GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

PART I: PROJECT INFORMATION

Project Title: Promotion of small hydropower-based mini-grids for a better access to modern energy services in Central African Republic.			
Country(ies):	Central African Republic	GEF Project ID:	9291
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5680
Other Executing Partner(s):	UNDP – Direct Implementation Modality	Submission Date:	22 December 2017
GEF Focal Area (s):	Climate Change	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of Parent Program	n/a	Agency Fee ($)	251,275

A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in $) GEF Project Financing	(in $) Co-financing
CCM-1 Program 1	Programme 1: Promote timely development, demonstration and financing of low carbon technologies and mitigation options	GEFTF	2,645,000	16,658,000
	Total project costs		2,645,000	16,658,000

B. PROJECT DESCRIPTION SUMMARY

Project Objective: To promote investment in small hydro-power (SHP) mini-grids and develop an appropriate business model for the sustainability of the provision of rural energy services.

Project Components/ Programs	Financing Type	Project Outcomes	Project Outputs	Trust Fund	(in $) GEF Project Financing	(in $) Confirmed Co-financing
1. Policy and financial instruments and incentive scheme for small hydropower (SHP) based mini-grids.	TA	Institutional and financial viability of SHP mini-grid ensured.	1.1 Policy package to develop and operate SHP-based mini-grids adopted. 1.2 Financial instrument to support SHP mini-grid development, adopted and implemented 1.3 Tariff criteria for SHP- based mini grids defined. 1.4 Dedicated window at national clearinghouse (one-stop shop) for SHP developers established.	GEFTF	250,000	600,000
2. Capacity Development for SHP based mini-grid system operation, maintenance and	TA	Capacity to deliver turnkey solutions and quality O&M&M services for SHP developed.	2.1 Published Guidebook on SHP-based mini-grid development. 2.2 On-the-job capacity	GEFTF	300,000	708,000

management (O&M&M).			development programme for SHP (men and women) plant developers delivered, including on plant design, construction, equipment selection, assembly and O&M. 2.3 Business and technical advisory services to mini-grid plant developers (men and women). 2.4 Tailored capacity development programme delivered to relevant national agencies.			
3. SHP-based mini-grids roll-out.	Inv	A functioning business model is demonstrated for the technical and financial viability of small hydro-based plants.	3.1 8 sites for mini-grids identified and assessed, and institutional/investment model defined. 3.2 At least 4 public private partnerships are established for the exploitation of SHP plants and mini-grids. 3.3 2 MW of SHP-based power generation capacity. 3.4 At least 2 selected sustainable O&M&M model demonstrated for all mini-grid schemes. 3.5 Productive use promoted to increase electricity demand in the 8 targeted sites.	GEFTF	1,750,000	14,750,000
4. Knowledge Management and knowledge sharing	TA	Increased awareness about SHP potential, investment climate and gender mainstreaming	4.1: National Plan to implement outreach/promotional activities targeting both domestic and international investors. 4.2: Published materials (including video) and informational meetings with stakeholders on project experience/best practices and lessons learned. 4.3: Dissemination of project results and lessons learned within the country and in the region. 4.4 Dissemination of	GEFTF	220,000	400,000

			lessons learned on mainstreaming gender in the project			
				Subtotal	2,520,000	16,458,000
				Project Management Cost (PMC)	125,000	200,000
				Total project costs	2,645,000	16,658,000

C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Cofinancing	Amount ($)
Recipient Government	Ministry of Mines, Energy and Hydraulics	Grants	600,000
Donor Agency	Multilateral Development and Local Banks (through Ministry of Mines, Energy and Hydraulics)	Grants	9,000,000
Private Sector	Centrafric Global Business Consulting, Surl	Equity	6,558,000
GEF Agency	UNDP	Grants	500,000
Total Co-financing			16,658,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES), FOCAL AREA AND THE PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee [a)] (b)[2]	Total (c)=a+b
UNDP	GEF TF	Central African Republic	Climate Change		2,645,000	251,275	2,896,275
Total Grant Resources					2,645,000	251,275	2,896,275

a) Refer to the Fee Policy for GEF Partner Agencies

E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	Direct emission reductions: *327,250 tonnes* Consequential emission reductions (bottom up): *780,000 tonnes*

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/CBIT Trust Fund) in Annex D.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF

The PIF envisaged the establishment of "up to 10 public private partnerships" for the exploitation of SHP plants and mini-grids, resulting in the construction of "2 MW of SHP-based power generation capacity".

The reasoning behind this was that there could be several hydropower stations, varying in size from pico to small (pico (≤ 5 kW), micro (5 kW – 100 kW), mini (100 kW – 1,000 kW) and small (1,000 kW - 10,000 kW) to eventually provide a total to 2 MW of installed capacity by the end of the 5-year project. However, during implementation of the PPG, it became clear that the presence of armed groups in certain areas in the country would make it difficult to initiate activities there. Therefore, the project focused on those areas that were considered safe for implementation of project activities and this resulted in the selection of potential sites in the "mini" category for which previously undertaken feasibility studies exist for development as run-of -the river power stations.

An additional consideration was that these sites were only a few kilometres away from load centres where Government-owned ENERCA (the CAR Electricity Utility) has existing isolated distribution grids, but no diesel generators are operational due to lack of spare parts and/or the absence of fuel to operate them. This presented the project with a great opportunity for proposing a private-public partnership with the private sector developing the power stations and utilising the ENERCA existing distribution grids, albeit with some refurbishment, for distribution and sale of electricity to consumers.

This resulted in 4 sites being identified for development and an equal number of public private partnerships to be eventually constituted, but with the target of "2 MW of SHP-based power generation capacity" still being achieved. Hence, the project proposes the establishment of 4 public private partnerships which are still within the "up to 10 public private partnerships" to be established for the exploitation of SHP plants and mini-grids.

The PIF also envisaged that 2 specific and sustainable O&M&M models would be demonstrated for all mini-grid schemes. During implementation of the PPG, the various models for rural electrification, viz. Public Utilities, Private ownership, NGOs, Community Cooperatives and Mixed (Source: The ACP-EU Energy Facility: Sustainability - Business Models for Rural Electrification, 2012) were discussed with the Government. As discussed under the "Rural Electrification in CAR" section of the project document, the Government has entrusted ACER (the Rural Electrification

Agency) with the responsibility to implement rural electrification in the country and based this decision on the successful experience of Government-established rural electrification agencies in Western Africa, e.g. AMADER in Mali. As ACER is yet to be operational due to lack of resources, the rural electrification functions are still under the responsibility of ENERCA and, accordingly, the Government wishes to continue with the public utility/ACER model for its rural electrification programme; it may, however, review this model in the future.

As it turns out, one of the selected sites (Gamboula) already has a 120-kW power station that was built in 1986 by Swedish missionaries (registered as an NGO) and the electricity generated powers the hospital, seminary and staff residences through its own local distribution grid. This site has the potential to increase the installed capacity by 300 kW to a total of 420 kW to supply the population of the Sub-Prefecture with the same name and consisting of over 2,500 households. Discussions have been initiated with the NGO to ascertain its interest to extend the capacity of the power station and supply the neighbouring village with electricity under an "NGO" model. Should these discussions not materialise, the Government proposes to either utilise the public utility/ACER model in this case as well, with ENERCA/ACER building and owning the distribution system, or resort to a completely private sector model for generation, transmission, distribution and sale of electricity.

A.1 PROJECT DESCRIPTION:

Situational Analysis and Development Challenge

The Central African Republic (CAR) is a landlocked country in Central Africa. It is bordered by Chad to the north, Sudan to the northeast, South Sudan to the east, the Democratic Republic of the Congo and the Republic of the Congo to the southwest and Cameroon to the west. The CAR covers a land area of about 623,000 square kilometres and has an estimated population of 5.1 million inhabitants (2016), with 39% living in the urban areas, against 61% in rural areas. Most of the CAR consists of Sudano-Guinean savannas, but the country also includes a Sahelo-Sudanian zone in the north and an equatorial forest zone in the south. Two thirds of the country is within the Ubangi River basin (which flows into the Congo), while the remaining third lies in the basin of the Chari, which flows into Lake Chad. Much of the country consists of flat or rolling plateau savanna approximately 500 metres above sea level, with the bulk of the northern half lying within the Sudanian savanna ecoregion. In addition to the Fertit Hills in the northeast of the CAR, there are scattered hills in the southwest regions. In the northwest is the Yade Massif, a granite plateau with an altitude of 348 metres. Much of the southern border is formed by tributaries of the Congo River; the Mbomou River in the east merges with the Uele River to form the Ubangi River, which also comprises portions of the southern border. The Sangha River flows through some of the western regions of the country, while the eastern border lies along the edge of the Nile River watershed. It is estimated that up to 8% of the country is covered by forest, with the densest parts generally located in the southern regions. The forests are highly diverse and include commercially important species of Ayous, Sapelli and Sipo – species of wood that are prized for their quality in the manufacture of furniture. The deforestation rate is estimated at approx. 0.4% per annum (FAO, 2015).

Fig. 1: Map of Central African Republic

The climate of the Central African Republic is generally tropical, with a wet season that lasts from June to September in the northern regions of the country, and from May to October in the south. During the wet season, rainstorms are an almost daily occurrence, and early morning fog is commonplace. Maximum annual precipitation is approximately 1,800 millimetres in the upper Ubangi region. The northern areas are hot and humid from February to May, but can be subject to the hot, dry, and dusty trade wind known as the Harmattan. The southern regions have a more equatorial climate, but they are subject to desertification, while the extreme northeast regions of the country are already desert.

Despite its significant mineral deposits and other resources, such as uranium reserves, crude oil, gold, diamonds, cobalt, lumber, and hydropower, as well as significant quantities of arable land, the Central African Republic is among the ten poorest countries in the world. As of 2016, according to the Human Development Index (HDI), the country had the lowest level of human development, ranking 187th out of 187 countries. It is a Least Developed Country (LDC) that went through difficult periods of political instability and civil wars in the fairly recent past. The per capita income of the CAR is often listed as being approximately $450/year, one of the lowest in the world, but this figure is based mostly on reported sales of exports and largely ignores the unregistered sale of foods, locally produced alcoholic beverages, diamonds, ivory, bushmeat, and traditional medicine. Export trade is hindered by poor economic development and the

country's landlocked position. Diamonds constitute the country's most important export, accounting for 40–55% of export revenues, with its largest export partner being Belgium, followed by China.

Country Situation and Development Context

Agriculture represents approx. 55% of the GDP and consists of the cultivation and sale of food crops such as cassava (manioc), cotton, peanuts, maize, sorghum, millet, sesame and plantain. The annual real GDP growth rate is just above 3%. The importance of food crops over exported cash crops is indicated by the fact that the total production of cassava, the staple food of most Central Africans, ranges between 200,000 and 300,000 tonnes a year, while the production of cotton, the principal exported cash crop, ranges from 25,000 to 45,000 tonnes a year. Food crops are not exported in large quantities, but still constitute the principal cash crops of the country, because Central Africans derive far more income from the periodic sale of surplus food crops than from exported cash crops such as cotton or coffee.

The primary energy supply of CAR in 2014 (the report that contains an analysis of 2014 raw data was issued in 2016) consisted of biomass (charcoal and fuelwood – 1,081,745 toe), petroleum products (43,503 toe) and electricity (11,959 toe) and their respective share in terms percentages is presented in Fig. 2 below.

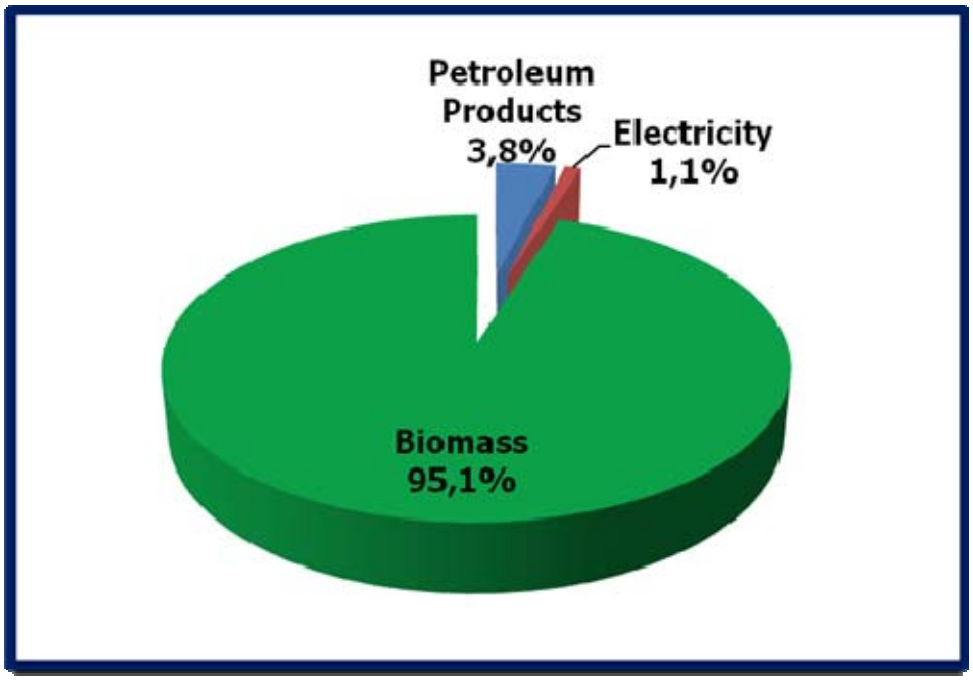


Fig. 2: Primary Energy Supply (2014)

For a more detailed description of the "Situation Analysis and Development Challenge", please refer to the UNDP Project Document (Prodoc), pages 6-17.

A.2. The baseline situation and the problem to be addressed:

Rural Electrification in CAR

The Government is cognisant of the fact that it is an unsurmountable task to serve the un-electrified 94% of the country's rural population through grid extension and/or new power stations due to the massive investments required and the scarcity of budget resources. Consequently, there is a keen awareness among decision makers of the need to develop more decentralised, sustainable and modern forms of energy for the much-dispersed rural areas in terms of lighting, refrigeration, cooking and income-generating activities. Among the priorities of the Government for the electricity sub-sector, there resides a focus for an increase in reliable electricity services through rehabilitation and extension of existing generation capacities, strengthening of the transmission and distribution system, reform of ENERCA for better governance, rural electrification based on renewable energy sources, implementation of energy efficiency measures, interconnection with neighbouring Congo-Kinshasa (an example of interconnection is the 11 MW hydropower station located in Mobayi in Congo-Kinshasa that already supplies electricity to Mobaye in CAR through a 0.9 km long, 6.6 kV line and a 630 kVA transformer) and potential hybridisation of the electricity network, mainly solar and hydro, where feasible.

As discussed earlier, rural electrification in the country is under the responsibility of ACER. Unfortunately, due to the lack of sufficient support from decision makers and the absence of a regular financial resource stream, ACER is yet to implement its first village electrification project, although it has installed, as mentioned above, a few PV street/outdoor space lighting systems under donor-funded programmes. Hence, as a stop-gap measure, this function has continued to be implemented by ENERCA in that it has installed and operated 15 diesel-based mini-grids to supply electricity to Prefectures/Sub-Prefectures, although only one 44 kVA generator is presently in operation in Mongoumba. Hence, the Government then de facto chose the public utility model for rural electrification from among the different options, viz. Public Utilities, Private ownership, NGOs, Community Cooperatives and Mixed (Source: The ACP-EU Energy Facility: Sustainability - Business Models for Rural Electrification, 2012).

However, besides being unable to replace those diesel generators that have been vandalised and taking note of the financial difficulties faced by ENERCA to maintain the remaining generators and/or supplying them with fuel for operation, the Government now considers Public Private Partnerships as an important vehicle in energy project development to meet the electricity needs of the 61% of the population that live in the rural areas without any access to clean fuels. This view was underscored at the forum for the promotion of the private sector that was held in Bangui in September 2015. In addition, as mentioned earlier, only 8% of the total population of the country's 5.1 million, urban, peri-urban and rural combined, have access to clean fuels. Such a public private partnership may lend itself to a win-win situation on the understanding that, as a start, the private sector would be encouraged to develop power stations, with ENERCA (the public sector) making available its existing and "dormant" distribution systems in the Prefectures/Sub-Prefectures, albeit with some refurbishment and/or extension, to the former to distribute and sell electricity to consumers. Utilisation of the existing distribution lines could be on a straight lease or lease-purchase basis under terms to be negotiated by both parties.

Barriers to Rural Electrification

In light of the above and with regard to rural energy services, the Government proposes to utilise the abundance of hydro resources, where available/appropriate, to meet the energy needs of the rural communities, especially as many of the rivers still have sufficient flow even during the dry season. Also, this is in line with the 3 objectives of the Sustainable Energy for All Initiative, viz. to ensure universal access to modern energy services, double the rate of improvement in energy efficiency and double the share of renewable energy in the global energy mix by 2030. Thus, the transformation of the rural energy sector to an economically viable and environmentally friendly system requires a comprehensive and multi-faceted approach in the design of appropriate policy and institutional frameworks, and incentives to fully integrate small hydropower among other renewable energy technologies into the country's energy mix.

Involving the private sector in rural electrification is an integral part of this approach. Currently, domestic commercial banks are not involved in the energy sector. Bank managers from ECOBANK and the Commercial Bank Centrafrique met during the PPG stage stated that they don't have either specific products or the expertise to invest in the renewable energy sector. According to a 2009 IMF Financial System Stability Assessment the domestic financial sector in CAR contributes very little to the country's economic growth and is saddled by government borrowing which in turn limits cash availability for the private sector. The IMF assessment further noted that "less than 1 percent of the population has access to banking sector services; the scope for promoting SME lending is constrained by weaknesses in the legal and regulatory framework; the range of financial products offered by banks is not diversified, and credit information is poor." The World Bank 2017 Doing Business report ranks CAR number 185 (out of 190 countries) for access to finance. In addition to these general barriers to rural electrification small hydro power plants are largely unknown in the country and are more expensive to set-up than diesel mini-grids.

For a more detailed description of the "The baseline situation and the problem to be addressed", including "Barriers to Rural Electrification", please refer to the UNDP Prodoc, pages 22-26.

A 3. GEF FOCAL AREA AND/OR FUND(S) STRATEGIES, ELIGIBILITY CRITERIA AND PRIORITIES:

The project is consistent with GEF-6, CCM-1: Technology Transfer, and Supportive Policies and Strategies Programme 1: Promote timely development, demonstration and financing of low carbon technologies and mitigation options and Programme 2: Develop and demonstrate innovative policy packages and market initiatives to foster new range of mitigation actions aimed at reducing GHG emissions. It will promote the market for the utilisation of small hydropower sources in an isolated mini-grid configuration to meet the needs of rural communities for electricity services.

For a detailed description, please refer to the UNDP Prodoc, Section "Project rationale and policy conformity", pages 26-27 and "Country ownership: country eligibility and country drivenness", page 31

A.4. Stakeholder Analysis and Institutional Framework

Stakeholders. Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes)? and indigenous peoples (yes ☒)?

Ministry of Mines, Energy and Hydraulics

The Ministry of Mines, Energy and Hydraulics (Fig.4) has the overall responsibility for formulating, implementing and monitoring policy in the energy sector. In accordance with Decree N° 16.349 of 11 October 2016 that relates to the organisation and functioning of the Ministry, it exercises its role through 2 distinct Directorates, viz. Directorate General for Energy and Directorate General for Petroleum. The functions of each Directorate General are described below:

Directorate General for Energy

The Directorate General for Energy is directly responsible for implementing the Government's energy policy and accomplishes this through its Directorate for Conventional Energy (for activities related to Electricity Services, Energy Management and Energy Efficiency), the Directorate for New and Renewable sources of Energy (for activities related to the promotion of Hydro electricity generation, Bioenergy, Geothermal Energy, and Solar and Wind Energy) and the

Directorate for Studies, Statistics and Planning (for activities related to Statistics and Documentation, Studies, Planning and Energy research, and Coordination, Monitoring and Evaluation of programmes and projects).

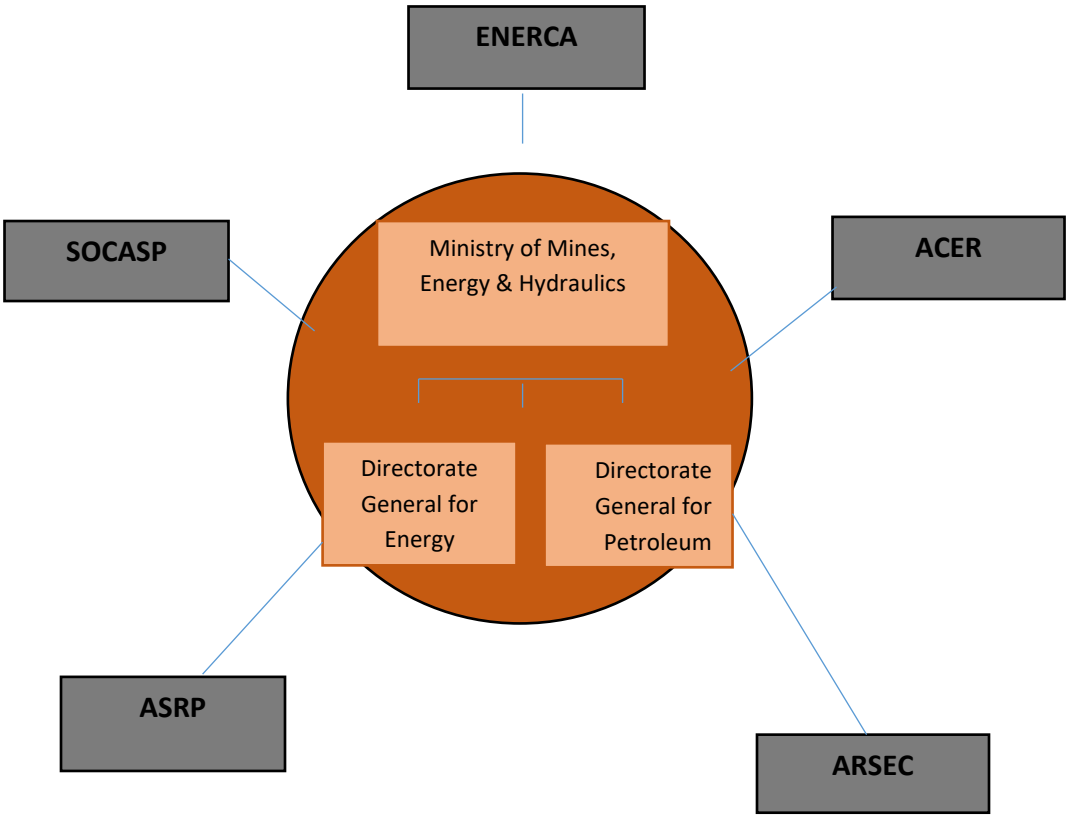


Fig. 3: Ministry of Mines, Energy, and Hydraulics Organisational Chart

The following three Agencies/Institutions in the electricity sub-sector operate under the responsibility of MMEH, in close cooperation with the Directorate General for Energy:

(i) **ENERCA** (Énergie Centrafricaine – Central African Electric Utility). ENERCA is a Government body established by decree N° 68/048 of 12 January 1968 with the exclusive mandate to generate, transmit, distribute and commercialise electricity throughout the country. However, as indicated earlier, the electricity sub-sector was "liberalized" on 1 January 2005 with the promulgation of Ordinance N° 001/05 related to the Electricity Code that opened up the sub-sector to other operators to generate, transmit, distribute and commercialise electricity anywhere in the country. However, as the accompanying decree and regulations are yet to be approved, no other operator has stepped up to the plate to date, with the result that ENERCA still remains the sole operator and, thus, maintains its de facto monopoly.

(ii) **ARSEC** (Agence Autonome de Régulation du Secteur de l'Électricité en République Centrafricaine - Autonomous Agency for Regulation in the Electricity sector of the CAR). ARSEC derives its mandate from Ordinance No 05.001 of 1 January 2005, but became operational only when Decree No 09.046 of 2 February 2009 was issued to regulate its functions. ARSEC's mandate is to ensure regulation, control and monitoring of activities in the electricity sub-sector. It

is also tasked with supporting the energy needs of consumers within a sustainable development context, bearing in mind economic, social and environmental issues, ensuring the streamlined and economically viable development of electricity services for industries, promoting competition in generation, transmission, distribution and sale of electricity, establishing electricity tariffs, etc.

(iii) ACER (Agence Autonome d'Électrification Rurale de Centrafrique – Autonomous Agency for Rural Electrification). ACER was established under Decree No 05.273 on 11 September 2005 and has been functionally operational since 2008. Its mandate is to implement Government policy, through the promotion of simplified procedures, that facilitates promotion and development of rural electrification. It is tasked to support developers in the implementation of rural electrification programmes and consumers in the utilisation of electricity services.

Unfortunately, due to the lack of sufficient support from decision makers and the absence of a regular financial resource stream, ACER is yet to implement its first village electrification project, although it has installed, as mentioned above, a few PV street/outdoor space lighting systems under donor-funded programmes. In this connection, the recently-published (January 2017) Technical Assistance Facility (TAF) report prepared by the European Union within the framework of Sustainable Energy for All (the report will serve as an input towards the formulation of the European Development Fund next assistance cycle (EDF-11) notes (page 38) that "The absence of a real energy policy has largely contributed to the inaccessibility to modern energy sources by the poor, particularly regarding rural electrification, that relates to the needs of 2/3 of the CAR population. It is indispensable to formulate a rural electrification policy and strategy, as well as an Energy Master Plan for CAR".

For a more detailed description of the "Stakeholder Analysis and Institutional Framework", including "National Strategies and Plans", please refer to the UNDP Prodoc, pages 17 – 22.

A.5. Proposed Alternative Scenario, Expected Outcomes and Components of the Project.

Project objective, outcomes and outputs/activities

The objective of the project is to contribute towards the reduction in the growth of GHG emissions through promoting the implementation of hydropower in a mini-grid configuration to meet the need for electricity services of the rural population. It proposes to put in place an enabling environment for the development of small hydropower stations and develop and showcase a suitable business model and financial instruments for their viability, sustainability and replication. This objective is proposed to be achieved through the participation of the private sector working hand in hand with village community organisations. Thus, this programme will not only benefit rural households and small commercial enterprises, but will also connect the private sector, financial and technical training institutions, and local organisations to promote the establishment of distribution channels to develop the small hydropower market for the provision of electricity services. Towards this end, the Government is planning to establish a Rural Electrification Fund (REF) that will support rural electrification, fund studies to promote the development of renewable energy, in partnership with ACER and ARSEC, and to possibly co-finance investment. It is envisaged that funding for the REF will initially come from donor grants and would be replenished from a levy on the sale of electricity in the cities and on certain goods and services.

The project consists of four components as outlined below. It is recognised that on-the-job training will be provided by the recruited consultants, both local and international, during the normal course of their support to the relevant project activities and a communication strategy formulated to inform stakeholders on project implementation. Moreover, the project will seek to achieve gender equality through the empowerment of women (e.g. working with women's

association such as the National Rural Women Organisation (Organisation Nationale des Femmes Rurales) and the equal participation of men and women (e.g. such as the National Rural Women Organisation (Organisation des Femmes Rurales, Femmes-Forets-Développement, Fleurs de Centrafrique) in all project activities and specifically those related to capacity development under the various components. In addition, the project will solicit the participation of NGOs working in the field of sustainable energy at the community level (e.g. ERADD – Energie Renouvelable et Action pour le Développement Durable, Groupe d'Etude et d'Action pour le Centrafrique and Association of Electricity Consumers), capacity development institutions like Lycée Technique de Bangui, Institut Moderne des Métiers Spécialisés, Institut Supérieur de Technologie, etc.

Further, the project will provide incentives to project developers in the form of a financial support for the procurement pre-project studies and the procurement of equipment or construction. In addition, it will establish linkages with existing loan guarantee facilities that will unlock investment capital in the sector and decrease the cost of capital for project developers thus enabling them to provide electricity at an affordable rate.

For a more detailed description of "Project Objective, Components, Outcomes, Outputs and Activities", please refer to UNDP Prodoc Section "Project objective, outcomes and outputs/activities", pages 31-45.

A.6. Incremental/Additional Cost Reasoning and Global Environmental Benefits

GEF intervention is needed to remove the policy, regulatory, technical, market and other barriers which hamper realisation of the Government plans to harness the abundant small hydropower potential in the country to provide the 61% of its total population who live in the rural areas with modern energy services. This is expected to create a conducive environment for the private sector to invest in electricity generation from small hydropower sources to establish rural mini-grids to serve the rural consumers by providing them with an efficient choice for meeting their energy needs. This will also promote investment in the country for developing income-generating activities utilising energy electricity services which would add value to local raw material, both for the local market and for export, and to create sustainable jobs

By completion of the 5-year project period, almost 35,000 tonnes of CO_2 would have been avoided as a direct result of hydropower electricity generation. Furthermore, these 4 small hydropower plants will continue to avoid almost 13,000 tonnes of CO_2 annually during their remaining 21-23 years of project life. When one looks at the 25-year lifetime of the hydropower stations earmarked for development during the 5-year project period, the power stations would have generated 374,000 MWh, thus avoiding 327,250 tonnes of CO_2; this is equivalent to $ 7.7 of GEF funds per tCO_2.

Finally, under the assumption of the interest generated in small hydropower-based mini-grids during project implementation and given the conducive environment for investment that the project would have created, the estimated total replication potential of small hydropower plants in the Central African Republic with the participation of private sector investors (estimated at 40 MW over the next 10 years of "project influence", in view of the 2,000 MW hydropower potential of the country) is several times greater than what will be achieved during the five-year project implementation. Finally, the indirect post-project emission reduction estimates related to an additional capacity of 35 MW over the next 10 years of project influence, on the basis of a conservative policy scenario and a GEF causality factor of 80% (top-down approach), can be computed at 4,550,000 tons of CO2 avoided, which translates into an abatement cost of $ 0.52 of GEF funds per tCO_2 avoided. In the case of the bottom-up approach, with a replication factor of 3 (in view of the market transformation potential and associated capacity development), the indirect post-project emission avoided are computed to be 780,000 tons of CO_2 and this translates into an abatement cost of $ 3.23 of GEF funds per tCO_2 avoided.

Project GHG emission reduction impacts

Time-frame	Direct project without replication (25-year equipment projected life).	Consequential post-project (top-down) with replication over next 10 years of project influence).	Consequential post-project (bottom-up)
Total CO_2 emissions reduced (tonnes)	327,250	4,550,000	780,000
Unit abatement cost ($/tonne CO_2)	7.7	0.52	3.23

For a detailed description of the Incremental/Additional cost reasoning, please refer to the UNDP Prodoc Section 1.4 on "Barriers to Rural Electrification", pages 23-26 and Section on "Cost efficiency and effectiveness" (pages 47-49) that includes GHG calculations.

A.7. Financial Support to project developers.

The project will support the roll-out of 4 SHP mini-grids totalling over 2 MW installed capacity and providing electricity to the towns of Bambari, Mbaiki, Boda and Gamboula. The total investment required for the 4 sites is estimated at 15.5 million USD of which 3.1 million USD (20%) is expected to come from private developers as equity and 12.4 million USD from financial institutions as debt financing.

Project developers interested in SHP face several challenges. The first challenge is to mobilize funds for feasibility studies, markets studies and environmental assessments (pre-project studies) which are all pre-requisites for approaching investors but are typically not financed by commercial banks. The second challenge is to contribute 20% of the total capital investment as co-financing which is required by most banks. The third, and perhaps most difficult challenge, is accessing finance for the remaining 80% capital investment.

The project will address the first two challenges by contributing $200,000 to each site for the procurement of pre-project studies and $125,000 for the procurement of SHP equipment or construction. Payment will be made to consulting firms selected to undertake the studies and to the vendors providing the equipment. These two grants combined will reduce project developers co-financing by $325,000 per site and make him/her ready for investment .

With regards to the third challenge, the project will link up with the soon-to-be-created National Fund for Guarantees and Investment (FNGI) to facilitate SHP developers' access to finance. In addition to unlocking funds from local banks, this guarantees can decrease the interest rate on the loan to project developers which would significantly lower their cost of capital and would result in lower electricity prices for consumers.

For a detailed description of the financial support to project developers, please refer to the UNDP Prodoc section III – "Strategy" pages 27-30.

A.8. Gender Equality and Women's Empowerment.

Gender Equality and Women's Empowerment. Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men. In addition, 1) did the project conduct a gender analysis during project preparation (yes ☒ /)?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes ☒)?; and 3) what is the share of women and men direct beneficiaries (women 55%, men 45%)?

Gender will be mainstreamed in all the activities planned by the project. To facilitate such action, a gender expert will be part of the Project Board, members of the Project Management Unit will receive training on gender mainstreaming and be supported periodically by a gender expert.

The development and operation of SHP mini-grids is expected to be male-dominated because women are generally absent from sectors considered too technical and that require heavy capital investments. However, even without the technical know-how, business-women can recruit engineers in their team and run a SHP mini-grid successfully. In selecting private developers for the 4 sites in component 3, women entrepreneurs will be strongly encouraged to apply. In the capacity building component, an emphasis will be put on including as many women as men and particularly tailoring some of the training to recent high school and college graduates, a group that may have a higher presence of young women.

On the demand side, access to electricity will help create or expand small enterprises. Component 3 (output 3.5) will target women groups and individual women entrepreneurs. Further, project developers will be sensitized on how to respond to the different electricity needs of men and women. For instance, when consulting with the population, project developers should ensure that women are well represented and are gathered in a setting that allows them to freely voice their opinion. In market studies, both men and women should be surveyed. In general, only heads of the household (mostly men) are asked their opinion which does not always reflect the needs of women in the household. Women-headed households are a particularly vulnerable group that should benefit from a "social tariff" or flexible payment terms. Data that is fully representative of the target population will help the developer design an inclusive marketing approach that will in turn, expand the client base.

Finally, the experience garnered in mainstreaming gender throughout the project will be documented and shared with a wider audience (Component 4, output 4.4). It will also form the basis for identifying capacity building needs for conducting gender inclusive energy projects in the future.

For a more detailed description of the "Gender Equality and Women's Empowerment", please refer to page 46 of Prodoc and "Social and Environmental Screening Template", Annex F of Prodoc, page 99.

A.9 Risks. 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.

Project Risks					
Description	Type	Probability & Impact	Mitigation Measures	Owner	Status
Civil Conflict: CAR is a post-conflict situation, but there are still some pockets of unrest in some parts of the country and this could derail smooth project implementation.	Political	P=4 I=5	UNDP has played and will continue to play a key role to resolve the political crisis that feeds into the civil unrest. UN Security continuously monitors the country situation and implements adaptation strategies as warranted by events on the ground. With this in mind and out of an abundance of caution, the project sites were selected in areas where the situation is relatively calm and where the possibility conflicting situations flaring up are minimal. Evolution of the conflict situation will be closely monitored by the UNDP Country Office security team, which will be regularly consulted during the course of project preparation and implementation and their inputs and advice will be sought on the security situation at the prospective project sites. Also, community involvement and consultation will be an integral part of project activities in order to ensure buy-in and minimize the risk of conflict escalation and other potential tensions.	UNDP CO	No change
Policy: Lukewarm support for a framework to encourage the	Operational	P=3 I=3	There exists the possibility that the Government may not act soon enough on a policy framework that will encourage the private sector to invest in small hydropower-based mini-grids for rural electrification; as examples, there is no	UNDP CO	No change

private sector to invest in small hydropower-based mini-grids for rural electrification.			Rural Electrification Masterplan and the 2005 Electricity Code authorising the private sector (IPPs) to generate electricity in the country either for sale to the ENERCA network or to operate an isolated mini-grid has not yet materialised into a single investment in the absence of the accompanying guidelines and procedures for private sector participation in the electricity sub-sector. If this were to happen, project implementation will get hampered. However, the Government is strongly motivated to provide access to modernised energy services to the large rural population that utilises traditional forms of energy, to improve their quality of life and for income-generating activities, and is driven by its plans to meet the Sustainable Development Goals. Towards this end, it only very recently issued a draft Decentralised Energy Policy, thus sending the right signal to stakeholders. The donor community, including AfDB, EU and the World Bank, is also working with the Government to have the right policy for rural electrification in place and it is hoped that this will encourage the Government to approve the Decentralised Energy Policy in the very near future, very likely this year (in 2017). Moreover, project interventions under Component 1 will assist in mitigating this risk.		
Financial risk: Widespread poverty among the population, resulting from a lack of a sustainable source of income can result in their decreased ability to pay for electricity services.	Operational	P=3 I=3	The project has deliberately decided to target those Prefectures/Sub-Prefectures with already existing but non-performing ENERCA mini-grids. In these locations, there is already a history of the consumers' capacity and willingness to pay when the mini-grids were energised. In addition, socio-economic surveys implemented during the PPG reveal that households do already spend a good share of their income on alternatives, such as dry cell batteries for	UNDP CO	No change

			lighting and radios, together with daily expenses for charging their mobile phones. Finally, the availability of electricity will enable them to engage in productive activities, thus boosting their capacity to pay for their electricity consumption. All this is addressed under Component 3 and points towards the financial risk not being too much of a cause for concern.		
Lack of Investor Appetite: CAR ranks in the 187th place among 189 countries in "Ease of doing Business", as per the WB/IFC publication "Doing Business 2015".	Operational	P=4 I=4	The fact that CAR ranks in the 187th place among 189 countries in "Ease of doing Business", as per the WB/IFC "Doing Business 2015" publication might act as a deterrent for investors in hydropower technology, although this has not tempered investors' willingness to invest in the diamond and forestry industries to benefit from business opportunities available in the country. In any case, with this in mind, the project will put in place a Financial Support under Component 1 that will be directed at minimising the financial risks that lenders and investors may face in doing business targeting hydropower development for rural electrification through mini-grids.	UNDP CO	No change
Technology: Small hydropower and other electrical equipment of poor quality introduced in the country.	Operational	P=3 I=3	Poor quality SHS and their shoddy installation utilising 12 V car batteries have been introduced in CAR, albeit on a limited basis, and these have been prone to frequent failures, thus shaking the confidence of the users. Hence, the project will assist the Government under Component 2 to ensure that there is no repeat of such unfortunate experience with regard to hydropower equipment components and other electrical equipment by putting in place, through its Department of Standards and Quality Assurance (DSQA), strict controls on the standards of hydropower and other electrical equipment that can be imported and installed in the country. In addition, the Government will ensure that all installations and	UNDP CO	No change

			maintenance should be undertaken only by licensed and certified technicians as per established electricity codes.		
Climate: Climate change can cause increased variability in CAR's hydrological regime and precipitation patterns which may pose challenges to SHP development that can affect energy planning and infrastructure investments.	Operational	P=3 I=3	There are multiple environmental risks, as outlined in CAR's Second National Communication to UNFCCC (e.g. reduced rainfall that can affect water flows, land and watershed degradation due to erosion and population pressures) that can negatively affect water flow, thereby affecting outputs from SHP stations. This risk will be mitigated through capacity development of Government staff on the key aspects to address national challenges associated with weather, climate and climate change. In addition, policy recommendations for SHP promotion will include regulations under Component 2 to protect watersheds in order to maintain the necessary vegetation/forest cover.	UNDP CO	No change

A.10. Institutional Arrangement and Coordination.

Due to the overall security situation of the country, and the lack of sufficient capacity from Governement entities, the project will be implemented through the DIM execution modality by UNDP. UNDP will carefully separate the oversight and execution functions, to provide an effective firewall avoiding double-dipping. UNDP will appoint a National Project Director, in consultation with the Ministry of Mines, Energy and Hydraulics, who will assume overall responsibility for project implementation, ensure the delivery of project outputs and the judicious use of project resources. The National Project Director will be assisted by a Project Management Unit headed by a Project Manager (PM) to be recruited through a competitive process. The PM will be responsible for overall project coordination and implementation, consolidation of work plans and project papers, preparation of quarterly progress reports, reporting to the project supervisory bodies, managing the grant to project developers and supervising the work of the project experts and other project staff. The PM will also closely coordinate project activities with relevant Government and other institutions and hold regular consultations with project stakeholders. An international part-time Chief Technical Adviser (15 weeks/year) will be recruited to support the PM on technical issues, while a full-time Project Assistant (PA) will support the PM on administrative and financial matters.

For additional information on "Stakeholder Participation", please refer to UNDP Prodoc, Section "Management Arrangements", pages 66-70.

Additional Information not well elaborated at PIF Stage:

A.11 Benefits.

(a) Technical Benefits: From a technical point of view, the viability of tapping hydropower, either for supplying the main grid or isolated mini-grids for rural electrification has now been demonstrated in several developing countries, including some located in Africa. By addressing the non-technical barriers that impede the development of hydropower based mini-grids in the Central African Republic, the project will assist in creating a sustainable niche through strengthening the policy, institutional, legal, regulatory and operational capabilities of the key national institutions, supporting the development of the technology through a market-driven approach, developing national capabilities and disseminating information. These efforts should ensure the long-term sustainability of hydropower-based mini-grids for rural electrification in the country.

(b) Financial Benefits: From a financial point of view, will bring in private sector funding and support the integration of local manpower and industries into the hydropower-based mini-grid sector. This will be achieved on the one hand through the provision of financial incentives to the project developers, training of financial institutions and partnership with guarantee facilities and on the other hand through focused support to households willing to venture into small income-generating activities utilising electricity, capacity development of technical personnel and local specialised engineering workshops for manufacturing the required ancillary supporting equipment and engineering firms in the design, construction, installation, operation, maintenance and repair of the renewable energy-based systems. With the increase over time in renewable energy-based mini-grid installations, it is envisaged that such efforts will intensify with opportunities for job creation with additional players entering this field.

(c) Socio-economic Benefits: The project fully endorses the human rights-based approach and will not lead to any adverse impacts on enjoyment of human rights (civil, political, economic, environmental, social or cultural) of any key or potential stakeholders, communities involved or the population at large.

The project will focus on the provision of decentralized modern energy services to the rural population and, in the process, demonstrate the benefits that hydropower technology can provide to improve livelihoods in the rural areas. These relate to social and economic benefits in the villages in terms of a healthier environment for the rural population, opportunities for income-generating activities and improved natural resource management. A particular attention will be put on increasing the role of women as actors in the energy sector rather than mere beneficiaries. Women entrepreneurs will be encouraged to run SHP installations. Those who are engaged in the processing and conditioning of agricultural products will be the focus of the promotion of electricity for productive use. Further, on-the-job capacity building for SHP (output 2.2) will geared at both men and women. These activities combined will help reduce the gender gaps that traditionally exist in the energy sector.

In addition, the utilisation of hydropower for the provision of these services, in lieu of imported fossil fuel, will reduce the country's GHG emissions and contribute to a safer environment for the rural population. In doing so, capacity development for electricity consumers will emphasise the importance of best practices in energy management and the use of energy efficient devices such as turning off on lights/radios/TVs when not in use, use of LEDs for lighting, utilisation of energy efficient appliances/motors, etc.

Some of the long-term benefits include: Electricity from the mini-grids will provide opportunities for households, mainly women, to pursue income-generating activities requiring an electricity service and extend the hours of school children for homework; Provision of electricity (a clean and smokeless fuel), instead of candles and kerosene, for lighting will assist in eliminating respiratory/eye problems associated with exposure to smoke and reducing all too frequent accidental house fires; some 450 jobs created in the small hydropower sector and related to income-generating activities; and over 10,000 rural households and small commercial/industrial enterprises connected to electricity services by project end.

(d) Environmental Benefits: CAR will draw upon all their strategies for addressing climate change to systematically mainstream climate change considerations in small hydropower development. This will aid decision-making on energy infrastructure and service delivery options to take into account the uncertainty associated with climate change predictions and to assess the climate resilience of different options. For instance, decisions to invest in hydropower should take into account possible changes in the hydrology regime (including possible changes in precipitation patterns, increased demand for irrigation, and associated energy inputs). The project will ensure that the agencies tasked with the country's climate change portfolio are actively engaged in the project coordination mechanism so as to promote an integrated approach.

The project will have a direct positive effect on environmental sustainability, as the primary objective of the project is to accelerate utilisation of small hydropower technology for the global good of the rural population. This will be beneficial to both the country's economy and to the global environment, through the reduction of greenhouse gas emissions. In this context and as indicated earlier, by completion of the 5-year project period, almost 35,000 tonnes of CO_2 would have been avoided as a direct result of hydropower electricity generation. Furthermore, these 4 small hydropower plants will continue to avoid almost 13,000 tonnes of CO_2 annually during their remaining 21-23 years of project life.

(e) Replicability:

The Project's potential for replicability within the country is very good in view of the fact that 61% of the country's population live in the rural areas with no access to electricity or modernised energy services. This represented 3.1 million of CAR's population in 2016 and constitutes some 450,000 households. The project will adopt a bottom-up approach within the overall policy/investment framework that is envisaged to be developed to promote renewable energy-based mini-grids for rural electrification. Technical assistance for barrier removal and institutional strengthening to be provided under the project will facilitate such replicability since it will create the required institutional, policy and

technical conditions to enable the generation of renewed investor interest for the development of additional projects in this field. Moreover, the lessons learned will be of great value to the neighbouring countries sharing a similar resource base, should they (in addition to Congo-Brazzaville and Congo-Kinshasa, where small hydropower UNDP-GEF projects are being implemented) decide to tap into their respective renewable energy resource base for isolated mini-grid rural electrification.

(f) Scaling Up

As indicated above, 61% of the country's population live in the rural areas with no access to electricity services. With regard to the annual per capita electricity consumption in the country as a whole, it is 28 kWh (Energy Information Report, 2016), significantly below the African average of 579 kWh and the world average of 2,777 kWh. On the other hand, the country possesses a potential of over 2,000 MW of hydropower resources, but only a very small 1% of this potential has been developed. This situation, therefore, presents a huge potential for scaling up, utilising a sound business model and capacity development on small hydropower provided to stakeholders at various levels, coupled with an aggressive awareness/outreach programme, that will encourage private sector participation in small hydropower electricity generation to meet the needs of rural consumers in isolated mini-grid configurations and in line with the proposed Decentralised Energy Policy that will aim at providing "access to electricity services to all rural and urban residents at an affordable cost".

A.12 Knowledge Management.

UNDP is presently implementing similar GEF-funded small hydropower projects dealing with small hydropower-based mini-grids for rural electrification in neighbouring Congo-Kinshasa and Congo-Brazzaville, and also in Equatorial Guinea and Sao Tome and Principe, with activities in all the 4 countries having just started or about to start. This presents a good opportunity for these countries to learn through one another's experience through joint training sessions, stakeholder exchanges, virtual networks and, may be, a common website. The possibility also exists, given that these countries have common borders and are all French-speaking, to recruit the same Non-resident Consultant who would bring synergy to the respective activities and act as a liaison for information exchange and capacity development.

In addition to this South-South Cooperation that will involve knowledge exchange on implementation procedures, technology transfer, opportunities for income-generating activities to improve livelihoods in the rural areas and lessons learned/best practices, the project will present private sector developers with opportunities to associate themselves with international partners to benefit from the latter's experience and exposure in similar markets outside the Central African Republic.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 Consistency with National Priorities.

National Plan for Recovery and Consolidation of Peace (Plan national de relèvement et consolidation de la paix - RCPCA) 2017 – 2021.

In order to avail itself of the window of opportunity provided by the present situation in the country to lay down solid bases for a fresh start, the Government has formulated a National Plan for Recovery and Consolidation of Peace (RCPCA) for the period 2017-2021 in order to define its intervention and that of its development partners over the next five years. The Government's vision through implementation of RCPCA is that of a country that has achieved peace, that is pursuing the dialogue for reconciliation, that has established concrete milestones on the road to solid peace and initiated a process of recovery and sustainable development. Pillar 3 of the RCPCA focuses on the rehabilitation of the

ageing electricity infrastructure and the construction of new electricity installations including small-scale installations based on renewable energy.

National Energy Policy

The Government approved, among others, Ordinance No 05.001 of 1 January 2005 on the Electricity Code aimed at liberalising the Electricity Sub-Sector, Laws No 07.005, No 07.006 and No 0.007 of 24 April 2007 on reorganizing the Petroleum Sub-Sector, establishing ASRP and SOCASP, respectively, and Law No 08.018 of 18 March 2010 on Bio-Fuels. Following these, the Government issued Decree No 10.092 on 18 March 2010 that made public its National Energy Policy (NEP).

The overall objective of the National Energy Policy is to "contribute to economic growth, to improve the quality of life through the increase in the electricity access level and to ensure energy independence in security of energy supply through interconnection with other countries". This overall objective is accompanied by 5 specific objectives, viz:

1. Improve institutional capacities to strategically manage the energy sector;

2. Guarantee continuity in energy supply to all enterprises and households throughout the country on a competitive basis;

3. Ensure protection of the people, property and environment against the risks arising from activities in the field of energy;

4. Ensure independence and security in energy supply in the country; and

5. Ensure governance in the energy sector within the framework of a sub-regional, regional and international interconnected system.

The guiding principles of the National Energy Policy takes into account economic competition and profitability, living environment, national independence, public-private partnerships, programmatic and participatory approaches, etc. The Government has for some time been contemplating the idea of revising/updating the National Energy Policy, but no time-frame has yet been proposed.

Intended Nationally Determined Contribution: Projections made in 2015 during preparation of the Intended Nationally Determined Contribution for submission to UNFCCC point to GHG emissions increasing to 189 million tonnes of CO2 by 2050 compared to the base year of 2010, representing a net increase of 63% that takes into consideration the projected level of population growth, if no remedial actions were implemented. The sectors contributing to such an increase are: LULUCF -69% increase, energy -13.4% increase (including 10.7% for wood fuel), waste -3.2% increase and industrial processes - 1.6% increase. As per the INDC, the Government plans to reduce emissions by 5% compared to the business as usual reference level (i.e. 5.5 million tonnes of CO2 of avoided emissions) by 2030 and 25% (i.e. 33 million tonnes of CO2) by 2050, within the framework of conditional implementation.

For additional information on "Consistency with National Priorities", please refer to UNDP Prodoc, Section "National Strategies and Plans", pages 20-22.

C. DESCRIBE THE BUDGETED M &E PLAN:

The Monitoring and Evaluation (M&E) Work Plan and Estimated Associated Budget are presented in the Table below:

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[1] (US$)		Time frame
		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	5,000	5,000	Within two months of project document signature
Inception Report	Project Manager	None	None	Within two weeks of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Monitoring of indicators in project results framework	Project Manager	12,000	8,000	$ 4,000/year carried out annually
GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
DIM Audit as per UNDP audit policies	UNDP Country Office	9,000	6,000	Annually or other frequency as per UNDP Audit policies -$ 3,000/year
Lessons learned and knowledge generation	Project Manager		3,000	Annually
Monitoring of environmental and social risks, and corresponding	Project Manager	None	3,000	On-going

[1] Excluding project team staff time and UNDP staff time and travel expenses.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[1] (US$)		Time frame
		GEF grant	Co-financing	
management plans as relevant	UNDP CO			
Addressing environmental and social grievances	Project Manager UNDP Country Office BPPS as needed	None for time of project manager, and UNDP CO	None	
Project Board meetings	Project Board UNDP Country Office Project Manager	None	3,000	At minimum, annually
Supervision missions	UNDP Country Office	None[2]	4,000	Annually
Oversight missions	UNDP-GEF team	None[2]	4,000	Troubleshooting as needed
Knowledge management as outlined in Outcome 4	Project Manager	26,450	None	On-going – to be covered as part of project fees
GEF Secretariat learning missions/site visits	UNDP Country Office and Project Manager and UNDP-GEF team	None	None	To be determined.
Mid-term GEF Tracking Tool to be updated by (add name of national/regional institute if relevant)	Project Manager	10,000	5,000	Before mid-term review mission takes place.
Independent Mid-term Review (MTR) and management response	UNDP Country Office and Project team and UNDP-GEF team	25,000	5,000	Between 2nd and 3rd PIR.

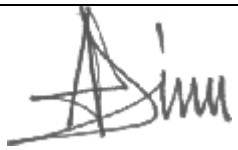
[2] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GEF Agency Fee.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[1] (US$)		Time frame
		GEF grant	Co-financing	
Terminal GEF Tracking Tool to be updated by (add name of national/regional institute if relevant)	Project Manager	10,000	5,000	Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team	40,000	5,000	At least three months before operational closure
Translation of MTR and TE reports into English	UNDP Country Office	10,000	5,000	
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		147,450	61,000	

PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)

A. GEF Agency(ies) certification

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for CEO endorsement under GEF-6.

Agency Coordinator, Agency Name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Adriana Dinu UNDP-GEF Executive Coordinator		12/22/17	Saliou Toure, Regional Technical Advisor, EITT	+90 850 288 2648	saliou.toure@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK

An abridged version of the logframe is provided below. However, a complete version can be found in the GEF-UNDP project document.

Objective/Outcome	Indicator	Mid-Project targets	End of Project Targets	Sources of Verification
Objective - To promote investment in small hydro-power (SHP) mini-grids and develop an appropriate business model for the sustainability of the provision of rural energy services.	Emission reduction (in tCO2 over 25-year project equipment lifetime). Investment in SHP. Capacity installed (MW) and annual energy produced (MWh) by SHP stations. Number of jobs created. Number of beneficiary households and enterprises in rural areas.	1 MW of SHP capacity installed, resulting in $ 8 million in investment. Cumulative SHP-based electricity generation of 12,210 MWh. Cumulative reduction of 10,684 tonnes of CO_2. Total of 200 jobs created. 3,500 beneficiary households and 500 small commercial/industrial businesses in rural areas.	2 MW of SHP capacity installed, resulting in almost $ 16.7 million in investment. SHP-based electricity generation of 14,535 MWh/year. Reduction of 327,250 tonnes of CO_2 over the 25-year lifetime of the SHP stations. Estimated cumulative indirect GHG emission reduction of 780,000 tonnes of CO_2 by 2038, applying a replication factor of 3. Total of 550 jobs created. Over 9,000 beneficiary households and 1,000 small commercial/industrial businesses in rural areas.	Project's annual reports, GHG monitoring and verification reports. Project mid-term review and terminal evaluation reports.
Outcome 1: Institutional and financial viability of SHP mini-grid ensured.	Policies and strategies for SHP development approved and operational.	Completed and approved by Government within 9 months of project initiation.	Already completed and approved by Government.	Project documentation.

Objective/Outcome	Indicator	Mid-Project targets	End of Project Targets	Sources of Verification
Outcome 2: Capacity to deliver turnkey solutions and quality O&M&M services for SHP developed.	Completion of capacity development activites of stakeholders.	Completed within 12 months of project initiation.	Already completed.	Project documentation.
Outcome 3: A functioning business model is demonstrated for the technical and financial viability of small hydro-based plants.	Business model defined, demonstrated and ready for widespread use.	Completed within 12 months of project start.	Already completed.	Project reports.
Outcome 4: Knowledge management and knowledge sharing- Increased awareness about SHP potential, investment climate and gender mainstreaming.	Public relations and investment promotion programme defined, approved and ready for roll-out..	Evidence of increased awareness among stakeholders.	Increased awareness among stakeholders in place to promote and develop SHP-based mini-grids for village energy services.	Project final report and web site.

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).

RESPONSE TO GEFSEC COMMENTS AT CEO ENDORSEMENT –

Secretariat Comment	UNDP Response	Reference

RESPONSES TO GEFSEC COMMENTS AT PIF STAGE

Secretariat Comment	UNDP Response	Reference

RESPONSES TO COUNCIL RECOMMENDATIONS

Comment	Response	Reference
France comments		
1. Is there any public body in charge of Environmental aspects? Environmental and social aspects should be included in the investigations to be carried out and relative capacity building be planned for institutional state bodies. Even if the considered size of SHP is small and not requiring any significant dams, there will be impacts (land use, impacts on biodiversity, water rights, electricity use safety…). To be incorporated in Components 1 and 2.	The Ministry of Water, Forests, Hunting, Fisheries, Environment and Tourism (short form: Ministry of Environment) is entrusted with this responsibility and it will work closely with the Ministry of Energy (short form) to ensure that environmental impact assessments are properly undertaken and remedial actions taken. Although no dam construction will be required, it will be necessary to build an access road to transport equipment, a weir where the intake pipe will originate, the power station house, transformer sub-station, etc. This would mean, for example, that trees have to be removed during construction and the developer will ensure that new trees will be planted upon completion of construction. This is further addressed in the SESP attached to the Prodoc and will be the subject of an environmental and social management plan that will properly address the issue of impacts and measures to mitigate them.	PRODOC, PAGES 22, 26, 29, 30 and 100.

2a. Due to the local political and crisis context, key technical and implementation issues to implement projects would rely on the ENERCA and ACER capabilities. We recommend that a strong support be provided to ACER in developing their internal capabilities on those aspects.	This will be absolutely the case as outlined under Component 2, Output 2.4: Tailored capacity development programme delivered to relevant national agencies.	PRODOC, PAGE 35.
2b. Even if the considered size of SHP is small and are not requiring any significant dams, there will be impacts (land use, impacts on biodiversity, water rights, electricity use safety…). To be incorporated in Components 1 and 2.	This issue is an important one and is earmarked to be addressed under Component 2, Output 2.2 related to land use, biodiversity, etc. and Ouput 2.4 regarding safety aspects related to the use of electricity. Again, this is further elaborated in the SESP.	PRODOC, PAGES 34-35 AND 100.
3. Even if it can be considered quite an early stage to draw attention of institutions and population on energy efficiency in a country where only 2.5% of population have access to electricity, we recommend that energy efficiency program be considered from now on by the public authorities within the development of mini-grids.	This will be addressed and the Prodoc specifies that "capacity development for electricity consumers will emphasise the importance of best practices in energy management and the use of energy efficient devices such as turning off on lights/radios/TVs when not in use, use of LEDs for lighting, utilisation of energy efficient appliances/motors, etc".	PRODOC, PAGE 54.

Germany comments		
1. Germany would like to note that PV technology should not be excluded from the project. It could have several advantages over small hydropower as it is not dependent on a suitable location, requires no additional grid connection to the villages, requires less maintenance and is likely to have cheaper production costs. PV technology has experienced great price reductions in recent years. Some cells have been designed to capture a broader range of the solar spectrum, thus working efficiently even when it is cloudy. However, average sunshine hours in the Central African Republic are much higher than, e.g., in Germany, where approximately 40,000 MW of PV capacity have been installed so far and are currently operating at ca. 0.12 € per kWh. Germany would therefore like to encourage the Central African Republic to consider the use of PV technology as it is likely to allow for a faster, cheaper, easier and larger development of rural electrification.	The Central African Republic has promoted solar PV in rural and urban settings for many years. In 2010, the UNDP "Seven Village Projects" installed solar kits in schools, community centers and markets. In 2016, 200 solar street lights were installed in Bangui and in the same year, the government completed a feasibility study for a 50 MW solar PV plant. Solar energy is indeed an integral part of the country's future energy mix. In contrast, small-hydro is largely absent from the energy portfolio (present and future) despites its low LCOE and the country's dense hydrographic network. Including PV technology in the project would divert precious financial resources away from small-hydro, a technology that faces more barriers than solar PV specifically with regards to awareness and capacity.	PRODOC, PAGE 14 AND 15

USA comments		
1. With regard to the project's global environmental benefits, although it can be expected to produce fewer CO_2 emissions than other potential power sources, depending on the size of the reservoir and if the reservoir is cleared before flooding, significant amounts of methane (a more potent GHG than CO_2) will be released. Please take this into account as you further develop this project.	The proposed power stations will be run-of-the-river mini type (100 kW – 1,000 kW) that do not require the construction of any reservoir/dam. Only a weir will be built in each case to channel the water to the pressurised turbine intake, with the remaining flow following its present course along the existing river. Thus, there will be little, if any, sediments that would be deposited upstream of the weir that could be disturbed during flood conditions to release any significant amount of methane.	PRODOC, PAGES 37 AND 103.
2. One risk of installing micro-hydro is coordinated water management between all of the dams to optimize water release and power production. We recommend the project include awareness raising with government officials about the potential benefits of incorporating centralized coordination among relevant agencies.	Again, there will be no dams that will be built, but only a weir that will provide pondage. However, awareness-raising of Government officials is an important component of the project and is addressed in the Prodoc.	PRODOC, PAGE 102.

RESPONSES TO STAP RECOMMENDATIONS

Comment	Response	Reference
1. The project's aim is to encourage the development of small-hydro power systems linked to mini-grids and develop appropriate means of payment by end-users. Local manufacture is encouraged and capacity building a key and necessary component. A roll-out of several projects is the target including 8 pilot sites.	This is a factual comment and is self-explanatory.	
2. It is not clear why they are "pilot-sites" for a technology that is very mature, though perhaps local demonstrations would encourage a greater rate of deployment if people can visit the sites or see cell phone photos and videos.	The term "pilot sites" was utilised not in relation with small hydropower technology that is well-established, but related to the business model to be adopted for the private sector to drive rural electrification through a public private partnership for a win-win situation for the government, private sector and rural population.	PRODOC, Page 35, component 3.
3. Care will be needed in selecting suitable sites to ensure the waterways run all year	The Ministry of Mines, Electricity and Hydraulics (MMEH) has data showing that low flow of the	PRODOC, Page 23.

round without drying up regularly during drought periods. This is also the case for the four previously selected sites as outlined in the Table on page 7. In addition, in all installations the intake of water needs to be designed to withstand flood conditions. This may increase the cost for some installations.	rivers at the selected sites during the dry season is sufficient to ensure smooth operation of the installed capacity at each SHP. The SHPs will be of the run-of -the river type. Feasibility studies will identify sites that are prone to flooding and a weir that can withstand flood conditions will be designed for those sites.	
4. Having a 12 V DC system is an interesting concept, though it should be noted that 12 V appliances (refrigerators, TVs etc) tend to be more limited in choice and relatively more expensive than their 110V or 240V equivalents due to lower levels of mass production. It is assumed they will need to be imported. The other option would be to invest in inverters to convert to 110 V or 240 V AC but these tend to be costly.	A 12 V DC system with only 1 wire and the ground utilised as "return" is not appropriate for capacities of 300 – 500 kW proposed to be installed. There is no experience with the operation of a 12 V DC distribution system in CAR and MMEH is not in favour of such a system, as it will be difficult to access DC appliances in the country, especially with regard to income-generating activities to uplift the rural population.	
5. If pico-turbines are to be deployed and manufactured or assembled locally, one company that uses old washing machine motors to produce turbines of around 1 kW capacity could be worth emulating. See http://nzcen.com/listings/e/ecoinnovation-ltd.aspx and http://shop.powerspout.com/contact However, it is assumed that larger installations than this (20 to 200 kW) are the target for most sites at the village level if 2MW total capacity is the target.	At the present time, the 4 proposed sites will have installed capacities between 300 – 600 kW and the situation where "old washing machines motors" (they are not readily available in CAR and will need to be imported) does not arise. However, this can be an interesting idea when much smaller pico-hydro power sites will be identified and developed. In addition, in the case of pico-turbines and their potential high demand, technology transfer from countries like China, Nepal, Vietnam, etc. could be arranged for their production/assembly in CAR.	PRODOC, Pages 41-42.
6. The technology is relatively simple but experienced installers are essential, so capacity building is important, as well as training local people to maintain the system. Even cleaning leaves etc. off the water intake grill is a task that shouldn't be under-estimated. Avoiding the need for technical specialists to visit sites in remote areas for maintenance procedures should be the aim. In some cases where cell phone coverage exists, direct links to the manufacturer/installer should be established. This may not be possible in the CAR but it is clear from the proposal that the challenge of training up local personnel is essential for long-term	Capacity development at all levels from decision makers to power station developers, equipment installers and consumers is an important aspect of the project and is addressed under Component 2: Capacity Development for SHP based mini-grid system operation, maintenance and management. This will include capacity development for electricity consumers that will also emphasise the importance of best practices in energy management and the use of energy efficient devices such as turning off on lights/radios/TVs when not in use, use of LEDs for lighting, utilisation of energy efficient appliances/motors, etc.	PRODOC, Page 34.

success.		
7. The cost analysis is acceptable but it assumes all year-round generation which may not always be the case where streams dry up. It is not clear whether the distribution costs have been included. These can be high if the turbine has to be located some distance away from the load.	As indicated in response to comment # 3 above, the installed capacities were determined on the basis of the low river flow during the dry season. A new cost analysis has been performed that takes into account construction, transmission, distribution, operation and maintenance. This cost analysis uses a capacity factor of 0.8 which means that installations may be down 20% of the time. The estimated cost per site is between 2.5 million USD and 5.2 million USD.	PRODOC, Page 27-30.
8. The 165 kt CO_2 avoided calculation seems OK but the emission factor of 786 g CO_2/kWh is not referenced and could be low if emissions relating to the delivery of diesel fuel to remote areas is included. If installations are in remote villages currently without electricity or on existing mini-grids but with growing demand, it is assumed that the mini-hydro would be the preference over diesel-fuelled generation.	The emission factor has been corrected to 0.875 tCO_2/MWh – this was used in the Second National Communication to UNFCCC. As indicated in the Prodoc, by completion of the 5-year project period, almost 35,000 tonnes of CO_2 would have been avoided as a direct result of hydropower electricity generation. Furthermore, these 4 small hydropower plants will continue to avoid almost 13,000 tonnes of CO_2 annually during their remaining 21-23 years of project life.	PRODOC, Page 48.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS

A. Provide detailed funding amount of the PPG activities financing status in the table below:

Project Preparation Activities	***GEF Amount ($)***		
	Amount Approved	***Amount Spent to date***	***Amount Committed***
Inception workshop			
Technical review and baseline analysis			
Define institutional arrangements and monitoring and evaluation framework	85,000	80,342.35	4,657.65
Financial planning and co-financing investments			
Validation workshop			
TOTAL	**85,000**	**80,342.35**	**4,657.65**