they will continue to be assessed along the entire project cycle for each chosen site. Based on that, a pertinent due diligence project development process, monitoring of operations, and active intervention are foreseen according to such environmental safeguards established in this project through the ESMF to ensure operation within the established parameters and in compliance with the applicable regulations.
External social factors, like for example political unrest, COVID-19 persistence and other issues, could lead to delay, abandonment of the project or decrease the ability of people to pay for the services.	Moderate (I = 3, L = 3)	This is an external risk to the project that will be mitigated in the context of a variety of other third-party activities from the Government. Furthermore, external social factors likely to be a risk will be considered within this project as part of the feasibility/assessment studies established in the ESMF for each site, which will use conservative assumptions to successfully operate.

Description of risk (grouped by category)	Level of risk (I, L)[1]	Mitigation
Potential negative impacts on the existing diesel generation supply chain and employment within the sector with the adoption of solar PV minigrids ? both at national level and pilot sites.	Low (I = 2, L=2)	Current data suggests that diesel use in the country is limited, therefore confining the impact and risk of solar PV minigrids disrupting established industries and livelihoods. Baseline surveys at the pilot sites confirmed that none of the community members were currently using diesel generators. The status quo and excess available RE capacity suggest there is no risk of the pilot beneficiaries reverting to diesel generation, the project being sabotaged by diesel generators or of current employment opportunities being impacted. Capacity building within the target communities has already been carried out and United Purpose will continue to carry out training courses on utilising the minigrid for PUE. As well as covering how the minigrid works and how to utilise energy from the minigrid to foster local economic development, the training will also cover the environmental benefits of utilising solar power, and the negative impacts of using environmentally harmful energy generation technologies such as diesel power. More generally, the project will work with the government of Malawi and industry representative such as REIAMA to promote solar minigrids also as a viable and profitable means of income generation and business opportunity. The focus of such engagement will be on promoting job creation and highlighting the job opportunities in the renewable energy sector available to those currently working with diesel generators.
Gender Equality and Inclusion		
There is a risk that the productive use benefit will be captured disproportionately by one gender, either exacerbating existing inequality or leading to backlash.	Low (I=2, L=2)	Eventually conducting focus group discussions in the affected communities will offer more insight into the likelihood of technological appropriation of the rice mills and other equipment, along with collaborative problem-solving around how to address any specific barriers to asset ownership and use faced by women?s businesses or cooperatives.

? The novel coronavirus (COVID-19) was declared a global pandemic on 11 March 2020. It has been far more than a health crisis, affecting societies and economies at their core. The situation in developing countries is even more tenuous. A World Bank working paper, published in November 2020, provided some of the first evidence on the socio-economic impacts among households and individuals in Sub-Saharan Africa. Using data collected monthly since May 2020, it shows that between 60 and 80% of households in Malawi had already lost income because of the pandemic. It also points out that socio-economic effects of the pandemic, such as food insecurity, are disproportionately borne by households that were already impoverished prior to the pandemic. A large share of Malawian households is therefore particularly vulnerable. The pandemic has also impacted consumer affordability and increased the risk for vulnerable households to fall back into energy poverty.

? The pandemic has highlighted the importance of access to electricity to power healthcare facilities, supply clean water for essential hygiene, enable communications and IT services for education or more broadly to connect people while maintaining social distancing. Access to clean energy is also expected to play a critical role in combatting the COVID-19 pandemic and catalyzing an economic recovery in its wake, particularly in African countries[1].

? The multidimensional COVID-19 crisis creates opportunities for the project to mitigate country- and project-level impacts, to contribute toward green recovery and building back better, and also to leverage global responses to COVID-19 to deliver global environmental benefits and/or climate adaptation and resilience benefits. access to reliable, affordable, clean energy will be crucial to support economic recovery. Not only are investments in off-grid renewable energy important levers to create jobs and generate financial savings but increasing energy access for the most vulnerable population creates opportunities for local economic development that enhance resilience to shocks and crises. In developing the project in Malawi, further opportunities were considered as they relate to (i) leveraging economic recovery and stimulus plans when defined, (ii) promoting the inclusion of electric cooking into the minigrid operators service offer for both pilot sites, (iii) health facilities as beneficiaries of minigrid pilots where possible, and (iv) using Communities of Practice activities to focus on COVID-19 impacts and opportunities (refer Annex 19 in the Project Document).

? Over the medium to long term, access to affordable, clean energy will be crucial to support economic recovery, highlighting the significant potential opportunities for co-benefits from rural electrification in the fight against COVID-19. Yet the enterprises providing off-grid electricity connections are severely threatened by the disruptions caused by the pandemic. At a project level, delivery of infrastructure projects, such as the minigrid pilot projects included under the AMP, are particularly vulnerable to supply chain disruptions, availability of implementation teams, access to rural communities, logistical and cost impacts of meeting health and safety compliance. At the broader project level, if a vaccine program in Malawi is delayed or if variants emerge that can escape the existing vaccines, this could lead to knock-on effects in advancing key activities.

? Likewise, ever-increasing climate risks present both risks and opportunities for minigrid developments. Minigrids lie at the nexus between rural electrification, climate resilience and sustainable development. The African Mini-Grid Community of Practice (AMG-CoP) ? a collaborative network of 16 African country governments including Malawi ? identified minigrids as a central element of developing a decarbonized, climate-resilient energy services sector for the millions of people in Africa who lack access to affordable, safe and clean energy. Green minigrids deliver climate change mitigation and resilience, while also advancing economic and social development benefits.

? While minigrids contribute greater resiliency to the overall energy system they are themselves vulnerable to the impacts of climate change. Climate hazards and risks such as higher temperatures, strong winds and prolonged periods of drought interspersed with flooding, will threaten generation and distribution infrastructure and impact consumer demand. These risks are aggravated by the logistical challenges facing remote, rurally located communities with limited access to technical support, spare parts, and maintenance capacity to address mini-grid issues and disruptions. As climate risks are expected to increase to 2050, climate risks will demand due consideration in project planning, design and operation.

The project design therefore takes cognizance of these escalating environmental and health risks, with comprehensive risk and opportunity analyses for both Climate risk and the COVID pandemic included as annexes to the Project Document (Annex 17 and Annex 19 respectively).

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[1] Multiple sources including: https://www.seforall.org/covid-19-response and https://ecdpm.org/events/green-gender-driven-covid-19-recovery-africa/

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[1] I = Impact; L = Likelihood

[2] Based on climate change indexes internationally recognised: https://germanwatch.org/en/cri and https://ccpi.org/ (released on 7 Dec), Malawi is vulnerable to climate risks, as follows 1) Climate risk: Stable trend from 1999 to 2018 at the SUBSTANTIAL range of countries affected by climate risks and surrounded in part by a HIGH climate risk country. 2) Malawi?s capacity to fight climate change is not expected to be among the best countries internationally. Climate risk is therefore considered as HIGH (to be conservative) in the coming years.

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.

Executing Agency: The Executing Agency for this project is the **Ministry of Energy** (MoE) within the Government of Malawi.

The Executing Agency 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 Executing Agency 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 Executing Agency 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.

- ? Risk management as outlined in this Project Document;
- ? 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.

A joint Project Unit will be incorporated under the Access to Clean and Renewable Energy (ACRE) Programme Support that is located within the Ministry of Energy (MoE) who serves as the Executing Agency and ?Programme Coordinator?[1] of the UNDP-supported ACRE project. The project team will coordinate across all the components and outputs of the project. The joint Project Unit will be supported by a United Nations Volunteer (UNV) acting as Project Assistant/Finance Officer for the AMP project. The scope of duties for these roles are available in Annex 8 to the Project Document. The project will also benefit from Government assigned officers who will dedicate part of their time to the day-to-day operation of the Project.

Responsible Parties: The Executing Agency may enter into a written agreement with other organizations, known as responsible parties, to provide goods and/or services to the project, carry out project activities and/or produce outputs using the project budget. Responsible parties are directly accountable to the Executing Agency in accordance with the terms of their agreement or contract with the Executing Agency. Any organization that is legally constituted and duly registered may become a responsible party including government agencies, NGOs, private firms, and academia.

Responsible parties have been identified to support the delivery of aspects of the project on behalf of the MOE. Contracts will be placed with the responsible parties for the delivery of:
•United Nations Capital Development Fund (UNCDF) ? Component 1, Output 1.1: Geospatial data; and
•University of Strathclyde ? Component 2, Output 2.1: Mthembanji and Kudembe productive use pilot projects.

The legal instruments (contracts/agreements) to engage responsible parties will be included in Annex 14 to this Project Document on conclusion and signature. Responsible parties should not serve on the Project Steering Committee to avoid conflict of interest.

During implementation, **additional parties may be identified and appointed to act as responsible parties** and these contracts added to the above.

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[1] Role as defined in the ACRE project documentation

Project stakeholders and target groups:
All the people of Malawi stand to benefit from accelerated investments in clean energy. All taxpayers and electricity users stand to benefit from more cost-effective ways to deliver clean energy to end users. More specifically, rural communities currently without access to electricity will benefit from solutions that will enable affordable, clean energy to be delivered to their communities. Very directly, the specific community who will be the recipients of the pilot project will benefit from access to clean energy and the multiple

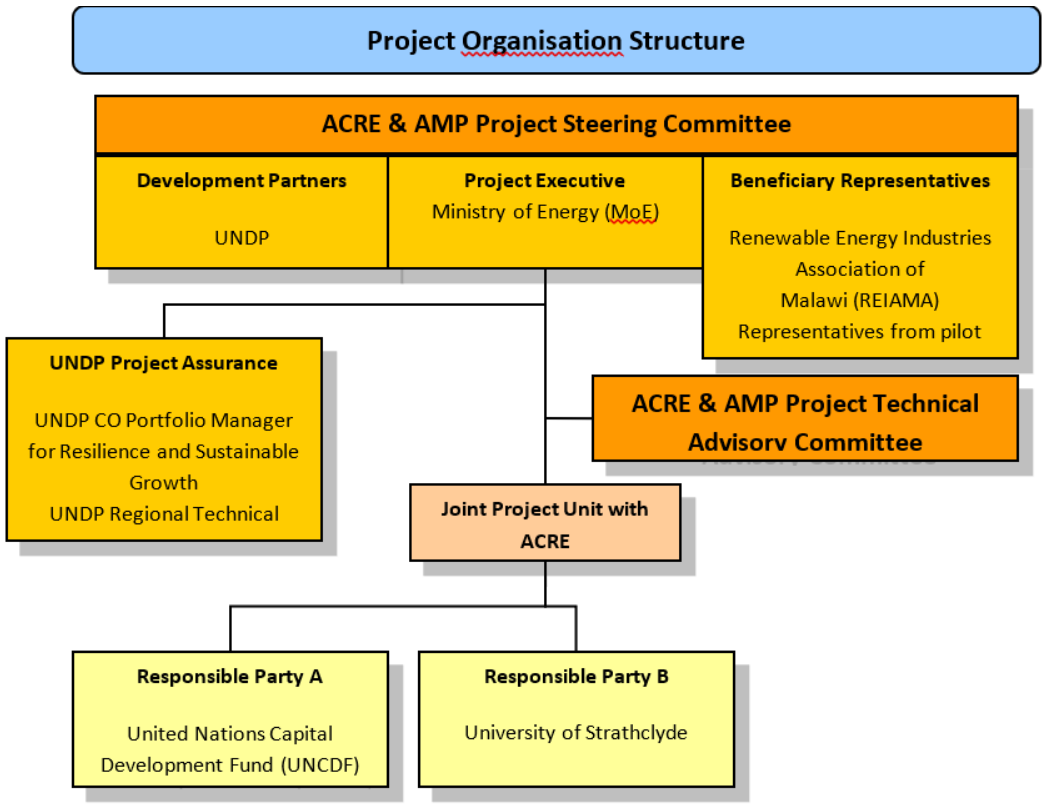
associated socio-economic benefits including opportunities for income generation. The community will be engaged in the design of the pilot initiatives and the selection of productive uses. Community representatives will be elected by the community for participation on the Project Steering Committee and/or the Technical Advisory Committee as deemed most appropriate. It is hoped that active engagement of direct beneficiaries at pilot level will inform future developments in other communities.

The potential RE minigrid industry will also benefit from the investment in capacity building and the piloting of innovative business models that can guide future development and operation. REIAMA, the Renewable Energy Industries Association in the country will be engaged as industry representative and Technical Advisory Committee member.

UNDP: UNDP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is also responsible for the Project Assurance role of the Project Steering Committee and Technical Advisory Committee.

Project organisation structure:

The AMP will be incorporated under the existing structures of the ACRE project. The ACRE project has an established Project Steering Committee supported by a Technical Advisory Committee (TAC). While these structures will continue to serve the ACRE project, only the relationship to the AMP is depicted below. The project structures, as they apply to the ACRE project, is described in the ACRE project document, Figure 9.



igure 1: Project organizational structure (integrated into existing ACRE structures)

The existing ACRE Project Steering Committee will extend its management oversight role to include the AMP project. The Project Steering Committee is chaired by the Ministry of Energy and coordinated by the Secretariat, which is also led by the Ministry of Energy. The Steering Committee will provide strategic guidance to the Project and periodically review the initiatives undertaken by the project and responsible parties. It will be responsible for taking corrective action as needed to ensure the project achieves the desired results. In order to ensure UNDP?s ultimate accountability, Project Steering Committee 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.

In case consensus cannot be reached within the Steering Committee, the UNDP Resident Representative (or their designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

Specific responsibilities of the Project Steering Committee include:

? Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;

? Address project issues as raised by the project manager;

? Provide guidance on new project risks, and agree on possible mitigation and management actions to address specific risks;

? Agree on project manager?s tolerances as required, within the parameters set by UNDP-GEF, and provide direction and advice for exceptional situations when the project manager?s tolerances are exceeded;

? Advise on major and minor amendments to the project within the parameters set by UNDP-GEF;

- ? Ensure coordination between various donor and government-funded projects and programmes;
- ? Ensure coordination with various government agencies and their participation in project activities;
- ? Track and monitor co-financing for this project;
- ? Review the project progress, assess performance, and appraise the Annual Work Plan for the following year;
- ? Appraise the annual project implementation report, including the quality assessment rating report;
- ? Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;

? Review combined delivery reports prior to certification by the Executing Agency;;

? Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;

? Address project-level grievances;

? Approve the project Inception Report, Mid-term Review and Terminal Evaluation reports and corresponding management responses;

•Review the final project report package during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.
•Ensure highest levels of transparency and take all measures to avoid any real or perceived conflicts of interest.

The existing Project Steering Committee already includes the following roles:

a. Project Executive: Is an individual who represents ownership of the project and chairs the Project Steering Committee. The Executive is normally the national counterpart for nationally implemented projects. The Project Executive is: Ministry of Energy, Secretary of Energy.

b. Development Partner(s): Individuals or groups representing the interests of the parties concerned that provide funding and/or technical expertise to the project. The UNDP and representatives from other Development Partners, as relevant to ACRE and AMP.

The Project Steering Committee is also required to include the following roles:

c. Project Assurance: UNDP performs the quality assurance and supports the Project Steering Committee and Project Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed, and

conflict of interest issues are monitored and addressed. The Project Steering Committee cannot delegate any of its quality assurance responsibilities to the Project Unit. UNDP provides a three ? tier oversight services involving the UNDP Country Offices and UNDP at regional and headquarters levels. Project assurance is totally independent of project execution.

d. Beneficiary Representative(s): Individuals or groups representing the interests of those 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 civil society representative(s) can fulfil this role. The Beneficiary representative(s) are: Nominated representative from the Renewable Energy Industries Association (REIAMA) and elected representatives from the pilot project recipient community.

The Project Steering Committee is supported by the Project Technical Advisory Committee (TAC) established under ACRE. The TAC serves as a sub-committee of the Steering Committee, with specific focus on technical advisory support to guide implementation and coordination of the project. It is chaired by the Ministry of Energy and meets at least quarterly prior to and in preparation for the scheduled Project Steering Committee meeting.

Duties and responsibilities of the TAC include, among others:

? Generally, provide technical guidance to the Ministry of Energy on implementation of the project;

? Review of annual work plans and budgets as well as the annual procurement plan for the Project and make recommendations of the same for adoption by the Steering Committee;

? Review and approval of technical designs of items of project components;

? Oversight on the development of terms of references for external consultancies on the Projects;

? Review the effectiveness of the Project?s technical standards, codes of practice and recommend remedial measures;

? Ensure that there is consistency between the technical Activities of the Project and relevant Government policies and Development Strategy;

? Review the technical aspects of any proposal that requires Steering Committee approval under the Projects; and

? Review and ensure linkages between the Project Outcomes with relevant Government bodies.

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[1] Role as defined in the ACRE project documentation

7. Consistency with National Priorities

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

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

- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC

- National Action Program (NAP) under UNCCD

- ASGM NAP (Artisanal and Small-scale Gold Mining) under Mercury

- Minamata Initial Assessment (MIA) under Minamata Convention

- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD

- National Communications (NC) under UNFCCC

- Technology Needs Assessment (TNA) under UNFCCC

- National Capacity Self-Assessment (NCSA) under UNCBD, UNFCCC, UNCCD

- National Implementation Plan (NIP) under POPs

- Poverty Reduction Strategy Paper (PRSP)

- National Portfolio Formulation Exercise (NPFE) under GEFSEC

- Biennial Update Report (BUR) under UNFCCC

- Others

The project corresponds with Malawi?s Third National Communication to the United Nations Framework Convention on Climate Change dated January 2021 and is aligned with the country commitments to the 2030 Sustainable Development Goals, pledges made under the Intended Nationally Determined Contributions on adaptation and mitigation actions to be implemented from 2015 to 2040, the National Climate Change Management Policy (NCCMP) adopted in 2016 and priorities agreed under the United Nations Development Assistance Framework, Malawi 2019 ? 2023, that includes:

? **Outcome 9:** By 2023, Malawi has strengthened economic diversification, inclusive business, entrepreneurship and access to clean energy.

? **CPD identified national priority or goal and cooperation framework outcome involving UNDP**: Transition Malawi to a productive, competitive and resilient nation. With supporting Country Programme Outputs.

o Output 1.1: Women and youth in targeted areas have access to employment opportunities.

o Output 1.2: Public and private sector institutions enabled to develop and implement policies and practices that enhance innovation, productivity and entrepreneurship.

o Output 1.3: Inclusive and sustainable solutions adopted at the national and subnational levels to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).

The context for and expected contribution from renewable energy minigrids is reflected in several key policy and planning documents:

Policy / planning document	**Relevance**
Energy Regulation Act, 2004	The Act established the Malawi Energy Regulatory Authority (MERA) that is mandated to regulate all energy activities in the country. In the electricity sector, MERA is responsible for issuing licences of generation, transmission and distribution and quality control of the electrical facilities. The planning, development and operation of minigrid facilities are also under MERA jurisdiction.
Electricity Act, 2004 and Electricity (Amendment) Act 2016	The Electricity Act 2004 governs the activities of the electricity sector pertaining to generation, transmission and distribution. The Act, read together with the Electricity (Amendment) Act 2016, gave rise to the reform of the power sector resulting in the unbundling of the vertically integrated national utility and opening of the market to private sector participation including minigrid operators. MERA developed electricity regulations to operationalize the Act. The regulations cover the planning, development, operation and maintenance of the generation, transmission and distribution facilities for electricity including minigrid systems.
Electricity Act, 2004	The Electricity Act governs the activities of the electricity sector pertaining to generation, transmission and distribution. The Act gave rise to the reform of the power sector, the unbundling of the vertically integrated national utility and opening of the market to private sector participation including minigrid operators. MERA developed electricity regulations to operationalize the Act. The regulations cover the planning, development, operation and maintenance of the generation, transmission and distribution facilities for electricity including minigrid systems.

Policy / planning document	Relevance
Rural Electrification Act, 2004	The Rural Electrification Act provides for the planning, development, operation and maintenance of rural electrification facilities. The Act defines (i) Management of rural electrification activities; (ii) Sources of funds for the rural electrification activities; (iii) Modes of electrifying rural areas; (iv) Installation of rural electrification facilities; (v) Operation and maintenance of rural electrification facilities; (vi) Subsidy provision for operation and maintenance of rural electrification facilities. The planning, implementation and management of rural electrification activities fall under the auspices of the Ministry responsible for energy. The Act establishes the Rural Electrification Management Committee to, among others, (i) ensure that the majority of the Malawian population in peri-urban and rural communities have access to efficient, sustainable and affordable energy for their social economic development through grid extension and off-grid electricity supply (including solar home system technologies) and (ii) develop a rural electrification master plan and update it at regular intervals. The Committee is supported by the Rural Electrification Unit established in the Ministry of Energy. The master plan, covering a five-year planning horizon i.e. 2020 ? 2025, has just been finalized. Rural electrification activities are funded from a ring-fenced Rural Electrification Fund (REF), capitalized from levies on energy sales. The Act allows for a subsidy under the REF to be available for off-grid solutions as well as for off-grid facilities to be operated on concession. Neither of these provisions have been operationalized as yet.
Malawi Nationally Determined Contribution (NDC), 2015	The NDC seeks to promote climate change mitigation and adaptation for sustainable livelihoods through measures that increase levels of knowledge and understanding and improve human well-being and social equity, while pursuing economic development that significantly reduces environmental risks and ecological scarcities. In particular, the share of national greenhouse gas (GHG) emissions arising from the energy sector is anticipated to increase to 17% in 2040 compared to being only 4% in 2015. Renewable Energy is recognized as key to emission reductions.
National Climate Change Management Policy (NCCMP), 2016	The NCCMP is a key instrument for managing climate change in the country of Malawi. The goal is to create an enabling policy and legal framework for a pragmatic, coordinated and harmonized approach to climate change management. The Policy provides strategic direction for Malawi's priorities for climate change interventions and outlines an institutional framework for the application and implementation of adaptation, mitigation, technology transfer and capacity building measures. It recognizes renewable energy as aprioritised technology under the policy priority areas.
Malawi Renewable Energy Strategy (MRES) 2017 ? 2022	The Renewable Energy Strategy outlines interventions necessary to remove barriers for the planning, development, operation, maintenance, promotion and utilization of renewable energy technologies. It has also identified opportunities on the same. Clean energy minigrids are identified as one of four priority areas to advance renewable energy in the country. The strategy targets at least 50 operational minigrids in Malawi by 2025. MRES noted the need for the review of policy and regulations to create an enabling environment for clean energy minigrids. This led to the review of the National Energy Policy and the development of the Minigrid Regulatory Framework (refer below).

Policy / planning document	Relevance
National Charcoal Strategy, 2017 ? 2027	The National Charcoal Strategy recognizes that Malawi?s demand for charcoal and firewood are increasing faster than the adoption of alternative energy sources. This is putting pressure on forests and destroys natural vegetation that would act as carbon sinks. The first pillar of the Strategy therefore, is premised on the promotion of alternative household cooking fuels. One of these alternative sources is electricity. The Strategy intends to assist in providing means for strengthening the electricity supply industry and make it more efficient and capable of providing adequate, affordable and reliable electricity supply that enables industrialization, rural transformation, sustainable economic development and wealth creation.
National Energy Policy, 2018	The National Energy Policy targets an increase in access to affordable, reliable, sustainable, efficient and modern energy for every person in the country, aligning the country commitments with both the Sustainable Development Goal 7 and the Malawi Growth Development Strategy III (MGDS III). It outlines broad policy outcomes that include (i) Diversified energy sources; (ii) Developed and efficient energy sector; (iii) Modern and sustainable energy sources; (iv) Improved living standards for women and men due to equitable provision of energy sources; (v) Increased access to clean, sustainable and affordable energy for all people. The policy calls for private sector involvement in the electricity sector and, in concurrence with the Electricity Act, prompted the restructuring of the sector, including the unbundling of the vertically integrated national power utility and establishment of the Single Buyer and System and Market Operator to enable private sector participation in the market.
Minigrid Regulatory Framework, 2020	The Minigrid Regulatory Framework has been developed under the UNDP & GEF funded project called, ?Increasing Access to Clean and Affordable Decentralized Energy Services to Selected Vulnerable Areas in Malawi?. The Minigrid Regulatory Framework was formulated to facilitate the planning and development of minigrid systems in Malawi in line with the National Energy Policy 2018 and MRES 2017-2020. It was published in July 2020 following a development process and extensive stakeholder consultation over 2 years. While being broad allowing for multiple scenarios of minigrid development, ownership and delivery models, the framework does provide important, initial clarity to the market. It defines a minigrid as an isolated system up to 5MW in size. It provides for systems smaller than 150 kW to be exempt from a license. It acknowledges the impact of grid arrival and provides some guidance for grid integration. It also allows for cost reflective tariffs, flexible tariff structures and subsidy options. It further includes guidance on selection criteria for minigrids and technical and licensing requirements.
Environmental Management Act (EMA), 2017	The EMA requires that an Environment and Social Management Plan (ESMP) be developed for an energy project - including a minigrid. The ESMP is required to adhere to (i) the Environmental and Social Impact Assessment (ESIA) guidelines for Environmental Impact Assessment (EIA) as well as (ii) Terms of Reference (TORs) that are provided by the Malawi Environmental Protection Agency (MEPA) after they receive a proposed project brief. The ESMP is used as a basis for managing, minimizing, mitigating and monitoring of the environmental and social impacts associated with the construction, operation, maintenance and decommissioning phases of the energy facility.

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 is core to the overall AMP. In the Malawi project structure, Component 3 is specifically focused on digital, knowledge management and monitoring and evaluation. A key aspect of the regional project is to collate and share knowledge across participant countries as well as support the development of the clean energy minigrid industry more broadly. Accordingly, knowledge management is very deliberately included into the project design with four outputs defined in support of knowledge management and dissemination. These outputs have also been harmonized across all national projects.

To achieve this, an early activity is the development of a data strategy to guide data collection throughout the project. This is supported by the requirement for a project website to serve as a complete, transparent knowledge platform. Data and knowledge resources that will be shared at both national and regional level are described in the following Outputs:

- 3.1: 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.

- 3.2: A Digital strategy is developed and implemented, including linkages to and following guidance from the regional project with smart metering data aggregated, analyzed and disseminated.

- 3.3: Minigrids digital platform implemented to manage data from pilots, and to support minigrids scale-up and cost-reduction.

- 3.4: Active interface with regional project established, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learnt.

- 3.5: Industry association strengthened to advocate for and actively engage Government on behalf of private sector minigrid developers and operators.

The combined budget to deliver these 5 outputs is $362,755. The foundations of the QAMF, digital strategy and platform will be developed during the first year of implementation. Data collection, analysis and knowledge sharing will continue throughout the implementation period with timing of knowledge sharing events, workshops and reports on metrics detailed in the Multi-Year Workplan and Monitoring Plan annexed to the Project Document.

Similarly, data collected for the DREI study (Output 1.2) will be collated at regional level, combining the insights from all AMP partner countries. Linkage or feedback loops within the national project structure as well as the regional project were also incorporated in the project design. Access to and support available

from the regional project will further facilitate knowledge management and sharing. Structures have been put in place to ensure consistent data collection, monitoring and reporting across all child projects.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The project results, corresponding indicators and mid-term and end-of-project targets in the project results framework will be monitored annually and evaluated periodically during project implementation. If baseline data for some of the results indicators is not yet available, it will be collected during the first year of project implementation. The Monitoring Plan included in Annex details the roles, responsibilities, and frequency of monitoring project results.

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. The UNDP Country Office is responsible for ensuring full compliance with all UNDP project monitoring, quality assurance, 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 costed M&E plan included below, and the Monitoring plan in Annex, 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 during the Project Inception Workshop and will be detailed in the Inception Report.

Additional GEF monitoring and reporting requirements:

Inception Workshop and Report: A project inception workshop will be held within 60 days of project CEO endorsement, with the aim to:

a. 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.

b. Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.

c. Review the results framework and monitoring plan.

d. 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.

e. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.

f. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.

g. Plan and schedule Project Board meetings and finalize the first-year annual work plan.

h. Formally launch the Project.

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. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR submitted to the GEF will be shared with the Project Board. The quality rating of the previous year?s PIR will be used to inform the preparation of the subsequent PIR.

GEF Core Indicators:
The GEF Core indicators included as Annex will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to the TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with TE consultants prior to required evaluation missions, so these can be used for subsequent groundtruthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF website.

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.

The evaluation will be ?independent, impartial and rigorous?. The evaluators that will be hired 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/GEF Directorate.

The final TE report and TE TOR will be publicly available in English and posted on the UNDP ERC by 1 June 2025. A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report?s completion.

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 lesson learned and opportunities for scaling up.

Agreement on intellectual property rights and use of logo on the project?s deliverables and disclosure of information**:** To accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy[2] and the GEF policy on public involvement[3].

Monitoring and Evaluation Plan and Budget:
This M&E plan and budget provides a breakdown of costs for M&E activities to be led by the Project Management Unit during project implementation. These costs are included in Component 3 of the Results Framework and TBWP. For ease of reporting M&E costs, please include all costs reported in the M&E plan under the one technical component. The oversight and participation of the UNDP Country Office/Regional technical advisors/HQ Units are not included as these are covered by the GEF Fee.

GEF M&E requirements	**Indicative costs (US$)[4]**	**Time frame**
Inception Workshop	3 000	Within 60 days of CEO endorsement of this project.
Inception Report	None[5]	Within 90 days of CEO endorsement of this project.
M&E of GEF core indicators and project results framework	12,000 (3,000 per year)	Annually and at mid-point and closure.
GEF Project Implementation Report (PIR)	None[6]	Annually typically between June-August, starting after first year of implementation.
Monitoring of Environmental and Social Safeguards Framework	None[7]	On-going data collection, Annual reporting
Monitoring of Gender Action Plan	None[8]	On-going data collection, Annual reporting
Supervision missions	None	Annually
Independent Mid Term Review (MTR)	30 000	1 September 2023
Independent Terminal Evaluation (TE)	42 000	1 June 2025

Monitoring and Evaluation Plan and Budget: This M&E plan and budget provides a breakdown of costs for M&E activities to be led by the Project Management Unit during project implementation. These costs are included in Component 3 of the Results Framework and TBWP. For ease of reporting M&E costs, please include all costs reported in the M&E plan under the one technical component. The oversight and participation of the UNDP Country Office/Regional technical advisors/HQ Units are not included as these are covered by the GEF Fee.		
GEF M&E requirements	**Indicative costs (US$)[4]**	**Time frame**
TOTAL indicative COST	**87,000[9]**	Add to TBWP component 4

[1] See https://www.thegef.org/gef/policies_guidelines

[2] See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/

[3] See https://www.thegef.org/gef/policies_guidelines

[4] Not including project team staff time

[5] To be prepared by PMU, with no additional costs

[6] Activities and costs included in the PMU, Country Office and Regional Technical Advisor functions.

[7] The ESMF has not identified specific indicators at this time, however socio-economic and environmental indicators have been incorporated under the data collection and overall monitoring framework and integrated under Output 3.4. A separate budget has therefore not been allocated.

[8] Gender specific indicators have been incorporated into the indicators, data collection and overall monitoring framework and are therefore already covered under the budget for Output 3.4. No additional budget allocation,

[9] The M&E activities under the project are funded through UNDP co-financing resources. Under Component 3, UNDP funding has been allocated to the M&E sub-component, for the procurement of International Consultants ($12,000), conducting the independent evaluations of the project ($72,000) and for organization, logistics and catering for the inception workshop ($3,000).

10. Benefits

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)?

All the people of Malawi stand to benefit from accelerated investments in clean energy. All taxpayers and electricity users stand to benefit from more cost-effective ways to deliver clean energy to end users. More specifically, rural communities currently without access to electricity will benefit from solutions that will

enable affordable, clean energy to be delivered to their communities as well as the multiple, broader socioeconomic benefits that will accrue into different socioeconomic aspects of rural livelihoods including a healthier environment, opportunities for income generating activities and improved management of natural resources. Data from 2019[1] showed employment creation and energy expenditure savings as direct benefits resulting from minigrids. While productive use impacts would differ depending on the country context, rural microenterprises in India experienced an income growth of 13% after connecting to minigrids.

The focus of the productive use overlay pilot at the two sites is on introducing various productive use applications, powering a range of commercial and agricultural electrical appliances coupled with technical and business development support. These will contribute indirect benefits associated with income growth and productive use job creation. Improved economic buoyancy should in turn contribute to the sustainability of the minigrid operations, creating a virtuous cycle of growth and resilience.

Across all outputs of the AMP in Malawi, at least 763 beneficiaries are expected to benefit directly. The largest number are the ~300 farmers who will benefit from having access to agricultural processing equipment. The two communities will also benefit from small businesses development support and/or subsidized electrical appliances or equipment. Across the other activities of the project, there will be multiple participants in training and knowledge sharing events, participants in the regional Community of Practice, and users of the online One Stop Information Centre.

Guidance from the Gender Analysis and Action Plan will help ensure that gender equity and empowerment remain a key part of the project implementation, while disaggregated indicators as well as monitoring and reporting will enable an understanding of gender specific impacts that can inform improved future planning and decision-making. Particular attention will be given to strengthening the role of women as beneficiaries, decision-makers, participants, managers and owners of mini-grid systems or energised end-uses as detailed in the gender action plan.

Socio-economic impacts will also be tracked more broadly for both pilot sites to allow refinements and inform future planning and decision-making. By linking this information back to the appropriate forums including the regional project, benefits can be replicated and enhanced in future mini-grid developments. The impacts of minigrids on poverty, gender, health and education have been difficult to quantify and demonstrate because of the high costs associated with impact data collection and lack of understanding of relevant impact metrics. In this respect, the standardized quality assurance and monitoring framework and digitization aspects of the AMP will contribute significantly to the understanding and further refinement of the minigrid contribution to the benefit of each AMP partner country, including Malawi.

The overall program is expected to mitigate significant amounts of CO? emissions and will be accompanied by co-benefits. At the national level, direct and consequential (indirect) emission reductions are expected to occur, calculated to be 1,068 metric tons of CO2e from direct interventions and 2,043,000 metric tons of CO2e accrued indirectly.

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[1] Power for All Fact Sheet. October 2019. powerforall.org. On average, every 1MW of mini-grid installed capacity requires about 180 direct jobs and as much as US$100 can be saved annually per rural household connection.

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 Endorsement/Approval	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
PIMS 6512 Malawi revseid SESP Sep 30 2021	CEO Endorsement ESS	
PIMS 6432 ANNEX_10-ESMF June 7	CEO Endorsement ESS	
PMIS 6512 ANNEX_06-SESP-June 2021	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).

This project will contribute to the following Sustainable Development Goal(s): *SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all and SDG 13. Take urgent action to combat climate change and its impacts. It will indirectly also contribute to SDG 3. Ensure healthy lives and promote well-being for all at all ages. SDG 5. Achieve gender equality and empower all women and girls. SDG 8. Promote sustained, inclusive and sustainable economic growth, full productive employment and decent work for all*				
This project will contribute to the following country outcome (UNDAF): *By 2023, Malawi has strengthened economic diversification, inclusive business, entrepreneurship and access to clean energy*				
	Objective and Outcome Indicators **(no more than a total of 20 indicators)**	**Baseline**	**Mid-term Target**	**End of Project Target**
Project Objective: Supporting access to clean energy by increasing the financial viability and promoting scaled-up commercial investment in minigrids in Malawi.	**Mandatory** GEF Core Indicator 6: *Indicator 1:* Greenhouse gas emissions mitigated (metric tons of carbon dioxide equivalent) *(Units of measure: metric tons of CO2e)*	Zero	N/A	1,068 (direct) 2,043,000 (indirect)
	Mandatory GEF Core Indicator 11: *Indicator 2:* Number of direct beneficiaries disaggregated by gender (and customer segment) as co-benefit of GEF investment Units of measure: number of people; number of connections disaggregated by customer segment	Zero	500 additional of which at least 250 women	763 additional persons of which 389 women --- 600 people (residential) 16 people (social) 147 people (commercial/PUE) 763 people (total) 120 connections (residential) 4 connections (social) 49 connections (commercial/PUE) 173 connections (total)

	Indicator 3: Number of direct primary jobs created in the minigrid sector, disaggregated by gender, for minigrid development, operation and productive use. *(Units of measure: Absolute number of direct jobs created)*	Zero	5 additional of which at least 2 women	10 additional of which at least 5 women
Project component 1	**Policy and Regulation**			
Project Outcome 1 Stakeholder ownership in a national minigrid delivery model is advanced, and appropriate policies and regulations are adopted to facilitate investment in renewable energy minigrids.	*Indicator 4: Number of policy derisking instruments for minigrid investments identified and endorsed by the national government.* *(Units of measure: Absolute number of policy derisking instruments)*	Minigrid regulatory Framework was newly published in July 2020. The resulting changes in the investment environment have not been assessed. Baseline of zero, counting amendments or additions to what is already established.	Remaining development risks identified on the basis of the Derisking of Renewable Energy Investments study. Next tier of policy and regulatory interventions for derisking identified and prioritized for Malawi. Policy and regulatory action plan formulated and endorsed by key stakeholders i.e., one plan incorporating any number of instruments relevant to the Malawi context.	1 new policy derisking instrument for renewable energy minigrids investment (e.g. standards, financial incentives / subsidy, etc.) identified and endorsed by the national government.

	Indicator 5: MSME, productive uses and district level data mapped and shared online to inform minigrid developments. *(Units of measure: binary (1/0))*	Least cost electrification plan for Malawi prepared, not including the proposed detail of interest to minigrids. Malawi Rural Electrification Plan published.	First iteration of map visualizing relevant data produced and shared.	Updated map incorporating MSME, productive uses and energyscaping data published on an open access, online platform.
Outputs to achieve Outcome 1	1.1 Geospatial, techno-economic modelling of least-cost off-grid renewable electricity technologies (minigrids, grid expansion, solar home systems) Energyscaping, Micro-, Small- and Medium Sized Enterprises and productive uses data digitized, mapped and shared on a suitable open access, online platform. 1.2 Minigrid DREI techno-economic analyses carried out to assess progress and propose most cost-effective basket of policy and financial derisking instruments. 1.3 An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying priority interventions for an integrated approach to off-grid electrification.			
Project component 2	**Business Model Innovation with Private Sector**			
Outcome 2 Innovative business models based on cost reduction operationalized, with strengthened private sector participation in renewable energy minigrid development	*Indicator 6: ?*Blueprint? for financially self-sustainable, small scale minigrid operations defined *(Units of measure: binary (1/0))*	Currently none of the minigrids operating in Malawi are self-sustainable.	Productive use offtake on two small minigrids significantly developed to identify inflection point for self-sustainability.	Business model defined with recommendations to guide future implementation of minigrids.
	Indicator 7: Number of minigrid pilots implemented that demonstrate a delivery model, cost-reduction measure(s) and/or productive use of electricity *(Units of measure: Absolute number of minigrid sites where pilots are implemented with project support)*	Baseline taken as zero specific to the AMP.	Two pilot sites demonstrating improved feasibility with PUE overlay	No further target.

	Indicator 8: Shortened development timelines for minigrid systems. *(Units of measure: Percentage reduction in development timelines)*	Baseline to be quantified at start of implementation. Processes were reported by multiple developers to be lengthy and unclear, especially for first time developers, but timelines have not been quantified / measured.	Baseline developed. First set of How to Guides and ?One Stop Information Centre? established. Development timelines monitored for users of the facility.	Development timelines for new minigrid systems improved by 25% relative to baseline.
Outputs to achieve Outcome 2	2.1: Extension of two minigrid pilots with productive uses to identify a business model suitable to small minigrid operations. 2.2: An online ?One Stop Information Centre? established with practicable guidance to developers for navigating unfamiliar and/or evolving regulatory processes from concept to commissioning.			
Project component 3	**Digital, Knowledge Management and Monitoring and Evaluation**			
Outcome 3 Data and digitalization are mainstreamed, across stakeholders, into local minigrid market development. Increased knowledge, awareness and network opportunities in the minigrid market and	*Indicator 9*. A digital strategy for the project is prepared and implemented by the relevant PMU to contribute to project implementation and local minigrid market development. *(Units of measure: binary (1/0))*	Digital strategy not currently in place.	Digital strategy developed and being implemented.	Digital strategy implemented. Complete dataset of all outputs and measured data from pilot projects. Comprehensive country specific knowledge resource with case studies, communications and training material.

among stakeholders, including benefitting from linkages to international good practice.	*Indicator 10:* Number of minigrid pilots sharing data on minigrid performance with the regional project and other stakeholders following best practices and guidance provided by the AMP Regional Project *(Units of measure: Absolute number of pilots sharing data)*	Baseline data from Mthembanji minigrid pilot project, Sitolo Minigrid and Mulanje Electricity Generation Company being collected but not aggregated.	The project?s ?digital & 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. Both (2) AMP minigrid pilot sites collecting and sharing data with the AMP Regional Project using the project?s ?digital & data management platform?.	At least 4 minigrid pilots are collecting and sharing data with the AMP Regional Project using the project?s ?digital & data management platform?.
Outputs to achieve Outcome 3	3.1: 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. 3.2: A Project_Digital strategy is developed and implemented, including linkages to and following guidance from the regional project with smart metering data aggregated, analyzed and disseminated. 3.3 Minigrids digital platform implemented to manage data from pilots, and to support minigrids scale-up and cost-reduction. 3.4: Active interface with regional project established, including, but not limited to, via (i) participating in Communities of Practice and (ii) capturing and sharing lessons learnt. 3.5: Industry association strengthened to advocate for and actively engage Government on behalf of private sector minigrid developers and operators. 3.6: M&E and Reporting, including (i) Conducting inception workshop and preparing report, (ii) Ongoing M&E, (iii) Mid Term Evaluation and (iv) 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).

Compilation of Comments submitted by Council Members of the GEF December 2019, Work Program. Regional project, GEF 7 Africa Mini-grids Program, UNDP (GEF Program Financing: $24,235,308) (GEF ID: 1043).

Table 1: Council Comments and Responses

Table 2: STAP Comments and Responses

Comment & Response	Reference
Council Comments (Germany):	

Comment & Response	Reference
1. Comment: *"Germany requests that the risk and co-financing sections of the document are revised to provide more information about how the project implementers intend to mobilize the proposed finance and what alternatives will be pursued in the event of delays or changes to the indicative funds. With around 344 Mio. USD, provided by 51 financiers, a well-managed and guaranteed flow of co-financing will be crucial to the project?s success. However, at this stage, co-financing sources and amounts are still indicative, thereby giving no assurance that finances will be made available."* **Response**: Indeed, co-financing and partnerships with the private sector and capital providers will be critical to the program?s success. During the PPG phase, discussions with co-financiers have been deepened and formalized. Details on this have been captured on this in both the CEO endorsement requests and project document. Measures to ensure that co-financing materializes will be addressed as follows, at the regional project and national project level: Regional project measures: (i) The AMP regional project will, as part of its monitoring activities under Component 5, track overall co-financing for the program, including co-financing for the regional project as well as for national projects. As per the regional project?s Stakeholder Action Plan (Annex 8), the regional project will be in a position to identify new sources of co-financing as a mitigation action for any of the sources confirmed at CEO Endorsement stage that do not materialize during implementation. (ii) UNDP is part of the Minigrid Funders Group (MGF), which represents the main donors and development agencies active in minigrids, which will provide a mechanism to coordinate with other key funders in the minigrids sector. (iii) UNDP?s oversight team for the regional project, and the regional project?s PMU, will monitor the realization of co-financing on an annual basis in the GEF PIR, and in the mid-term and terminal evaluation. (iv) The regional project?s Board is tasked in its TOR with tracking and monitoring co-financing. - - Malawi national project measures. The risk analysis for Malawi AMP includes consideration of co-financing risk. The risk is however considered low, with the bulk of the co-finance committed by partners with established relationships with the ACRE project and minigrids in the country. In addition, the following measures have been put in place: (i) UNDP?s Country Office, and the national project?s PMU, will monitor the realization of co-financing on an annual basis in the GEF PIR, and in the mid-term and terminal evaluation. (ii) The national project?s Board is tasked in its TOR with tracking and monitoring co-financing.	Malawi CEO endorsement request: - Table C Malawi national project document: - Section IV. RESULTS AND PARTNERSHIPS, and - Section VIII. FINANCIAL PLANNING AND MANAGEMENT. Regional project document: Section IV. RESULTS AND PARTNERSHIPS: - Description of Component 5); - Key Risks (Table 9) Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS: - Key Risks, and Section VII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

Comment & Response	Reference
2. Comment: *"Germany requests **clear identification of relevant stakeholders for all countries and all program components**, including regional and national agencies, technical stakeholders (implementation phase), strategic partners and relevant companies for e.g. capacity building. The program includes 11 African countries and numerous stakeholders. For some countries, relevant ministries and relevant technical implementation partners have been appointed, for others not."* **Response**: All relevant stakeholders have been identified for Malawi and included in the project document?s comprehensive Stakeholder Engagement Plan (Annex 9). Stakeholders identified as partners and potential partners are also highlighted in the project document, Section IV. RESULTS AND PARTNERSHIPS The Executing Agency/implementing partners for Malawi has been identified as the Ministry of Energy (MoE).	Malawi Project document: Annex 9 and Section IV. RESULTS AND PARTNERSHIPS Malawi CEO endorsement/ approval request document: - (Part II, Section 6 - Institutional Arrangement and Coordination) And Malawi Project document: - Section VII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

Comment & Response	Reference
3. Comment: *"Germany requests a **breakdown of component 2 activities**, including more details on the project approach under Component 2. A large part of the program?s allocated funding is for investments in this component (49% of total budget). However, the activities in this component are not sufficiently described. Given the importance to the project outcomes, Germany would also **recommend further describing how project activities contribute to the project?s overall theory of change.**"*	
Response: Malawi National project: Component 2 activities, which include GEF INV for minigrid pilots, for the AMP in Malawi are comprehensively described in the project document, Section IV, RESULTS AND PARTNERSHIPS. The contribution of the respective components to the national project?s theory of change has been detailed in the project document Section III, strategy, immediately following the TOC diagram. Regional project. At the program level, the contribution of minigrid investment pilots to the program?s overall TOC has been further explained in the Strategy Section of the AMP Regional project document as follows: *?Minigrid investment pilots? contribution to the Program?s TOC: National Projects include funds, under Component 2 (Business model innovation and private sector), for supporting minigrid investment pilots seeking to demonstrate innovative business models and cost-reduction opportunities. Minigrid pilots have a key role within AMP by contributing to demonstrate cost-reduction which can be leveraged to improve the financial viability of renewable energy minigrids. Minigrid pilots are aligned with one or more of the three key areas of opportunity mentioned above by demonstrating: (i) a particular delivery model or elements of a delivery model around which the government wishes to build capacity and engage with minigrid developers; (ii) productive uses of electricity and their potential to reduce costs and enable minigrid development at scale; and/or (iii) opportunities around digitalization and the use of data for minigrid cost reduction. Feedback loops to other national project activities (e.g. national dialogues, capacity building) and with the AMP Regional Project (e.g. Community of Practice) are intended to actively disseminate the learnings from the pilots to inform both the policy and regulatory environment as well technical capacity building.?*	Malawi National project document: Section IV. RESULTS AND PARTNERSHIPS - Component 2 description Malawi National project Document: Section III. STRATEGY Regional Project Document: Section III. STRATEGY

Comment & Response	Reference
4. Comment: *"Experiences with implementing mini-grids in Africa have proven that high financial costs are linked to high financial risks in local markets. The proposal considers the risk, but* ***Germany recommends that special attention should be given to financial risk reduction and risk-hedging approaches****. The risk section should be revised accordingly.* ***The lack of skilled technical staff is a further risk that requires greater consideration****. Germany recommends a greater focus on capacity building for skilled technicians."* **Response**: Effectively and efficiently addressing investment risks will be key to transforming local minigrid markets. AMP?s design - both at national and regional project levels - will use UNDP?s innovative Derisking Renewable Energy Investment (DREI) framework to identify, quantify and then target the underlying risks that are driving high financing, investment and operation costs. The DREI framework facilitates selection from a menu of possible policy and financial derisking instruments which can then reduce, transfer of compensate for these risks. Following the performance of a DREI techno-economic analyses in Malawi in year 1, in Output 1.2, findings can then shape follow-on project and partner activities. Lessons learnt at national level in each country will be aggregated into regional knowledge products by the AMP Regional Project and disseminated widely. Other than the capacity building done on site for the pilots, capacity building for skilled technicians have not been specifically targeted under the AMP in Malawi. This was informed by (a) the most immediate priorities identified in consultation with stakeholders and (b) existing work already initiated in the country to develop training material and build capacity in this area. These existing initatives include (i) skills development within local communities for O&M and grid expansion by Community Energy Malawi (CEM), (ii) comprehensive practical design and implementation training modules developed under the earlier GEF-funded Increasing Access to Clean and Affordable Decentralised Energy Services for Selected Vulnerable Areas of Malawi project and the parallel Access to Clean and Renewable Energy (ACRE) project that includes an activity focused on providing technical assistance and training in operation, maintenance and management of mini grids and establishing last mile connections (Activity 1.5 under ACRE).	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS ? Description of Component 1
Council Comments (Norway/Denmark):	
5. Comment: *"USD 1,303,576 is budgeted for Program Management Cost (i.e. ca. 5%) presumably for implementing the various components"* **Response**: Comment targeted at program level and addressed in the regional project response. Details of the Malawi AMP co-financing, fees and Project Management Costs are included in the documents.	

Comment & Response	Reference
6. Comment: *"USD 2,181,178 in addition is requested from the UNDP, i.e. ca. 8.3% - is this on top of the fee above? "* **Response**: Comment targeted at program level and addressed in the regional project response. Details of the Malawi AMP co-financing, fees and Project Management Costs are included in the documents.	
7. Comment: *"Estimated co-financing is USD 344,310,000 ? of this only about USD 95 mill is loans (from WB, GCF, AfDB and GIZ), or ca. 28%. This is to be expected as there are still not strong business models for mini-grids without significant grant financing. "* **Response**: Agreed. Minigrids still require grant financing and concessional lending which is why the co-financing sources identified for AMP include a mix of grants and loans with loans representing a smaller fraction of the total co-financing.	
8. Comment: *"Output 2.1 stipulates that ?Pilots developed, including on productive use/innovative appliances and modular hardware/system design, leading to cost-reduction in mini-grids? ?* ***are there not a lot of lessons that can be gained from existing mini-grid programs now****? "* **Response**: While the program builds on lessons learned from previous projects and programs, minigrid markets in many countries overall remain immature, and there is a strong need for continued piloting of minigrids. The emphasis for minigrid pilots (Output 2.1) will be on piloting and showing proof-of-concept business models. To provide a better recount of lessons learned the program builds off from, a section on lessons learned has been added to regional project document, section III Strategy.	Regional Project Document: Section III. STRATEGY

Comment & Response	Reference
9. Comment: *"Output 3.3 ?General market intelligence study on mini-grids prepared and disseminated amongst public officials and finance community? ?* ***how will this be different from existing market intelligence,*** *for example:* ? https://www.esmap.org/mini_grids_for_half_a_billion_people ? https://eepafrica.org/wpcontent/uploads/EEP_MiniGrids_Study_DigitalVersion.pdf ? https://www.reeep.org/mini-grid-development-africa *There is also at least one existing ?community of practice?:* ? http://ledsgp.org/community/africa-mini-grids-community-ofpractice/?loclang=en_gb *Similarly,* ***how will the knowledge tools (4.1) be different from/build on others****?"* **Response**: This comment is not applicable to Malawi, as it does not have this output. Regional project: Knowledge tools Comment targeted at program level and addressed in the regional project response.	

Comment & Response	Reference
10. Comment: *"**How will the implementers ensure that markets are not undermined?** There arecurrently several mini-grids invested in by commercial actors (e.g. Norfund in Madagascar - https://www.norfund.no/newsarchive/lighting-up-madagascar) and the program should provide assurances that it will not undermine markets through **(overly) subsidized** new mini-grids (e.g. if a few villages are connected to a mini-grid which has been commercially invested in and pay a relatively high tariff, **it can lead to discontent** if another few nearby villages are connected to a new mini-grid that due to a higher level of grant financing pay a lower tariff)."* **Response**: Risk of overly subsidization of new minigrids. To avoid any over subsidization, the level of subsidy that will be applied to GEF ?Investment? (INV) funds will be based on a minimum concessionality principle. This principle can be achieved methodologically in different ways, for example by ensuring LCOE parity with a reference tariff; or based on willingness/ability to pay (which may be determined by a 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 recipients of pilot support. Each project?s CEO endorsement/approval request document (and UNDP Project Document) elaborates on this principle and establishes the need for each national project to 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). Among other key aspects, the project?s Minigrid Plan Pilot Plan will determine the project?s approach to ensure minimal concessionality for the level of GEF INV support to the pilot(s). 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. In addition, for Malawi, it should be noted that the focus of the pilot projects is on developing a self-sustainable scalable and replicable business model(s) for minigrids implementing PUE in multiple agricultural value chains. This will include, among others, concurrent techno-economic modelling and analysis as well as financial feasibility assessment and tariff setting against willingness to pay intended to inform tariff design in future developments. Potential social discontent on tariffs. Even when avoiding the risk of over subsidization of minigrid pilots by applying the minimum concessionality principle, there is a possibility that new minigrids have lower tariffs than existing minigrids which were developed with a lower grant element and/or in general incurred in relatively higher costs. As minigrids scale, and costs decline over time, electricity tariffs (particularly cost-reflective electricity tariffs) are expected to decline as well. Mitigation for this risk comes from the systematic national dialogue that national projects will promote and support under Component 1, concretely under Output 1.3. ?An inclusive national dialogue to identify minigrid delivery models is facilitated, clarifying priority interventions for an integrated approach to off-grid electrification?. Results from activities implemented in parallel under the other outputs will loop their respective (pre-)results back into the national dialogue discussions. This will include, but not be limited to, activities which can shed light on trends and progress regarding minigrid cost reduction, and the interplay between subsidies and electricity tariffs.	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS ? Description of Component 2 Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS ? Description of Component 1.

Comment & Response	Reference
Council Comments (Canada):	
11. Comment: *"Mini-grids can have important impacts on development, including on energy access, agriculture, health and education.* ***It would be interesting if the project could explore opportunities to make further linkages with rural development programs****."* **Response**: Indeed, energizing productive uses of energy in rural communities unlocks agricultural value and rural economic development that initiates a virtuous cycle of growth: increased and more predictable demand for electricity that improves the viability of minigrid operations, lowers the costs of supply and in turn improves affordability and gives more people access. In Malawi, rural industrialization and value addition have been included as a prominent focus of the AMP, including: - Output 1.1 (Geospatial mapping) makes provision for value chain mapping as a data overlay. - Output 2.1 (pilot projects) focuses on implementing PUE in multiple agricultural value chains as an enabler and accelerator for minigrids in Malawi. -	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS ? Description of Components 1 and 2

Comment & Response	Reference
12. Comment: *"The mini-grids program has value for engagement where there are market failures,* ***and there should be entry points for the private sector****.* *The project is also was well-aligned with Ethiopia?s Growth and Transformation Plan and its objective of ?Building Climate Resilient Green Industry? and ?Expanding Energy Infrastructure and Ensuring its Quality?.* **Response**: We agree with this statement. AMP seeks to scale commercial and private investment in minigrids. Market failures will be identified and addressed. The design and activities of AMP Malawi, seeks to create multiple entry points for the private sector. This includes (but is not limited to): - Output 1.3 on national dialogues, where delivery models will be explored and identified that engage private sector. - Output 1.2 on DREI techno-economic analyses, where the private sector will undergo structured interviews on their risk perceptions. - Output 2.1 on pilots, where the objective of the PUE overlay and business model ?blueprint? is to reach a critical level of electricity sales to secure financial viability to electricity providers and encourage private sector players. - Output 2.2 establishing an ?One Stop Information Centre? hosted by the industry association with practicable guidance to developers for navigating unfamiliar and/or evolving regulatory processes from concept to commissioning. - Output 3.4 strengthened the industry association to advocate for and actively engage Government on behalf of private sector minigrid developers and operators.	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS
Council Comments (United States):	

Comment & Response	Reference
13. Comment: *"The proposal addresses social acceptance risk but offers the use of policy and financial de-risking measures as a way to reduce cost, thereby increasing social acceptance risk. It does not address the value of messaging or public promotions and education campaigns to lower that risk further. Also, the program mentions working groups, but does not elaborate on make-up of the groups or state a commitment that the working groups will include representatives from local and community consumer and user stakeholders. Reviewers suggest a mechanism to ensure these groups include consumer stakeholders, indigenous representatives, and local authorities to educate and seek input on unexpected effects or consequences of the project at the local level."* **Response**: AMP Malawi has considered risks arising from lack of awareness and resistance to renewable energy and minigrids in communities, among other risks driving high costs for minigrid development. Social acceptance issues are usually due to due to unfamiliarity with electricity and renewable energy sources; mis-information/perceptions and lack of awareness for mini-grid offerings; resistance from incumbent businesses (e.g., diesel based generation) and users (e.g., SHS), which can get disrupted by minigrids. AMP Malawi seeks to address this risk by engaging and consulting with a diverse array of stakeholders, including representatives from local and community consumer and user stakeholders as per the Stakeholder Engagement Plan (Annex 9). In addition, salient among opportunities to engage and consult with representatives from local and community consumer and user stakeholders, is the national dialogue on delivery models Output 1.3.	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS

Comment & Response	Reference
14. Comment: *"Finally, the program will promote a value chain approach to technology transfers that will integrate local labor and local industries / service providers in the development of solar PV-battery minigrids. Reviewers note that monitoring the value chain periodically to ensure sufficient local integration (or make the necessary adjustments) will be important to the success of the project. GEF may want to consult with experts at the U.S. Department of Energy?s Office of Electricity, which works with U.S. state and local electricity officials and industry groups, to share data and best practices"* **Response**: Local labor and industries, together with local private sector developers and service providers, will be a key element in the long term viability and sustainability of the minigrid market in Malawi. At the national project level, the AMP will contribute alongside existing initiatives to build capacity and encourage local industry and skills development. Specifically, the AMP will focus on empowering the local industry association to serve as a strong collective custodian and voice for the industry that can contribute to removing barriers to entry and sector growth as well as promote public and private sector coordination towards the cost optimization and localization of the minigrid industry and towards climate change, sustainable development and other national objectives. At the regional project level, component 1 ?Knowledge Tools? will curate and disseminate materials and reports detailing examples of good practice in this area. The work developed by the U.S. Department of Energy?s Office of Electricity, with U.S. state and local electricity officials and industry groups, is one of the resources that will be leveraged for this purpose. In addition, supply chain actors and the private sector are stakeholders that will participate as members of the AMP community of practice and benefit from South-South cooperation, knowledge sharing, identifying common challenges, and reviewing outputs of the AMP.	Malawi national project document: Section IV. RESULTS AND PARTNERSHIPS Regional Project Document: Section IV. RESULTS AND PARTNERSHIPS
Comment & Response	**Reference**

Comment & Response	Reference
1. Comment: *Mini-grids have much potential to bypass old development pathways for electrification. However, there is also growing literature on their pitfalls, which should be addressed. As with other GEF project proposals, more effort is needed to engage with the peer-reviewed literature on the topics. Examples of literature in this genre include:* ? Mini-Grids for the Base of the Pyramid Market: A Critical Review (*https://www.mdpi.com/1996-1073/11/4/813*); ? Mini-grid based off-grid electrification to enhance electricity access in developing countries: What policies may be required? (*https://www.sciencedirect.com/science/article/pii/S0301421516301781*); ? Rethinking the sustainability and institutional governance of electricity access and mini-grids: Electricity as a common pool resource (*https://www.sciencedirect.com/science/article/pii/S2214629617303638*); ? Institutional Innovation in the Management of Pro-Poor Energy Access in East Africa (*https://www.sussex.ac.uk/webteam/gateway/file.php?name=2015-29-swps-gollwitzer-etal.pdf&site=25*). **Response**: At the national project level, the project design drew on lessons from multiple country projects, consultations with minigrid experts and development partners and extensive literature review, including (but not limited to): - GIZ, GET.transform (2020). A Renewable Energy Minigrid Technical Assistance Guide. Take-aways from 15 years of GIZ support in minigrid market development. April 2020. - UNIDO (2020). Clean energy mini-grid policy development guide Fast tracking rural electrification through accelerated and precise mini-grid policy formulation. - AMDA (2020). Benchmarking Africa?s minigrids. - SEforAll, BNEF and MGP (2020). State of the Global mini-grids Market Report 2020. Trends of renewable energy hybrid mini-grids in Sub-Saharan Africa, Asia and Island Nations. - IRENA (2016). Innovation Outlook: Renewable Mini-grids. - IRENA (2016). Policy and regulations for Private Sector Renewable Energy Mini-grids. - ESMAP (2019). Mini Grids for half a billion people. Market Outlook and Handbook for Decision Makers. Technical Report 014/19. - IFC (2020). Off-grid Solar. Market Trends Report 2020. - University of Strathclyde (2018). Mini-grids in Malawi: Status, Opportunities and Barriers. - University of Strathclyde (2020). Assessing the market for Solar Photovoltaic Microgrids in Malawi.	

Comment & Response	Reference
2. Comment: Furthermore, there is considerable literature on the opportunities presented by blockchain technology for energy projects like this, including for renewable energy generation, distribution and management. STAP recommends that the project proponents explore the possibilities of using this technology to enhance the global environmental benefits of the project. Examples of relevant literature on this include: ? STAP?s blockchain paper (http://stapgef.org/harnessing-blockchain-technology-delivery-global-environmentalbenefits); ? Blockchain technology in the energy sector ? (https://www.sciencedirect.com/science/article/pii/S1364032118307184); ? Blockchain meets Energy (https://fsr.eui.eu/wp-content/uploads/Blockchain_meets_Energy_-_ENG.pdf); ? Blockchain: A true disruptor for the energy industry (https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-blockchaindisruptor-for-energy-industry.pdf). **Response**: As part to the PFD addendum approved in June 2021, a new component has been added to the regional project focused on mainstreaming the use of digital tools and solutions across national child projects and other national stakeholders. This is premised upon the notion that digitalization offers great potential for minigrid cost reduction. While no specific emphasis has been placed within AMP on developing Blockchain applications, the Regional Project will knowledge-build on and identify opportunities to add value via the use of digital tools and solutions for planning, operations, financing and other key applications.	

Comment & Response	Reference
3. Comment: A generic diagram of the theory of change for mini-grids is presented which starts with a diagnosis of risks and then proposes how to address them. However, this is linear and has only one step. There needs to be consideration of how particular kinds of policies could lead to change rather than just stating that policies will address the diagnostics. This diagram needs to be refined with more steps that unpack points like ?innovative financing? and ?business model and innovation? and ?policies and regulations.? Please see STAP paper on theory of change for further guidance: http://stapgef.org/theory-change-primer. **Response**: The theory of change diagram for the program has now been further developed and refined to unpack key policies/activities under each of the four main components, which indeed feed back to address the originally identified risks. A new outcome column has also been inserted. The country specific theory of change has also been amended to incorporate the refinements made at program level. This new theory of change diagrams are now reflected in the national project documents, as well as regional project documents as relevant.	Malawi national project document: Section III. STRATEGY Regional Project Document: Section III. STRATEGY
3. Is the objective clearly defined, and consistently related to the problem diagnosis? **Comment**: Yes. **Response:** NA	
4. A brief description of the planned activities. Do these support the project?s objectives? **Comment**: Nicely described with clear objectives. **Response:** NA	

Comment & Response	Reference
5. A description of the expected short-term and medium-term effects of an intervention. **Comment**: These are adequately provided. **Response:** NA	
6. A description of the products and services which are expected to result from the project.Is the sum of the outputs likely to contribute to the outcomes? **Comment**: Adequately provided. **Response:** NA	
7. Is the baseline identified clearly? **Comment**: Baselines are linked to earlier Child projects. **Response:** NA	

Comment & Response	Reference
8. What is the theory of change? **Comment**: There is a growing literature on the barriers to minigrid adoption. As with other GEF project proposals, more effort is needed to engage with the peer-reviewed literature on the topic. An example of an article in this genre which is open source is linked here: https://www.mdpi.com/1996-1073/11/4/813 - **Response**: - At the national project level a preliminary assessment of barriers and risks to minigrid adoption in Malawi was included as part of Section II, Development Context. This informed the country specific theory of change included in the strategy section. This preliminary view will be supplemented by the Derisking of RE Investment study (Output 1.2) that will focus on country specific barriers and risks during implementation.	National Project Document: Section III. STRATEGY
9. GEF trust fund: will the proposed incremental activities lead to the delivery of global environmental benefits? **Comment**: Cost reasoning is well defined. Monitoring and evaluation is noted adequately through the Child projects phase. The prior usefulness of these monitoring mechanisms should be reviewed. **Response:** At a national project level monitoring and evaluation has been expanded into a Quality Assurance and Management Framework (QAMF) that will aggregate data across the program and will link to specific outputs (e.g. publications and insight briefs) and intelligence to ensure the usefulness of collected data.	

Comment & Response	Reference
10. Are the benefits truly global environmental benefits, and are they measurable? **Comment**: The proposal identifies carbon mitigation benefits with adequate referencing of methods. Tradeoffs are not discussed but should be, in terms of reliability failures that can happen with mini-grids. What are the backups to prevent diesel generators from still being frequently used? Resilience needs to be built into the grid architecture to address times of power outages. **Response**: Minigrids are generally characterised by a very high availability. A recent report by the Africa Minigrid Developers Association (Benchmarking Africa?s Minigrids) shows that uptime of all monitored minigrids is 99% on average, which is significantly higher than all national interconnected grids. When power outages occur in minigrids, it is rarely due to inverter failure, but rather because the system shuts down due to overload or low battery state-of-charge (if there is no diesel generator), or because the diesel generator fails. Recent evidence is revealing that diesel generators are now more prone to failure than the renewable energy components. To prevent power outages, a minigrid should be sufficiently dimensioned. This can lead to larger amounts of excess energy being available at non-peak times, which cannot normally be used and reduce the overall system efficiency. Currently, new approaches are being developed that take advantage of artificial intelligence to manage loads, based on machine learning and stochastic optimization. Examples include intelligent control of diesel generators to minimise fuel consumption, demand side management to precisely control deferrable loads (e.g. water pumps) that can consume excess energy. All this leads to minimising outages and the need to use diesel generators. Current challenges with the reliability of power supply in Malawi are highlighted in the Project Document in Section II. DEVELOPMENT CHALLENGE. At a national project level, consideration was also given to the use of diesel generation, both at national level and at the pilot sites. A summary of findings is included in the Project Document as Annexure 22. The findings showed that Malawi has a relatively small market (by number of units and energy generated) of diesel generators in use. It also showed that solar is generally cheaper than diesel only systems: ?In every location within the inclusion zone the Cost of Energy for a solar microgrid was less than a diesel mini-grid in the same location, with improvement of solar microgrid COE over diesel microgrid COE ranging from 0.03 $/kWh to 1.19 $/kWh?. For the two pilot sites, no diesel generation was previously in use.	National Project Document, Section II. DEVELOPMENT CHALLENGE. National Project Document: Annexure 22

Comment & Response	Reference
11. Is the project innovative, for example, in its design, method of financing, technology, business model, policy, monitoring and evaluation, or learning? **Comment**: Proponents have partnered with Rocky Mountain Institute which has a distinguished record of innovative approaches to energy policy and there are clear highlights of scaling out (even though they note this as scaling ?up?). There is a focus on finding innovative ways of cost reduction and also to consider financing linkages between minigrids to promote resilience following the Rockefeller Foundation?s CrossBoundary Energy Access (CBEA) investment. **Response:** NA	

Comment & Response	Reference
12. Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers? **Comment**: Adequate presentation of stakeholders through the UNF Minigrid Partnership. However, diesel generation industry is quite widespread in Africa and how to ensure they don?t sabotage prevalence of project and have incentives for new livelihoods should be considered. **Response**: Experience shows that deep-rural villages are usually not a market for the diesel generator industry as such. In many villages, however, individual owners of diesel or petrol generators can be found selling electricity to the neighborhood(s). These business models no longer work when a minigrid supplies the village with electricity. However, there is a significant demand for skilled labor in the minigrid sector. The local diesel generator operators can become important here, as they have the technical know-how on the one hand and know the respective village very well on the other. These skills can be put to good use, for example, for the rapid establishment of PUE, or in the context of rural industrialization approaches (e.g. KMM). At a country level consideration was given to diesel generators / generation in Malawi with an overview of the findings included as a new Annex 22 to the Project Document. It found that the use of diesel generation in the country is limited, therefore confining the impact and risk of solar PV minigrids disrupting established industries and livelihoods. This was echoed by the monitoring and evaluation baseline done at the two pilot sites, preceding the development of the pilot projects to which the AMP will contribute the PUE overlay. Community members were specifically asked which energy sources they already used. None of the participants in the survey was currently using diesel generators. Additionally, the questions regarding income levels revealed a low ability and willingness to pay, suggesting diesel generators are too expensive for most community members. Acknowledging that there remain a level of risk, this risk and related mitigation actions have been added to the risks log and elaborated upon in the CEO Endorsement request/approval document (Part II, section 5).	National project document, Annex 22 and included as a risk in Annex 7. National project CEO Endorsement request, Part II, Section 5.
13. Have gender differentiated risks and opportunities been identified, and were preliminary response measures described that would address these differences? **Comment**: Yes ? there is a fairly detailed section on gender aspects of this project. **Response:** NA	

Comment & Response	Reference
14. Are the identified risks valid and comprehensive? Are the risks specifically for things outside the project?s control? **Comment**: Identified. Detailed climate risk assessment should be carried out. **Response:** A climate risk assessment has been performed and is included as Annex 17 Malawi Project Document.	
15. Are the project proponents tapping into relevant knowledge and learning generated by other projects, including GEF projects? **Comment**: Good coordination details provided based on historical relations as well. **Response:** NA	
16. What overall approach will be taken, and what knowledge management indicators and metrics will be used? **Comment**: Identified and details adequately provided. **Response:** NA	

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

PPG Grant Approved at PIF: **10,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent To date***	***Amount Committed***

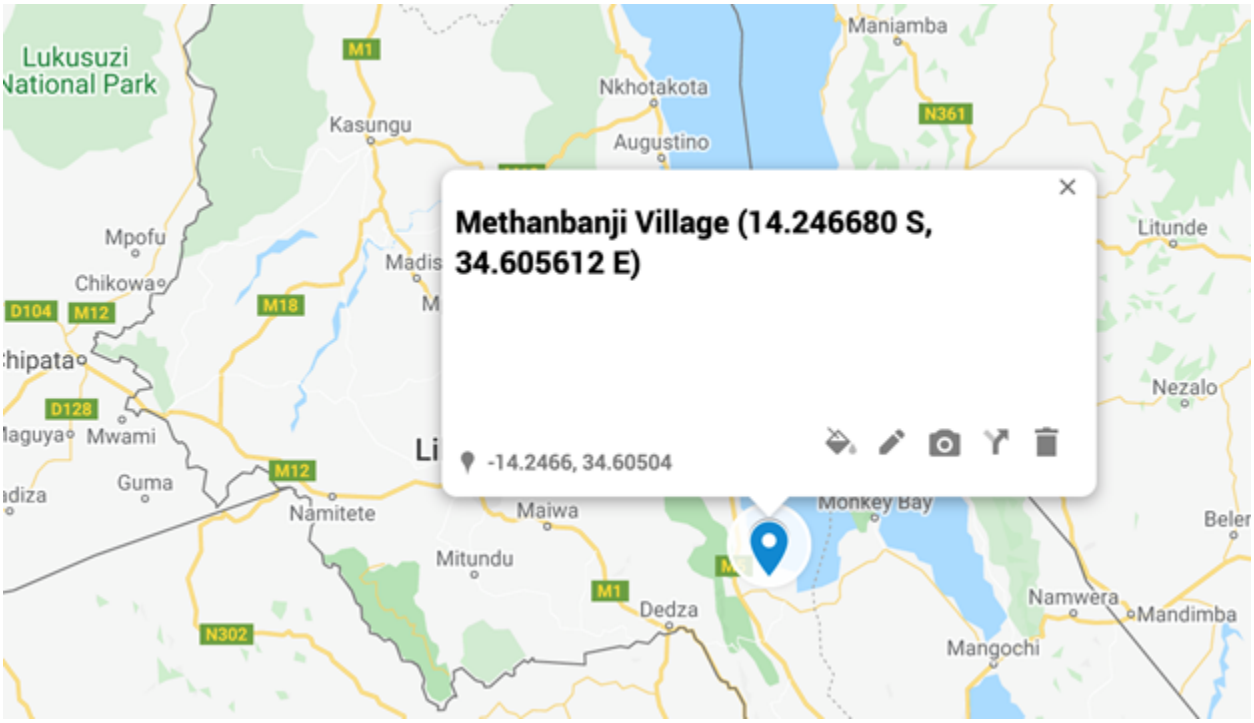
Technical assistance (design technical elements as well as all the required financial and administrative components of the project)	10,000	7,000	3,000

ANNEX D: Project Map(s) and Coordinates

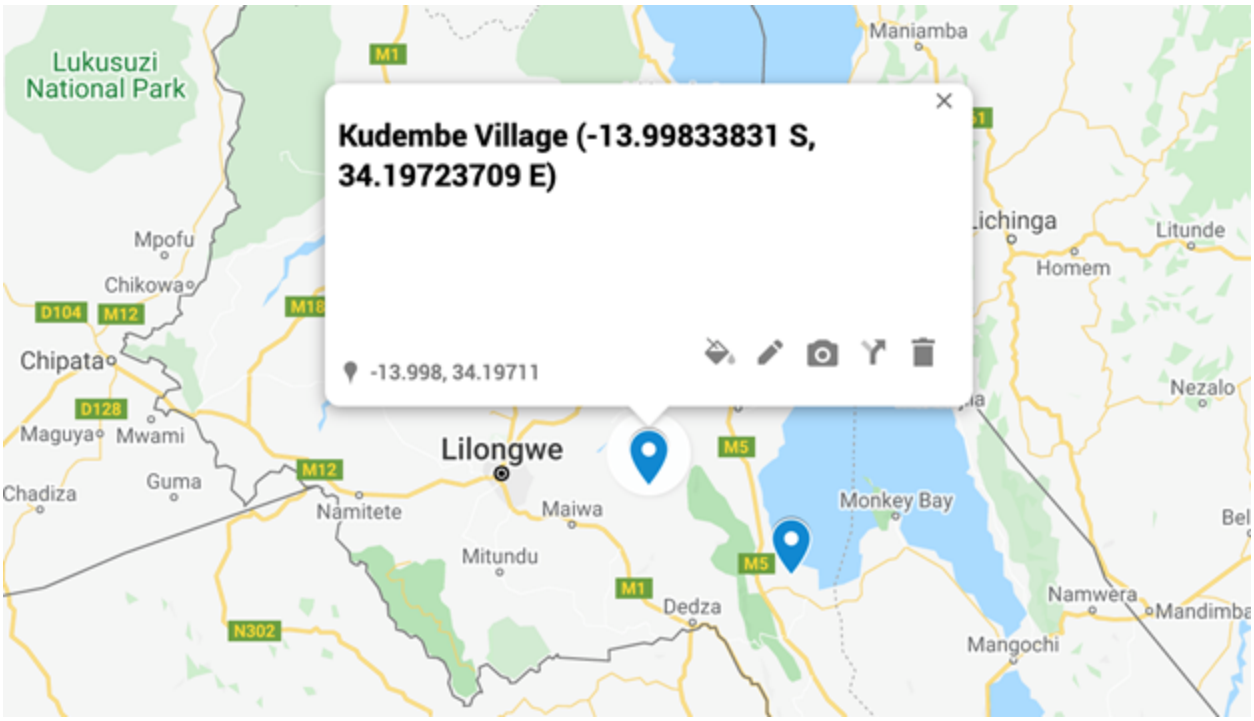
Please attach the geographical location of the project area, if possible.

The Productive Use of Energy overlay pilot projects will be developed at Mthembanji and Kudembe Villages.

The Mthembanji village is located in Katchindamoto Traditional Authority in Dedza district, relatively close to lake Malawi. The GPS coordinates for the site are -14.246680 S, 34.605612 E.



Kudembe is also located in Katchindamoto Traditional Authority in Dedza district relatively closer to Lilongwe than Mthembanji. The GPS coordinates for the site are -13.99833831 S, 34.19723709 E.



ANNEX E: Project Budget Table

Please attach a project budget table.

Expenditure Category	Detailed Description	Component (USDeq.)						Total (USDeq.)	Responsible Entity
		Component 1	*Component 2*	*Component 3*	*Sub-total*	*M&E**	*PMC*		(Executing Entity receiving funds from the GEF Agency)[1]
		Sub-components 1	*Sub-component 2*	*Sub-component 3*					

Equipment	Procurement of PUE equipment and electrical appliances for the two pilot sites estimated to include 3 x rice mills ($11,111), oil pressing machine ($11,000), various PUEs including Egg incubation machine, peanut butter machine, internet caf? facilities with printer at both sites (budgeted at $12,000) as well as allowance for a variety of domestic PUEs for cottage industries including hair clippers, TVs, fridges, household rechargeable torches, budgeted at ($8,700). [Total 42,810]		42,810?		42,810			42,810	Ministry of Energy (IP); University of Strathclyde (UoS)

Contractual services-Company	Contractual services under Component 1 funded from the GEF allocation, are foreseen to include: - An allowance of $2,000 for the establishment, convening and hosting of a technical workgroup to oversee the geospatial mapping. [$2,000] - Allowance for an upgrade of the existing MOE data platform [$13,000]. - Part funding ($50,500) towards the sourcing of data and developing of GIS-based mapping information to supplement grid expansion planning and facilitate the identification of areas suited to mini-grids in Malawi. The complete contract value with the UNCDF is expected to be $260,000 (remainder funded from TRAC resources) over the first twenty-four months of implementation. [$50,500] - An allowance of $ 7,000 to support the	72,500			72,500			72,500	Ministry of Energy (IP); United Nations Capital Development Fund (UNCDF)

Contractual services- Company	Contractual services under Component 2 funded from the GEF allocation, are foreseen to include: - Delivery and operation of PUE overlay including all logistics, design and development, implementation of appliance subsidies, PUE operational and business development training, agriculture field support to farmers, coordination of MFI financing offer, Social and environmental impact monitoring, gender action plan, stakeholder consultation as well as continued refinement to system utilisation, PUE operations and tariffs in response to feedback from techno-economic and business modelling. It also includes securing continuation of minigrid system operations support post 2023 (EASE co-finance until 2023) . [Total		117,024		117,024			117,024	Ministry of Energy (IP); University of Strathclyde (UoS)

Contractual services-Company	Contractual services under Component 3 funded from the GEF allocation, are foreseen to include: - Implementing of data strategy, Output 3.2. Contract service provider to set up digital platform, develop data protocols and central database to automatically collate data from participating projects (pilots plus UNDP supported (Sitolo, MEGA, others) into a central database that meets specifications provided by the regional project including confidentiality of data and standardised reports, tracking of trends. Total costing of contract includes all hardware, software (budgeted at $10,000), licensing fees (budgeted at $500 per annum per pilot site), maintenance and support that may be relevant. [Total:			110,291	110,291			110,291	Ministry of Energy (IP)

International Consultants	International consultants for Component 3 funded under the GEF budget allocation: - Provision of $5,000 during first year of implementation for the procurement of international consultant / Technical Advisory support from the Regional Project for design of data strategy. - Appointment of a gender specialist to develop a gender brief as per gender action plan ($5,000). [Total $10,000]			10,000	10,000			10,000	Ministry of Energy (IP)
Local Consultants	Provision is made for input from a gender specialist to support data analysis and interpretation $2,000 per week for 3.75 weeks during 2022. An additional 1.25 weeks are funded from the UNDP funding allocation (see budget note 4 below)	7,500			7,500			7,500	Ministry of Energy (IP); United Nations Capital Development Fund (UNCDF)

Local Consultants	Local consultants for Component 3 funded under the GEF budget allocation: - Procurement of technical writer(s) to develop lessons learnt drawing on data from QAMF, database outputs and inputs from the regional project to guide format. Budget estimate of $3,000 per year based on two to four case studies per year depending on the extent of research and data analysis required to produce content. Note. One case study to be dedicated to gender impacts as per the gender action plan. ($12,000)			12,000	12,000			12,000	Ministry of Energy (IP)
Travel	Allowance of $3,000 per year for travel by members of the project team (4 year implementation).				-		12,000	12,000	Ministry of Energy (IP)

Other Operating Costs	Provision of $3,000 professional services per year for auditing of the project (4 year implementation).				-		12,000	12,000	Ministry of Energy (IP)
Grand Total		**80,000**	**159,834**	**132,291**	**372,125**	**-**	**24,000**	**396,125**	

Note: * The M&E activities under the project are funded through UNDP co-financing resources. Under Component 3, UNDP funding has been allocated to the M&E sub-component, for the procurement of International Consultants ($12,000), conducting the independent evaluations of the project ($72,000) and for organization, logistics and catering for the inception workshop ($3,000).

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 Agencys 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).