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Report No: PAD2741

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR 46.8 MILLION  
(US\$65.0 MILLION EQUIVALENT)

TO THE

CENTRAL AFRICAN REPUBLIC

FOR THE

EMERGENCY ELECTRICITY SUPPLY AND ACCESS PROJECT (PURACEL)

February 14, 2019

Energy and Extractives Global Practice  
Africa Region

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CURRENCY EQUIVALENTS  
(Exchange Rate Effective December 31, 2018)

Currency Unit = CFA Franc (XAF)

XAF 572.79 = US\$1

US\$1 = SDR 0.719

FISCAL YEAR  
July 1 – June 30

**ABBREVIATIONS AND ACRONYMS**

ACER	<i>Agence Centrafricaine d'Electrification Rurale</i> (Rural Electrification Agency)
AFD	<i>Agence Française de Développement</i> (French Development Agency)
AfDB	African Development Bank
ARSEC	<i>Agence Autonome de Régulation du Secteur de l'Électricité</i> (Autonomous Electricity Sector Regulatory Agency)
CAPEX	Capital Expenditures
CAR	Central African Republic
CEMAC	<i>Communauté Économique et Monétaire des Etats de l'Afrique Centrale</i> (Central African Economic and Monetary Community)
CEMAC-PFTT	<i>Projet de Facilitation du Transit et des Transports en Zone CEMAC</i> (CEMAC Transport-Transit Facilitation Project)
CEN	Country Engagement Note
CPF	Country Partnership Framework
DA	Designated Account
DGE	<i>Direction Générale de l'Energie</i> (Directorate General for Energy)
EIRR	Economic Internal Rate of Return
ENERCA	<i>Energie Centrafricaine</i> (Central African Energy Company)
ENPV	Economic Net Present Value
ESIA	Environmental and Social Impact Assessment
ESMAP	Energy Sector Management Assistance Program
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FCV	Fragility, Conflict, and Violence
FIRR	Financial Internal Rate of Return
FM	Financial Management
FNPV	Financial Net Present Value
GBV	Gender-based Violence
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GTF	Global Tracking Framework
GW	Gigawatt

GWh	Gigawatt Hour
HEIS	Hands-on Expanded Implementation Support
HFO	Heavy Fuel Oil
HIPC	Heavily Indebted Poor Countries
IDA	International Development Association
IFR	Interim Financial Report
IPF	Investment Project Financing
IPP	Independent Power Producer
ISP	Implementation Support Plan
Km	Kilometers
kV	Kilovolt
kWh	Kilowatt Hour
M&E	Monitoring and Evaluation
MDEWR	<i>Ministère du Développement de l'Énergie et des Ressources Hydrauliques</i> (Ministry of Development of Energy and Water Resources)
MFD	Maximizing Finance for Development
MICS	Multiple Indicator Cluster Survey
MINUSCA	<i>Mission Multidimensionnelle Intégrée des Nations Unies pour la Stabilisation en République Centrafricaine</i> (United Nation's Multidimensional Integrated Stabilization Mission in CAR)
MoH	Ministry of Health
MoU	Memorandum of Understanding
MTPER	<i>Ministère des Travaux Publics et de l'Entretien Routier</i> (Ministry of Public Works and Road Maintenance)
MTR	Midterm Review
MW	Megawatt
MWh	Megawatt Hour
MWp	Megawatt Peak
NGO	Nongovernmental Organization
NPF	New Procurement Framework
O&M	Operations and Maintenance
OHADA	<i>Organisation pour l'Harmonisation en Afrique du Droit des Affaires</i> (Organisation for the Harmonization of Corporate Law in Africa)
PAP	Project-affected People
PASEEL	<i>Projet d'Amélioration des Services de l'Eau et de l'Électricité</i> (Water and Electricity Upgrading Project)
PDO	Project Development Objective
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PP	Procurement Plan
PPA	Project Preparation Advance
PPIAF	Public-private Infrastructure Advisory Facility
PPP	Public-private Partnership
PPSD	Project Procurement Strategy for Development
PURACEL	<i>Projet d'Urgence pour la Fourniture et l'Accès à l'Électricité</i> (Emergency Electricity Supply and Access Project)

PURCE	<i>Projet d'Urgence en Réponse à la Crise Electrique</i> (Emergency Power Response Project)
PV	Photovoltaic
RAP	Resettlement Action Plan
RCPCA	<i>Plan National de Relèvement et de Consolidation de la Paix</i> (National Recovery and Peacebuilding Plan for the CAR)
RFP	Request for Proposal
RPBA	Recovery and Peacebuilding Assessment
RPF	Resettlement Policy Framework
SC	Steering Committee
SCADA	Supervisory Control and Data Acquisition
SCD	Systematic Country Diagnostic
SDG	Sustainable Development Goal
SDR	Special Drawing Rights
SEA	Sexual Exploitation and Abuse
SEforALL	Sustainable Energy for All
SENI	Health System Support and Strengthening Project
SFQC	Selection Based on Qualifications and Cost
SODECA	<i>Société des Eaux de Centrafrique</i> (Water Company of the CAR)
SORT	Systematic Operations Risk-Rating Tool
STEP	Systematic Tracking and Exchanges in Procurement
SYSOHADA	<i>Système Comptable</i> (Accounting System, OHADA)
T&D	Transmission and Distribution
TEN	Turnaround Eligibility Note
ToR	Terms of Reference
UN	United Nations
UNFPA	United Nations Population Fund
VfM	Value for Money
VRE	Variable Renewable Energy

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**BASIC INFORMATION**

Country(ies)	Project Name		
Central African Republic	CAR Emergency Electricity Supply and Access Project		
Project ID	Financing Instrument	Environmental Assessment Category	Process
P164885	Investment Project Financing	B-Partial Assessment	Urgent Need or Capacity Constraints (FCC)

**Financing & Implementation Modalities**

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input checked="" type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Disbursement-linked Indicators (DLIs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
28-Feb-2019	28-Feb-2024

Bank/IFC Collaboration

No

**Proposed Development Objective(s)**

The PDO is to increase electricity supply and access in Central African Republic.

**Components**

Component Name	Cost (US\$, millions)
Component 1: Construction of a Solar PV Electricity Generation Plant	48.00



Component 2: Strengthening of the transmission and distribution (T&D) networks	10.60
Component 3: Institutional strengthening, capacity building, and project implementation support	6.40
Component 4: Contingent emergency response	0.00

**Organizations**

Borrower:	Ministry of Economy, Planning, and International Corporation
Implementing Agency:	Ministry of Development of Energy and Water Resources (MDEWR) Energie Centrafricaine (ENERCA)

**PROJECT FINANCING DATA (US\$, Millions)****SUMMARY**

<b>Total Project Cost</b>	65.00
<b>Total Financing</b>	65.00
<b>of which IBRD/IDA</b>	65.00
<b>Financing Gap</b>	0.00

**DETAILS****World Bank Group Financing**

International Development Association (IDA)	65.00
IDA Grant	65.00

**IDA Resources (in US\$, Millions)**

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
National PBA	0.00	65.00	0.00	65.00
<b>Total</b>	<b>0.00</b>	<b>65.00</b>	<b>0.00</b>	<b>65.00</b>

**Expected Disbursements (in US\$, Millions)**

WB Fiscal Year	2019	2020	2021	2022	2023	2024
<b>Annual</b>	0.59	5.39	10.17	17.89	19.14	11.82



<b>Cumulative</b>	0.59	5.98	16.15	34.04	53.18	65.00
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**INSTITUTIONAL DATA**

**Practice Area (Lead)**

**Contributing Practice Areas**

Energy & Extractives

**Climate Change and Disaster Screening**

This operation has been screened for short and long-term climate change and disaster risks

**Gender Tag**

**Does the project plan to undertake any of the following?**

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

No

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

No

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

No

**SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)**

**Risk Category**

**Rating**

1. Political and Governance

● High

2. Macroeconomic

● High

3. Sector Strategies and Policies

● Substantial

4. Technical Design of Project or Program

● Substantial

5. Institutional Capacity for Implementation and Sustainability

● High

6. Fiduciary

● High

7. Environment and Social

● Moderate

8. Stakeholders

● Moderate

9. Other

● High



10. Overall

● High

**COMPLIANCE**

**Policy**

Does the project depart from the CPF in content or in other significant respects?

Yes  No

Does the project require any waivers of Bank policies?

Yes  No

**Safeguard Policies Triggered by the Project**

	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36	✓	
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

**Legal Covenants**

Sections and Description

The Recipient shall, not later than one (1) month after the Effective Date, formalize the land title for the Project Site (Financing Agreement, Schedule 2, Section I, H, 2)

Sections and Description

The Project Implementation Unit shall, not later than two (2) months after the Effective Date customize its existing accounting software to confirm with the SYSCOHADA accounting system to be applied to the Project (Financing Agreement, Schedule 2, Section 1.H.1).





Sections and Description

The Recipient shall, not later than three (3) months after the Effective Date, conclude a Design, Supply and Installation, Operation and Maintenance Contract for a solar PV plant with battery storage, with a Contractor following a competitive tender, in form and substance satisfactory to the Association (Financing Agreement, Schedule 2, Section 1.G.1).

Sections and Description

The Recipient shall, not later than six (6) months after the Effective Date recruit an external auditor with terms of reference, qualifications and experience satisfactory to the Association (Financing Agreement, Schedule 2, Section 1.E).

Sections and Description

The Recipient shall furnish to the Association, not later than November 30 of each year, the annual work plans and budgets approved by the Steering Committee for the Association’s review and approval; except for the annual work plan and budget for the Project for the first year of Project implementation, which shall be furnished no later than one (1) month after the Effective Date. Only the activities included in an annual work plan and budget expressly approved by the Association (each an “Annual Work Plan and Budget”) are eligible to be financed from the proceeds of the Financing (Financing Agreement, Schedule 2, Section 1.C.2).

**Conditions**

Type	Description
Effectiveness	The Recipient has updated the PIM in form and substance satisfactory to the Association (Financing Agreement, Article IV, 4.01.(a)).
Disbursement	No withdrawal shall be made for payments made prior to the Signature Date; or under Category 3 unless the following conditions have been met: The Recipient has determined that an Eligible Crisis or Emergency has occurred, has furnished to the Association a request to include such activities in the Project in order to respond to said Eligible Crisis or Emergency, and the Association has agreed with such determination, accepted said request and notified the Recipient thereof (Financing Agreement, Schedule 2, Section III, B, 1(b)(i)).
Disbursement	The Recipient has adequate staff and resources for the purposes of said activities (Financing Agreement Schedule 2, Section III, B, 1(b)(ii)).
Disbursement	The Recipient has adopted the EROM in form, substance and manner acceptable to the Association (Financing Agreement, Schedule 2, Section III, B, 1(b)(iii)).





**CAR EMERGENCY ELECTRICITY ACCESS PROJECT (PURACEL)**

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## I. STRATEGIC CONTEXT

### A. Country Context

1. **The Central African Republic (CAR) is a landlocked country with a history of political instability.** It has an area of 623,000 square kilometers (km<sup>2</sup>) and is sparsely populated with uneven distribution of its people. Approximately 60 percent of the country's 4.9 million people live in rural areas (World Bank 2017<sup>1</sup>). The average population density is 7.7 inhabitants per km<sup>2</sup>, ranging from one inhabitant per km<sup>2</sup> in the north (in the prefectures of Vakaga, Bamingui Bangoran, and Haute Kotto) to 9,300 inhabitants per km<sup>2</sup> in the capital city of Bangui. The economy is dominated by the agriculture sector, which employs 80 percent of the active population and provides close to 50 percent of the gross domestic product (GDP), which was about US\$2 billion in 2016. The bulk of export revenue comes from three products: diamonds, timber, and cotton.

2. **Political fragility has aggravated the country's extremely low level of socioeconomic development.** In 2017, the CAR ranked second to last out of 188 countries on the United Nations Human Development Index. The latest available data indicate that even before the latest violent conflict more than two-thirds of the country's population was living below the international poverty line of US\$1.90 per day (PovcalNet 2016<sup>2</sup>). The health of the population has been negatively affected by the lack of development and repeated conflict, with a present life expectancy of only 51.4 years, compared to an average of 59 years for Sub-Saharan Africa, and an infant mortality rate that is more than 60 percent above the Sub-Saharan average (World Bank 2017<sup>3</sup>). In 2017, the gross national income per capita was just US\$390. Women in the CAR face significant gender inequality: in the United Nations Development Programme's 2017 Gender Inequality Index, the country had a value of 0.673, ranking it 156 out of 158 countries. The 2012 World Bank Diagnostic on Gender<sup>4</sup> has stated that the status of women in the CAR is 'low' on all political, economic, social, and cultural indicators. Moreover, the inequality between men and women has increased during the cycle of insecurity and poverty that the country has known over the past decades. Sexual and gender-based violence (GBV) is also widespread. About one-third of women have experienced sexual violence, which is often associated with the practice of witchcraft. About 25 percent of women working in the country are HIV positive, compared to about 16 percent of the population overall. At the elite level, very few women have managed businesses or have been in positions of influence in the public sector.<sup>5</sup>

3. **Since achieving its independence from France in 1960, the CAR has endured five military coups, multiple armed rebellions, and numerous episodes of localized violence.** These conflicts have severely weakened public and private institutions and the country's socioeconomic infrastructure. Years of misrule, a widening center-periphery divide, and ethnically motivated government patronage have eroded the quality and credibility of the public administration, leaving communities vulnerable to the rise of rebel groups and defensive militias. Instability and violence are regionwide phenomena that stem from multiple causes that are not reducible to ethnic or religious divisions. Human rights abuse, including sexual violence,<sup>6</sup> has been rampant and has added to both the level of violence and the acceptance of violence

<sup>1</sup> World Bank. 2017. "World Development Indicators." Washington, DC.

<sup>2</sup> <http://iresearch.worldbank.org/PovcalNet/home.aspx>.

<sup>3</sup> World Bank. 2017. "World Development Indicators." Washington, DC.

<sup>4</sup> Gender Equality and Development, Washington, DC, 2012.

<sup>5</sup> Annex 3 provides more details on GBV assessment in the Central African Republic.

<sup>6</sup> <https://www.hrw.org/report/2017/10/05/they-said-we-are-their-slaves/sexual-violence-armed-groups-central-african>.



against women.<sup>7</sup> The country is bordered by six countries—Cameroon, Chad, Sudan, South Sudan, the Republic of Congo, and the Democratic Republic of Congo—some of which are plagued by ongoing intrastate conflicts. As a result, the CAR experiences repeated conflict spillovers from these countries. Meanwhile, weak government institutions and the lack of economic opportunity have encouraged the spread of criminal networks that profit from an ongoing climate of lawlessness and instability.

4. **The CAR was still recovering from the effects of the 2008 global recession when a domestic political and security crisis erupted at the end of 2012.** The most recent major conflict occurred in early 2013, when a coalition of armed groups mostly from the northeast (Séléka) took control of much of the territory and seized power in Bangui. The situation worsened when anti-Balaka—mostly Christian village self-defense groups—arose in response and violently retaliated against Séléka combatants and against the Muslim population. The ensuing insecurity led to massive forced displacement, the collapse of state institutions, and devastation of the country’s economy. The GDP fell by 36 percent in a single year, government revenue was cut by two-thirds, and public services were either radically reduced or ceased to function throughout much of the country. The crisis severely disrupted the public administration, and the Government has been struggling to rebuild its institutions and resume its core functions ever since.

5. **After a three-year transition period, the security situation remains fraught, and authorities are struggling to regain control of extended areas.** The CAR remains politically fragile, with armed groups present in the territory and tense relations between communities. About 60 percent of the country is estimated to be under the control or influence of armed groups and militias. After a post-transition respite, the optimistic momentum in the country has started to unravel, with a deteriorating security situation in various regions of the country and an intensifying humanitarian crisis, which appears to be weakening the regime’s authority and credibility. Although the presence of the United Nations (UN) peacekeeping force—the United Nations Multidimensional Integrated Stabilization Mission in CAR (MINUSCA)—remains essential, it is barely able to contain the violence, including sporadic interethnic fighting in the capital, Bangui. As of August 2018, more than 600,000 people were internally displaced, up from about 400,000 in January 2017, while another 570,000 are now refugees in neighboring countries. It is estimated that 2.9 million people, half the country’s population, will require acute and immediate humanitarian assistance at the end of 2018, a 16 percent increase compared to the situation of 2017. This widescale flight to safety is creating even more pressure on the few public infrastructure systems that are still operating.

6. **Among all its urgent challenges, the Government is committed to increasing access to reliable electricity as a peace dividend.** After a three-year transition period, the interim government, which was installed in 2014, has drafted a new constitution and organized presidential and legislative elections, which were peacefully held in February 2016 with strong international support. The country is now heavily reliant on the international community as long-term development assistance returns to complement emergency assistance. In October 2016, the Government developed the National Recovery and Peacebuilding Plan for the CAR (*National de Relèvement et de Consolidation de la Paix* - RCPCA). In this plan, the Government identified the priorities and needs for recovery and peacebuilding and is seeking the technical and financial support of its development partners in the process. Among the priorities identified, electricity infrastructure development is one key element. At a donor conference held in Brussels in November 2016, the international community pledged an unparalleled US\$2.3 billion to cover

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<sup>7</sup> The Multiple Indicator Cluster Survey (MICS) 2010 study shows that 84 percent of women and 39 percent of men believe that men have the right to beat their wives.



urgent needs in the country over 2017–2021. Of this, a significant share will finance the promotion of economic recovery and the boosting of productive sectors, including the rehabilitation and construction of key energy infrastructure.

## B. Sectoral and Institutional Context

7. **The electricity sector is characterized by inadequate infrastructure, a weak policy and regulatory framework, and a utility that is struggling to recover costs and thus to maintain and expand services.** The CAR is endowed with abundant low-cost energy resources, including considerable hydroelectric and solar potential, but these remain underdeveloped. Electricity generation and transmission capacity has long failed to keep pace with the growth in demand, and the sectoral infrastructure stock is inadequate and dilapidated. Access to the national power grid is limited, and the electricity supply is highly erratic. The state-owned power utility, the Central African Energy Company (*Energie Centrafricaine* - ENERCA), suffers from serious technical, organizational, and financial deficiencies, and the sector lacks a clear policy vision or national energy development strategy.

8. **As a result, access to electricity remains extremely low, and the country is in a persistent state of supply deficit.** The country's overall rate of access to electricity (8 percent) is far below the average for Sub-Saharan Africa. The grid is largely limited to the capital, Bangui, where electrification has reached 35 percent, while access to modern electricity services in the rest of the country is just 2 percent. Total installed capacity is 28 megawatt (MW), of which 23 MW is available, whereas the current load is 45 MW, and the projected unmet demand is estimated at around 60 MW. The bulk of production is composed of two hydropower plants—Boali 1 (8.5 MW) and Boali 2 (10 MW)—which are located approximately 85 km northwest of Bangui. The plants were installed in 1954 and 1976, respectively, and have undergone partial rehabilitation in past years. However, the actual combined generation fluctuates between only 13 and 16 MW. Most of the remaining capacity is provided by a set of six diesel generators in Bangui, of which only one is still in use due to a lack of maintenance. As a result, residents experience load shedding and rolling blackouts for up to 16–18 hours per day. Before the recent crises, the 16 district capitals were also provided with electricity using generators. Today, only three are still receiving electricity (Mongoumba, Mobaye, and Bossangoa), and electricity is provided only for a few hours at night, though even this remains limited due to the prohibitive cost of sourcing fuel in this landlocked country.

9. **Sector governance is weak, and ENERCA has an effective monopoly on the sector.** The country's electricity sector is governed by the Ministry of Development of Energy and Water Resources (*Ministère du Développement de l'Énergie et des Ressources Hydraulique* - MDEWR), specifically by the Directorate General for Energy (*Direction Générale de l'Énergie* - DGE). In 2005, the Government issued a decree establishing the Electricity Code, with the aim of improving sector performance and attracting private sector investment. The reform included the creation of the Autonomous Electricity Sector Regulatory Agency (*Agence Autonome de Régulation du Secteur de l'Électricité* - ARSEC) and the Rural Electrification Agency (*Agence Centrafricaine d'Électrification Rurale* - ACER). Nevertheless, both agencies exhibit a total lack of capacity and are unable to carry out their functions. Thus, although the power sector has in principle been liberalized, with the exception of some self-producing industrial consumers, investment and operations are exclusively led by ENERCA.

10. **ENERCA is not achieving cost recovery.** The average tariff of US\$0.14 per kilowatt hour (kWh) is below the cost of supply, which is three times higher than the Sub-Saharan average. This is due to the use of thermal generation, which is necessary during peak periods to complement the supply from the Boali



hydropower system. ENERCA realized a turnover of US\$14 million in 2017, whereas its collections were significantly lower (US\$7.5 million). The resulting unfavorable cost recovery ratio is driven primarily by the inefficient collection of payment for electricity, coupled with the large amount of power lost during transmission and distribution (T&D), which is thus never billed at all. Operational costs were estimated at US\$12.2 million in 2017. As for generation from other fossil fuels—heavy fuel oil (HFO), diesel, or gas—these sources remain expensive and unreliable due to the landlocked location of the country, as well as the existing state of internal conflict, which further discourages investment in industrial or service activities and thus the diversification of the economy.

11. **Total technical and commercial losses are substantially higher than the Sub-Saharan African average of 18–20 percent.** Transmission losses are estimated at 7 percent of energy production and distribution losses at 33 percent, whereas the bill collection rate stands at around 67 percent. Most technical losses are the result of an obsolete and dilapidated infrastructure, which suffered additional and severe damage during the civil war in 2013. Compounding this situation, nontechnical losses are caused by illegal connections, faulty meters, unmetered consumption, ineffective lumpsum billing practices, and the resale of electricity. The poor quality of electricity services discourages consumption among paying customers and creates incentives to use costly and environmentally damaging diesel generators. The low service quality is likely another contributing factor to the low bill collection rate, as dissatisfied customers choose not to pay their bills. Table 1 summarizes the key performance indicators of the sector.

**Table 1. Energy Sector: Key Performance Indicators**

Parameter	Value
Electricity access rate	8% (35% in Bangui and 2% outside Bangui)
Number of active accounts (2016)	40,000, of which 99% are residential (2018)
Installed capacity	28 MW, of which 23 MW available (2017)
Energy mix	96% hydropower and 4% diesel (2015)
Average tariff	US\$0.14 per kWh (2017)
Transmission losses	7% (2017)
Distribution losses	33% (2017)
Bill collection rate	67% (2017)
Cost recovery	55%

12. **To support the Government in addressing these issues, the World Bank has invested in the country's energy sector over the past decade.** In 2009, the World Bank approved the US\$10.5 million International Development Association (IDA)-financed Emergency Power Response Project (*Projet d'Urgence en Réponse à la Crise Electrique – PURCE*, P114111), the development objectives of which were to partially restore a reliable electricity supply to ENERCA's customers in Bangui, including essential service providers such as the water utility and hospitals, and to improve the financial and operational performance of the sector. Implementation of the project was delayed because of the 2013 conflict. However, given its success in delivering tangible results to restore a reliable electricity supply to ENERCA's customers in Bangui and improve the financial and operational performance of the sector, outcomes for the project were rated Moderately Satisfactory by the World Bank's Independent Evaluation Group, on project completion in April 2017. The PURCE components included rehabilitation of the Boali 1 hydropower plant (8.75 MW), investment in a distribution network to reduce technical losses, and the installation of 5,000 prepaid meters to improve ENERCA's bill collection rate and revenues. Through the PURCE, distribution losses were reduced from 50 percent in 2009 to 33 percent in 2017, and the bill collection rate increased from 50 percent in 2009 to 67 percent in 2017. In January 2018, the World Bank



also approved the US\$20 million IDA-financed Water and Electricity Upgrading Project (*Projet d'Amélioration des Services de l'Eau et de l'Électricité – PASEEL*, P162245) to continue investment and support for the sector recovery.

13. The PASEEL was designed to capitalize on the achievements of PURCE, with the objective of enhancing ENERCA's operational performance and increasing access to an improved electricity supply in Bangui and selected secondary towns, starting with Bambari and Berberati. Among the PASEEL activities is restoration of the electricity supply in these two cities by using solar resources and preparing feasibility studies for developing solar and/or other renewable solutions in six other cities, which would be financed with additional IDA financing and potentially with cofinancing from other development partners as well.<sup>8</sup> The PASEEL is also supporting strengthening the resilience of the Boali 1 hydropower plant and further improvement in the bill collection rate by installing an additional 5,000 prepaid and smart meters in Bangui. Furthermore, it is providing technical assistance to improve ENERCA's operational and financial performance and is supporting the MDEWR in putting in place adequate planning tools to rationalize investment in the sector, including the updating and strengthening of the energy sector strategy, drafting of application decrees for the Electricity Code, developing a least-cost development plan for generation and transmission, and so on. Additional World Bank-administered support includes two technical assistance programs: one designed to improve the financial and operational performance of the utility and to explore various options for encouraging private sector participation in the sector and another to assess solar resources in Bangui and other secondary cities and to integrate solar photovoltaic (PV) production onto the grid.<sup>9</sup>

14. **The World Bank's 2016 'CAR: Building a New Foundation for Stability and Growth' policy note<sup>10</sup> identified increased access to reliable electricity as a key priority for improving sector recovery.** The note outlined the most urgent challenges and policy options that were identified to improve sector performance, including increasing access to reliable electricity while reducing technical and nontechnical losses, restoring the sector's financial viability, and enhancing the policy, regulatory, and institutional framework for both urban electric grids and rural electrification projects. While these reforms are expected to be carried out as part of a larger sector development strategy, improving service reliability is critical in reestablishing customer confidence and in increasing revenue. The note also highlighted the need to improve coordination between public institutions and the country's development partners and to eventually create an enabling environment to promote decentralized private sector solutions, including renewable energy generation.

15. **To improve reliability in the power system, support stability, and promote peacebuilding in a context of fragility, the country is in dire need of sizeable and urgent increases in its electricity generation capacity.** Given the limited output from the Boali hydroelectric system, ENERCA is currently relying on expensive and polluting diesel generation to meet increasing demand whenever possible. This affects the utility's financials, as ENERCA does not have sufficient funds to pay for the diesel imports needed to sustain its operations. To substantially increase capacity at an acceptable cost and to increase access to reliable and affordable electrical services, the country needs to harness its considerable

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<sup>8</sup> The potential development partners include but are not limited to the Japanese Policy and Human Resources Development Fund, and Lighting Africa.

<sup>9</sup> Public-Private Infrastructure Advisory Facility (PPIAF) trust-funded activity: "ENERCA: from recovery to sustainable strategy," and Energy Sector Management Assistance Program (ESMAP) trust-funded activity: "Support for the promotion and implementation of solar PV projects in the Central African Republic."

<sup>10</sup> *Central African Republic - Building a new foundation for stability and growth (English)*





hydroelectric potential, estimated to total 2 gigawatt (GW), across large and small sites. To this effect, the African Development Bank (AfDB) is financing the expansion of the Boali 2 hydropower plant by 10 MW, while discussions are under way between the Government of the CAR and the Chinese Cooperation to relaunch the installation of generation capacity at Boali 3 that was interrupted during the 2013 conflict (10 MW of which only 5 MW is available during dry season). The preparation and development of additional hydropower projects is likely to be both lengthy and costly. Beyond the urgent needs, this challenge is compounded by the fact that private investment in the sector is unlikely in the medium term because of the country's difficult security situation, its generally adverse business climate, the absence of a clear sector strategy, and ENERCA's operational and financial performance. This also makes off-grid technology deployment, which is heavily dependent on private sector participation due to the complex distribution networks involved, difficult to achieve in the short run.

16. **Against this backdrop, the Government of the CAR has committed to developing a 40 MW peak of solar PV capacity with battery storage to increase the country's electricity supply.** Harnessing solar resources through a PV plant with battery storage is the least-cost solution and will be the most effective in the short term to address the generation shortage. The country benefits from abundant solar resources, with an annual overall solar radiation of approximately 6.6 GJ per m<sup>2</sup> per year (5 kWh per m<sup>2</sup> per day) on average, which corresponds approximately to a mean sunshine duration of 2,600 hours per year (7.1 hours per day). Because of the country's persistent supply deficit, it is expected that any additional power production will be consumed. Despite this, solar power does not yet feature in the country's energy mix. The proposed project is expected to catalyze this process by preparing a site for such development; financing the phased installation of solar PV capacity, starting with a 25 megawatt peak (MWp) PV plant with a 25 megawatt hour (MWh) battery electricity storage system; and laying the foundation for future capacity expansion up to 40 MWp. The use of battery storage will enable the harnessing of energy produced with PV, despite fluctuations during the rainy season, and will dispatch it seamlessly to the grid, allowing it to meet evening demand peaks.

### C. Relevance to Higher-Level Objectives

17. **The proposed project is aligned with Sustainable Development Goal 7 (SDG 7), and with Sustainable Energy for All (SEforALL), both of which aim to ensure access to affordable, reliable, sustainable, and modern energy for all.** The progress toward SDG 7 in every area of sustainable energy falls short of what is needed to achieve energy access for all and to meet the targets for renewable energy. Globally, 1.06 billion people, predominately rural dwellers, still function without electricity. Half of those people live in Sub-Saharan Africa. Per the Global Tracking Framework (GTF) 2017,<sup>11</sup> which tracks the progress of the SEforALL mission by 2030, the annual growth of electricity access was only 0.19 percentage points from 2012 to 2014, much lower than the required rate of 0.92 percentage points a year to meet the universal access to electricity objective in 2030. The proposed project, the Emergency Electricity Supply and Access Project (*Projet d'Urgence pour la Fourniture et l'Accès à l'Électricité* - PURACEL, P164885), will not only provide electricity to consumers in the CAR but will also increase the share of electricity generated by renewable energy—in this case solar energy—for the country.

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<sup>11</sup> GTF has been renamed as 'Tracking SDG7: The Energy Progress Report'. It is updated annually, and it provides the international community with a global dashboard to register progress on the targets of SDG 7. The data and reports can be found at <https://trackingsdg7.esmap.org/>.



18. **The project is also fully consistent with the World Bank’s twin goals of ending extreme poverty and promoting shared prosperity and is aligned with its Energy Sector Directions Paper.**<sup>12</sup> Low service quality and limited access to electricity undermine poverty eradication efforts. Energy is a key driver of economic growth and an important means of improving equity and reducing poverty. Reliable and affordable sources of electricity are an essential precondition for a healthy population and for robust economic activity, especially in the country’s current context of constrained economic activity. This project will increase access to reliable electricity and will lay the technical and institutional foundation for more sustainable development. It will also address gender inequality by specifically targeting women for productive uses of electricity and improving service provision for women who are suffering from GBV.

19. **The proposed project will contribute directly to the objectives of the 2015 Country Engagement Note (CEN) and the 2016 IDA Turnaround Eligibility Note (TEN) for the CAR, which in turn supports the Recovery and Peacebuilding Assessment (RPBA) process.** The CEN and TEN provide the framework for the provision of preliminary support for recovery and development for the country by 2030. These are the latest strategic documents that outline the rationale for World Bank support to the CAR for rebuilding after the events of 2012. The CEN outlines the World Bank Group’s strategy to support stabilization and to provide preliminary support for recovery and development, for a period of 18 months (July 2015-end 2016). The TEN focuses on a combination of stabilization efforts and development activities and outlines key projects to be prepared in the medium term, explicitly targeting the water, sanitation, and energy sectors in its proposed turnaround program. Consistent with CEN and TEN objectives, the proposed project will increase the country’s electricity supply and access to electricity, to rebuild the state-citizenry social compact in Bangui, where there are currently only limited functioning electricity services. The project will contribute to the stabilization and peacebuilding efforts by strengthening the presence of state services and by helping build trust between the state and its citizens. Finally, a Systematic Country Diagnostic (SCD) is currently under preparation, and the new Country Partnership Framework (CPF) is expected to follow in 2019.

20. **The project is consistent with the World Bank’s Maximizing Finance for Development (MFD) principles, and it is hoped that it will create a demonstration effect to attract private sector participation in the CAR.** Considering the country’s challenging business environment, and the dire situation of ENERCA and the energy sector, there is currently little appetite for private sector participation in the country’s expansion of electricity generation at a reasonable cost. By creating familiarity with grid-scale solar PV with battery storage within the Government and ENERCA, by demonstrating that a solar project can be successfully implemented and operated in the country, and by lowering the utility’s costs, the proposed project will provide the foundation for potential commercial investment in future capacity additions at the same project site and potentially in others as well. Furthermore, in combination with the ongoing PASEEL, the proposed project will support improved sector planning and improved utility performance, with hopes of attracting private sector investment into the energy sector.

21. **The project is triggering condensed procedures considering the urgent need to increase electricity supply and access.** The CAR experiences capacity constraints because of country-level fragility, country-level governance constraints and specific vulnerabilities of the power sector arising from a lack of sector planning and lack of financial viability as discussed above. In addition, the country is in urgent need to improve electricity supply and access as a peace dividend. As a result, the proposed project is being prepared under Investment Project Financing (IPF) Policy, paragraph 12 “Projects in Situations of

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<sup>12</sup> “Toward a Sustainable Energy Future for All: Directions for the World Bank Group Energy Sector.” July 2013.



Urgent Need of Assistance or Capacity Constraints”. Project preparation has been supported by a US\$2 million Project Preparation Advance (PPA).

## II. PROJECT DESCRIPTION

### A. Project Development Objective

22. The Project Development Objective (PDO) is to increase electricity supply and access in Central African Republic.

23. The PDO indicators are as follows:

- Indicator 1: Annual electricity generation dispatched from solar energy Gigawatt-hour (GWh)
- Indicator 2: People provided with new or improved electricity service, including how many are female (number, percentage)

### B. Project Components

24. To achieve the PDO, the project will provide an IDA grant equivalent to US\$65 million to fund four components: (a) Construction of a solar photovoltaic (PV) electricity generation plant; (b) Strengthening of the transmission and distribution (T&D) networks; (c) Institutional strengthening, capacity building, and project implementation support; and (d) Contingency emergency response.

25. This project constitutes the first phase of development of 25 MWp solar generation capacity with a 25 MWh battery storage system in Bangui. With this project, the utility will be able to supply 37 GWh more of electricity annually to the system, corresponding to a 30 percent increase from the current level of annual electricity production and provide 250,000 people with new or improved electricity services.

26. Technical studies will also include the design of a second phase that will allow for an increase in the installed capacity at the same proposed site to 40 MWp under a separate public project or public-private partnership (PPP). The project will prepare the project site and the ancillary infrastructure required for both phases, so that the second phase could be implemented seamlessly with a ‘Plug and Play’ solution.

#### **Component 1: Construction of a Solar PV Electricity Generation Plant (US\$48.0 million equivalent)**

27. This component will finance a greenfield 25 MWp solar PV plant with a 25 MWh battery electricity storage system designed to minimize grid absorption issues associated with variable renewable energy (VRE) and to optimize synchronization between power plant output and the demand profile. The identified 75 ha project site is located near the village of Danzi, about 20 km north of Bangui and about 3 km from the existing transmission line (63 kilovolt (kV)) that links the Boali hydropower system to Bangui.

28. The project will finance the design, supply, and installation contract for the plant, in addition to an operations and maintenance (O&M) contract for a period of three years. The plant will be designed so that it can be complemented by a future extension (Phase II) to increase generation capacity up to 40 MWp under a separate project should the Government decide to pursue such an option. For Component



1 of the proposed project, the cost, which includes contingencies, has been estimated following a benchmarking exercise completed by the World Bank. The final cost for the plant will be firmed up upon completion of the international competitive bidding for the supply and installation of the system. The annual output for the 25 MWp-25 MWh plant is calculated at 37 GWh.<sup>13</sup> The average daily generation is around 103 MWh, which fluctuates significantly between the dry and wet seasons: 110–120 MWh in the dry season and 80–90 MWh in the wet season.

29. Investment in the solar PV plant will include a step-up substation and other ancillary transmission equipment on the project site, as well as a connection to the existing transmission line. No upgrade works are envisaged on the existing transmission line through the proposed PURACEL.<sup>14</sup> The plant will be composed of a series of polycrystalline or monocrystalline PV modules installed on fixed steel structures. Modules will be connected in strings, and the strings will be connected to the inverters. The project site will be secured by a fence and will have an adequate security system and staff. Considering the geographical situation of the CAR the logistics will be challenging, as all the equipment will have to be delivered by road, on truck containers from the closest harbor to Bangui (most likely Douala in Cameroon).

30. The addition of battery storage is needed for various purposes, including (a) providing stability to the grid by smoothing solar generation fluctuations; (b) protecting the plant from grid fluctuations; (c) allowing a portion of the solar power generated during daylight to be used during evening peak hours; and (d) providing additional ancillary services to the weak power system, through voltage and frequency regulation.

31. A pre-feasibility study of the system was finalized by the Government in early 2018, and a network assessment to determine optimal plant size (PV and batteries) was undertaken by the World Bank as part of project preparation, with support from the ESMAP. The plant design for this first phase has been defined following analysis of various optimization scenarios to meet both the grid stability requirement and the nighttime peak demand. The energy storage size has been preselected by minimizing the number of instabilities and maximizing the energy available after sunset for nighttime peak demand. According to this analysis, the adequate battery storage system size has been set at 25 MWh, considering the solar PV system of 25 MWp and the size of the existing power system. The sizing of battery storage will be further refined during the competitive procurement process for the design, supply, and installation of the plant through an initial selection, plus a two-stage Request for Proposal (RFP) approach. Potential bidders will have the flexibility to propose alternate solutions during the first stage if they meet the requirements of grid stability and improve nighttime peak response.

32. The battery storage system has a lifetime of between five to ten years. The need for and sizing of a replacement system will depend on the progress of the grid development, particularly with respect to hydropower generation under consideration as mentioned above<sup>15</sup>. Cost of storage technology is significant but is changing rapidly.<sup>16</sup> As the battery storage industry develops, and the technology matures, the cost and frequency of battery replacement are decreasing, so it is difficult to estimate these costs at this stage. The project is designed to improve ENERCA's financial position, and therefore to position the

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<sup>13</sup> There is a 2 percent loss due to the roundtrip efficiency of the battery storage systems.

<sup>14</sup> The AfDB is financing generation capacity expansion in Boali 2 (10 MW) in addition to upgrading the existing transmission line linking Boali hydropower system to Bangui, from 63 to 110 kV.

<sup>15</sup> Developing hydropower projects with some level of storage may reduce the need for battery storage.

<sup>16</sup> Battery storage is a rapidly evolving technology, and prices are decreasing while battery life is increasing. Currently, the need for battery replacement varies from five to 10 years.



utility to finance this cost of battery storage replacement when and if needed. If the project were treated as a stand-alone project, the cash flow generated over five years should be sufficient to cover for battery replacement if properly provisioned. ENERCA will have a maintenance contract in place with the battery storage manufacturer to ensure a minimum annual performance for the batteries. The ability of the utility to operate and maintain the solar plant and other generation and T&D assets in a sustainable way (including covering investment for battery replacement) is closely linked to improving its overall financial and operational performance, which is the underlying objective of the proposed project as well as of other World Bank interventions supporting the energy sector.

33. The supply and installation contract for the solar plant will incorporate provisions for O&M of the plant for a minimum period of three years, including performance guarantees to optimize the quality of the equipment and works during installation, and a bonus scheme to enforce rigorous O&M execution by the contractor. For battery storage, the contractor will have a 10-year maintenance contract with the technology provider to guarantee a minimum annual performance. The contractor would transfer the 10-year maintenance contract for battery storage to ENERCA after the conclusion of the three-year period of O&M by the contractor. After the project closes, it is expected that ENERCA will finance the maintenance of battery storage. The O&M contract will also include provision for the required security needed to guard the project site. During the O&M period, the contractor will be required to train ENERCA staff to operate and maintain this type of plant, including the maintenance of energy storage: this capacity building will allow ENERCA to take over operations after three years. Under Component 3, the project will support further capacity building to ENERCA staff to manage the integration of VRE into the grid and use of the Supervisory Control and Data Acquisition (SCADA) system as discussed in Component 2 below.

34. The 25 MWp plant, supported by battery storage, will allow the partial coverage of peak demand while (a) providing experience to ENERCA in operating and maintaining this type of installation and (b) allowing time to adjust the SCADA to manage the generation-demand balance in the system and reinforce the T&D network to increase reliability in the system. This will also inform the preparation for a potential subsequent project to expand the solar PV plant up to 40 MWp.

## **Component 2: Strengthening of the Transmission and Distribution Networks (US\$10.6 million equivalent)**

35. This component will finance the necessary T&D upgrades to (a) absorb the additional generation capacity; (b) help reduce T&D losses; (c) increase access by extending the distribution network and new connections throughout Bangui; and (d) improve the management of generation assets and T&D networks. The following subcomponents are included.

36. **Subcomponent 2.1. Reinforce and upgrade transmission infrastructure and install SCADA system (US\$3.4 million equivalent).** This subcomponent will include necessary investments in transmission to reinforce and upgrade substations Bangui A and Bangui B so that they can handle the additional generation from the solar plant and to permit automatization with the SCADA system. This will include building a new 25 MVA capacity transformer and related equipment in substation Bangui A and the installing a SCADA system and related improvements to existing equipment.

37. The SCADA system will facilitate the management of generation, demand-supply balance, and integration of solar generation into the national grid. It is an essential tool for managing energy generation for existing and future assets, including facilitation of the integration of VRE, without which there is an



elevated risk of stranded assets and instabilities. The SCADA system will manage (a) the balance between demand and supply; (b) the coordination of generation facilities; and (c) systemwide distribution operations. The system will be open, efficient, and highly secured with modern management tools for power generation and transmission systems using state-of-the-art techniques in the field.

38. Specific feasibility studies will analyze and propose an optimal configuration for the new SCADA system and required upgrades in transmission infrastructure. The studies will include future investments in transmission that will be needed to enable capacity expansion up to 40 MWp. Necessary upgrades in the transmission stations will be in place to ensure that the solar plant can dispatch its load when it is commissioned in two years. New transmission infrastructure (lines and stations) that will be needed to accommodate the second phase of the project will be included in the project scope if budget allows; if not, they can be considered for future development partner support.

39. **Subcomponent 2.2. Improve distribution infrastructure and services (US\$7.2 million equivalent).** This subcomponent will finance (a) upgrade investments to the existing distribution infrastructure to reduce distribution losses and improve service quality and (b) construction of new distribution lines and related equipment including the installation of transformers, circuit breakers and installation of equipment and equipment for last mile connection; and (c) financing specific feasibility and studies. The improvements will cover the priority zones identified by ENERCA in Bangui and in localities around the project site in Danzi. This will include (a) installing 40 medium-voltage and low-voltage substations, including transformers, circuit breakers, and related equipment; (b) installing 110 km of new medium-voltage distribution lines including poles and related equipment; (c) installing 340 km of new low-voltage distribution lines, including poles and related equipment; (d) installing equipment to connect new customers; and (e) providing equipment for the installation and maintenance of the distribution infrastructure by ENERCA.

**Component 3: Institutional Strengthening, Capacity Building, and Project Implementation Support (US\$6.4 million equivalent)**

40. This component will finance activities to support planning in the energy sector, promotion of renewable energy, capacity building for ENERCA and the MDEWR, and project preparation and implementation support, including financing for compensation related to the implementation of the Resettlement Action Plan (RAP). Support under this component complements the activities under the PASEEL to support sector planning and reforms.

41. **Subcomponent 3.1: Strategic support for strengthening of the energy sector through technical assistance (US\$0.8 million equivalent).** This technical assistance to the MDEWR (including the DGE, ACER, and ARSEC) will support studies such as the following:

- (a) A policy and prospectus for the promotion and integration of renewable energy sources in the CAR's electricity system and updating of the national energy policy document to factor in renewable energy and the promotion of energy efficiency.
- (b) A cost of services and tariff design study.
- (c) An update of the legal and regulatory framework needed to promote private sector participation in renewable generation (on-grid and off-grid) and energy efficiency.



- (d) A market assessment and feasibility study for developing solar home systems and solar panels for public buildings. This will include identification of priority deployment areas, required investment costs and timelines, and financing and subsidies options to bridge the affordability gap.

42. **Subcomponent 3.2: Capacity-building activities for ENERCA and MDEWR technical management and staff and the Project Implementation Unit (PIU) (US\$0.55 million equivalent).** The project will finance various activities designed to support the capacity building of ENERCA and MDEWR staff in various areas, including training on:

- (a) Procurement, project management, and contract management;
- (b) O&M of solar plants to complement planned training by contractors as part of the supply, installation, and O&M contracting for the solar plant;
- (c) Grid management and SCADA in a diversified generation pool; and
- (d) Safeguards, including topics such as GBV, labor influx, and the Grievance Redress Mechanism (GRM);
- (e) Gender training and gender-sensitive capacity building activities in ENERCA and MDEWR, including to address and prevent GBV.

43. **Subcomponent 3.3: Project implementation support (US\$4.80 million equivalent).** Activities in this subcomponent are as follows:

- (a) Studies for project preparation, including safeguards studies; topographic, geotechnical, and hydrologic studies for the project site; feasibility studies for SCADA; generation, transmission, and distribution development and upgrades to prepare for Component 2 of the proposed project; and second-phase development of generation capacity.
- (b) Project implementation support, including an Owner's Engineer<sup>17</sup> to assist the PIU and ENERCA during the procurement phase for the plant as well as during supervision of project construction; preparation of a funding request to the Green Climate Fund (GCF); and outreach and sensitization campaigns.
- (c) PIU support to implement the project. The IDA grant will support staff salaries, including two new technical experts, a procurement specialist, and an accountant<sup>18</sup>; ad hoc expert support; a financial audit of the project; key studies and manuals (Project Procurement Strategy for Development [PPSD], Project Implementation Manual [PIM]); operational and supervision costs; support equipment (offices, IT equipment, and vehicles); and supervision support for ENERCA and the MDEWR, including the provision of vehicles.

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<sup>17</sup> An Owner's Engineer is generally a construction and/or consultancy firm that will protect the owner's interests and support the supervision of works during construction.

<sup>18</sup> Recruitment of new staff for PIU is cofinanced between the proposed project and PASEEL.



- (d) Implementation of the Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP), RAP and prevention against GBV. A provision of US\$500,000 was earmarked from IDA proceeds to cover compensation related to the implementation of RAP.<sup>19</sup> A total amount of US\$900,000 will cover ESMP and RAP implementation for Component 1, including compensation of Project Affected People (PAP), and preventive measures against GBV such as establishing a code of conduct that includes provisions against SEA and GBV, training for contractors and key stakeholders, community information and awareness sessions, and ensuring that responsibility for preventing instances of GBV is included in all procurement contracts.

44. **Subcomponent 3.4: improve access to GBV prevention and support services for women in the project implementation area (US\$0.25 million equivalent).** The project will support the creation of a primary health care center, which will offer medical and basic psychosocial care to GBV survivors<sup>20</sup> living in project implementation areas, as well as a women's center that will provide psychosocial and socioeconomic activities for women to raise awareness of women's rights and GBV in these communities. The socioeconomic component will include financial support to women's associations for income-generation activities. The project will also commit to gender-sensitive training and capacity-building activities within ENERCA and the MDEWR, to ensure equal opportunities for both male and female employees. Considering the low level of gender equality in employment within the CAR, and within the energy sector, the project will work with ENERCA and the MDEWR to not only help improve the gender balance within these organizations but also increase the capacity of staff to be better equipped to engage on issues with female consumers, where it is female-headed households or businesses, and/or training staff on core issues such as GBV issues and inclusive consultations. The following activities are envisaged:

- (a) **Gender-sensitive training activities** to ensure that female participants can freely and actively take part in all the training activities offered to stakeholders, recognizing that at times this would mean organizing women-only sessions (to also be facilitated by women).
- (b) **Training on gender.** The project will offer stakeholders (ENERCA, MDEWR, PIU, and so on) training on the benefits of integrating women into their organizations and on how to be an equal opportunity employer.

45. The PIU staff will include a Social Safeguards Expert and a Monitoring and Evaluation Expert that will be trained on gender and GBV. In addition, the PIU will rely on additional collaboration and support from local and/or international nongovernmental organizations (NGOs) active in the country. The Owner's Engineer that will be supervising the construction works will have specific provisions to address the monitoring and reporting of any GBV-related events. The GBV subcomponent of the project will capitalize on close coordination and cofinancing with the Health System Support and Strengthening Project (SENI - P164953), approved in September 2018, which will include the establishment of integrated units for free medical care for victims of GBV in four districts, and awareness raising and communication at all levels. More definitive activities will be defined at a national gathering of a GBV focus group led by the Ministry of Health (MoH), in collaboration with the Ministry of Promotion of Women, Family, and Child Protection,

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<sup>19</sup> A memo was submitted to the Regional Vice President and approved as part of the Project Appraisal Document package.

<sup>20</sup> 'GBV survivor' and 'GBV victim' are terms used interchangeably to describe a person who has experienced gender-based violence or sexual exploitation and abuse. The term 'victim' is often (but not exclusively) used in a legal context, while 'survivor' is favored by the social sector because it focuses on resilience.





along with the United Nations Population Fund (UNFPA) as a GBV cluster lead; various other UN agencies; and international NGOs. Subcontracting to NGOs and obtaining GBV-related medical kits from the UNFPA might also be considered. The proposed project will benefit from SENI implementation arrangements and solutions to train health staff and assist the health facility to attend the victims.

#### **Component 4: Contingent Emergency Response (US\$0)**

46. The objective of this component is to improve the Government's ability to respond effectively in the event of an emergency, following the procedures governed by paragraph 13 (on disaster prevention and preparedness) in the World Bank Investment Project Financing (IPF) Policy. There is a risk that during the life of the project, the CAR may experience a crisis, which might result in a request to the World Bank to support mitigation, response, and recovery measures. Component 4 will enable a rapid project restructuring, including the reallocation of funds and disbursements if needed. Once it is triggered, this component would be subject to the exceptional policy requirements set out in paragraph 12 of the World Bank IPF Policy. An Emergency Response Operational Manual will be prepared during implementation to outline procedures to be followed should such an emergency occur.

#### **C. Beneficiaries**

47. The primary direct beneficiaries of the project are the current electricity consumers in Bangui—including residential, commercial, and industrial consumers—and the government entities that will benefit from an increased availability and reliability of electricity supply. The proposed project will benefit existing grid-connected consumers by meeting their suppressed demands and improving the efficiency of supply. Specifically, consumers would benefit from (a) increased hours of power supply due to avoiding load shedding and blackouts; (b) reduced risk of power system collapse, with the associated economic losses during the time that the power supply is cut; and (c) better quality of power supply (for example, more stable voltage and frequency), which would extend the operating life of electrical appliances. ENERCA currently has 40,000 existing connections, corresponding to a total of 200,000 beneficiaries.<sup>21</sup> Other direct beneficiaries will include women affected by GBV in the project area who will benefit from close support as envisaged under Component 3.4.

48. Increased investment in the capacity for generation, T&D, and the resultant increase in the availability of bulk electricity will also ease supply constraints to enable more end user connections to the grid and increase overall electricity access in Bangui. As the power generation under the project will increase the bulk electricity supply by 30 percent in Bangui, it will cover connection for 10,000 additional households (about 50,000 additional beneficiaries). Investment in generation and T&D infrastructure will also improve the sustainability of ENERCA's operations and financial viability, which in turn will lead to further investments to improve the reliability of the system and will enable additional new connections funded by the utility. In total, 250,000 people will be provided with new or improved electricity access.

49. According to the latest MICS done for the CAR in 2010, 45 percent of households in Bangui had access to electricity from the grid: almost all the connected households are in the top wealth quintile, including 22 percent of female-led households. However, given the extremely constrained supply of electricity (only 8 percent of households in the country have access to electricity and about 45 percent of

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<sup>21</sup> Average household size is five people per household.



households in Bangui), it is important to rebuild and expand the energy infrastructure to support economic growth and the expansion of basic services.

50. ENERCA and the MDEWR will benefit from institutional support aimed at improving sector management and laying a foundation for further sector reform. Under this project, 30 staff and officials in ENERCA and the MDEWR will receive technical assistance for capacity building, notably to support the promotion and development of solar solutions. In the long term, the experience will enhance the efficiency and capacity of officials and staff to plan and manage the institutions and the sector, which is expected to lead to greater investment in service expansion across the country, including potentially from the private sector.

51. The proposed project will increase available generation, reduce system losses, and improve the management of ENERCA. As a result, improved institutional performance in the power sector will indirectly benefit all stakeholders and consumers. The promotion of renewable energy could potentially enable the development of off-grid solar solutions to serve poor populations in secondary cities and rural areas as well, and the tariff study will enable ENERCA to improve the electricity-related tariff structure and propose adequate pricing mechanisms for various types of consumers.

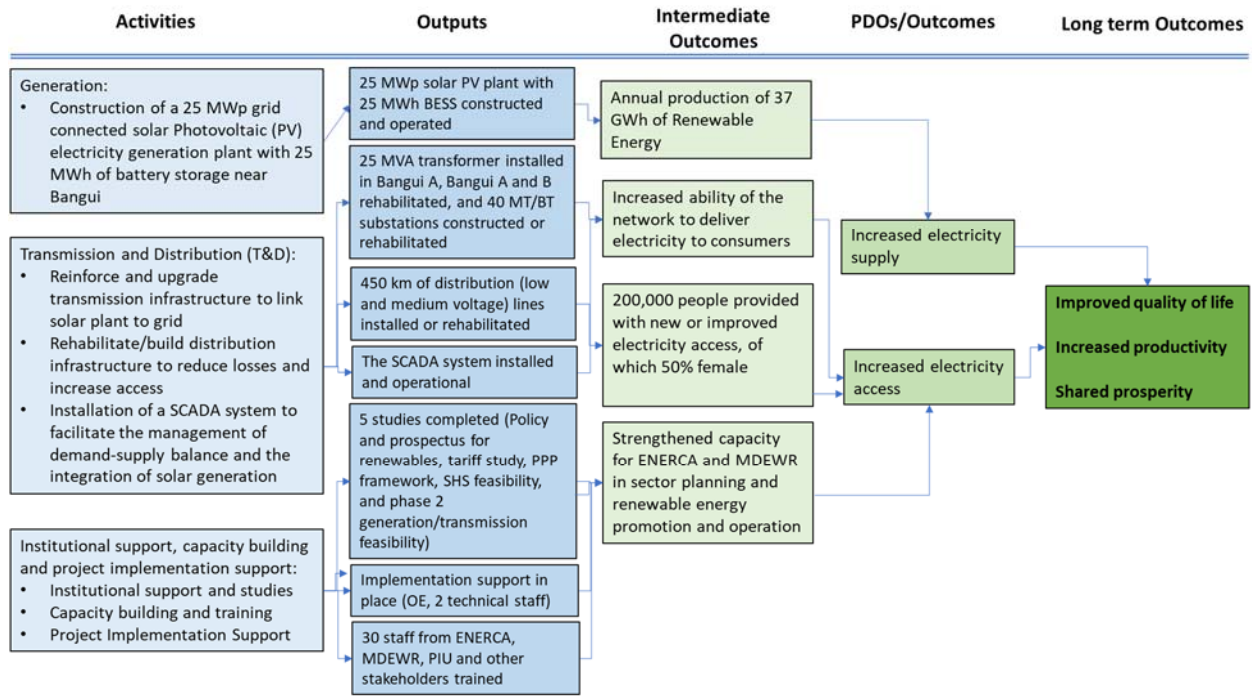
52. It is also expected that the project will bring direct temporary benefits for skilled and unskilled workers who will be employed for the construction, operation, and maintenance of the solar plant. The development of the project and more broadly the renewable energy sector in the CAR could also promote the development of a local industry that would support solar development and generate additional indirect employment opportunities for the population. It is also expected that the project will contribute to improving gender equalities within the targeted communities by creating empowerment opportunities for women and supporting the efforts of local institutions to address GBV.



**D. Results Chain**

53. Figure 1 depicts the results chain underlying the project.

**Figure 1. PURACEL Results Chain**



Note: BESS = Battery Energy Storage System; OE = Owner’s Engineer; SHS = Solar Home System.

**E. Rationale for World Bank Involvement and the Role of Partners**

54. **As part of the RCPA, several of the country’s development partners are investing in the support of the power sector, the World Bank being the largest contributor.** The French Development Agency (*Agence Française de Développement - AFD*) is implementing a project to rehabilitate the Boali 2 hydropower plant (10 MW). In 2016, the AfDB rehabilitated two generators of the peak thermal (diesel) plant in Bangui (2 × 2.5 MW). It is also supporting the doubling of the Boali 2 plant’s capacity (10 MW), with a related upgrade of the existing transmission line linking the Boali hydropower system to Bangui from 63 kV to 110 kV. Meanwhile, the Chinese Government is considering the installation of an additional 10 MW of capacity in Boali 3 (2 × 5 MW during the wet season, and 5 MW during the dry season). Development partners have welcomed the World Bank’s leading role as investor and adviser on the long-term development of the energy sector and the coordination and rationalization of efforts for increased generation and improved T&D. Coordination within the sector, especially coherent planning of transmission expansion investment, will be crucial to ensure that additional future increases in generation are well integrated into the current network.

55. **The project will leverage IDA resources to attract further investment in electricity generation as per MFD principles.** The World Bank’s MFD framework seeks to ‘crowd in’ private capital and to resort to scarce public concessional financing only when necessary. The proposed project will strengthen the financial position of ENERCA, improve its operational performance, and work toward improving sector



development and planning and thus help position this public utility for more commercially oriented financing in the future. For now, however, public financing remains essential for major capital investments in the country's energy sector. The challenging business and security environment, coupled with the dire situation of the energy sector in general, does not attract private sector participation at a reasonable price. By helping overcome the present infrastructure gap and capacity constraints, IDA financing will lay the foundation for additional public and possibly future private investment. ENERCA will soon start the financial restructuring process to meet the Organisation for the Harmonization of Corporate Law in Africa (*Organisation pour l'harmonisation en Afrique du droit des affaires* - OHADA) standards, among other standards, and to explore options for private sector participation in the management of the utility. Though the proposed project benefits from public financing through IDA, because the cost of a private sector independent power producer (IPP) would be unaffordable, the World Bank will capitalize on its success to present a strong demonstration effect and to eventually leverage private sector-oriented financing options for a second phase, which would aim to increase plant capacity from the current proposed 25 MWp up to 40 MWp. The options would consider, among others, concessional/commercial financing and PPP.<sup>22</sup> As the performance of the utility and the sector improve owing to various envisaged interventions in the PURACEL and the PASEEL, as well as projects funded by other development partners, the World Bank will also explore the appetite for private sector participation.

#### F. Lessons Learned and Reflected in the Project Design

56. **Having a dedicated PIU helps build local capacity and improves project implementation.** In the context of generalized weak capacity and political instability, a capable and experienced PIU is particularly important to anchor the project and to ensure its effective implementation. This was a key lesson learned through the PURCE, which is reflected in the proposed project by anchoring its implementation within an existing and well-performing PIU. At the same time, the need for specific expertise has been honored by reinforcing the PIU with a dedicated team recruited to support the current project and PASEEL, including technical experts detached from ENERCA to act as focal points with the MDEWR and ENERCA who retain the technical responsibility for project implementation.

57. **Increasing local procurement capacity is key to ensuring smooth and rapid project implementation.** In the context of the CAR, the procurement process will be critical to ensure solar plant commissioning within two years, considering the complex and large contracts to be awarded (design, supply, and installation of the solar PV plant with battery storage, Owner's Engineer). Though the procurement process needs to move swiftly, it will be important to ensure that World Bank procedures are followed to avoid any potential claims from bidders, which could lead to significant delays. To provide reinforced assistance to the PIU to carry out these activities, the proposed project is already benefiting from the Hands-on Expanded Implementation Support (HEIS) for procurement.<sup>23</sup>

58. **Project design also considers broad lessons from the World Bank's energy sector experience, particularly in small countries facing a power crisis.** During the 1990s and the first decade of the 21st century, many developing countries implementing reforms (Armenia, Brazil, Chile, Colombia, Georgia, Ghana, India, Kenya, Moldova, and Peru) incorporated incentive-based regimes for regulation of the electricity distribution segment, providing incentives for distribution utilities to deliver high-quality service

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<sup>22</sup> The World Bank is exploring how to capitalize on the existing Memorandum of Understanding (MoU) in place with China EXIM to support cooperation for the funding of the second phase.

<sup>23</sup> See *World Bank Guidance: Procurement Hands-on Expanded Implementation Support*.



to their customers and maximize their profits through efficiency in operations. These projects emphasized the importance of addressing the energy sector shortfalls in a holistic way. Therefore, the design of the proposed project not only includes increasing generation capacity using solar energy but also focuses on decreasing distribution and transmission losses and complements activities envisaged under the PASEEL to improve utility and sector performance.

59. **The project design also benefits from World Bank experience in working in countries affected by fragility, conflict, and violence (FCV).** The CAR remains in an extremely precarious security situation, with a weak government, armed militias controlling large parts of the country, and a high potential for the flare-up of ethnic tensions. A well-designed project in a fragile state should not just meet narrow project objectives but should also make a positive contribution to wider stabilization, and thus the sustainability of its outcomes. The project design reflects this by proposing straightforward yet impactful infrastructure improvements to be managed by established utility counterparts that have been cooperating with the World Bank for years. Moreover, it reflects the lessons learned regarding the following aspects:

- (a) **Close coordination with partners.** Funding and expertise are scarce in the CAR. It is thus imperative to coordinate with partners to concentrate resources, share expertise, and avoid duplication of efforts. The proposed intervention was chosen through a process of in-depth discussions with the relevant ministries and partners, including the AfDB, the AFD, the Arab Bank for Economic Development in Africa, and the Chinese embassy. All the traditional development partners who have been active in the country are already investing in the energy sector, thus funding sources are stretched thin for supporting significant additional financing for the project.
- (b) **Quality control in project preparation.** Prior World Bank projects have noted the importance of a direct and intensive quality control process during preparation because circumstances can change rapidly in fragile states and information can quickly become outdated. The team has followed this advice and carried out field inspections of project sites to confirm needs, the state of preexisting infrastructure, and the security situation. The Project Preparation Advance (PPA) is also funding detailed feasibility studies to obtain high-quality and timely planning information and a complete understanding of the available options as well as the scope of goods, works, and services required.
- (c) **Project implementation support.** Considering the low level of local capacity and the challenging environment in the country, the team is putting into place strong implementation support for the project, including reliance on the World Bank's HEIS program, under the New Procurement Framework (NPF), to support the PIU and ENERCA during the procurement phase. The team is also mobilizing various experts on an ad hoc basis to support the PIU (GBV experts, SCADA experts, and so on). Two technical experts will be recruited by the PIU to lend support during project preparation and procurement. Finally, the project will fund an Owner's Engineer to provide technical expertise to the PIU during the procurement phase and to monitor works during the construction phase.
- (d) **Contingent emergency response.** Considering the fragile security environment and the challenging implementation environment, a fourth project component has been included to allow for flexibility and quick response to the Government's request in the event of an



emergency during the life of the project, and to enable a rapid project restructuring, including the reallocation of funds.

### III. IMPLEMENTATION ARRANGEMENTS

#### A. Institutional and Implementation Arrangements

60. Implementation arrangements for the proposed project will leverage the existing implementation arrangements adopted by the PASEEL and are summarized in Figure 2.

61. The Government counterpart for this project is the MDEWR. For project implementation, the MDEWR will be supported by an existing PIU currently located within the Ministry of Public Works and Road Maintenance (*Ministère des Travaux Publics et de l'Entretien Routier* - MTPER) and in charge of implementing another World Bank project, CEMAC Transport-Transit Facilitation Project (*Projet de Facilitation du Transit et des Transports en Zone CEMAC* - CEMAC-PFTT, P079736), because the MDEWR and ENERCA currently lack the capacity and experience to take direct fiduciary responsibility for the management of the project.<sup>24</sup> The existing PIU is already in charge of implementing the PASEEL, and considering the wider World Bank project portfolio that it already must monitor, the PIU is recruiting additional staff to strengthen its capacity in this regard. Should additional concurrent World Bank-financed projects be implemented, it is expected that the energy sector projects could eventually support a dedicated PIU with direct accountability to the MDEWR.

62. Oversight for the proposed project will be carried out by a Steering Committee (SC) that was established to provide guidance and direction during implementation. It is chaired by the MDEWR, and consists of representatives of key stakeholder institutions, including the Ministry of Economy, Planning and Cooperation and ENERCA. This SC will meet at least once every quarter, and the PIU coordinator is expected to serve as the SC secretary. These arrangements have already been set up for the PASEEL and will benefit the proposed project as well.

63. The PIU's implementation capacity is currently being strengthened to ensure successful implementation of the project by hiring additional staff. This has combined advantages of having an experienced PIU with thorough knowledge of World Bank and government processes and having a dedicated team committed to implementing both the proposed project and the PASEEL. The additional dedicated staff will include an accountant, a procurement specialist, a monitoring specialist, and a social and environmental safeguards expert. These positions are funded by the PASEEL and recruitment is in progress. In addition, the PIU is recruiting two energy specialists to be detached from ENERCA to the PIU, to provide dedicated technical support during project preparation and implementation for the current project and PASEEL and to act as focal points with ENERCA and the MDEWR.

64. The PIU will have responsibility for the day-to-day management of the project and the coordination of project-related activities, including (a) ensuring the timely implementation of the project in accordance with the PIM; (b) preparing annual work plans and budgets and annual procurement plans (PPs); and (c) assuming overall responsibility for, among other things, fiduciary tasks such as procurement, financial management (FM), monitoring and evaluation (M&E). For instance, the PIU will have responsibility for developing and maintaining a system for monitoring the project's key performance

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<sup>24</sup> Refer to the Key Risks section, where this is reflected in the high institutional capacity and substantial fiduciary risk ratings.

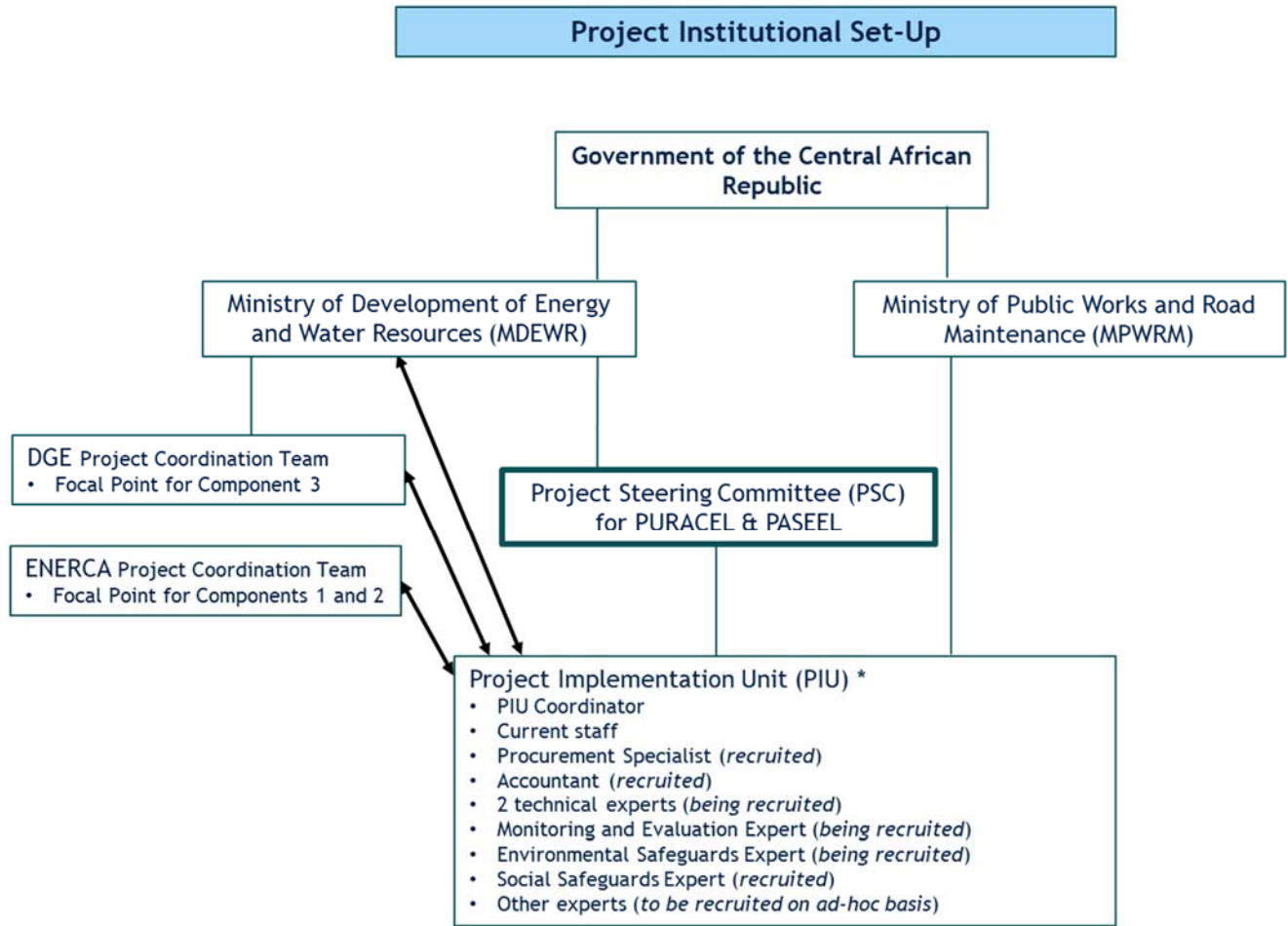


indicators, communications, and environmental and social safeguards, by ensuring adherence to the safeguard documents of all entities involved in the project's implementation. The PIU will report to the SC to ensure clear communication with all relevant ministries and to obtain decisions on issues pertaining to multiple government stakeholders. For all technical issues related to project implementation, a full-time project focal point at ENERCA will be appointed, and technical ENERCA staff tasked to the project will contribute to the preparation and implementation of relevant activities. The PIU will also have a tripartite agreement with ENERCA and the MDEWR to clarify its responsibilities (fiduciary, safeguards, and so on) as well as those of ENERCA during project implementation.

65. Because of the capacity building envisaged under the proposed project, as well as the Least-Cost Sector Development Plan to be financed under PASEEL, the MDEWR will be positioned to lead the planning and coordination of investment across the sector. In this regard, it will play a significant role in authorizing and promoting the development of future capacity for electricity generation, including the solar capacity envisaged to achieve the Government's 40 MWp objective and any related upgrades to the transmission network. Any future projects, whether financed by the World Bank or by other development partners, will be reviewed by the MDEWR in consultation with ENERCA to ensure that their technical design is aligned with the preexisting network. ENERCA, with the support of the PIU, will be responsible for highlighting any changes to the network that may be required for future projects, including upgrades in transmission or controls, and the MDEWR will be responsible for ensuring that such upgrades are included in the investment proposals. The MDEWR will lead the coordination of sector investment and will make sure to disclose publicly any relevant information to ensure that all development partners are aligned and that their interventions are technically coherent.



Figure 2. Project Institutional Arrangements



↔ Responsibilities and relationships defined by Memorandum of Understanding (MoU)

### B. Results Monitoring and Evaluation (M&E) Arrangements

66. M&E will be an integral part of the project. This function will be under the responsibility of the PIU, working with the project teams within ENERCA and the MDEWR. In general, existing baseline data and M&E systems are weak: the PIU will thus be expected to carry out its own data collection and verification processes. Funding for activities critical for ENERCA operations and for M&E is provided for in the project budget: for example, a client enumeration that will help track new connections and independent financial audits at the utility will support the tracking of operational performance improvements. Sensitive topics such as labor influx, GBV, and/or GRM will be monitored by the PIU as part of the ESMP, with support from the Owner’s Engineer, who will supervise the works during the construction period.

67. The PIU coordinator will provide quarterly progress reports on the project to the MDEWR and ENERCA management through the SC. The M&E specialist who will be recruited by the PIU will compile





the data necessary to monitor progress on various project indicators. The procurement specialist, finance assistant, and safeguards specialist will continuously monitor their areas of expertise, highlighting any exceptional or urgent issues immediately and systematically reporting developments in their quarterly reports. A midterm review (MTR) will be conducted by June 2021. An assessment of project impacts, including a beneficiary survey, will be carried out at project closing.

### **C. Sustainability**

68. The sustainability of the power sector in the CAR and the investments to be financed under the project will largely depend on the Government's continued commitment to supporting comprehensive improvements and reforms in ENERCA's operations and beyond. The basis for the project's sustainability is therefore the strong commitment that has been shown by the Government following the initial written request for financing by the Ministry of the Economy, Planning, and Cooperation on February 6, 2017. The energy sector is a critical priority for implementing the RPBA and related commitments agreed to during the Brussels conference in November 2016. The primary risks to the sustainability of the project results are a continued lack of cost recovery affecting the viability of ENERCA and the sector and the broader political, security, and capacity risks.

69. Adequate O&M of the sector assets to be rehabilitated or created is the linchpin to ensure long-term technical sustainability of the project. To this effect, the project will finance an O&M contract for the solar plant for a minimum of three years. After three years, ENERCA will take over O&M for the plant and will be responsible for ensuring the availability of resources for proper O&M and replacement of equipment, especially battery storage replacement to maintain the plant's performance levels. The project will also support adequate training and capacity building on O&M issues and will ensure that a team of specialists is set up within ENERCA. Best practices about training call for ensuring that the team is formed during an early stage of project implementation and that it follows, in tandem with the contractors, the construction and commissioning of the equipment. Provisions will be made in the design, supply, and installation contracts to ensure adequate training and transfer of knowledge by the equipment suppliers. Further training activities are also included under Component 3 to ensure that ENERCA is well equipped to operate and maintain the plant after three years of the contractor's operations.

70. Ultimately, ENERCA's financial and operational recovery will ensure the long-term sustainability of the electricity sector. The utility must be managed and operated by experienced and professional staff with an incentive to maintain and upgrade infrastructure and to keep systems running smoothly. The project includes activities to support ENERCA in this direction and to put the utility on a path toward financial sustainability.

## **IV. PROJECT APPRAISAL SUMMARY**

### **A. Technical, Economic, and Financial Analysis**

#### **Rationale for Public Sector Financing**

71. The World Bank Group's new MFD framework seeks to crowd in private capital and resort to scarce public concessional financing only when necessary. The proposed project will strengthen the financial position of ENERCA, improve its operational performance, and support improved sector



development and planning, and thus help position this public utility for more commercially oriented financing in the future. For now, however, considering ENERCA's lack of attractiveness to private capital due to low-cost recovery and poor financial performance, public financing remains essential for major capital investments in the CAR's energy sector. This, in addition to major political and macroeconomic risks, makes it a high-risk offtaker for any potential IPP PPP because these risks would translate into unreasonably high electricity costs when factoring in a higher expected return on investment for private sector operators.

72. Because ENERCA is currently not able to recover its operational costs, self-financed investments or borrowing at commercial interest rates to address critical infrastructure constraints will remain out of reach until commercial and technical loss reduction plans, such as those envisaged under the support provided through the PURACEL and the PASEEL, can improve the sector's financial sustainability. By helping overcome the present infrastructure gap and capacity constraints, IDA financing will lay the foundation for additional concessional and possibly private investment in the future.

### **Value Added of World Bank Support**

73. The World Bank brings strong added value in supporting the Government of the CAR for the preparation and implementation of this project:

- (a) IDA financing is essential to initiate the solar power plant construction within a limited time frame, which requires high upfront capital expenditure (CAPEX) with large long-term benefits;
- (b) The World Bank is providing expert advice to the Government on the technical parameters of the plant, investment benchmarks, transaction structuring, and risk mitigation;
- (c) The World Bank will provide close procurement support to the PIU through HEIS;
- (d) The World Bank will provide expertise for enhancing the T&D infrastructure, enabling the system to diversify the energy mix, and planning its least-cost supply plan (this is important because public investment in transmission and battery storage is critical to enable integration of solar energy into the grid);
- (e) The World Bank will provide expert support to the MDEWR and to ENERCA to improve their financial and operational performance and will be equipped to plan investment in the sector in coordination with all development partners;
- (f) The World Bank has solid experience operating in countries affected by FCV environment, and lessons learned from that experience are strengthening the project design; and
- (g) The World Bank will continue to support development and seek financing for a second phase to increase generation capacity up to 40 MWp.

### **Summary of Economic and Financial Analysis**

74. The planned 25 MWp solar PV plant with a 25 MWh battery electricity storage system (Component 1) has an expected lifetime of 30 years. During that period, the power plant is expected to generate 1,032 GWh of electricity (around 37 GWh per year), and the improvements to the T&D infrastructure (Component 2) are expected to provide an additional 695 GWh of electricity (on average 23 GWh per year) to the system. Out of a total project cost of US\$65 million, US\$58.6 million is investment capital cost and US\$6.4 million is capacity building and institutional support. Among the investment



capital cost, the solar power plant capital expenditures is US\$48.0 million, which includes the US\$3 million cost for the first three years of O&M and the US\$10.6 million investments needed to rehabilitate the T&D infrastructure to reduce losses and increase access.

75. The economic analysis is based on a willingness to pay of XAF 125 per kWh (US\$0.235 per kWh).<sup>25</sup> Based on the historical and current situation of the country, other lower-cost alternatives could not deliver the capacity needed on a limited time frame, which is critical for overall stability and peacebuilding efforts in the country. Hydropower has been the main electricity source for the country, with the development of the Boali hydropower system. However, any other large hydropower development would require significant lead time to prepare and implement. The possibility of constructing a coal or natural gas power plant would also face a bottleneck due to a lack of local resources, importation difficulties, and the lack of the required infrastructure. The alternative of a diesel or HFO power plant has been considered; however, with the current diesel price at XAF 810 per liter<sup>26</sup> (around XAF 245 per kWh), this option would be economically more expensive than a solar power plant with a battery electricity storage system that will yield an equivalent amount of energy while avoiding the negative environmental impact that a diesel power plant would have. Although the cost of HFO is lower than diesel,<sup>27</sup> with the high cost of transportation and local distribution, the retail HFO price could be XAF 665 per liter (XAF 166 per kWh or US\$0.3 kWh),<sup>28</sup> which is higher than the willingness to pay.

76. The results of the analysis show that the project is both financially and economically viable. In the baseline scenario, which assumes the achievement of project targets, a two-year capital investment timeline (25 percent capital disbursement in Year 1 and 75 percent capital disbursement in Year 2), and a social discount rate of 4 percent,<sup>29</sup> the model yields a positive economic net present value (ENPV) of approximately US\$73 million and a positive economic internal rate of return (EIRR) of 11 percent. In addition, the project brings both local and global environmental benefits by avoiding the use of diesel, which would be the only feasible alternative. With the environmental benefits gained, the ENPV of the project increases to US\$166 million, with the EIRR at 21 percent. In fact, the ENPV estimates are conservative because some of the indirect positive economic effects and possible positive externalities could not be explicitly modeled due to a lack of reliable available data (for example, security-related gains due to more public lighting). But these effects are likely to occur and would further improve the ENPV profile. The main economic benefits from the project will result from the increased energy supply in Bangui and the savings from greenhouse gas (GHG) emission reduction.

<sup>25</sup> The willingness to pay is calculated as a weighted average of the minimum assumption (tariff, including tax) at 75 percent and maximum assumption (self-generation cost) at 25 percent in Bangui, according to data from ENERCA 2016.

<sup>26</sup> ENERCA, May 2018.

<sup>27</sup> According to the U.S. Energy Information Administration, the monthly average wholesale price of HFO in 2017 was US\$1.1 per gallon.

<sup>28</sup> The transportation and local distribution costs are based on the cost of importing diesel. However, the actual local retail price of HFO could be higher given the fact that the Central African Republic has never imported this type of fuel. The fuel consumption is assumed at 0.25 liter per kWh.

<sup>29</sup> Based on the World Bank Energy Global Practice Guideline on Economic Analysis for Energy Projects, a credible and conservative assumption of a social discount rate for economic analysis is to double the expected growth of income per capita of the country, that is, the Central African Republic. Source of data: IMF database, retrieved April 16, 2018.



**Table 2. Summary of Economic and Financial Analysis Results**

	XAF (million)	USD (million)
Discount rate	4%	4%
Levelized Cost of Energy (LCoE)	28.71	5.40
<b>Economic rate of return (ERR)</b>		
<b>ERR</b>	<b>12%</b>	<b>11%</b>
<b>ERR+local externalities</b>	<b>20%</b>	<b>19%</b>
<b>ERR+local+GHG</b>	<b>22%</b>	<b>21%</b>
<b>Composition of NPV</b>		
<i>Costs</i>		
<b>capital cost - project construction</b>	<b>27,752</b>	<b>56</b>
<i>Generation capital expenditures (CAPEX)</i>	22,456	45
<i>T&amp;D CAPEX</i>	5,297	11
capital cost - battery replacement	8,213	15
<b>O&amp;M</b>	<b>7,840</b>	<b>15</b>
<b>total costs</b>	<b>43,805</b>	<b>86</b>
Avoided fuel cost: diesel	84,562	159
<b>total benefits</b>	<b>84,562</b>	<b>159</b>
<b>NPV (before environmental benefits)</b>	<b>40,757</b>	<b>73</b>
local environmental benefits: avoided diesel	35,647	67
NPV (incl. Local environmental benefits)	76,404	144
value of avoided GHG emissions	11,733	22
<b>NPV (including environment)</b>	<b>88,137</b>	<b>166</b>
<b>Financial NPV</b>	<b>18,802</b>	<b>35.39</b>
<b>FIRR</b>	<b>3.2%</b>	<b>3.2%</b>

77. The financial model evaluates changes in free cash flows due to the project. With a cost of capital at zero because all the CAPEX for construction will come from the IDA grant, the financial net present value (FNPV) is about US\$35.4 million in the baseline case, with the financial internal rate of return (FIRR) at 3.2 percent.

78. The financial situation of ENERCA remains fragile due to the utility’s problems in converting its energy generation into sustainable cash flows due to high T&D losses and a bill collection efficiency of 67 percent. The financial situation of ENERCA is expected to remain precarious over the duration of the project; however, if the project realizes its targets, it will make a significant contribution to stabilizing ENERCA’s finances as it would both increase its revenue base (more generation) and decrease its costs (through a reduction in technical losses). The largest cost during the operation of the power plant will be the battery replacement every five years. The option of setting up a dedicated account to be replenished by ENERCA’s revenues and dedicated to battery replacement was explored with ENERCA and the Government during project appraisal, but it was difficult to achieve, as the utility is cash constrained and faces various investment priorities in the short term. However, all parties agreed that the ability of the utility to operate and maintain the solar plant (including covering the investment for battery replacement) is closely linked to the ability to improve its financial and operational performance, which is the underlying objective of the proposed project and of other World Bank interventions supporting the energy sector. Considering this, ENERCA will commit to provisioning and funding battery maintenance and replacement,



notably by signing a maintenance contract with battery storage supplier to ensure minimum performance guarantee.

79. **Analysis based on switching values.** A sensitivity analysis based on switching values shows that both the financial and economic viability of the project remain resilient to changes in the key assumptions. The main risks facing this project (as discussed in Section V) would potentially result in overrun of capital and operating expenditures and shortage of demand due to rapid expansion of the power system. The analysis shows that if only 80 percent of the power generated from this project is sold, the ENPV would decrease by 12.5 percent, but it would still be viable, since the EIRR is at 19 percent. The project could also be overestimating the willingness to pay, which in turn would overestimate the return on the project. The expected discount rate could also potentially affect the ENPV of the project.

### Technical

80. The proposed project uses well-established PV technologies, but battery storage may present some operational challenges for ENERCA. Because these technologies are new to the CAR (including utility-scale PV operation), these challenges may create difficulties during implementation. Therefore, specific activities are being planned to minimize the challenges and to provide the implementing entity with all the required training and capacity building needed.

- **Component 1.** The plant definition and bidding process will be carried out under an initial selection, plus a two-stage RFP approach. The first phase will allow bidders to propose their solutions and to agree to the optimal technical configuration with ENERCA, while bidders will submit their technical and financial proposal during the second phase. This procurement process and the construction will be supervised by an expert Owner's Engineer. The contract for the construction of the plant will include an O&M contract for at least three years to allow hands-on training to ENERCA staff and optimize the plant's integration into the grid. An appropriate payment and performance scheme will be agreed with the contractor to ensure optimal design, installation, and O&M and timely and fair payments from the project.
- **Component 2.** The reinforcements and upgrades in transmission, including the SCADA system, will be defined with the support of a specialized feasibility study completed by an expert firm financed under Component 3. Implementation will be supervised by the Owner's Engineer. For the distribution extension, the activities are well known by ENERCA and will also be supervised by the Owner's Engineer.

81. As part of the project's implementation arrangements, as is common for these types of projects, the contracted Owner's Engineer firm will help ensure that execution is carried out in accordance with the applicable terms of reference (ToR) and international best practices.

## B. Fiduciary

### (i) Financial Management

82. The PIU, which is based in the MTPER and is currently in charge of managing the PPA for the proposed project, will have overall FM responsibilities during project implementation. An FM assessment of the implementing unit designated to manage this project was carried out in October 2018. The



objective of the assessment was to determine whether the PIU has acceptable FM arrangements in place to ensure that the project funds will be used only for the intended purposes, with due attention to considerations of economy and efficiency. The assessment complied with the World Bank Directive Financial Management Manual for World IPF operation, effective March 1, 2010, and as last revised on February 10, 2017.

83. The FM assessment indicates that the arrangements will be acceptable if they are capable of accurately recording all transactions and balances, supporting the preparation of regular and reliable financial statements safeguarding the project’s assets, and are subject to auditing arrangements that are acceptable to the World Bank. These arrangements will be in place when project implementation starts and will be maintained as such during implementation.

84. The overall FM performance of PIU is Moderately Satisfactory. The unaudited interim financial reports (IFRs) and the audit report for the transport project (P079736) have been submitted on time and are acceptable to IDA.

85. The overall fiduciary risk rating is assessed as High. Detailed risk assessment and mitigation measures have been proposed to strengthen the internal control environment, and to maintain the continuous timeliness and reliability of information produced by the PIU, and an adequate segregation of duties have been carried out to meet the World Bank’s minimum requirements under World Bank IPF Policy and Directive (see Table 3). The CAR is a fragile and conflict-affected country. The inherent risk at the country level is high and poses a serious risk to the project from a fiduciary perspective. In addition, the capacity of the PIU will need to be strengthened. To maintain adequate FM arrangements to handle the activities to be implemented by the proposed project, the PIU will undertake the following actions:

- Produce a PIM, including explanation of fiduciary procedures.
- Recruit an internal auditor to strengthen the internal control system.
- Customize the current accounting software (TOMPRO) to meet the needs of the project.

Table 3. Risk Assessment and Mitigation

Risk	Risk Rating	Risk Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
<b>Inherent Risk</b>				
<b>Country level:</b> As a post-conflict country, the CAR is a high-risk country from the fiduciary perspective. Various procurement and FM weaknesses at all ministry levels in terms of governance and public funds management are noted.	H	The Government is committed to a reform program that includes strengthening the procurement and FM through World Bank support (P161730: Public Expenditure and Investment Management Reform Project).	N	H
<b>Entity level:</b> Project resources may not be used for the intended purposes; and there	H	The fiduciary responsibility of the project will be managed by the PIU team, which	N	S



Risk	Risk Rating	Risk Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
is weak coordination among stakeholders.		has experience in managing World Bank project funds.		
<b>Project level:</b> Project design is relatively complex because it involves several agencies. Project activities involve payment for the purchase of solar plan components that are new for the portfolio. These may pose a serious fiduciary risk to the project.	S	The team will be strengthened by additional staff, including an internal auditor to ensure the effectiveness of internal control.  Training on fiduciary policies and procedures will be conducted for the FM staff, including the internal auditor.	N	S
<b>Control Risk</b>				
<b>Budgeting:</b> Lack of capacity and appropriate tools to prepare and monitor the execution of the budget.	S	The project Financial Procedures Manual will define the arrangements for budgeting, budgetary control, and the requirements for budget revisions.  Accounting software will be set and will generate the IFRs and other relevant data to enable monitoring of the budget.  A qualified accountant will be recruited to support the team that is preparing and monitoring the budget.	N	M
<b>Accounting:</b> The project accounting function may not be properly discharged due to eventual capacity issues, software related issues, and/or lack of clear procedures.	S	The accounting procedures will be documented in the Procedures Manual.  The FM functions will be carried out by an experienced FM staff, and the existing software will be customized to consider the needs of this new project. Additional training will be provided to the FM staff in better use of the accounting software.	N	S
<b>Internal control:</b> A weak control environment may lead to fraud and error.	H	Redaction of an FM Procedures Manual and training on the use of the manual by the financial expert.  The PIU will recruit an internal auditor to strengthen the internal control system.  The scope of work and control process will be defined through the CAR's generic manual.	N	S
<b>Funds flow:</b> Delays in the payment of suppliers and in replenishment of the Designated Account (DA).	S	A DA will be opened, into which advances will be deposited for timely payment of suppliers; requests for replenishment of the DA should be sent to the World Bank at least every quarter. The use of petty	N	S



Risk	Risk Rating	Risk Mitigating Measures Incorporated into Project Design	Conditions for Effectiveness (Y/N)	Residual Risk
Security threats in the country may pose a serious risk to implementation of project activities.		cash should be reduced to a minimum level.		
<b>Financial reporting:</b> Inadequacy of the accounting system may result in inaccurate IFR and financial statements, as well as other related reports.	S	A computerized accounting system will be used (TOMPRO). IFR and financial statement formats will be agreed upon. The project coordination unit will oversee overall reporting. The consolidated IFRs will be submitted to the World Bank no later than 45 days after the end of the quarter.	N	S
<b>Auditing:</b> Audit may not be carried out in compliance with acceptable audit standards; delay in the submission of audit reports and/or delays in the implementation of audit report recommendations.	H	The project will recruit acceptable external (independent) auditors. The World Bank will review the audit ToR and the short list of proposed audit firms to be consulted.	N	S
<b>Governance and accountability:</b> The possibility of circumventing the internal control system with colluding practices such as bribes, abuse of administrative positions, and misprocurement is a critical issue.	H	The ToR of the external auditor will include a specific chapter on corruption auditing. The review performed by the internal auditor will be an additional mitigation tool. The FM Procedures Manual will be incorporated into the Project Implementation Manual and approved before effectiveness. There will be a quarterly IFR including budget execution and monitoring. Measures to improve institutional capacity and provide training in procurement, project management, and contract management have been integrated into the project design.	N	S
<b>Overall FM risk</b>	<b>H</b>			<b>S</b>

86. It is expected that the FM of the project will satisfy the World Bank’s minimum requirements once mitigation measures have been implemented. An FM action plan to enhance the FM arrangements for the project is summarized in Table 4.





Table 4. FM Action Plan

Action	Responsible Party	Deadline and Conditionality
1. Update the PIM	PIU	Before effectiveness
2. Customize accounting software	PIU	Two (2) months after effectiveness
3. Recruit an external auditor	PIU	Six (6) months after effectiveness

87. **Internal control system.** The internal control system will include an SC to oversee the project activities and an accounting and administration procedures manual to define control activities. The composition, mandate, and frequency of committee meetings will be strengthened to ensure adequate oversight of the project. Given the country’s high-risk rating, to maintain a good standard of internal control, an internal auditor will be recruited at the national level. The modality of the internal control system will be precisely defined in the PIM.

88. **Planning and budgeting.** The PIU will prepare a detailed annual work plan, a budget, and the related disbursement plan, which should be approved by the SC. The PIU will submit the approved annual work plan and budget to the World Bank for no-objection no later than November 30 of the year preceding the year the work plan will be implemented.

89. **Accounting.** The *Système Comptable* OHADA (SYSCOHADA), which is the assigned accounting system in West and Central African Francophone countries, will be applicable. The PIU will customize the existing accounting software (TOMPRO) to meet project requirements.

90. **IFRs.** The unaudited IFRs will be prepared every quarter and submitted to the World Bank regularly (no later than 45 days after the end of each quarter). The frequency of IFR preparation, as well as its format and content, will remain the same as that of the current transport project (P079736) and PASEEL (P162245), which are being implemented by the PIU.

91. **Annual financial reporting.** The PIU will produce annual financial statements for the project, which will comply with SYSCOHADA and World Bank requirements. These financial statements may comprise

- Project presentation and project developments and progress during the year, to provide context for (or other explanations of) financial information reported;
- A statement of sources and uses of funds that recognizes all cash receipts, cash payments, and cash balances;
- A statement of commitments;
- Accounting policies adopted and explanatory notes; and
- A management assertion that project funds have been expended for the intended purposes, as specified in the relevant Financing Agreements.

92. **Disbursement arrangements.** Disbursements under this project will be carried out in accordance with the provisions of the Disbursement Guidelines for IPF dated February 2017, the Disbursement and Financial Information Letter, and the Financing Agreement. The project will finance 100 percent of eligible expenditures. A new XAF-denominated DA will be opened in a commercial bank under terms and conditions acceptable to IDA. An initial advance up to the ceiling of the DA will be made, and subsequent disbursements will be made against the submission of statements of expenditures reporting on the use



of the previous advance. The option to disburse against the submission of quarterly unaudited IFRs (also known as report-based disbursements) could be considered, as soon as the project meets the qualifying criteria. The other methods of disbursing funds (reimbursement, direct payment, and special commitment) will also be available to the project. The PIU coordinator will sign and submit withdrawal applications electronically using the eDisbursement module, accessible on the World Bank’s Client Connection website.

**Table 5. Eligible Expenditures**

Category	Amount of the Financing Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, and consulting services; training and operating Costs for the Project	45,300,000	100%
(2) Refund of Preparation Advance	1,500,000	Amount payable pursuant to Section 2.07 (a) of the General Conditions
(3) CER Component	0	
<b>TOTAL AMOUNT</b>	46,800,000	

93. **Auditing.** The PIU will submit audited project financial statements that are satisfactory to the World Bank every year within six months after closure of the previous fiscal year. A single opinion on the audited project financial statements that is following the International Federation of Accountants Guidelines will be required, as well as a Management Letter. The Management Letter will contain auditor observations and comments and recommendations for improvements in accounting records, systems, controls, and compliance with financial covenants in the Financial Agreement. The PIU should recruit a technically competent and independent auditor by no later than six months after the effective date of the project. The project will comply with the World Bank disclosure policy of audit reports and will place the information provided on the official website within one month of the report being accepted as final.

94. **Implementation support arrangements.** As part of the proposed project implementation support missions, risk-based FM supervision will be conducted every six months. These will pay particular attention to (a) project accounting and internal control systems; (b) budgeting and financial planning arrangements; (c) review of IFRs; (d) review of audit reports, including financial statements, and remedial actions recommended in the auditor’s Management Letter; and (e) disbursement management and financial flows.

**(ii) Procurement**

95. **Applicable procurement rules and procedures.** Procurement for the proposed project will be carried out in accordance with the ‘World Bank Procurement Regulations for IPF Borrowers’, dated July 1,



2016, revised November 2017 and August 2018, hereafter referred to as ‘Procurement Regulations.’ The project is subject to the World Bank’s Anticorruption Guidelines, revised in July 1, 2016. A short form of PPSD has been prepared by the MDEWR. A PPSD was prepared and identified the appropriate selection methods, market approach, and type of review by the World Bank Group for the high-risk and high-value contracts that will be executed during the implementation of the proposed project. It also describes the overall project operational context, market situations, implementing agencies capacity, and possible procurement risks. The PP sets out the procurement selection method as well as prior and post review thresholds to be followed by the Borrower during project implementation in the procurement of goods, works, and non-consulting and consulting services. A PIM will be prepared and will include, among other things, the unified administrative and financial manual and procurement manual, which defines procedures for procurement during the implementation of the project to help the PIU carry out the project procurement in accordance with the Procurement Regulations. On behalf of the MDEWR, procurement under this project is carried out by the PIU for the CEMAC-PFTT project under the MTPER, and an MoU between the PIU and the MDEWR is in place to define the scope of this delegation.

96. **The project includes preferred procurement arrangements using new features of the NPF to achieve procurement efficiency.** According to the scope, nature of the critical activities, and the market research and analysis undertaken, proposed procurement arrangements are packaged as the following: (a) supply and installation of the power solar plant and its maintenance will consist in attracting and fostering the participation of big reputable international firms through international competition using the initial selection and RFP in two stages, including HEIS support to achieve high rate of success of the contract closing (US\$48 million); (b) consulting service for an Owner’s Engineer through international competition using the RFP document for Selection Based on Qualifications and Cost (SFQC) selection method with open international advertisement of request Expression of Interests for the short list of qualified firms in solar-generated electricity projects and contract management capabilities in the particular CAR environment (US\$2 million); and (c) T&D plant rehabilitation and rehabilitation of old and new identified electrical networks to improve distribution infrastructure and services (US\$10.6 million). Low value/low risk but important contracts will also be financed, for example, tailored transfer-of-knowledge (capacity building) program for ENERCA’s personnel to assure ownership and sustainability of the project.

97. The procurement profile of the project is a mix of high-value and high-risk contracts, three high-value and high-risk contracts representing 92 percent of total amount of the project and small-value consulting contracts for 5 percent. The large share of the project funds is meant to finance the construction of the solar plant, its maintenance, and the extension of distribution transmission network. The thresholds of procurement activities are set in the PP table. The CEMAC-PIU under the MTPER will take up all procurement activities. This existing PIU is well staffed and has acquired hands-on procurement experience while it is currently managing several World Bank-financed projects. Coupled with this arrangement is the technical support of ENERCA as technical arm of the MDEWR. The PIU is benefiting from a World Bank HEIS expert appointed to bring efficiency and agility in the procurement of the contracts.<sup>30</sup>

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<sup>30</sup> Refer to Annex 5 for more details on procurement arrangements and PP.



## C. Safeguards

### (i) Environmental Safeguards

98. The environmental and social impacts of the project are expected to be limited in scope, easily manageable, and site specific. The project is therefore in the environmental and social Category B and trigger OP/BP 4.01 (Environmental Assessment), OP/BP 4.11 (Physical Cultural Resources), OP/BP 4.36 (Forests), and OP/BP 4.12 (Involuntary Resettlement). The other operational policies have not been triggered by this project.

99. No activity will be implemented (nor advertised) in the field (a) before the completion of all the required safeguard instruments (ESIA and RAP), which shall be satisfactory to the World Bank, and the integration of appropriate measures/clauses per such safeguards documents within the documents governing activity implementation and (b) before the GRM is operational.

100. **OP 4.01. Environmental Assessment.** Project activities that focus on enhancing ENERCA's operational performance and on increasing access to improved electricity supply, especially under Components 1 and 2 can have environmental and social impacts. The solar plant will be in the greater area of Bangui, about 20 km north, near the Danzi village, on a 75-ha area. As the site is identified, an ESIA and a RAP have been developed for the activities envisaged under Component 1. Regarding the investment activities under Component 2, because the locations are yet to be defined and firmed up, an Environmental and Social Management Framework (ESMF) was developed to define the impacts that could occur and possible mitigation measures that could be applied, along with a Resettlement Policy Framework (RPF) to clarify the rules and procedures for land acquisition and for identification and compensation of PAPs. All safeguard documents were prepared and consulted upon and reviewed and submitted for World Bank no-objection and disclosure in the country and on the World Bank external website on December 29, 2018. Once the activities under Component 2 have been defined, specific safeguard instruments (ESIA/RAP) will be developed for these activities, consulted upon, and disclosed within the country and on the World Bank external website before any civil works begin.

101. **OP 4.11. Physical Cultural Resources.** There are no archeological sites or cultural monuments in or near the project location. However, the study identified the presence of graves and a religious site in the surroundings of the proposed site for the solar plant, which may be negatively affected by the proposed operation. The ESIA includes a chapter to discuss the management measures for these physical and cultural properties. Due to the potential for the discovery of artifacts during the excavations for the project activities, safeguard documents as well as contractors' contracts will include a 'chance find' procedure to ensure that these aspects are considered and are reflected in the specifications of the contractors.

102. **OP 4.36. Forests.** This safeguard policy is triggered, as activities under Component 1 (related to construction of the solar plant) and Component 2 (related to strengthening of the T&D infrastructure to channel new capacity) will have a negative impact on forested areas in the Danzi region surrounding the proposed project site for the solar plant. The ESIA provides specific mitigation measures that consider the management of these forested areas. The ESMF will define the potential impacts and will propose mitigation measures to address them after specific safeguard documents are elaborated for this component.



103. **Responsibilities for safeguard screening and mitigation.** The PIU, in close collaboration with the MDEWR and ENERCA, will be responsible for following up on all safeguard concerns and will also ensure that all safeguard screening and mitigation requirements will be applied for each project component. The PIU's capacity will be enhanced through a capacity-building process (including trainings) during project implementation. In addition, the proposed project and the PASEEL will support recruitment of one environmental specialist and one social development specialist to support the implementation of safeguard requirements. Finally, the implementation and monitoring of safeguard requirements will be included in the scope of work for the Owner's Engineer that will supervise the project during the construction phase.

104. **Consultation and disclosure.** The first consultations took place in October 2018 with all key stakeholders, including communities near the project site, to discuss the project impacts and benefits and the communities' perceptions and concerns. This benefited the ESIA/ESMP preparation. The ESIA/ESMP/RAP for Component 1 and the ESMF/RPF for Component 2 were submitted to the World Bank for no-objection on November 30, 2018 and disclosed both in-country and on the World Bank's external website on December 29, 2018. Further consultations will take place with the affected stakeholders to disseminate the content of the safeguard instruments.

105. **Climate change.** The CAR is vulnerable to climate variability, most notably through its effects on agricultural productivity and food security, forest production, water resources, health, and exposure to natural disasters. Of relevance to this project is the potential impact of climate change on rainfall, with a predicted overall increase but also more erratic precipitation. Extreme events such as storms, floods and drought are likely to occur more often. As the production and transmission of electricity in the targeted area rely on sunshine and moderate weather, changes in rainfall and an increase in extreme weather events may significantly affect the infrastructure performance as well as the socioeconomic and health situation of beneficiary populations.

106. **GHG accounting.** Over the 30-year lifetime of the project, the investments will result in a net reduction of GHG emissions relative to the pre-crisis situation of 848,259 tons of CO<sub>2</sub>. The solar power plant generation will contribute to a net emission reduction of 670,674 tCO<sub>2</sub> and the improvement of T&D infrastructure to a net emission reduction of 177,585 tCO<sub>2</sub>.

## **(ii) Social Safeguards**

107. **Gender.** Women are particularly affected by lack of access to basic services and are also typically the most burdened by household-related service shortfalls, such as a lack of water or electricity. Improving access to basic services such as electricity will benefit women by increasing their productivity, with particular benefits stemming from the availability of electric lighting. It is expected that the project will directly benefit 40,000 households, or about 200,000 people, of which 50 percent are women. Under Component 3, the project will commit to gender-sensitive training and capacity-building activities and a gender-sensitive resettlement and compensation approach as well as support for holistic GBV service provision for women living in the project implementation area.

108. **Citizen engagement.** A citizen engagement and feedback process will be established to ensure that beneficiaries are aware of the project activities. The project will also develop a GRM to ensure that any complaints about the project or the performance of the utility will be effectively addressed. This process will include not only dedicated public consultation events but also improved customer complaint



systems to be supported under the project's capacity-building activities. Specific attention will be paid to GBV-related complaints and will create a female-friendly, confidential reporting and monitoring system.

109. **One social safeguards policy is triggered: OP 4.12. Involuntary Resettlement.** This policy is triggered because people may be affected by the planned works envisaged for (a) the project site, which will require land acquisition; (b) the 1 km access road linking the project site to the national road, which will cross Danzi village; (c) the 3 km transmission line to link the project site to the existing transmission line linking Boali to Bangui; and (d) the upgrading and construction of distribution lines, which may lead to temporary resettlement. The project has prepared a RAP covering the Danzi site up to the existing transmission line linking Boali to Bangui (under Component 1). The RAP was sufficiently consulted upon and publicly disclosed both in-country and on the World Bank external website. For Component 1 of the project, about 120 PAPs in and around the project site are expected to be compensated. Further consultations will take place with the affected stakeholders to disseminate the findings and recommendations of safeguard documents after they have been published. For activities envisaged under Component 2, an RPF was developed to clarify the rules and procedures for land acquisition and for identification of the affected population. It is expected that specific safeguard documents for this component will be developed and publicly disclosed no later than six months after project effectiveness.

110. Compliance with OP 4.12 is a mandatory preconstruction requirement for the start of civil works. Preconstruction measures include mitigating negative social and economic impacts associated with the project activities and paying compensation to PAP for direct adverse social and economic impacts including land acquisition, loss of properties, and loss of means of livelihoods. Despite the Government's desire to fully comply with the OP 4.12 policy objective and principles, its ability to support resettlement is constrained by its overall fiscal challenges. Government resources are extremely constrained and limit its ability to bear resettlement costs in a timely and orderly manner. Considering the prevailing fiscal difficulties, the Government has requested the World Bank to allow US\$500,000 of the grant proceeds to be earmarked to pay for resettlement activities relating to the solar plant and the associated T&D networks. Compensation under the RAP consists of cash payments to PAP who are living in and/or carrying out livelihood activities in the project site and right-of-way for access road and distribution networks. For Component 1, the RAP costs (including compensation, implementation, and monitoring) were estimated at XAF 177 million (approximately US\$307,000). The remaining provisioned amount will cover resettlement costs when the RAP is developed for Component 2 of the project

111. **Labor influx.** It is assumed that contractors will bring in engineers and experienced equipment operators from outside the region, and they are likely to be housed in work camps during construction. Environmental and social clauses for contractors to be inserted in the ESMP and works contracts will include measures for managing the potential impacts of such an outside workforce on the local community, such as impacts on environmental health and safety. Environmental and social clauses for contractors will consider measures to prevent child labor, sexual exploitation and abuse (SEA), and GBV. A code of conduct will be in place that everyone—community, contractors, workers, supervising engineer, and so on—are fully aware of, including specific channels for monitoring and reporting that go beyond the standard GRM (There will be specific measures ensuring that confidentiality and accessibility will be put into place for sensitive complaints such as GBV).

112. **GBV.** In collaboration with the SENI, the proposed project supported a country assessment of GBV in the CAR, and findings and recommendations have been incorporated into the project design (see Annex 2 for details). There is a risk that setting up temporary workers' camps during solar plant construction may



result in increased GBV, sex trafficking, and child abuse. While the types of civil works envisaged in the project are not expected to result in large numbers of workers from outside the communities, the project will be mindful of this risk and will take appropriate measures to prevent and address any negative consequences. The level of discrimination against women and the level of GBV in the country may also impede women's participation in project activities and limit their benefits from the project. PIU, ENERCA, MDEWR, and contractors' staffs will profit from GBV-related activities and trainings focused on enhancing prevention and response to violence both at the project and at the institutional level. A code of conduct will also be developed and disseminated to all stakeholders (community, contractors, workers, supervising engineers, and so on), and specific channels for monitoring and reporting will be established, beyond the GRM, to ensure confidentiality and accessibility to services for GBV survivors. The focus will be on two aspects: (a) at the project activities level, related to energy operations, for example, contractors, beneficiaries, and communities; and (b) at the client level, focused on strengthening institutional aspects (for example, staff capacity, human resource aspects/policies, and safe and ethical reporting of GBV at the ENERCA and MDEWR levels). Responsibility for preventing instances of GBV will be included in all procurement contracts. Contracts for supervising engineers will include responsibility for monitoring and reporting any instances of GBV, and the contract with the Owner's Engineer that will be supervising the construction works will have specific provisions to address the monitoring and reporting of any GBV-related events. The risks of GBV are clearly identified in the ESIA, and specific mitigation measures are being proposed for the period of project implementation. Some of these measures aim to improve access to GBV services for women in the areas of project implementation.

### (iii) Other Safeguards

113. The project will commit to a gender-sensitive resettlement and compensation approach as follows:

- **Consultations.** The ESIA ensured that public consultations were gender inclusive (for example, holding women-only meetings at convenient times and locations, conducted in the local language, 'illiteracy friendly', with female facilitator/interpreters).
- **Social assessments.** The ESIA included a gender analysis in social assessments to be undertaken for the project in line with safeguards requirements.
- **Compensation.** The project will ensure that the compensation strategy and options offered to the affected communities account for both men's and women's needs and priorities, as expressed in consultations and analyzed in gender-informed social assessments. The project will consider disbursing cash compensation to both spouses (for example, handing the amount to the household head in the presence of the spouse or transferring it into joint bank accounts).

### (iv) Grievance Redress Mechanisms

114. Communities and individuals who believe they are being adversely affected by a World Bank-supported project may submit complaints to existing project-level grievance redress mechanisms (GRMs) or to the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project-affected communities and individuals may submit their complaints to the World Bank's Independent Inspection Panel, which determines



whether harm has occurred, or could occur, as a result of noncompliance with its policies and procedures. Complaints of a sensitive nature, such as SEA or GBV, will be treated in a specific manner to ensure confidentiality and avoid further harm or stigmatization. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and World Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit <http://www.inspectionpanel.org>.

115. The GRM for the project is detailed in the ESIA and ESMF disclosed both in-country and on the World Bank's external website on December 29, 2018. It will include a local committee to record complaints, transmit them to the PIU and follow up with plaintiffs, and a grievance management committee that will receive the complaints and propose solutions. The PIU will support and supervise the overall implementation of the GRM.

## V. KEY RISKS

### A. Overall Risk Rating and Explanation of Key Risks

**Table 6. Systematic Operations Risk-Rating Tool (SORT)**

Risk Category	Rating
1. Political and Governance	High
2. Macroeconomic	High
3. Sector Strategies and Policies	Substantial
4. Institutional Capacity for Implementation and Sustainability	High
5. Fiduciary	High
6. Technical Design of Project	Substantial
7. Environmental and Social	Moderate
8. Stakeholders	Moderate
9. Other: Security	High
<b>OVERALL</b>	High

116. **The overall risk of the project is High.** This risk rating reflects high ratings of political, macroeconomic, institutional capacity, and fiduciary risks, compounded by substantial risks related to sector strategy.

117. **Political and Governance: High.** Following the severe crisis in 2012, the political situation of the CAR remains fragile. Since May 2017, the optimistic momentum in the country has started to wane with a deteriorating security situation in various regions of the country and with the loss of nine peacekeepers from the UN peacekeeping force (MINUSCA). The 2012 crisis severely disrupted public operations, and the Government is still struggling to rebuild its institutions and resume its core functions. Since mid-2013, the Government has restored treasury functions, relaunched the computerized accounting and budgetary system, and normalized expenditure procedures. However, the country's already limited physical and





institutional infrastructure was badly degraded during the crisis and will require long-term rehabilitation. In the case of ENERCA, not only was infrastructure actively destroyed but also business was disrupted and experienced staff fled. There remains the risk of another political-military crisis, which could severely affect project implementation. **Mitigation:** To mitigate this risk, project sites were chosen to be in comparatively well-secured areas with a strong presence of the UN stabilization mission nearby. The political and governance situation will be continuously monitored, and the project will closely coordinate with the UN mission on the ground.

118. **Macroeconomic: High.** Although the country has returned to positive GDP growth in 2015, the current growth rates are still low by the standards of Sub-Saharan African countries emerging from conflict. While inflation has receded from its double-digit peak at the height of the crisis, it remains above the 3 percent target set by the Central African Economic and Monetary Community (*Communauté Économique et Monétaire des États de l'Afrique Centrale* - CEMAC). Domestic resource mobilization is still insufficient to cover public sector wages and priority expenditures, leaving the economy highly dependent on external aid. The conflict severely degraded the capacity of the public administration in core areas, including revenue collection, expenditure management, public investment, and the maintenance of a hospitable business climate, particularly in the agriculture, energy, forestry, and mining sectors. A further worsening of the macroeconomic situation could negatively affect ENERCA and thus the project, by limiting the ability of the Government to support its public utility and by reducing the capacity of the population and state institutions to pay their utility bills, thereby undermining ENERCA's financial and operational sustainability. **Mitigation:** This risk will be mitigated by project activities under Component 2, which aim to reduce technical and commercial losses and strengthen cost recovery of ENERCA. This will reduce dependency on direct or indirect state subsidies.

119. **Sector Strategies and Policies: Substantial.** The prolonged political-military crisis has led to a situation in which both the sector ministry (MDEWR) and the utility (ENERCA) have been primarily focused on short-term crisis management, rather than long-term planning. The energy sector is lacking a long-term sector strategy, and even at the utility level, strategic documents and planning tools (for example, financial models) are missing. There is thus a substantial risk that the PDO may be adversely affected because the sector framework and utility-level planning do not convey a clear strategy. **Mitigation:** The project is proactively mitigating and improving this situation by financing the development of strategy documents and tools at both the sector and utility levels. The proposed project and PASEEL will develop key strategic documents in the energy sector, including a least-cost development plan and a tariff study, an energy sector strategy, proposed revision of the electricity law, the drafting of relevant application decrees, and a rural electrification plan. These documents will be developed in close cooperation with the MDEWR and its partners to ensure national ownership as well as financially realistic targets.

120. **Institutional Capacity for Implementation and Sustainability: High.** The human resource capacity and technical resources of ENERCA as well as their governing ministry (MDEWR) are limited. Implementation of reforms that are critical for the long-term sustainability of project outcomes will depend on correct incentivization and cooperation of management and political stakeholders. **Mitigation:** The project will support several mitigation measures, including the training of management personnel and staff to be deployed for the operation and maintenance of the solar plant, the improvement of management tools (for example, billing systems and asset inventories), and technical resources and standard-setting business processes (for example, an independent audit) to improve institutional capacity and standards.



121. **Fiduciary: High.** ENERCA has had recent experience with World Bank procedures under the recently completed PURCE, but it does not have up-to-date, reliable, and independently audited and validated financial statements, and the overall capacities in procurement and FM are low. **Mitigation:** To mitigate this risk, the project will seek to reinforce existing capacities within the PIU in charge of fiduciary aspects; and this project will help build ENERCA capacities for future operations. An independent financial audit of ENERCA will be carried out under the PASEEL. The PPA will fund a procurement expert and an Owner's Engineer to support the PIU during the procurement process for the solar plant. In addition, the project will seek HEIS support from the World Bank.

122. **Technical Design of the Project: Substantial.** For this project, land allocation is not a major concern because land has already been allocated for the project and is registered in the cadaster under the Ministry of Energy. Land title should be formalized not later than one (1) month after the Effective Date. The required technology, on the other hand, presents a major challenge. Although the project will use well-established PV technologies and presents no unusual construction or operational challenges, the use of battery storage may create challenges during operations: (a) solar PV and battery systems have never been implemented at the utility scale in the Africa region, including in the CAR; (b) the sizing of battery storage will be critical to ensure grid stability; and (c) the batteries will require replacement every five years. **Mitigation:** The envisaged procurement process for the solar plant (RFP in two stages) will enable dialogue with bidders to reassess current technical design and the size of batteries and to explore opportunities for further refining technical design and optimizing investment. An Owner's Engineer will be recruited to provide technical support during the procurement process for the plant and to monitor work during construction. An O&M contract will be in place for a minimum period of three years, until a proper handover of the plant operation to ENERCA takes place. A contract will also be in place between ENERCA and the battery technology provider to ensure a minimum performance guarantee for the battery storage. The PIU will ensure continued coordination with the Owner's Engineer for Components 1 and 2. Component 3 will also support technical training and capacity building for ENERCA on management and O&M of these types of systems. Finally, ENERCA will commit to provisioning and securing adequate funding to cover the cost of battery replacement.

123. **Environment and Social: Moderate.** While the environmental risk is considered Moderate, the social risk is considered Substantial, especially regarding GBV. The project includes investment in generation, transmission, and distribution. There could be populations that need to be displaced from the solar plant site, and the T&D lines, in addition to an influx of labor in the project site. **Mitigation:** Mitigation measures include the use of existing right-of-way for T&D lines when possible to minimize the social footprint. There will also be a community outreach campaign designed to ensure community understanding of the project activities and the reasons behind them, including specific outreach efforts in relation to SEA and GBV. There will also be an ongoing feedback loop for authorities and the utility to monitor consumer perceptions and to adjust the implementation as required. The project will also finance a health center and a women's center in the project area to provide first treatment to women that have been subject to GBV.

124. **Stakeholders: Moderate.** This risk is considered Moderate based on the continuous dialogue between the Government and the World Bank as part of the World Bank's significantly larger engagement in the country. The funding of the project is relying only on an IDA grant, but close coordination with other development partners such as the AfDB and the Chinese Government is key to ensure proper planning and coordination of various energy investment projects planned in the sector in the short to medium term. **Mitigation:** This risk will be mitigated through regular meetings organized with other development



partners, as well as with ENERCA and the MDEWR. In addition, various tools for sector planning will be developed as part of the current project and PASEEL to streamline this coordination (least-cost development plan, tariff study, SCADA system, and so on.).

125. **Other - Security Risk: High.** This risk is considered high as the country is still recovering from the domestic political and security crisis that erupted at the end of 2012. Even after a three-year transition period, the security situation remains fraught and could cause delays in project implementation.

**Mitigation:** To mitigate this risk, project sites were chosen to be in comparatively well-secured areas with a strong presence of the UN stabilization mission nearby. The security situation will be continuously monitored, and the project will closely coordinate with the UN mission on the ground to ensure safe implementation and supervision of the proposed project.



**VI. RESULTS FRAMEWORK AND MONITORING**

**Results Framework**

**COUNTRY:** Central African Republic

**CAR Emergency Electricity Supply and Access Project**

**Project Development Objective(s)**

The PDO is to increase electricity supply and access in Central African Republic.

**Project Development Objective Indicators**

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
<b>Increase electricity supply</b>				
Annual electricity generation dispatched from solar energy (Gigawatt-hour (GWh))		0.00		37.00
<b>Increase electricity access</b>				
People provided with new or improved electricity service (CRI, Number)		0.00	200,000.00	250,000.00
People provided with new or improved electricity service - Female (CRI, Number)		0.00		125,000.00

**Intermediate Results Indicators by Components**



Indicator Name	DLI	Baseline	Intermediate Targets		End Target
			1	2	
<b>Construction of a Solar PV Electricity Generation Plant</b>					
Generation capacity of energy constructed or rehabilitated (CRI, Megawatt)		0.00			25.00
Renewable energy generation capacity (other than hydropower) constructed under the project (CRI, Megawatt)		0.00			25.00
<b>Strengthening of the Transmission and Distribution Networks</b>					
Distribution lines constructed or rehabilitated under the project (Kilometers)		0.00	150.00	250.00	450.00
Transmission and distribution substations rehabilitated or constructed (Number)		0.00	15.00	25.00	42.00
SCADA system installed and operated (Number)		0.00	1.00	1.00	1.00
<b>Institutional Strengthening, Capacity Building, and Project Implementation Support</b>					
Number of ENERCA and MDEWR staff trained (Number)		0.00	10.00	18.00	30.00
percentage of female trained (Percentage)		0.00			50.00
Number of studies/frameworks completed (Number)		0.00	2.00	4.00	5.00
Share of grievances responded to and resolved (Percentage)		0.00	100.00		100.00



**Monitoring & Evaluation Plan: PDO Indicators**

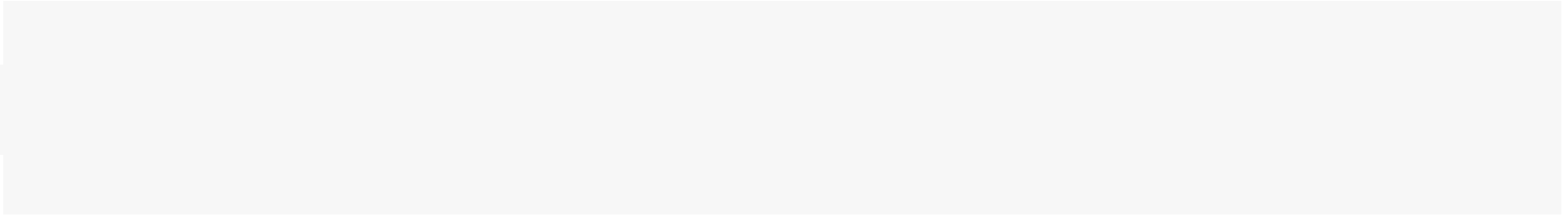
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Annual electricity generation dispatched from solar energy	The indicator measures the annual amount of electricity (in gigawatt hour) that is produced by the solar plant and transmitted to the existing transmission line Boali/Bangui.	yearly	ENERCA, MDEWR	yearly report	PIU
People provided with new or improved electricity service		yearly	ENERCA, MDEWR	yearly report	PIU
People provided with new or improved electricity service - Female		yearly	ENERCA, MDEWR	yearly report	PIU

**Monitoring & Evaluation Plan: Intermediate Results Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Generation capacity of energy constructed or rehabilitated		yearly	ENERCA, MDEWR	yearly report	PIU
Renewable energy generation capacity (other than hydropower) constructed under the project		yearly	ENERCA, MDEWR	yearly report	PIU
Distribution lines constructed or rehabilitated under the project	The indicator measures in kilometers (KM) the distribution lines	yearly	ENERCA, MDEWR	yearly report	PIU



	rehabilitated or constructed under the project				
Transmission and distribution substations rehabilitated or constructed	2 transmission substations (Bangui A and Bangui B) should be rehabilitated (including construction of a 25 MVA transformer in Bangui A), and 40 new low and medium voltage substations constructed	yearly	ENERCA, MDEWR	yearly report	PIU
SCADA system installed and operated	The indicator measures the number of SCADA systems that are installed and operational	yearly	ENERCA, MDEWR	yearly report	PIU
Number of ENERCA and MDEWR staff trained	The indicator measures in numbers the staff from ENERCA and MDEWR trained, of which the percentage of female staff trained	yearly	ENERCA, MDEWR	yearly report	PIU
percentage of female trained	The indicator measures the percentage of women staff from ENERCA and MDEWR that are trained out of the total of staff trained	yearly	ENERCA, MDEWR	yearly report	PIU
Number of studies/frameworks completed	The indicator measures in number the studies and frameworks completed	yearly	ENERCA, MDEWR	yearly report	PIU
Share of grievances responded to and resolved	Percentage of complaints and grievances recorded by the PIU and resolved.	Yearly	PIU	Yearly report	PIU







## ANNEX 1: IMPLEMENTATION SUPPORT PLAN

**COUNTRY: The Central African Republic  
CAR Emergency Electricity Access Project**

### Strategy and Approach for Implementation Support

1. The objective of the Implementation Support Plan (ISP) is to ensure that the Government of the CAR is able to implement the project successfully and to achieve the PDO while remaining fully in line with World Bank policies and procedures. To achieve this aim and to allocate the necessary resources in terms of World Bank staff and supervision budget, the strategy of implementation support is designed to mitigate the high political and governance, institutional capacity, and fiduciary risks. World Bank staff will work closely to (a) support the host MDEWR to put in place adequate sectorial strategies, planning tools, and technical studies; (b) build capacity of utility ENERCA to operate the solar plant with battery storage and reinforce/develop the T&D networks for future generation capacity expansion; and (c) work closely with the PIU to support project implementation and build capacity of the newly recruited experts, including the two technical experts.
2. The ISP will be centered around semiannual formal missions; participation in coordination meetings of the PIU; regular videoconference calls between the task team, PIU, and the MDEWR; visits to the project sites; and fiduciary compliance reviews. An MTR will be held after approximately 24 months of implementation to review performance in depth and to make necessary adjustments to project substance and schedule. The use of an existing and tested PIU structure for the implementation of the project reduces implementation risks; however, as the PIU will have newly recruited staff, particular attention will have to be paid to new staff selection, training, and initial supervision. To build a well-functioning implementation structure, the World Bank will encourage close coordination between the PIU and the project coordination teams within the implementing agency, ENERCA.

### Implementation Support Plan and Resource Requirements

3. In the initial phase of the project, World Bank implementation support will focus on assisting the Client in meeting the conditions of effectiveness and disbursement, in particular the successful recruitment of new staff and the timely completion of feasibility studies, as well as the environmental and social safeguard documents. Following effectiveness, World Bank support will prioritize procurement processes to ensure that the major infrastructure contracts are prepared in time and to the highest quality standards, a critical condition for the project to stay on track.
4. Once infrastructure works and key studies commence, the World Bank's implementation support will focus on monitoring construction processes, contract management, disbursements, and the effectiveness of capacity building and technical assistance activities. The World Bank team will include staff and consultants, to be complemented with specialized expertise as required. As an ongoing concern, particular attention will be paid to the following aspects.
5. **Safeguards.** Enforcing safeguards requirements will be a particular concern in light of the high degree of instability, low capacity, and the difficult governance situation in the CAR. The World Bank safeguards team will provide implementation support for (a) implementation of safeguards requirements



through regular supervision missions, including visits to the project sites; (b) review of grievances submitted through the GRM that have not been resolved directly; (c) review of environmental monitoring reports and following up with the relevant government authorities on any safeguards issues that may arise during project implementation; and (d) provision of safeguards training to the PIU and other relevant stakeholders. The environmental and social specialist to be appointed for supervision of the project will pay specific attention to the risk and mitigation measures identified and will regularly report updates regarding environmental and social safeguard compliance to the task team leader and management, bringing to attention any critical issues on time. Particular attention will be given to sensitive issues such as SEA and GBV to ensure confidentiality and to avoid additional harm to and stigmatization of those concerned.

6. **Procurement and technical support.** The World Bank team, and in particular its procurement specialists, will provide implementation support for reviewing procurement documents (including technical specifications, providing timely feedback, and clearances) and monitoring progress against the PP that has been developed by the PIU in coordination with ENERCA. Moreover, the World Bank will provide procurement training on World Bank guidelines to the PIU. During the regular implementation support missions, the PPs will be updated at least once each year (or more often as required to reflect actual project implementation needs) and post-procurement reviews will be carried out at a least once annually. The World Bank will also lend additional support through HEIS, as provided under the NPF.

7. **FM.** The World Bank team will provide implementation support for reviewing the project's FM system, including but not limited to accounting, reporting, and internal controls. In particular, the FM supervision will review quarterly progress reports and financial audits. The World Bank's project team will closely monitor FM activities to identify in advance any potential delays in the preparation of the financial and audit reports and will undertake corrective measures if necessary.

8. It is expected that the following skills mix and resources will be needed by the World Bank to supervise project implementation:

**Table 1.1 Skills and resources needed for the project implementation and supervision**

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First 12 months	Hire and equip additional experts to reinforce PIU; complete feasibility studies and safeguard documents; design procurement documents; implement ESIA and RAP as required.	Engineering, procurement, FM, environmental, social, and legal	US\$200,000	No cofinancing
12–48 months	Review progress in construction and capacity building; review sector technical and financial performance;	Engineering, sector regulatory activities and planning, M&E specialist, financial analyst,	US\$600,000	No cofinancing



Time	Focus	Skills Needed	Resource Estimate	Partner Role
	procurement; M&E; safeguards; and FM.	economist, environmental and social specialists		

**Table 1.2 Skills and resources needed for the project implementation and supervision**

Skills Mix Required			
Skills Needed	Number of Staff Weeks (Annual)	Number of Trips (Annual)	Comments
Team Leader - Energy	10	5	Washington, DC
Power Engineer	4	3	Washington, DC
Energy Specialist	6	0	Based in country
Procurement Specialist	8	0	Based in country
Safeguards Specialist	8	4	Based in region
Operations Officer	4	1	Washington, DC
Economist	2	1	Washington, DC
Program Assistant	8	0	Based in country
Total	50		



## ANNEX 2: GENDER-BASED VIOLENCE ASSESSMENT IN THE CENTRAL AFRICAN REPUBLIC<sup>31</sup>

### COUNTRY: The Central African Republic The CAR Emergency Electricity Access Project

1. **Gender equality is central to the World Bank Group goals of ending extreme poverty and boosting shared prosperity.** The incidence of GBV, which is likely to exist in every environment where the World Bank operates, can compromise this mission. Projects can increase the risk of GBV or compound risks that already exist.
2. GBV is not only harmful to the well-being of women who experience it and to their children, but it also impedes development for communities and countries. GBV significantly limits women's choices and their ability to act, make informed decisions, work, and take care of themselves and their families. GBV can create a substantial burden on national social systems and services such as health care, the police, legal aid, crisis centers, and other response services. The costs of GBV, both direct and indirect, are a staggering burden for both households and national economies.
3. The GBV Risk Assessment Tool has been used for the proposed project and the CAR's score is 12.75, which places it in the Moderate risk category. Current legislation in the country in relation to GBV may not be perfect, but it is quite advanced after the most recent reviews, which have given it higher scores in the tool. However, the legislation is largely unknown to the population and hardly accessible due to the challenges that the justice and security systems face in the country. Therefore, based on the information gathered during desk review of reports by organizations working in the country, as well as on interviews conducted by the consultant with in-country GBV actors, it is assumed that the GBV country-level risk should be higher than what is presented in the GBV tool.

#### Key GBV/SEA Risks That could be Aggravated by the PURACEL

4. While some of the risks are quite high, for example, SEA, forced prostitution, and lack of services for survivors, others are relatively lower. However, even the lower risks are worth noting in a high-GBV risk context such as the one in the CAR.
5. **SEA of women and girls by men working on the projects.** The presence of men, especially men from outside of the community, creates a high risk of SEA for the women and girls living in the project area, as well as for women who may be employed by the project. There have been reports of SEA committed by the armed forces (including peacekeeping forces), humanitarian workers, teachers, and so on, while many other incidents certainly have been left unreported. This risk concerns not only the staff of the company that will be hired to install the solar panels but also ENERCA staff who, for example, might ask women for payment or sexual favors if they want to take part in a training or be provided with electricity. The participation of women will be explicitly monitored by the project because there is a risk that their involvement in the project will be made conditional to their providing sexual or other favors. Women who work on the project sites (doing construction, as cooks, and so on) are also at risk of SEA and

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<sup>31</sup> A full report of the GBV assessment conducted between July and November 2018 is also available. The full report includes more information on the GBV situation in the country and its legal framework, as well as the coordination efforts and services that are available for survivors of GBV.



sexual harassment. Lack of separate facilities that are lockable from the inside, and/or inadequate lighting can exacerbate these risks.

6. **Human trafficking, forced prostitution, and child marriage.** Girls and young women are particularly at risk, even more so because having sex at an early age is accepted in many areas of the CAR. Poverty and lack of opportunities might push families or social circles to encourage girls or women to look for ‘relationships’ with the workers as a way to improve their lives. There is also the risk of an increase in child marriages of girls from within or outside the community to workers who will have the means to pay the ‘bride price’.

7. **Lack of services, acceptance of violence.** As indicated earlier, the prevalence of GBV in the country is very high as is acceptance of the use of violence, particularly against women and girls. The seeking of help is limited by the fear of stigma and rejection from family members and communities. This means that even when services exist some women cannot access them or cannot access them fully. The proposed project is in an area that is not targeted by many associations dealing with GBV, as other areas of the country have higher needs. This could mean that women and girls might have limited access to holistic GBV services and that they would have to travel to Bangui to access care, which would be costly as well as difficult to reach immediately (in cases of rape, HIV prevention can only be administered within the first 72 hours).

8. **Preexisting rates of GBV in these communities and gender norms will affect the implementation and results of the projects.** If women are not specifically targeted by carefully planned interventions, they may not be allowed to effectively take part in planned activities such as consultations, assessments, and/or meetings that are part of the preparation before the project starts. This is even more likely if only men conduct those meetings. Other times women might be allowed to meet with the World Bank or with partner staff but only in the presence of men from the community, which would limit their willingness to express their own opinions freely. Consequently, the project would not know about their aspirations, fears, and/or their suggestions linked to project implementation or about how they will benefit from the project (how will they use the road, the water reservoir, and so on). Gender norms are closely linked to the cultural identity of the community, and any perceived interference often bears negative consequences to those with the least power—and in many families, those are women and girls. This is quite visible in projects that target women for economic empowerment: some research has shown an increase in intimate partner violence (at least in the short term) when women have a better income. These risks should not stop projects from targeting women for economic empowerment or decision making, but steps should be taken to mitigate the risk of increased violence.

9. **The risk of increased GBV at the hands of husbands and/or partners** (or fathers and other male relatives of unmarried girls) linked to the project cannot be neglected. Women are at increased risk of intimate partner violence<sup>32</sup> when men feel jealous or threatened by other men present in the community. Women, especially girls, can become even more isolated when the men in their lives forbid them to go to the market, or to school, or to visit family to prevent their contact with other men. This is sometimes seen as a way to protect women and girls from harassment or sexual abuse. But even when the isolation is

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<sup>32</sup> There is no Demographic and Health Surveys data on intimate partner violence in the Central African Republic but other studies (UNESCO 2017) report that 71 percent of surveyed women suffered from domestic violence—note that that intimate partner violence and domestic violence are often used as interchangeable terms. (*Stratégie Nationale De Lutte Contre Les Violences Basées Sur Le Genre En République Centrafricaine 2018–2022*)



justified by caring or love, it is also directly linked to the need to control and exercise power over those who are considered 'property' and has negative consequences for women, such as lack of social connections, information, or education (in the case of forced dropping out of school).

### Recommendations for the Proposed Project

10. To mitigate SEA risks, the following actions are recommended:

- (a) **Code of conduct.** Ensure that all personnel of the contractor that will be hired for solar panel installation and conservation as well as the utility ENERCA and the MDEWR sign and respect a code of conduct that includes provision against SEA and GBV, including sexual relations with members of the local community who are below 18 years.
- (b) **Training for contractors and the PIU.** Offer the staff of the contractors as well as of ENERCA and the MDEWR training on gender equality and GBV capacity-building opportunities covering the basic concepts of women's rights, gender equality and its benefits, GBV and its consequences (for individuals and also for communities and society), the roles and responsibilities of all actors involved in the project, and the GBV reporting mechanisms.
- (c) **Make GRM accessible to GBV/SEA survivors.** Design and review the GRM to ensure that it is accessible to women and well suited to enabling safe, confidential reporting of GBV for survivors (or witnesses).
- (d) **A monitoring and reporting system** for GBV activities should be set up, with indicators for both the GBV activities on the project as well GRM. Supervision of GBV prevention and mitigation efforts should be clearly defined in the overall project supervision and monitoring framework. Third-party GBV monitoring could also be considered to evaluate the quality of actions undertaken by all actors.
- (e) **Community information sessions.** The community members living near the project site should be offered awareness-raising and information-sharing sessions, so they know about the roles and responsibilities of the actors involved in the project for the reporting of project-related GBV incidents and corresponding accountability structures.

11. To prevent and respond to incidents of GBV, a holistic, survivor-centered approach to GBV service provision should be supported for the areas of project implementation. Medical and psychosocial services should be prioritized, but access to legal and socioeconomic assistance should also be available, at least through referrals. The leading role of the state institutions in service provision to survivors should be strengthened, especially within the MoH<sup>33</sup> structures (hospitals and health centers) and in the social services of Ministry of Women.<sup>34</sup> Because the health sector's (SENI) will support GBV service provision in the country with a similar implementation timeline, it is recommended that the two projects align their implementation strategies to capitalize on their expertise and to contribute to a higher impact against GBV prevalence in the CAR.

<sup>33</sup> *Ministre de la Santé et de la Population.*

<sup>34</sup> *Ministre de la Promotion de la Femme, de la Famille et de la Protection de l'Enfant.*



## **ANNEX 3: ECONOMIC AND FINANCIAL ANALYSIS**

### **COUNTRY: The Central African Republic The CAR Emergency Electricity Access Project**

#### **Introduction**

1. This annex provides an economic and financial analysis of the proposed project, in particular, Components 1 and 2, for which the benefits are estimated. The specific activity under Component 1 is to build a 25 MWp solar power plant with 25 MWh of battery system. Component 2 focuses on improvement of the T&D system and is aimed at reducing distribution losses from 33 percent to 25 percent within five years and increasing access by connecting new customers. The benefits of Subcomponent 2.1 relating to SCADA system and Component 3 are not considered in the economic and financial analysis. However, the long-term benefits of these components should be noted.

2. Subcomponent 2.1 contains activities designed to analyze and plan the first SCADA system of the CAR, which would allow the country's electricity system to integrate various energy sources for future expansion. Component 3 will provide technical assistance to build the capacity of ENERCA. Taken together, the expenditure on these two components accounts for less than 8 percent of the IDA grant, but is expected to generate significant economic and financial benefits by improving the capacity of the utility and by allowing the system to satisfy the rising demand for affordable electricity.

#### **Value Added of Bank's Support**

3. The World Bank brings strong added value in supporting the Government of the CAR for the preparation and implementation of this project: (a) IDA financing is essential to initiate the solar power plant construction within a limited time frame, which requires high upfront CAPEX with large long-term benefits; (b) the World Bank is providing expert advice to the Government on the technical parameters of the plant, investment benchmarks, transaction structuring, and risk mitigation; (c) the World Bank will provide close procurement support to the PIU through HEIS; (d) the World Bank will provide expertise for enhancing the T&D infrastructure, enabling the system to diversify the energy mix, and planning its least-cost supply plan. (This is important because public investment in transmission and battery storage is critical to enable integration of solar energy into the grid); (e) the World Bank will provide expert support to the MDEWR and ENERCA to improve their financial and operational performance and will be equipped to plan investment in the sector in coordination with all development partners; (f) the World Bank has solid experience operating in countries affected by FCV environment, and lessons learned from that experience are strengthening the project design; and (g) the World Bank will continue to support development and seek financing for a second phase to increase generation capacity up to 40 MWp.

#### **Summary of Economic and Financial Analysis**

4. The planned 25 MWp solar PV plant with a 25 MWh battery electricity storage system (Component 1) has an expected lifetime of 30 years. During that time, the power plant is expected to generate 1,032 GWh (around 37 GWh per year) and the loss reduction of T&D (Component 2) will provide an additional 695 GWh to the system (on average 23 GWh per year). Out of a total project cost of US\$65 million, the investment capital is US\$58.6 million. This includes the solar power plant capital expenditures



of US\$48 million, including the first three years of O&M costs of US\$3 million (The O&M cost includes maintenance of both the solar PV and the battery system), and the rest for the T&D loss reduction component of US\$10.6 million.

### **Rationale for Public Sector Financing**

5. The World Bank's MFD framework seeks to 'crowd-in' private capital and to resort to scarce public concessional financing only when necessary. The proposed project will strengthen the financial position of ENERCA, improve its operational performance, and work toward improving sector development and planning, thus helping position this public utility for more commercially oriented financing in the future. For now, however, public financing remains essential for major capital investments in the energy sector in the country. The World Bank team has explored this option in discussions with IFC and has confirmed that there is a lack of attractiveness to private capital due to ENERCA's low-cost recovery and significant existing debt, along with major political and macroeconomic risks. Even if there were potential private sector interest, the cost of electricity would be unaffordable if it included return on investment that would commensurate with the risks.

6. As ENERCA is currently not able to recover its operational costs, self-financed investments, or borrowing at commercial interest rates, addressing critical infrastructure constraints is out of reach until commercial and technical loss reduction plans are able to improve its financial sustainability. Moreover, high existing debt levels of the utility and the country's elevated level of macroeconomic and political risk further reduce the likelihood of viable private financing. By helping overcome the present infrastructure gap and capacity constraints, World Bank financing will lay the foundation for additional public and possibly future private funding along the lines of the World Bank's vision to promote the MFD principle. ENERCA will benefit from the PPIAF technical support to improve its financial performance and will start the financial restructuring process to meet the standards of OHADA, among other standards, and to explore various options for private sector participation in the management of the company.

7. Furthermore, renewable energy technologies require relatively high capital costs: this makes it difficult to attract commercial financing given the current tariff structure, high level of technical and nontechnical losses, and absence of ENERCA's creditworthiness as an offtaker. Moreover, the country is identified by the World Bank Guarantee Operations as 'not ready' for the guarantee option, as the risk is too high and a guarantee would not be cost effective to address the need for private financing.

### **Summary of Economic Analysis**

8. The results of the analysis show that the project is economically viable. In the baseline scenario, which assumes the achievement of project targets, a two-year capital investment timeline (25 percent capital disbursement in Year 1 and 75 percent capital disbursement in Year 2), and a social discount rate of 4 percent, the model yields a positive ENPV of approximately US\$73 million and a positive EIRR of 11 percent. In addition, the project will bring local and global environmental benefits by avoiding the current and potential use of diesel, which would be the only feasible alternative. With its environmental benefits, the ENPV of the project increases to US\$166 million, with the EIRR at 21 percent. The ENPV estimates are conservative, as some indirect positive economic effects and possible positive externalities could not be explicitly modeled due to a lack of reliable data (for example, security related gains due to more public lighting). But these effects are likely to occur and would further improve the ENPV profile. Of course, the





main economic benefits from the project result from the increased energy supply in Bangui with the new solar power plant and the savings from the GHG emission reduction.

**Table 3.1. Summary of Economic and Financial Analysis Results**

	XAF (million)	USD (million)
Discount rate	4%	4%
Levelized Cost of Energy (LCoE)	28.71	5.40
<b>Economic rate of return (ERR)</b>		
<b>ERR</b>	<b>12%</b>	<b>11%</b>
<b>ERR+local externalities</b>	<b>20%</b>	<b>19%</b>
<b>ERR+local+GHG</b>	<b>22%</b>	<b>21%</b>
<b>Composition of NPV</b>		
<i>Costs</i>		
<b>capital cost - project construction</b>	<b>27,752</b>	<b>56</b>
<i>Generation capital expenditures (CAPEX)</i>	22,456	45
<i>T&amp;D CAPEX</i>	5,297	11
capital cost - battery replacement	8,213	15
<b>O&amp;M</b>	<b>7,840</b>	<b>15</b>
<b>total costs</b>	<b>43,805</b>	<b>86</b>
Avoided fuel cost: diesel	84,562	159
<b>total benefits</b>	<b>84,562</b>	<b>159</b>
<b>NPV (before environmental benefits)</b>	<b>40,757</b>	<b>73</b>
local environmental benefits: avoided diesel	35,647	67
NPV (incl. Local environmental benefits)	76,404	144
value of avoided GHG emissions	11,733	22
<b>NPV (including environment)</b>	<b>88,137</b>	<b>166</b>
<b>Financial NPV</b>	<b>18,802</b>	<b>35.39</b>
<b>FIRR</b>	<b>3.2%</b>	<b>3.2%</b>

9. The economic analysis takes an approach to analyzing benefits based on a willingness to pay of XAF 125 per kWh (US\$0.235 per kWh). Based on the historical and current situation of the country, other lower-cost alternatives against the designed project cannot quickly deliver the capacity needed, which is critical for overall stability and for the economy. Hydropower has been the main electricity source for the country; however, the designed projects for the expansion of Boali 2 and 3 have been experiencing significant delays. The possibility of constructing a coal or natural gas power plant would also face bottlenecks due to a lack of local resources, no experience in importation, and none of the required infrastructure. The alternative of constructing a diesel or HFO power plant has also been considered. However, with the current diesel price at XAF 810 per liter<sup>35</sup> (around XAF 245 per kWh), this option is economically more expensive than a solar power plant that will yield an equivalent amount of energy, not to mention the negative environmental impacts that would be generated by a diesel power plant, through added local pollution and GHG emissions. Although the cost of HFO is lower than diesel,<sup>36</sup> with the high

<sup>35</sup> Provided by ENERCA, May 2018.

<sup>36</sup> According to the U.S. Energy Information Administration, the monthly average wholesale price of HFO in 2017 was US\$1.1 per gallon.



cost of transportation and local distribution, the retail HFO price could be about XAF 665 per liter (XAF 166 per kWh or US\$0.3 per kWh)<sup>37</sup>, which is still higher than consumers' willingness to pay.

10. Considering the size of the power system, the solar radiation of the site, and its ability to integrate solar resources, the technical prefeasibility study determined that a 25 MW peak solar power plant with 25 MWh of battery system is optimal for the country, and thus has been used as the base scenario of the economic analysis. The major economic benefit of the power plant will come from the sale of energy. The base yield of the power plant will be 37 GWh per year, with a plant lifetime of 30 years. To cope with the Government's political agenda for the upcoming election in February 2021, the solar power plant is planned to be in operation in 2020.

11. As the solar power plant does not require any variable fuel costs, the major upfront costs will be in CAPEX; there are only minimal O&M costs. All the up-front construction CAPEX, which accounts for more than half of the total cost of the project, will be covered by the IDA grant. The major maintenance expenditure will be battery replacement. The base scenario is conservative in assuming that the battery replacement frequency will be every five years because this is a rapidly evolving technology and the battery lifetime may increase to 8 to or even 10 years. Based on both the economic and financial model, this cost will be able to be covered by the income generated by the sale of power.

12. Another critical component for economic benefit is the reduction of distribution loss. According to ENERCA, the distribution loss rate in 2018 was 33 percent, and it aims to reduce this to 25 percent in the next five years, owing largely to investment that will be provided under Component 2 of the project. The total cost of the infrastructure enhancement work is projected to be around US\$7 million and will all be covered by the IDA grant. Table 3.2 presents the specific project assumptions used in the economic and financial analysis.

13. Last but not the least, there are significant environmental benefits generated from the project. The major benefit is the savings on GHG emissions through the solar power plant and the enhancement of the T&D system. The savings on GHG emissions are converted to economic benefit based on the shadow price of carbon, following the 2017 Bank Guidance Note on Shadow Price of Carbon.

14. Table 3.2 presents the specific project assumptions used in the economic and financial analysis.

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<sup>37</sup> The transportation and local distribution costs are based on the cost of importing diesel. However, the actual local retail price of HFO could be higher, given the fact that the country has never imported this type of fuel. The fuel consumption is assumed at 0.25 liter per kWh.



**Table 3.2. Project Specific Assumptions**

<b>Component 1 - 25 MWp PV plant with 25 MWh battery storage</b>		
Solar PV size	25	[MWp]
Battery size	25	[MWh]
Battery price	400	[US\$/KWh]
Battery cost reduction	0.05	[%/year]
Battery replacement frequency	5	[year]
Operating expenditures (OPEX)	805,463	[\$/year]
Capital expenditures (CAPEX)	<b>44,940,838</b>	[US\$]
O&M Cost for first 3 years	<b>3,059,162</b>	[US\$]
Project life	30	[year]
Plant operation start year	2020	
Disbursement: year 1	0.25	[ ]
Disbursement: year 2	0.75	[ ]
<b>Component 2: T&amp;D reinforcement</b>		
T&D Component CAPEX	<b>10,600,000</b>	[US\$]
Current T&D loss rate	0.33	[ ]
Target T&D loss rate	0.25	[ ]
Timeline	5	[year]
First year	2019	

<b>Environmental Benefit - Avoid GHG emission</b>												
<i>GHG Shadow price of carbon:</i>		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Low Estimate	[\$/tCO2]	39	40	41	42	43	44	45	46	47	48	49
High Estimate	[\$/tCO2]	78	80	82	84	86	87	89	91	94	96	98

15. Meanwhile, the country’s electricity system is expected to expand rapidly in next three years with the installation of two new hydropower plants, Boali 2 expansion and Boali 3, with a total capacity of 17.5 MW.<sup>38</sup> Table 3.3 shows the current power sector situations in the CAR. As the installed capacity of the system will almost be doubled in the coming years, the economic benefit from the loss reduction will significantly increase the amount of power available for sale.

<sup>38</sup> Boali 3 is built with installed capacity of 10 MW. However, due to lack of resources in the dry season, the capacity of the hydropower plant is estimated at 7.5 MW.



**Table 3.3. Power System Assumptions**

<i>CAR Electricity system</i>		
Installed Capacity in country	23	[MW]
Expected capacity of Boali 2	10	[MW]
Expected commission of Boali 2	2020	[year]
Expected capacity of Boali 3	7.5	[MW]
Expected commission of Boali 3	2021	[year]
Capacity factor	0.80	[ ]
VAT	0.19	[ ]
Willingness to Pay	125	[XAF/KWh]
Average Tariff	83	[XAF/KWh]

16. In addition, the economic analysis has been conducted in both local currency (XAF) and in U.S. dollar, which is the currency for investment, to factor in the exchange rate risk. Tables 3.4 and 3.5 present the macroeconomic assumptions and the exchange rate forecast used in the analysis.

**Table 3.4. Macroeconomic Assumptions**

<i>Financial and Macroeconomic Assumptions</i>		
Domestic currency	XAF	
Social Discount rate	0.04	[ ]
US\$ inflation	0.02	[ ]
XAF inflation	0.03	[ ]
Current Exchange rate	531.225	[XAF/US\$]

**Table 3.5. Exchange Rate Forecast (first 10 years)**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
US\$ Inflation		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Domestic inflation		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Expected exchange rate (XAF/US\$)	531.23	536.44	541.70	547.01	552.37	557.79	563.25	568.78	574.35	579.98	585.67

17. **Switching value analysis.** A sensitivity analysis based on switching values shows that both the financial and the economic viability of the project remain resilient to changes in the key assumptions (see table 3.6). The main risks facing this project would potentially result from an overrun of CAPEX and OPEX and a shortage of demand due to rapid expansion of the power system. The analysis shows that if only 80 percent of the power generated from this project is sold, the ENPV would decrease by 12.5 percent, but the project would still be viable, as the EIRR is at 19 percent. The project could also be overestimating the willingness to pay, which in turn would overestimate the return on the project. The expected discount rate could also be a potential impact to ENPV of the project.

**Table 3.6. Results of Switching Value Analysis of Key Assumptions**

	<b>FNPV (million US\$)</b>	<b>FIRR</b>	<b>EIRR (w/o env.)</b>	<b>EIRR (w/ env.)</b>
<b>CAPEX cost overrun (USD)</b>				
Baseline	<b>35.39</b>	<b>3.2%</b>	<b>11.4%</b>	<b>20.7%</b>
Cost overrun by 5%	34.86	3.1%	11.3%	20.6%
Cost overrun by 10%	33.79	3.0%	11.0%	20.2%
Cost overrun by 15%	32.19	2.8%	10.7%	19.6%
<b>OPEX cost overrun</b>				
Baseline	<b>35.39</b>	<b>3.2%</b>	<b>11.4%</b>	<b>20.7%</b>
Cost overrun by 5%	34.24	3.1%	11.3%	20.7%
Cost overrun by 10%	33.09	3.0%	11.2%	20.6%
Cost overrun by 15%	31.93	2.9%	11.2%	20.5%
<b>Battery replacement frequency change</b>				
every 5 years	<b>35.39</b>	<b>3.2%</b>	<b>11.4%</b>	<b>20.7%</b>
every 6 years	39.41	3.7%	11.9%	21.1%
every 7 years	45.23	4.2%	12.3%	21.4%
every 10 years	52.91	4.9%	12.9%	21.8%
no replacement	59.55	4.9%	11.8%	19.1%
<b>Short of demand (oversizing)</b>				
100%	<b>35.39</b>	<b>3.2%</b>	<b>11.4%</b>	<b>20.7%</b>
95%	31.52	2.9%	10.8%	20%
90%	27.64	2.6%	10.3%	20%
85%	23.76	2.2%	9.7%	19%
80%	19.88	1.9%	9.2%	19%
<b>Energy generation interruption</b>				
no interruption	<b>35.39</b>	<b>3.2%</b>	<b>11.4%</b>	<b>20.7%</b>
interrupt for 2 years	30.52	2.6%	9.3%	17.8%
interrupt for 3 years	27.87	2.4%	8.5%	16.8%
interrupt for 4 years	25.08	2.1%	7.8%	15.9%
interrupt for 5 years	22.29	1.8%	7.2%	15.2%



**Table 3.7. Results of Switching Value Analysis of Key Assumptions only for Economic Analysis**

	EIRR (w/o env.)	EIRR (w/ env.)
<b>Willingness to Pay (XAF)</b>		
125	11.4%	20.7%
119	10.6%	20.0%
113	9.7%	19.2%
106	8.9%	18.5%
<b>Social discount rate</b>		
4%	11.4%	20.7%
6%	11.4%	20.7%
8%	11.4%	20.7%
10%	11.4%	20.7%

**Summary of Financial Analysis**

18. The financial model evaluates changes in free cash flows due to the project. With the capital costs at zero because all the CAPEX for construction is from the IDA grant, the FNPV is about US\$35.4 million in the baseline case, with the FIRR at 3.2 percent.

19. The financial situation of ENERCA remains fragile due to the utility’s problems in converting its energy generation into sustainable cash flows, due to high T&D losses and bill collection efficiency of only 67 percent. The financial situation of ENERCA is expected to remain precarious over the duration of the project; however, if the project realizes its targets, it will make a significant contribution to stabilize ENERCA’s finances. On the generation component, the largest cost during the operation of the power plant will be the battery replacement every five years. Based on the project’s unlevered cash flows, the profit generated in the year of the battery replacement will be unable to cover the cost occurred. Therefore, it is strongly suggested that ENERCA provision for such expenditure.

20. In addition, to cover the high cost of battery replacement, a battery replacement provision should be built into the financial model. Every year, the provisioning could save 20 percent of the expected battery cost from the project cash inflow and release them in the year of battery replacement. With such a provisioning, the project would be able to not only cover the cost of battery replacement but would also have saved positive free cash flow every year during the 30 years of lifetime, which would prove that the project is sustainable.

**Table 3.8. Battery Replacement Reserve Account (first 5 years)**

	Unit	2020	2021	2022	2023	2024
Battery replacement periods		1	2	3	4	5
Battery replacement cost	[XAF]	-	-	-	-	4,140,401,475
Next expense	[XAF]	4,140,401,475	4,140,401,475	4,140,401,475	4,140,401,475	4,140,401,475
Battery replacement accrual	[XAF]	828,080,295	828,080,295	828,080,295	828,080,295	828,080,295
Accrued Replacement liability	[XAF]	828,080,295	1,656,160,590	2,484,240,885	3,312,321,180	-
Draw to fund Battery Replacement		-	-	-	-	3,312,321,180
<b>Final project Unlevered Cash Flow (UCF)</b>	[XAF]	1,080,276,140	1,326,447,951	1,760,670,235	1,517,070,749	711,359,203
<b>Final project Unlevered Cash Flow (UCF)</b>	[US\$]	2,033,557	2,496,961	3,314,359	2,855,797	1,339,092



### **Financial Analysis of ENERCA**

21. Improving the operational performance of ENERCA remains crucial and is partly addressed under the proposed project, in addition to support that will be provided as envisaged under the PASEEL and PPIAF technical assistance. The financial situation of ENERCA remains fragile due to the utility's problems in converting its generation of energy into sustainable cash flows, due to distribution losses, and a bill collection rate of only 67 percent.

22. Due to weak governance and years of political instability, no independently audited financial statements of ENERCA are available for recent years. This financial analysis has thus been based on provisional financial statements for 2012–2016, commercial data and summary documents provided by ENERCA's commercial department, annual activity reports, and discussions with ENERCA staff. A key task under the PASEEL will be to finance an independent audit in line with international standards to improve the available financial data.

23. Based on the available information, ENERCA has realized a turnover of US\$13 million including taxes, of which energy sales excluding other works, services, and charges were approximately 80 percent. Collections were significantly lower, at US\$7.5 million including tax, or 67 percent of billed sales. After taxes and other dedicated charges—for example, for public lighting and for support of the regulatory agency—were subtracted, ENERCA generated US\$5.8 million in retainable income in 2016.

24. By contrast, operational costs have been estimated at US\$10.4 million in 2016. Therefore, the effective cost recovery ratio is approximately 55 percent. While staff costs of nearly US\$4 million are the most important cost factor, a particularly large cost element is also fuel costs for the thermal plants that augment the production of hydroelectric power. Although barely 5 percent of the electricity produced is from the thermal plants, the fuel costs constitute nearly 20 percent of total operational costs.

25. On the revenue side, the two key reasons for the unfavorable cost recovery ratio are the inefficient collection of electricity billed, coupled with the large amount of production lost during T&D and thus never billed at all. Bill collection is 67 percent because many consumers are simply not paying what they owe. At the end of 2016, more than US\$54 million in electricity bills remained unpaid, of which US\$24 million by private customers and over US\$28 million by state institutions. It will be important to seek commitment from the central government to put into place a mechanism to pay for the electricity bills of critical facilities such as hospitals, schools, and security related facilities. This should be combined with an energy efficiency campaign in all public institutions.

26. The revenue shortfalls due to low bill collection are severely aggravated by the large losses during T&D. In 2017, transmission losses amounted to 7.3 percent of energy produced and distribution losses to 33 percent of energy distributed due to old infrastructure and theft of electricity, a loss worth approximately US\$8 million annually if priced at the average tariff of US\$0.14 per kWh.

27. The key to the financial viability of ENERCA thus lies in the reduction of its technical and commercial losses to monetize the value of the energy, which—at least in the main market of Bangui—is relatively inexpensive to produce owing to the major hydropower plants at Boali. Improving the operational efficiency, in particular loss reduction, is a critical priority both for the financial viability of the project and for ENERCA's future more generally.



28. ENERCA’s total liabilities amounted to US\$139.7 million in 2015, of which US\$68 million were in long-term financial debt, and US\$49.8 million in short-term liabilities (including value added tax payables as well as employee related and supplier debts). In addition, there was US\$21.9 million in cash flow liabilities such as bank and cash loans. Two major underlying loans, amounting to 75 percent of ENERCA’s long-term financial debt, have been cancelled as part of the Heavily Indebted Poor Countries (HIPC) initiative. Under the terms of the HIPC agreement, however, these loans have remained on ENERCA’s books as the Government has agreed to reallocate the freed-up funds in line with its Poverty Reduction Strategy rather than simply cancelling the liabilities of ENERCA. According to information from the utility, however, ENERCA is not actually making any payments toward these liabilities at present.

29. Looking toward the future, the financial situation of ENERCA is expected to remain precarious over the duration of the project. However, if the project realizes its targets, it will make a significant contribution to stabilizing ENERCA’s finances. The primary reason the project is not expected to have a larger effect on cost recovery is the high expected operational costs of the new secondary centers, which will remain partially reliant on expensive diesel fuel. Beyond the project, ENERCA has the opportunity for significant additional improvements in its financial status by focusing on converting sales into cash flows more effectively. A key part of this effort will be improving the payment compliance of government agencies, which consistently accumulate arrears.

**Table 3.9. ENERCA - Key Financial Parameters**

<b>Parameter</b>	<b>2016/17</b>
Production, sales, and collections	
Total production	135,756 MWh
Electricity for distribution	125,792 MWh
Electricity billed (percentage of production billed)	73,979 MWh (55%)
Total ordinary income including tax	US\$13 million
Net sales including tax	US\$12.5 million
Collections rate (2017)	67%
Retainable collections, that is, excluding tax and charges due to the Government	US\$5.8 million
Transport losses (production-distribution)/production	7.3%
Distribution losses (Distribution-sales)/distribution	41.2%
Average tariff realized (including taxes)	US\$0.14 per kWh
Expenses and cost recovery	
Total ordinary expenses	US\$10.4 million
of which staff costs	US\$4 million
of which energy costs	US\$1.95 million
Average cost of production of energy distributed	US\$0.08 per kWh
Cost recovery (total turnover/ordinary expenses)	123%
Cost recovery (retainable collections/production costs)	55%
Financial debts	<b>2015 (Provisional)</b>
Short-term liabilities	US\$71.7 million
Long-term financial debt	US\$68 million
Total liabilities	US\$139.7 million





## ANNEX 4: EXECUTIVE SUMMARY OF THE PPSD AND PROCUREMENT PLAN

### COUNTRY: The Central African Republic The CAR Emergency Electricity Access Project (P164885)

- 1. Applicable procurement rules and procedures.** Procurement of goods, works, and non-consulting and consulting services for the proposed project will be carried out in accordance with the procedures specified in the Procurement Regulations, dated July 2016 and revised in November 2017 and August 2018; the World Bank's Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (Anti-Corruption Guidelines) revised as of July 1, 2016; and the provisions stipulated in the Financing Agreement. All goods, works, and non-consulting services will be procured in accordance with the requirements set forth or referred to in the Procurement Regulations Section VI, 'Approved Selection Methods: Goods, Works and Non-Consulting Services'. Consulting Services will be procured in accordance with the requirements set forth or referred to in Section VII, 'Approved Selection Methods: Consulting Services' of the Procurement Regulations. Procurement will also be guided by the Borrower's PPSD and simplified PP, approved by the World Bank.
- 2. Procurement capacity assessment.** A procurement capacity assessment has been carried out by the World Bank and recognizes that the CEMAC-PU under the Ministry of Transports is familiar with the World Bank's guidelines, procedures, and procurement documents and has gained sufficient capacity to be responsible for the procurement for the project, on behalf of the MDEWR. The PIU is well staffed and a newly recruited procurement specialist is dedicated to carry out the procurement for the project. The PIU has acquired hands-on procurement experience while it is currently managing several World Bank projects. The PIU will be reinforced with two technical experts from ENERCA that will be detached to the PIU and short-term technical experts on a needs basis. In addition, considering PIU's limited prior experience in procuring and managing complex contracts through the NPF, the PIU has asked and benefited from a HEIS expert. In addition, procurement staff will receive World Bank procurement training and guidance on NPF, contract management, Systematic Tracking of Exchanges in Procurement (STEP) to ensure clean procurement transactions and timely project implementation.
- 3. PIM.** The PIM will define the project's internal organization and its implementation procedures and will include (a) the internal organizational and institutional arrangement for the proposed project; (b) the unified administrative and financial manual which define procedures for procurement, FM, and disbursement operational guidelines; and (c) the internal organization for supervision, control, monitoring, and safeguards procedures.
- 4. STEP.** The project will use STEP, the World Bank's planning and tracking system, which will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance. The first 18 months PP shall be reviewed and cleared by the World Bank through STEP. This PP shall be updated at least annually. All procurement to be carried out under the project shall be included in the PP with previous World Bank clearance.
- 5. Record keeping.** All records pertaining to award of tenders, including bid notification; register pertaining to sale and receipt of bids; bid opening minutes; bid evaluation reports; and all correspondence pertaining to bid evaluation, communication sent to/with the World Bank in the process, bid securities, and approval of invitation/evaluation of bids will be retained by the respective agencies and uploaded in



STEP. For contracts awarded by post review mode, a review shall be carried out independently on a sample basis or included as part of the ToR for internal audit (which will include the physical verification of community infrastructure/goods procured, process followed, record keeping, and appropriate sign off as per the process laid down for the beneficiary).

6. **Disclosure of procurement information.** The following documents shall be disclosed on the project website: (a) PP and updates; (b) invitation for initial selection application/proposals/bids for goods and works and non-consulting services for all contracts; (c) Request for Expression of Interest for selection/hiring of consulting services; and (d) contract awards of goods, works, and non-consulting and consulting services.

7. **Complaints handling.** For procurement-related complaints, the project will follow the procedure prescribed in the Procurement Regulations (paragraphs 3.26 and 3.31). To deal with the complaints from bidders, contractors, suppliers, consultants, and general public at large, a complaint handling mechanism will be set up at the PIU level and the detailed procedure is prescribed in the PIM in establishing mechanisms for addressing and escalating their grievances and complaints.

8. **Fiduciary oversight and procurement review by the World Bank.** The World Bank shall do a prior review of contracts according to prior review thresholds set in the PP. All contracts not covered under prior review by the World Bank shall be subject to post review during implementation support missions and/or special post review missions, including missions by consultants hired by the World Bank. The PIU shall be responsible for providing the consolidated list of contracts for carrying out the annual procurement post review. For contracts at the PIU level, procurement post review shall be carried out by the World Bank's procurement specialist or a World Bank-appointed consultant. For procurement at the community level, the annual post review shall be carried out as per the sample defined in ToR of a procurement consultant to be hired under the project for carrying out the procurement review or included as part of the ToR of the internal auditor. The sample size shall be specified in the ToR. The World Bank may conduct, at any time, independent procurement reviews of all the contracts financed under the loan.

9. **Frequency of procurement supervision.** In addition to the prior review to be carried out by the World Bank, supervision missions will be undertaken at least once per year. One in five procurement packages not subject to World Bank prior review will be examined ex post on an annual basis.

10. **Contract management capability.** The major consultancy contracts are awarded by the PIU. The PIU being the nodal agency is overall responsible for the compliance to the agreed procurement procedures and processes and shall monitor the contractual performance including contract management issues, if any.

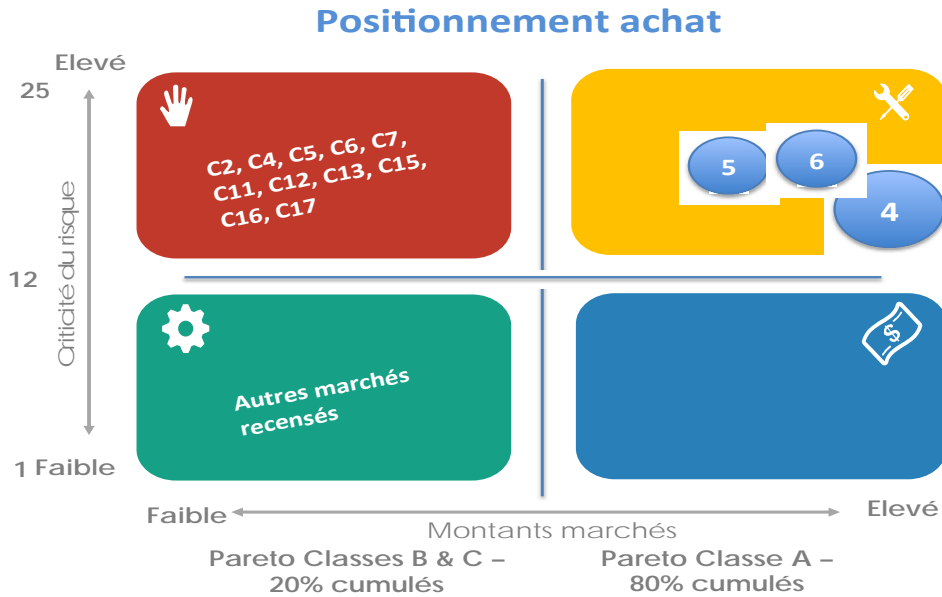
11. **PPSD executive summary.** The PPSD for the project has been prepared by the MDEWR during the project preparation and is summarized in the following paragraphs.

12. **Market analysis.** Owing to the economic conditions and general instability of the country, the possibility of attracting large reputable international companies to bid could be limited. However, communicating and consulting with reputable bidders, suppliers, and consultants will be important in attracting foreign competition. Open international advertisement will be the preferred approach for some of the specific parts in all the critical contracts to achieve the value-for-money (VfM) and fit-for-purpose results. The only exception will be the installation of the outside plant and distribution line, which will be



performed by a force account approach to take advantage of ENERCA’s expertise and buying of the proposed project by the national electricity company. The supply positioning aimed at determining the high and value contracts is shown in Figure 4.1.

Figure 4.1. Supply positioning



Note: The numbers within the blocks refer to contracts as described in the PPSD document.

13. **Key procurement under the project.** The total financing of the proposed project is US\$65 million, of which high-risk contracts are estimated at US\$61 million representing 94 percent of the total financing. These contacts comprise procurement of (a) works (US\$51.40 million); (b) goods, furniture, and equipment (US\$7.2 million); and (c) consulting services (US\$2 million). Table 4.1 is the key procurement contract table.

Table 4.1. Key procurement under the Project

Type of Procurement	Prior Review High Risk Contracts (US\$, millions)	Percentage of Total Value High-Risk Contracts (%)
Works (the solar plant construction and maintenance turnkey contract, rehabilitation of infrastructures T&D, small works execution of SCADA system interface, small works in force account for restoring and extension of OSP and distribution lines)	51.40	85
Goods, furniture, and equipment acquisition (packages for the restoring and extension of outside plant and distribution lines)	7.20	12
Consulting services (Owner’s Engineering for the solar construction of turnkey works supervision and control works)	2.00	3



Type of Procurement	Prior Review High Risk Contracts (US\$, millions)	Percentage of Total Value High-Risk Contracts (%)
execution related to the transmission and distribution supervision and control)		
<b>Total</b>	<b>60.6</b>	<b>100</b>

14. **Preferred arrangements of major contracts.** As per the PPSD, Table 4.2 summarizes the key high-risk value and prior review contracts for the proposed project.

**Table 4.2. Procurement arrangements for major contracts**

#	Contract Description	Budget Estimate (US\$, millions)	Procurement Method	World Bank's Review (Prior/Post)
<b>1</b>	<b>Works</b>	<b>51.40</b>		
1.1	Suppliers/contractor selection for suppliers/contractor selection for the design, supply, construction, commissioning and maintenance of the solar power plant 25 MW at Danzi through a turnkey approach	48	RFP through a two-phase process following the initial selection	Prior
1.2	Suppliers/contractors selection for the rehabilitation of transmission core network	3.40		
1.3	Execution of the repairing, rehabilitation, and extension of outside plant and distribution line equipment infrastructures through force account approach with ENERCA technicians	—	Force account	—
<b>2</b>	<b>Goods and Non-Consulting Services</b>	<b>7.20</b>		
2.1	Equipment, goods and furniture, infrastructures acquisition for the repairing, rehabilitation, and extension of outside plant and distribution line equipment infrastructures	7.20	RFP	Prior
<b>3</b>	<b>Consulting Services</b>	<b>2.00</b>		
3.1	Consultancy for Owner's Engineering for the solar construction of turnkey works supervision and control as well as works execution related to the transmission and distribution supervision and control	2.00	QCBS	Prior
<b>Total</b>		<b>60.60</b>		

Note: QCBS = Quality and Cost Based Selection.

15. **Procurement risks analysis and mitigation measures.** The PPSD identified major risks and recommended mitigating measures and actions to correct procurement deficiencies that may affect the implementation of the project, which have been summarized in Table 4.3.



Table 4.3. Procurement risks and mitigation measures

Risk Description	Description of Mitigation	Risk Owner
Quality of technical specification and bidding documents at the preparation phase and the entire process	Require technical assistance and technical guidance from the World Bank for the critical and major contracts during the contract awarding.	Client
	Concerning the power solar plant construction, apply the Vfm as key driven objective to achieve quality and sustainability for the important project.	Client
	In the consultancies of the Owner’s Engineering and/or feasibility studies, include in the contract a phase service concerning technical assistance for the evaluation of the suppliers until the contract awarding.	Client
Quality of equipment, supplies and work done that does not meet the standards	Factory samples must be required, and integration tests are done during the negotiation phase and before the signing of these critical contract parts.	Supplier
	During the execution of the rehabilitation works, ENERCA technical onsite visits and integration test should be performed under the control of Owner’s Engineer at the critical phase of the work execution.	Client
	Strengthen technical specifications quality and expected outputs.	Client
	Different milestones with key performances must be set in these critical contracts and these triggers must be defined and controlled in the contract of the Owner’s Engineering during the works execution.	Client
Security concerns during the custom clearance in Cameroun, the transport of equipment from Douala to Bangui or the execution of the works	Suppliers should be well informed and/or aware of the constraints and requirements of the supply chain (link with selected Incoterms).	Client
	Anticipate shipments of equipment and ensure transit conditions well in advance.	Supplier
	Anticipate facility warehouses to stock goods, furniture as using last trip container as a storage warehouse in a way to avoid loss and deficiency of the equipment due to physical storage inappropriate conditions.	Supplier
Competencies and qualification of consultants: well-qualified experts availability during the full	Seek assistance from MINUSCA if necessary for the transport of the equipment, furniture, and goods at the last mile site.	Client
	Appoint short-term experts on a needs basis to define technical specifications and expected outputs and services for the delivery of standard electricity services to the population.  Contract administration should be in place to make sure all conditions set in the contract have been met with special	Client



Risk Description	Description of Mitigation	Risk Owner
period of the mission realization	emphasis on the frequent replacement of key personnel after the realization of the mission.  Structure should be in place to assure effective collaboration and between the consultants and local staff, coordination between international and local partners.	Client

16. **PP for the project.** Based on the analysis of the PPSD, a comprehensive draft of the PP had been prepared to take in account all major activities and packaging related to the proposed project. In accordance with paragraph 5.9 of the Procurement Regulations, the World Bank’s STEP system will be used to prepare, clear, and update PPs and conduct all procurement transactions for the proposed project.

17. This textual part and the procurement tables in STEP constitute the PP for the proposed project. The following conditions apply to all procurement activities in the PP. The other elements of the PP, as required under paragraph 4.4 of the Procurement Regulations, are set forth in STEP.

18. **The World Bank’s standard procurement documents.** For each procurement arrangement subject to international competitive procurement, the PIU shall use the applicable World Bank’s standard documents in their latest version, as specified in the PP tables in STEP.

19. **National procurement arrangements.** In accordance with paragraph 5.3 of the Procurement Regulations, when approaching the national market (as specified in the PP tables in STEP), the CAR’s own procurement procedure may be used.

- When the Borrower uses its own national open competitive procurement arrangements as set forth in ‘Code des Marches Publics’, such arrangements shall be subject to paragraph 5.4 of the Procurement Regulations
- When national procurement arrangements other than national open competitive procurement arrangements are applied by the Borrowers, such arrangements shall be subject to paragraph 5.5 of the Procurement Regulations

20. **Procurement prior review thresholds.** The PP shall set forth contracts, which shall be subject to the World Bank’s prior review for high-risk environment as shown in Table 4.4.

**Table 4.4. Thresholds for prior procurement review**

Type of Procurement	High Risk (US\$, millions)
Works (including turnkey, supply and installation of plant and equipment, and PPP)	5
Goods, information technology, and non-consulting services	1.5
Consultants: Firms	0.5
Consultants: Individual	0.2

21. **PP table.** The PP includes for each contract (a) a brief description of the activities/contracts; (b) the selection methods to be applied; (c) the cost estimates; (d) time schedules; (e) the World Bank’s review requirements; and (f) any other relevant procurement information. The PP will be updated by the



PIU at least on an annual or as-needed basis to reflect actual project implementation need and will be submitted to the World Bank no-objection and the PPSD updated accordingly. The PP for the project is set as listed in Table 4.5.

**Table 4.5. Procurement activities planned under the Project**

Label	Activity Description	Cost Estimate (US\$, millions)	Method	World Bank's Review (Prior/Post)	Starting Date	Signing Contract Date
<b>1</b>	<b>Works</b>	<b>51.72</b>				
1.1	Suppliers/contractor selection for the design, supply, construction, commissioning and maintenance of the solar power plant 25 MW at Danzi through a turnkey approach	48	RFP through a two- phases process following the Initial Selection	Prior	05/2018	09/2019
1.2	Suppliers/contractors selection for the rehabilitation of transmission core network and interface SCADA small works	3.4	RFB	Prior	09/2019	02/2020
1.3	Execution of the repairing, rehabilitation, and extension of outside plant and distribution line equipment infrastructures through force account approach with ENERCA technicians	—	—	—	04/2020	10/2020
1.4	Contractor selection for PIU's office facility rehabilitation	0.07	RFQ	Post	02/2020	06/2020
1.5	Contractor's selection for the Center's GBV construction works in conjunction with others World Bank Group-funded projects	0.25	RFQ	Post	06/2021	12/2021
<b>2</b>	<b>Goods and non-consulting Services</b>	<b>8.29</b>				
2.1	Goods, furniture, and equipment acquisition for the rehabilitation, extension, and repairing of outside plant and distribution lines	7.20	RFB	Prior	09/2019	04/2020
2.2	Vehicles and motorcycles acquisition for ENERCA and the PIU devoted to the management and supervision of the project	0.35	RFQ	Post	06/2019	09/2019
2.3	IT system for Internet services at ENERCA (Very Small Aperture Terminal and accessories) equipment acquisition and installation	0.04	RFQ	Post	04/2019	06/2019
2.4	Operator selection and/or center for the training program delivery concerning PIU and ENERCA personal in procurement, contract, and project management	0.10	RFP	Post	06/2020	10/2020
2.5	Operator selection for the training program delivery of local NGOs including large	0.15	RFP	Post	02/2019	06/2019



Label	Activity Description	Cost Estimate (US\$, millions)	Method	World Bank's Review (Prior/Post)	Starting Date	Signing Contract Date
	communication awareness concerning GBV thematic					
2.6	Operator selection for the training program delivery concerning SCADA and the management of the new solar plant network as transfer knowledge for proper exploitation and maintenance of the Centrale	0.3	RFP	Post	10/2020	12/2020
2.7	Operator selection for the training program delivery concerning safeguards and GBV-related complaints thematic and handling structure.	0.15	RFP	Post	10/2020	12/2020
<b>3</b>	<b>Consulting services</b>	<b>3.68</b>				
3.1	Consultancy for Owner's Engineering for the solar construction of turnkey works supervision and control as well as works execution related to the transmission and distribution supervision and control	2.00	RFP	Prior	06/2018	06/2019
3.2	Consultancy for feasibility studies related to the extension and rehabilitation of the solar generation, transmission and distribution network and equipment in preparation of the project upcoming Phase 2	0.15	SFQC	Post	06/2020	01/2021
	Consultancy for feasibility studies related to renewable energy grid, efficiency including preparation of document aiming at promoting renewable energy sector	0.2	CQS	Post	04/2019	06/2019
3.3	Consultancy Danzi site hydraulic studies where the solar power plant will be located	0.025	SCQ	Post	12/2018	02/2019
3.4	Consultancy Danzi site geotechnics studies where the solar power plant will be located	0.025	SD	Post	12/2018	02/2019
3.5	Consultancy Danzi site topographic studies where the solar power plant will be located	0.025	CQS	Post	12/2018	02/2019
3.6	Consultancy the feasibility studies concerning the use of the solar panel in domestic habitation and public buildings	0.25	SFQC	Post	06/2019	10/2019
3.7	Consultancy for safeguard studies including the RAP	0.25	CQS	Post	03/2019	06/2019
3.8	Selection of two experts from ENERCA for the strengthening of the CEMAC-PFTT concerning technical matters	0.04	DS	Post	10/2018	12/2018
	Consultancy for feasibility studies for ENERCA	0.2	CQS	Post	01/2020	03/2020
3.7	Consultancy for legal framework for the PPP	0.15	CQS	Post	06/2019	10/2019





Label	Activity Description	Cost Estimate (US\$, millions)	Method	World Bank's Review (Prior/Post)	Starting Date	Signing Contract Date
	Consultancy for a communication campaign during the implementation of the project for the awareness of the population concerning the benefits of the project	0.05	CQS	Post	06/2019	10/2019
	Consultancy for the financial audit of the project	0.06	SFQC	Prior	10/2019	04/2020
	Selection of an expert SCADA to carry out the feasibility of the existing system and formulate the new suitable SACDA to interface with the solar panel and the existing power plant	0.075	SD	Post	09/2018	12/2018
	Selection of consultant to draft project PPSD	0.05	SD	Post	10/2017	12/2017
	Selection of expert consultant for elaboration of a financing request to the GCF	0.075	SCI	Post	06/2020	10/2020
	<b>Total (PP)</b>	<b>63.85</b>				
	<b>Operating Cost</b> (Salary, Internet, communication, workshops, various operational spending cost, and so on)	<b>1.15</b>				
	<b>Total Budget (PP + Operating Cost)</b>	<b>65.00</b>				

Note: DS: Direct Selection; RFB: Request for Bids; SCI: Selection of Individual Consultants; CQS: Selection Based on Consultants Qualifications.



ANNEX 5: Map

COUNTRY: The Central African Republic  
The CAR Emergency Electricity Access Project

