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GROUPE DE LA BANQUE AFRICAINE DE DÉVELOPPEMENT

MULTINATIONAL: ANGOLA AND NAMIBIA

PROJECT: INDEPENDENT PANEL OF EXPERTS FOR BAYNES HYDRO POWER PROJECT

MIC TAF GRANT REPORT

NOVEMBER 2021

P-Z1-FAB-025

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Abbreviations and Acronyms

AfDB	African Development Bank
ALSF	Africa Legal Support Facility
DFI	Direct Foreign Investment
EUR	Euro
ESEEP	Energy Sector Efficiency and Expansion Program
FCP	Fiscal Consolidation Plan
FY	Financial Year
GDP	Gross Domestic Product
GoA	Government of Angola
GRN	Government of Republic of Namibia
IMF	International Monetary Fund
MoF	Ministry of Finance
MICs	Middle Income Countries
MIC TAF	Middle Income Countries Technical Assistance Fund
NDS	National Development Strategy
NDP	National Development Plan
PFM	Public Financial Management
PESD	Power Systems Development Department
PJTC	Angola-Namibia Permanent Joint Technical Commission
PPP	Public Private Partnerships
RMC	Regional Member Country
SA	Special Account
SAPP	Southern Africa Power Pool
SAPP PAU	Southern Africa Power Pool Project Acceleration Unit
SEFA	Sustainable Energy Fund for Africa
TA	Technical Assistance
TYS	Ten Year Strategy
UA	Unit of Account
USD	United States Dollars

CURRENCY EQUIVALENTS

As of November2021

1 Unit of Account (UA)	=	912.444 Angola Kwanza (AOA)
1 Unit of Account (UA)	=	20.79 Namibian Dollar (NAD)
1 Unit of Account (UA)	=	1.428 USD

FISCAL YEAR

Namibia:	1 April – 31 March
Angola:	1 Jan - 31 Dec

WEIGHTS AND MEASURES

1 metric ton	=	2204 pounds (lbs)
1 kilogram (kg)	=	2.200 lbs
1 meter (m)	=	3.28 feet (ft)
1 millimeter (mm)	=	0.03937 inch
1 kilometer (km)	=	0.62 mile
1 hectare (ha)	=	2.471 acres

GRANT INFORMATION

Client's Information

RECIPIENTS: Republic of Namibia, and Republic of Angola
EXECUTING AGENCY: Southern Africa Power Pool (SAPP)

Financing Plan

ANGOLA

Source	Amount in (UA)	Instrument
ADB	250,000	MIC TAF Grant
Republic of Angola	37,500	In-kind counterpart contribution
Total Cost Angola	287,500	

NAMIBIA

Source	Amount in (UA)	Instrument
ADB	250,000	MIC TAF Grant
Republic of Namibia	37,500	In-kind counterpart contribution
Total Cost Namibia	287,500	

GRAND TOTAL – UA 575,000

ADB's Key Financing Information

MIC Grant Currency USD

Timeframe – Main Milestones (expected)

MIC Grant Approval : November 2021
Effectiveness : January 2022
First Disbursement : February 2022
Last Disbursement : January 2025
Closing date : January 2026

MIDDLE INCOME COUNTRY TECHNICAL ASSISTANCE FUND

RESULTS FRAMEWORK

A PROJECT INFORMATION

PROJECT NAME AND SAP CODE: Independent Panel of Experts for Baynes Hydro Power Project, P-Z1-FAB-025	COUNTRY/REGION: MULTINATIONAL/RDGS
PROJECT DEVELOPMENT OBJECTIVE: **To provide Technical Assistance to review and validate technical studies and designs of the development of the Baynes Hydro Power Project that will attract private investment**	
ALIGNMENT INDICATOR (S): Independent Panel of Experts recruited	

B RESULTS MATRIX

RESULTS CHAIN AND INDICATOR DESCRIPTION	RMF/ADOA INDICATOR	UNIT OF MEASUREMENT	BASELINE (2021)	TARGET AT COMPLETION (2023)	MEANS OF VERIFICATION
OUTCOME STATEMENT 1: Quality project preparation for sustainable infrastructure					
OUTCOME INDICATOR 1.1: Design standards meet international norms,, risk evaluation and impact assessment met that reduces risk consequences and dam failure and hence increase investors' confidence	☐	Number	*0*	*10*	Project progress implementation documents and outcome of bidding process for developer
Component 1: Technical Assistance to Recruit Independent Panel of Experts					
OUTPUT STATEMENT 1: Verified studies and design					
OUTPUT INDICATOR 1.1: Review feasibility studies, technical designs, and bidding documents, Prepared Procedures, guidelines and Standard Documents to implement project and key risk identified	☐	Number	0	1	Project progress implementation documents
Component 2: Project Management and coordination					
OUTPUT INDICATOR 1.1 Number of project audits	□	Number	0	1	1 external audit report will be requested (6) months after project completion.

I. INTRODUCTION

1.1 Background Information

The Angolan and Namibian Government have both set out to develop the energy sector to meet increasing demand and respective economic transformation agendas, while fostering the entry of the private sector. Angola's Long-Term Strategy (Angola 2025)[1], prioritizes the energy sector and has the objective of doubling its national electricity access rate to 60% by 2025. A public investment program has been defined under the framework of the 2018-2022 Action Plan for the energy sector, aiming at addressing some of the sector's key challenges, specifically enhancing the sector's technical and financial sustainability. In its efforts to increase private sector participation in the sector, the Government of Angola (GoA) has since 2018 revised the Private Investment Law, launched a Privatization Program and approved a revised Public-Private Partnerships (PPP) Law. Furthermore, reforms are ongoing to improve sector efficiency and attractiveness for private investments in renewable energy. On the other hand, the Government of the Republic of Namibia (GRN) in its National Development Plan (NDP 5) aims for a sustainable mix of domestic generated capacity in order to decrease its dependence on energy imports. It also seeks to increase the national electricity access rate from 49% in 2018 to 67.5% by 2023. As part of the measures adopted by the GRN to incentivize the entry of private sector into the energy sector, an Independent Power Producers (IPP) Framework was approved. In addition, the GRN has also recently introduced several initiatives to support infrastructure investment through off-budget financing, including PPPs and mobilization of capital through private equity, Development Finance Institutions (DFI's), as well as the Development Bank of Namibia (DBN).

The economic slowdown over the past five years in both countries recently worsened by the COVID-19 pandemic has increased fiscal pressures on the Governments, therefore impacting the timely achievement of their medium-term development objectives. Both countries remain highly susceptible to global shocks due to dependence on external commodity trade and tourism. Since the oil price plunge, Angola has been in a recession for the past five years with real GDP growth shifting from 4.8% in 2014 to an estimated -5.4% in 2020. This shift in dynamics resulted in increased fiscal constraints to meet financing needs and a weakened currency, leading to a substantial increase in the debt-to-GDP ratio, from 39.8% in 2014 to an estimated 135.1% in 2020. After achieving robust growth since 2010, driven by mine construction and expansionary fiscal spending, Namibia's real GDP growth came to a slowdown, from a peak of 6.4% in 2014 and contracted in two out of the three years ending 2019. This was on account of poor performances in various sectors including construction and mining, and persistent drought, which affected agricultural output. Weakening demand for Namibia's exports particularly mineral products has also affected the economy. A combination of negative GDP per capita growth and economic uncertainty translated into sluggish private consumption, thereby weighing heavily on aggregate demand. The adverse impact of the COVID-19 pandemic has been severe on the overall economy, with the principal transmission mechanisms through tourism, retail, trade and investments, health and education. Subsequently, the Namibian economy is estimated to have contracted by 7.3% in 2020. Macroeconomic imbalances were further spurred by significant fiscal deficits and public debt as a percentage of GDP on the rise, at 46.9% as of 2017 to 67.5% in 2020.

Despite the unfavorable economic landscape, the outlook in both countries remains positive with progressive economic recovery built on prudent structural reforms. The GoA remains committed to implementing fiscal consolidation measures guided by its Macroeconomic Stabilization Plan that institutes measures to ring-fence its public finance management and enhanced domestic resource mobilization. The GoA has also prioritized financing from bilateral and multilateral development partners, as it aims to contain its debt levels through longer maturities and favorable financing terms. In the medium-term paired with its commitment to ongoing reforms, Angola is expected to

[1] Long-term strategy is currently under revision and extension to 2050.

progressively recover with growth projected at -0.1% in 2021 and 2.4% in 2022, as COVID-19 restrictions ease and oil prices sustain current levels. Similarly, Namibia is expected to gradually recover in the medium term, as growth is projected to return to positive territory from 2021 onwards. Real GDP is projected to grow by 2.2% and 3.4% in 2021 and 2022 respectively, on the back of a steady recovery in financial services, tourism, retail and wholesale trade and the mining industries, combined with an improvement in regional and global economic environment. Angola and Namibia are beneficiaries of policy reform-oriented support from the Bank, the World Bank and the IMF. As both countries undergo structural changes while containing sustainable debt levels, the energy sector plays a key role complementing the need for increase in productivity, as well as diversification, job creation and economic transformation.

Following the Bank's mission in 2019, the Governments requested the Bank to lead the Baynes hydropower project to financial close. According to the studies presented to the Bank, the project is to be jointly developed by the Angola-Namibia Permanent Joint Technical Commission (PJTC). Situated on Cunene River Basin, Baynes is a proposed 600MW with an average mean generation of 1610 GWh on a mid-merit/peaking basis, with 300MW allocated to Namibia and 300MW to Angola. Currently, Angola has an installed power generation capacity estimated at 5 GW, over half of the 2025 target (9 GW; whereas Namibia has an installed hydro generation capacity of 557 MW, of which 467MW is available against a peak power demand of 652MW, as of 2018. Rising urbanization and growth in mining have exacerbated the electricity supply gap. The shortfall in domestic supply is met through imports and trading from South Africa and the Southern African Power Pool (SAPP). However, supply is at risk as the region faces generation and transmission bottlenecks. The Baynes HPP seeks to strengthen the transmission interconnection between Namibia and Angola by providing redundancy and security to the planned Angola-Namibia transmission interconnection. Both Angolan and Namibian utilities are members of both the Southern Africa Power Pool ("SAPP") and seek to trade the power to be generated by the Baynes HPP. Power trading will also contribute to the economic diversification and regional integration of both countries.

1.2 Study Objectives

The proposed operation's development objective is to provide Technical Assistance to review and validate technical studies and designs of the development of the Baynes HPP that will improve the preparation and readiness of this proposed project, which is of strategic relevance to Angola, Namibia and overall Southern Africa. The specific objectives therefore include:

a. Ensure, design criteria and provide recommendations on risk analysis, impact assessment, and suitable mitigation measures based on international standards and guidelines, by developing clear set of standards and guidelines to guide at all phases of the project development that will guarantee value for money;
b. Address all the feasibility level issues of the project with the appropriate degree of technical due diligence; consider the technical risks, analyze and advise on the possible trade-offs between techno-economic issues and the safeguards issues of dam safety, environmental, social (including gender), resettlement and impacts; and
c. Present the findings to inform all the stakeholders, Government, potential lenders, EPC contractors, developers etc.

1.3 Regional Department/Field Office responsible for preparing the Request: This request has been submitted by the Southern Africa Regional and Business Delivery Office and has been prepared by PESD with support from RDGS & COAO.

1.4 Request Form clearance Date

The Request Form for the project was cleared by RDVP on the 24 of May 2021.

1.5 Justification for the use of resources

The GoA and GRN had requested the Bank to assist in preparation and financing of Baynes Hydro Power Project to financial close which is anticipated in Q1 2025. The proposed request is aligned with the National Development Plan (PDN 2018-2022) and the *Angola 2025* long-term strategy for Angola, and with the Fifth National Development Plan (NDP 5 2017-2022) for Namibia. Both countries recognize the development of clean and sustainable energy infrastructure and efficiency in the sector as fundamental to spur industrialization and economic growth. Both Plans emphasize the need to continue investing in the power sector to meet current and future demands.

The proposed operation also seeks to ultimately set the stage to meet the *New Deal on Energy for Africa* (2016-2025) that aims to assist Regional Member Countries (RMCs) achieve universal access to electricity by 2025. It is also consistent with the Bank's Ten-Year Strategy (TYS) which has both Governance and Infrastructure development as core priorities. Improvements in infrastructure and service delivery are also bound to reap benefits in socioeconomic development and yield regional integration thus contributing to the Bank's High 5s.

In addition, the proposed operation is aligned with the respective countries' Country Strategy Papers – For Angola: *Pillar II Support to Sustainable Infrastructure Development* (CSP 2017-2021); and for Namibia: *Pillar II Support Infrastructure and Promote Value Addition* (CSP 2020-2024). Furthermore, support to the development of the binational Project builds on the Southern Africa Regional Integration Strategy Paper (RISP-SA 2020-2024) with objectives to foster an integrated and diversified region, promoting structural transformation and inclusive and green growth. This RISP has two mutually reinforcing Priority Areas of Bank support: (i) Infrastructure Connectivity; and (ii) Market Integration and Industrialization.

The Bayne's project is a priority project identified, by the Program for Infrastructure Development in Africa (PIDA PAP2), and the SADC Revised Regional Indicative Strategic Development Plan (RISDP) 2020-2030. Regional energy deficit, aged power plants, missing links in regional power connectivity and under-developed backbone transmission lines have been consistently identified as posing major infrastructural challenges in Southern Africa. The project is well anchored on the operational priorities of the SADC/COMESA regional infrastructure development master plans which place emphasis on: (i) infrastructure development; and (ii) enhancing institutional capacity and skills.

The request is therefore responding to strengthening the studies to gain the confidence of the private sector by ensuring its participation to leverage the already constrained government fiscal spaces. With various preparation components, ALSF, NEPAD-IPPF and SwedFund have also provided total of USD 4.8 million in preparation of the readiness of the project.

In addition, a number of operations have been approved or implemented to date, paving the way for sustainable infrastructure in the energy sector, including the 2019 approved USD 530 million Angola Energy Sector Efficiency and Expansion Program (ESEEP), which is currently on-going. The ESEEP project serves as a backbone for the interconnector to Namibia grid network that will be critical for linking the evacuation of power from the Baynes Hydro project. These linkages, are of strategic alignments and implications that the Bank is supporting. Furthermore, the ongoing SEFA-funded Angola Renewable Energy Program (USD 1 million) aims to support the development of a legal and regulatory framework for contracting independent producers (IPP) of renewable energy and to strengthen technical capacities for the preparation and management of public tenders of this nature.

2. 0 PROJECT DESCRIPTION

Based on the feasibility studies, the project is viable and a PPP model has been recommended with an estimated value of USD 1.34 billion. The techno-economic studies, that are currently being updated, were completed in 2011 and were found to be technically and financially feasible. In

addition, the environmental studies are also at an advanced revision stage and indications are that no fatal flaws have been found.

The purpose of the technical assistance is to engage an Independent Panel of Experts (IPoE) to review and validate all the design work according to the best international standards. The techno economic studies that are being updated, and the biddign document that is expected to be prepared by the transaction advisor by the ALSF, are all subject to the review by the IPoE. The key areas subjected to the review of the IPoE includes,: all engineering, economic aspects with their pros and cons for options selection (dam type, height, power generation facility and capacity, etc.).

In addition, the team composition will include bare minimum the following five experts, Dam and seismic, hydrology, geotechnical, mechanical and electric experts. Will review all available reports related to the project and provide comprehensive opinions/recommendations as per engineering studies performed and design, including basic data, design calculations, field investigations, models (hydrologic, hydraulic and structural), technical and economic selection of project and optimization of the components, and construction method and procedures,for the proposed Baynes HPP.

Below are technical characteristics;

2.1 **Technical characteristics of the Baynes HPP** (Hydropower Project):

- Concrete-faced rock fill dam with height of 200m; Crest length of 1025m
- Storage Capacity of 2 560 mil m^3 and an active Storage of 1 291 mil m^3
- Dam water level of a maximum of 580 metres with a reservoir area of 57.67km^2
- Maximum water level – 580 m.a.s.l
- Maximum water head available for generation – 186 m
- Installed capacity – 600MW
- Nominal power of generating units - 2 x 71 MW & 3 x 156.75 MW
- Type - Vertical Francis Turbines
- Annual mean energy production: 1610 GWh (shared equally between Namibia & Angola).

2.2 **Climate change & green growth, Environmental & social safeguards**

2. 2.1 Climate Change and Green Growth

Due to its nature, the operation is classified as Category 3 using the Bank Climate Change Safeguards System (CSS). Nonetheless, the project seeks to improve the climate resilience and carbon mitigation design process of the Baynes hydro-power plant through independent expert review and institutional capacity building aligned with the Equator Principles. The panel of independent experts will include climate change expertise to review the ESIA/ESMP and the design-build technical parameters of the Baynes hydropower plant in compliance with international standards such as the *Hydropower Sustainability Assessment Protocol (HSAP)***.** This includes compliance with integrated climate risk in the hydraulic design of the reservoir to enhance resilience to climate extremes; climate-proof downstream-upstream infrastructural safety and the consideration of measures to mitigate the project carbon footprints to align with Angola and Namibia's Nationally Determined Contributions (NDCs). The project is aligned with the Angola National Strategy for Climate Change (ENAC,2017); the National Policy on Climate Change for Namibia (2011), and the Bank Climate Change Action Plan with overall 100% of the budget account for climate finance.

2.2.2 Environmental and social safeguards

The project environmental and social category is confirmed as 3. This TA does not directly or indirectly affect the environment adversely and is unlikely to induce adverse social impacts. The TA aims at recruiting an independent panel of experts to support the review of the design documents of the hydro dam. Further, the TA does not intend to finance any feasibility study for future investment projects. Beyond the categorization, no environmental and social assessment is required for this operation.

2.3 Project Components and Expected Outputs

The project has two components, as outlined in the table below

Table 1: Project Components

Components	Activities	Outputs
Component 1: *Recruitment of IPoE (485,000)*	1.1 **Recruitment of Independent Panel of Experts** • Procurement of Panel of Experts • Provide supervisory support on bidding documents and during negotiations with bidder	• Revised bidding documents • Mitigation measures for dam failure • Standards and procedures developed
Component 2: *Project Management and coordination (90,000)*	• Project audit • Translation • Validation workshop • Capacity building	• Audits report

Component 1: *Recruitment of an Independent Panel of Experts*

The EA will recruit the panel of 5 IPoE members to review the design, analyze the gaps, identify risks and propose mitigation measures and outline a guideline to help with implementation of the project as per international standards and to present the findings to the key stakeholders of the project

Component 2: *Project Management and coordination*

The EA will recruit an auditor to audit the project but in addition will carry out other activities such as translation services, workshops, capacity building and renumeration of the PIU staff supporting the project execution

3.0 Cost Estimates and Financing Plan

3.1 Cost

The total estimated cost is UA 575,000 of which UA 500,000 is provided by the Bank under the MIC TAF Grant**.** This will be used to cover the cost of the IPoE and the project audit only. The value of UA 75000, accounting for 15% of the TAF, is in kind contribution by both Governments. The detailed cost estimate by components is shown in Table 2 & 3 & 4 below.

Table 2 : Project cost estimates

Components	MIC Grant UA	Local (UA)	Total Cost (UA)	% of Total
Component 1: Recruitment of IPoE	485,000	0	485,000	84%
Component 2: Project Management and coordination		90,000	90,000	16%
TOTAL	**485,000**	**90,000**	**575,000**	**100%**

Table 3: Summary of Estimated Costs by Expenditure Categories

Disbursement categories	Cost In UA		
	Local	Foreign	Total Cost
Services	15,000	485,000	500,000
Operating Cost	75000	0	75,000
Total cost	**90,000**	**485,000**	**575,000**

Table 4: Expenditure by Component and Source (UA)

Component	ADB MIC	(Goa/GoN)	Total
Component 1. Recruitment of IPoE	485,000	0	485,000
Component 2: Project coordination and management.	15,000	75,000	90,000
Total	**500,000**	**75,000**	**575,000**

3.2 Financing Plan

The Technical Assistance shall be financed by a MIC grant allocation of **UA 500,000** under the MIC Technical Assistance Fund (TAF) and counterpart funds of **UA 75,000** from the Governments of Angola and Namibia**.** The MIC TAF grant will fund 85% of the total cost of the TA, while 15% will be in kind contributions by the Governments of Angola and Namibia. Table 5 presents the estimated project costs by financing source.

Table 5: Estimated Cost by Financing Source (UA)

Sources of Financing	Foreign Exchange	%	Local Currency	%	Total	%
ADB MIC Grant	485,000	97	15,000	3	500,000	85
Government of Namibia & Angola	0		75,000	100	75,000	15
Total	**485,000**	**97**	**90,000**	**3**	**575,000**	**100**

IMPLEMENTATION ARRANEMENTS

The two Governments through their ministries of Energy have set up the Project Joint Technical Commiittee (PJTC) respsonsible for the day to day management of the project activities. Due to the capacity limitations at both the Governments and PJTC, the two Governments have assigned the Southern Africa Power Pool to act as the Executing Agency (EA) of the Project. The SAPP will thus be repsonsible for project procurement, disbursement, financial management and reporting to the Bank. Under the Supervision of a project coordinator, the PJTC will collaborate closely with SAPP, and coordinate the day to day physical execution of Project activities, preparation and submission of progress reports to SAPP, and all Project related supervision, monitoring and evaluation activities, including managing the studies, reviewing reports and comments, and providing interface with in-country relevant institutions and stakeholders.

4.0 Procurement Arrangements

4. 1 Executing Agency: An assessment of Southern Africa Power Pool Project Acceleration Unit (SAPP -PAU) was conducted to evaluate its capacity to execute procurement under Bank-financed

projects and to identify specific structural, behavioral, reputational and operational issues that could affect its management of project procurement. The assessment concluded that SAPP -PAU has the capacity to execute procurement under Bank-financed projects. It has a procurement team with qualified procurement experts who have experience in implementing AfDB-financed projects having previously implemented Bank-financed Projects. SAPP is currently implementing studies under NEPAD-IPPF.

4.2 Procurement of Consulting Services

Procurement of Consulting Services: the acquisition of consulting services financed by the Bank will be in accordance with the "Procurement Framework for Bank Group Funded Operations", dated 2015 and following the provisions stated in the Financing Agreement. Procurement shall be carried out following Bank Procurement Methods and Procedures (PMPs), using the relevant Bank Standard or Model Solicitation Documents (SDs) and review procedures. All selections of consultants will be based on the Individual Consultants (IC) method, with the exception of the audit, which shall be procured through Least Cost Selection (LCS). Under Component 1, there shall be five (5) consultants recruited. The Terms of Reference of the Consultants are set out in Annex I and the Procurement Plan and Summary of Procurement Arrangements are presented in Annexes II and III respectively. The audit of the operation shall be conducted by an independent external auditor based on the Least Cost Selection (LCS) method and paid using Grant funds.

4.3 General Procurement Notice: the text of a General Procurement Notice (GPN) will be agreed with the SAPP PAU and it will be issued for publication in UNDB online and on the Bank's Internet Website, prior to launching any procurement activities.

4.4 Review Procedures: all procurements shall be subject to prior review by the Bank. The following documents are subject to review and approval by the Bank before promulgation: Specific Procurement Notices; Reports on Evaluation of Consultants' Proposals and recommendations for Contract Award and Draft Contracts.

4.5 Procurement Plan: SAPP PAU shall prepare and furnish to the Bank for its approval, a Procurement Plan acceptable to the Bank prior to initiating any procurement activities. The Plan shall specify each contract to be financed by the Grant, the different consultant selection methods, estimated costs, prior-review requirements, and time frame. It shall update the Procurement Plan annually or as needed throughout the duration of the project and shall implement the plan in the manner in which it has been granted approval by the Bank. The draft Procurement Plan is attached as Annex III.

5.0 FINANCING ARRANGEMENTS

Financial Management and Disbursement Arrangements

5.1 Disbursement Modalities

The project will make use of the direct payment method of disbursement for activities under component 1 for payments on contracts and the audit under component 2 of the grant. The Bank will issue a Disbursement Letter of which the content will be discussed and agreed during negotiations. Suspension of disbursement of the funds can take place in accordance with the Bank's disbursement regulations contained in the Disbursement Handbook as applicable.

Remuneration for project coordination and management done by PJTC will be borne by both Governments as in-kind contributions. This will include the salaries and allowances of staff involved in executing the study, and activities relating to the study such as site visits, validation workshops, translation etc. over the period.

5.2 Financial Management

SAPP-PAU will be responsible for the overall financial management aspects of the project including budgeting, recording, accounting, reporting and audit coordination. The entity will ensure that, a sound system of internal controls governs the operations of the project to ensure that the project objectives are achieved, and that funds are used solely for intended purposes with due care to economy and efficiency. A qualified and experienced financial management expert of the project is already officially designated and will be responsible for all aspects related to financial management and included in the entity's project implementing unit under the supervision of the Project Coordinator. In addition, SAPP-PAU will prepare quarerly interim unaudited financial reports (IFRs), to capture the project's financial activities. The IFRs will be shared with the Bank no later than 45 days after the end of the calendar quarter to which they relate. On completion, one set of project financial statements will be prepared, in a format to be agreed with the Bank. The financial statements will be subjected to audit by a private audit firm, to be hired on terms of reference agreed with the Bank, with the audit fees paid out of the grant proceeds, and the audit report, together with the applicable management letter, shared with the Bank no later than six months after the end of the close of the project.

6.0 IMPLEMENTATION MODALITIES AND PROJECT SCHEDULE

6.1 Institutional Capacity Assessment, Arrangements, and Implementing Modalities

6.1.1 The Ministries through PJTC will be responsible for the management and supervision of the project. SAPP PAU will be responsible for for reporting to the Bank (MIC Fund) on its implementation, and reports. Both ministries, PJTC and SAPP PAU have had previous experience with the Bank and other donors in the implementation of the different programs.

6.1.3 During the project implementation period, the SAPP PAU will forward to the Bank, the prepared reports, within 30 days of the end of the assignment a Final Report highlighting the achievements on activities, disbursements made, problems encountered, and mitigations to the challenges. The Bank will monitor the implementation of the project through reviews of key outputs such as the Inception Reports, Interim & Final Reports for studies.

6.2 Timing of Planned Activities

The Technical Assistance will be implemented over a period of three (3) years between January 2022 to January 2025 following approval by the Bank. The indicative timeframe is presented in Annex IV which shows the detailed planned activities and the timeline for their completion.

Supervision and Monitoring: With support from the Bank, a monitoring and evaluation framework derived from the results based *logframe* will be developed by the SAPP PAU in coordination with the PJTC. Such a plan will identify project data requirements, collection methods and its utilization. SAPP PAU will be responsible for managing and reporting on results in collaboration with stakeholders and implementing agencies. The project will be closely monitored by the project's team in quarterly meetings or special meetings when the need arises. The Bank will also closely monitor the project through reports and supervision missions, which will include bi-annual project reviews and a project mid-term review. Annual financial audits and a project evaluation at the end of the project, will be conducted and financed by the Bank. A project completion report will be prepared to evaluate progress against outputs and outcomes and draw lessons for possible follow-up operation.

7.0 DRAFT WORK PROGRAM AND PROCUREMENT SCHEDULE

7.1 Work Program

The work program is summarized in Annex IV with the key activities and the indicative dates for their completion within the timeframe of the Project. This will be amenable to revisions as and when seen fit by the project team in consultation with the Bank's supervision team. The Procurement Arrangements and Plan is presented in Annex II.

8.0 Legal Instruments and Authority

8.1 The legal instruments for the financing of the project will be (a) a Letter of Agreement between the Republic of Angola (the "Recipient") and the African Development Bank (the "Bank"), (b) a Letter of Agreement between the Republic of Namibia (the "Recipient") and the Bank; and (c) a Subsidiary Agreement (Project Agreement) amongst the Republic of Namibia, the Republic of Angola, the Bank, and SAPP as Executing Agency for the Project selected by the two Recipients.

8.2 *Entry into Force:* The Agreements shall enter into force upon signature by the parties.

8.3 *Disbursement Conditions:* The obligation of the Bank to make the first disbursement of the Grant shall be conditional upon the entry into force of the Agreements.

9.0 CONCLUSION AND RECOMMENDATIONS

Management recommends that the Director General, RDGS, approves the proposed MIC-TAF Grant of two hundred and fifty thousand Units of Account (UA 250,000) to the Republic of Angola, and two hundred and fifty thousand Units of Account (UA 250,000) to the Republic of Namibia, to finance implementation of the Project under the terms and conditions stipulated in this report.

Annex1:

TERMS OF REFERENCE

INDEPENDENT PANEL OF EXPERTS (IPOE) FOR THE IMPLEMENTATION OF THE BAYNES HYDROPOWER PLANT DAM

1.0 Introduction

The Baynes hydropower potential site is located on the lower Cunene River, on the border between Angola and Namibia, at a site with the geographical coordinates of 17° 02' 55.55" South Latitude and 12° 53' 4.99" East Longitude. This site lies in a dry and mountainous region approximately 48 km downstream from the Epupa falls.

In order to establish the feasibility of using the Cunene River Catchment as a source of hydropower to meet both Angolan and Namibian future demand, the Governments of the Republic of Angola and the Republic of Namibia appointed a Permanent Joint Technical Commission (PJTC) for the Cunene River Catchment. A committee of the PJTC, known as the Baynes Committee has been established to act on behalf of the PJTC, and is responsible for the administration and management of both the Technical and Economic as well as Environmental Feasibility of the Baynes Project.

The PJTC appointed the Cunene Consortium (A consortium consisting of 4 Brazilian companies) to undertake a techno-economic study to revise the 1998 Feasibility Study, where the Baynes Site was identified as an alternative to the Epupa Site for the generation of hydropower. The PJTC also appointed ERM (Environmental Resources Management) and Urban Dynamics to carry out the Environmental, Social & Health Impact Assessment (ESHIA) from 2008 and completed in 2011.

During the study all possible hydropower development sites along the Cunene River, downstream of Ruacana, were investigated. The Epupa Site was selected as the more technically viable one, with the Baynes Site as the preferred alternative. Both sites were shown to be technically viable. Further work continued on these two sites, with comparisons made in terms of technical, social, and ecological aspects. The Feasibility Study concluded that the Epupa Site would be technically preferable (due to its greater storage potential), while the Baynes alternative would result in far less ecological and social impacts as a result of a smaller inundated area, resulting in less destruction of habitat and natural resources, less water loss through evaporation, and significantly reduced human impact, such as loss of access to grazing, physical resettlement, and loss of grave sites. The Epupa scheme would have been far more disruptive to the life of the local Himba People, since it would require the flooding of a broad valley extensively used by farmers and herders. Opposition to the plans of a dam at the Epupa Site by local and international NGOs and the Himba, saw the project being shelved.

The Baynes Site however, being the preferred site from an environmental and social perspective, has remained an option for both countries and due to a reduction in regional import capacity, increasing costs associated with electricity generation and increasing demands for electricity in both countries.

1.1 Brief description of the Project

The techno-economic study looked at the viability of constructing a mid-merit/ peaking hydropower plant at the Baynes Site. The techno-economic studies were completed in 2011 and accepted by both Angolan and Namibian Governments. The Baynes Project was found to be technically and financially feasible. The studies have however shown that upstream water abstraction plays a critical role in the viability of the project. The environmental studies are at an advanced stage and indications are that no fatal flaws have been found.

Herewith some technical characteristics of the Baynes HPP (Hydropower Project):

2. Concrete-faced rock fill dam with height of 200m; Crest length of 1025m;
3. Storage Capacity of 2 560 mil m^3 and an active Storage of 1 291 mil m^3;
4. Dam water level of a maximum of 580 metres with a reservoir area of 57.67km2
5. Maximum water level – 580 m.a.s.l.
6. Maximum water head available for generation – 186 m
7. Installed capacity – 600MW
8. Nominal power of generating units - 2 x 71 MW & 3 x 156.75 MW
9. Type - Vertical Francis Turbines
10. Annual mean energy production: 1610 GWh (shared equally between Namibia & Angola)

1.2 Procurement

The Governments of Angola and Namibia intend to establish an Independent Panel of Experts (IPOE) for the development of Baynes Hydropower Project.

The Independent Panel of Experts will be mandated to provide an independent assessment and review of technical, environmental and social issues associated with the project. The IPOE will provide relevant opinions/recommendation in accordance to the client, prospectus financiers and any other relevant agency as deemed necessary.

2.0 Objective, Purpose

2.1 Purpose

- The purpose of this assignment is to provide an independent and high-level engineering evaluation of Projects for the following areas: -
- Geotechnical and seismicity
- Electromechanical
- Hydro mechanical
- Hydrology and Dam safety

To advise the Client on all aspects of the Project(s) as mentioned above

2.2 Main Objective of the services

The IPOE is recruited to perform detailed evaluation and provide recommendations with the overall purpose of assessing the technical compliance of the proposed design, safety procedures, cost effectiveness of the project and sustainability including mitigation measures in all aspects of the project and inform all stakeholder such as; Client, Consultants PAP's and the Development partners which intend to provide financing of the project.

The IPOE opinion will be considered and reflected in the final discussions before financial closure as well as design and supervising consultancies' reports in future.

3.0 SCOPE AND APPROACH

3.1 Scope of the Services

The scope of IPOE is to review all available reports related to the project and provide comprehensive opinions/recommendations as per engineering studies performed and design, including basic data, design calculations, field investigations, models (hydrologic, hydraulic and structural), technical and economic selection of project and optimization of the components, and construction method and procedures, as well as all environmental and social studies for the proposed Baynes HPP.

The IPOE shall review Consultants' work covering all engineering, economic, environmental, and social aspects with their pros and cons for options selection (dam type, height, power generation facility and capacity, etc.). The Panel shall assist the Client in clarifying to the stakeholders the tradeoffs between these aspects of the various project elements/decisions.

The scope of the services may be modified as required by each expertise constitute member of the IPOE as per client consent. The IPOE shall review, comment, provide suggestions or recommendations as per expertise where necessary, or as requested by the client or its Consultant or Development partners on any subject related to the project.

3.2 Detailed Scope of the Services

The scope of the services covers the overall review and certification of all project's feasibility studies, ESIA studies and the ongoing 2020 additional investigation, all available reports from 2008 to date. The Previous Feasibility studies will be provided to IPOE for further analysis.

The following is the detailed scope per each category/expertise: -

3.2.1 Engineering Geology and Geotechnical Engineering

Review the quality and sufficiency /adequacy of the following: -

- Engineering geology study reports, program for field investigations, testing (number, location and direction of adits, borings, and trenches) and laboratory tests reports and interpretation presented.

- Design parameters, permeability, optimum water content, slope stability, and any other parameters demanded by the design.

- Embankment structure's core materials, filter materials, rock fill and their necessary placement

- Proposed methods for acceptance of the materials and conditions for their placement, provisions for drainage and other details of embankment construction will be also reviewed.

- For concrete structures, quality and sufficiency of concrete aggregates, pozzolans, etc.

- Studies and investigations related to the hydrogeology of the Project area, reservoir area, and sites for the Project structures (intake, dam, power house) to assure water tightness or measures needed to obtain it or necessary limitations on the maximum reservoir level.

- Seismic hazard assessment (probabilistic and deterministic seismic hazard approach) - Review the identification of sources/location of seismic activity, active faults/lineaments, the assignment of earthquake magnitude to each source, the criteria and methodology for derivation of parameters for maximum and credible design earthquakes, the seismic design criteria, safety allowances and methods used to withstand them.

3.2.2 Hydrology, Hydraulics and Sediments

The IPOE will review and assess the extent and sufficiency of the following: -

- Basic hydrology data available and the method used to develop adequate stream flow records that take into account water usages

- Criteria and methods used to analyze flow regime and estimate flows available for the project, design flow and flows to be diverted during project construction,

- The proposed elevations of the cofferdams, and the need to use other methods to improve accuracy of results, evaluate the risk factors associated with diversion during construction

- The criteria and method of routing the maximum inflow through the reservoir to obtain the required spillway capacity.

- Formulation of the power plant characteristics and operation rules used in the simulation studies for estimating and comparing power and energy of the project, including the integration of environmental and social limitations.
- The methods and criteria adopted to identify the best scenario for the optimal development of available hydropower potential, and for the techno-economic optimization of each component of the hydropower scheme and plant characteristics.

- The hydraulic design of the spillways and energy dissipation facilities, diversion works during construction and their closure upon completion of project construction, water conveyance systems (approach channel, intake gates, and draft tube gate etc.), and hydraulic equipment (gates, valves, etc.

- Conditions of proposed initial reservoir filling and of hydraulic downstream conditions that could impact safety of populations and/or assets including related mitigation structural and non-structural measures proposed.

- Risk assessment of the impact of upstream development on the sustainability and stability of the project performance and recommend mitigation measures.

- The criteria and methodology used for estimating the sediment load that will enter the reservoir, analysis of sedimentation in the reservoir, and measures to minimize the impact of sedimentation on the reservoir.

- The adequacy, with respect to sustainable development, of the overall river development and each project arrangement/layout including dam heights and reservoir capacities. This review shall consider:
  - the effect of the proposed layout on future developments
  - the most suitable methods and sequences of project construction and operation and maintenance of the projects
  - potential risks that could affect the scheme or part of the scheme
  - the acceptability of the layout and conceptual design including the access roads, and the location of the major project components with regard to the intake, dam, bottom outlets, spillway and energy dissipating facilities, diversion works, water conveyance systems, powerhouse, draft tube, etc.

3.2.3 Type of Dam and Project Layout

- Review the selections of the type; Concrete Faced Rock-fill Dam (CFRD)/RCC Arch Gravity Dam, axis, and characteristics of the dam and other infrastructure such as embankment dam, spillways etc. and establish whether these selections are justified compared to alternative options.

- Review stability analysis and results, factors of safety for normal, extreme and unusual loadings including seismic loading criteria for the dam (Concrete Faced Rock-fill /RCC Arch Gravity, embankment, etc.), spillway structures and outlet works.

- Review the selection and design of water conveyance structures such as intake type, as affected by the geology and overall geotechnical parameters, and the impact of the proposed design on the most suitable methods and sequences of project construction including inspection during construction, and operation and maintenance of the project.

- Review powerhouse arrangement, spillway types and suitability of the energy dissipation structure, the selection of type and number of gates and valves and hoisting equipment, the technical/economical size of water conveyance structures, the need, extent and type and adequacy of tunnel linings, and the effect of the proposed layout/design on the most suitable methods and sequences of project construction including inspection during construction, and operation and maintenance of the Project.

Asses the possibility for the dam design to operate for peaking load and recommend the optimal operational mode.

3.2.4 Electromechanical Equipment

- Review the technical and economic design and characteristics of major hydro-mechanical and electromechanical equipment (gates, hoists, cranes, turbines, generators, transformers, switchyard, SCADA etc.) and the design criteria comparing to state-of-the-art practices.

- Review cavitation risks at various hydraulic structures.
- Review the structural and electro-mechanical design of the control gates at the diversion weirs and other inlet/outlet structures, lifting mechanism, control system, and operational procedures/arrangements including long term maintenance and safety inspections and make recommendations for modification if required.

- Review the design and optimized selection of the size and efficiency of electromechanical components (turbines and generators) based on the river flow regime characteristics (rating curve)

- Overall review the Emergency Preparedness Plan (EPP) and provide recommendations for any additional required analytical studies and system development to be undertaken during and after project implementation.

3.2.5.2 Health and Safety Issues

- Review all aspects of the project related to health and safety of workers and populations, on construction site, around the dam, and in the affected communities, as well as the safety related to water released from the dam during operation (Alert System including potential regulated warning water releases).

- To do so, the Panel will need to take ownership of all health and safety issues of the ESIA and confirm the relevance of the proposed measures, and their compliance within the applicable regulatory framework.

- Similarly, the Panel will analyze the relevance and compliance of the ESMP for the health and safety aspects, including the environmental monitoring and surveillance plans.

- The Health and Safety Plan to be prepared and implemented by the contractors need to be in compliance with OHSAS 18001:2007or similar standards.

4.0 IPOE TEAM COMPOSITION AND QUALIFICATIONS

The IPOE will be composed of 5 experts:

(i) Dam Specialist,

(ii) Hydrology / Hydraulic structure Specialist,

(iii) Geotechnical Specialist,

(iv) Electrical specialist

(v) Mechanical Specialist.

The team will be responsible for selecting the Chairperson who will coordinate with other panelists to ensure that the objectives of this assignment are met and provide balance to its reviews and recommendations to both Lenders and Client.

The chairperson should be a professional with proven experience in leading groups of multidisciplinary experts in relation to important Hydropower projects with similar nature. In particular, she/he should have been involved in balancing the environmental and social aspects with engineering requirements of Hydropower projects.

The chairperson will also be responsible for preparing the minutes of the meeting and IPOE report in coordination with other experts and he/she will be responsible for official correspondence with the Client. The required qualifications and roles for each expert are described below.

4.1 Shared/ Common requirements

- All Experts will be requested to have at least an Engineering Degree/Master Level (MSc.) or PhD in the intended expertise in the categories required. Each must be fluent in English and have advanced written and reading skills.
- Each Expert will have to demonstrate international experience in at least 5 hydropower projects as key technical staff and/or expert in the fields relevant to the Position requested.
- Experts must demonstrate capability to work effectively in a team and have strong oral and written communication skills.

4.1.1Dam specialist

- The Expert required is expected to have at least 20 years of professional experience in the development and implementation of hydropower dam projects and cascade developments, has worked with experts from different disciplines in hydrological, geotechnical, mechanical and other fields with ideally previous field work experience in Sub-Saharan Africa, and proven track record of project optimization with due consideration to environmental and social issues.
- Expertise shall cover all aspects of civil engineering, including field investigations, design of dam and water conveyance structures, modeling, and construction planning, knowledge of international standards and best practices by ICOLD, etc.

- The Expert shall have recognized competences in dam safety and be familiar with Development Partner's guidelines especially on dam safety. Working knowledge in Electricity Sector and dam safety regulations in Sub-Saharan Africa would also be a significant advantage.

4.1.2 Hydrologist and Hydraulic Structure Specialist

- The Hydrologist and hydraulic specialist must be a licensed qualified engineer/hydrologist and should have demonstrated expertise and at least 20 years of experience in hydrological monitoring, assessment and simulation.
- Expertise shall cover data collection (including field measurements), modeling, establishment of flow records and water levels, flood studies, sedimentation, and reservoir impoundment and should also have expertise and experience in the design of inlet/outlet works as well as hydraulic analysis and structural designs.
- The Expert shall have working knowledge of dam safety policies/regulations within multilateral organizations and, ideally, of local regulations in Sub-Saharan Africa.
- Experience in reservoir operation, generation estimates and cascade development will be a significant advantage.
- Competences in generation planning, valuation of power, load-supply balance and reliability analysis will be also considered as an asset.

4.1.3 Engineer Geologist with geotechnical expertise

- The personnel should be a professionally registered and have demonstrated expertise and at least 20 years of experience in geotechnical investigations, laboratory tests, and analysis for large dams with ideally working knowledge of conditions prevailing in Sub-Saharan Region.
- Expertise shall cover all aspects of geology and geotechnical engineering, from feasibility studies to additional geotechnical investigations, including field investigations, laboratory testing, design of dams, foundations and underground structures, construction planning, and dam monitoring.
- S/he should also have a top notch expertise and experience of the design of treatment works for foundation, abutment and reservoir rims.

4.1.4 Mechanical Specialist

- The Expert required is expected to have at least 20 years of professional experience in the design of hydro-mechanical
- Expertise shall cover key design aspects of turbine, hoists, gates, cranes and other mechanical equipments
- Knowledge of international and multilateral dam safety policies /regulations would also be a significant advantage.
- The expert should have a knowledge of sub sahara region and also some basins in Africa

4.1.5 Electrical Specialist

- The Expert required is expected to have at least 20 years of professional experience in the design of electrical and hydro-electrical equipments

- Experience in and electro equipment for hydropower dam projects and interconnection to the grid.
- Expertise shall cover key design aspects of generators, transformers, control and protection, instrumentation, switchyard, and their integration in the hydropower scheme and the grid.
- The Expert shall have working knowledge of power grids, operation structures and, ideally, regulations in Sub Sahara region.
- Hands on experience in SCADA, balance of plants, operation & maintenance of hydropower plants and dam monitoring would be evaluated favorably.
- Competences in generation planning, valuation of power, load-supply balance and reliability analysis will be considered an asset.

5.0IPOE SCHEDULE AND ARRANGEMENTS

5.1Time frame

The number of days allotted for this work will be three hundred and sixty days (360) working days in a span of two and half years. Each member for 60 days. The IPoE will arrange the meetings and field visits for the panelists with assistance from the Client and other relevant agencies as required.

5.2 Reporting

The Panels of Experts shall document the results of each one of

(i) their reviews
(ii) meetings and
(iii) Overall conclusions and recommendations following their visits and meetings at the project sites.

The draft report shall be presented as per the schedule submitted by the IPOE including the submission of final report, all within the 90 calendar days, taking into account the time required by PJTC to review the initial draft report.
The final report from overall review and/or site visits should be coordinated by Chairman who will collect and integrate each individual contribution towards single, all-in-one report and deliver to client two weeks after receiving comments from the client.

5.3 Payment

Advance payment of 15% of the total contract value prior to commencement of the services will be paid to IPOE.

After commencement IPE shall submit Draft Final Report to the Client to provide comments

within a limited period of time to be mutually agreed by the Client.

The remaining 40% of the contract value will be paid upon submission of the Final Report following comments by the Client.

The final remaining 45% will be paid upon final accepted submission

The invoices have to be paid within 30 days upon submission to the client.

Supporting Services from the Client

The Client shall make available its authorized personnel and that of the Consultants of the Project for discussions with the Panel of Experts as per request of the Chairperson of each Panel.

The Client shall provide the necessary documentation such as background information, relevant data, engineering design reports (criteria and calculations), laboratory tests, and minutes of consultation meetings, related to the Project.

The client shall take necessary actions to assist on travel clearances of the members of the Panels or specialists requested by the Panels and shall provide full safe physical access to the Project area and sites.

Members of the Panels will be requested to have their own computers and will be responsible to store all communication and documents on their own device, while ensuring confidentiality and security of these data. Request for receiving again past reports or information should remain exception.

ANNEX II: Procurement Plan

Procurement System	Package No.	Package Description	Category	Lot No.	Lot Description	Estimated Cost (UA)	Procurement Method	Pre-or Post-Qualification	Procurement Oversight	Planned SPN Publication Date
Bank PMP		Dam Specialist	Consulting Services	N/A	N/A	99,000	Individual Consultant (IC)	N/A	Prior Review	XX
Bank PMP		Hydrology/ Hydraulic Structure Specialist	Consulting Services	N/A	N/A	96,500	Individual Consultant (IC)	N/A	Prior Review	XX
Bank PMP		Geotechnical Specialist	Consulting Services	N/A	N/A	96,500	Individual Consultant (IC)	N/A	Prior Review	XX
Bank PMP		Mechanical Specialist	Consulting Services	N/A	N/A	96,500	Individual Consultant (IC)	N/A	Prior Review	XX
Bank PMP		ElectricalSpecialist	Consulting Services	N/A	N/A	96,500	Individual Consultant (IC)	N/A	Prior Review	XX
Bank PMP		Audit	Consulting Services	N/A	N/A	15,000	Least Cost Selection (LCS)	N/A	Prior Review	XX

ANNEX III: Summary of Procurement Arrangements

	IC (UA)	LCS (UA)	Shopping (UA)	Other (UA)	Total (UA)
1. Consulting Services					
1.1 Consultant (IC)	99,000				99,000
1.2 Consultant (IC)	96,500				96,500
1.3 Consultant (IC)	95,500				96,500
1.4 Consultant (IC)	96,500				96,500
1.5 Consultant (IC)	96,500				96,500
1.7 Audit (Firm)		15,000			15,000
Sub Total - 1	**485,000**	**15,000**			**500,000**
TOTAL	**485,000**	**15,000**			**500,000**

ANNEX IV

9.1 Implementation Schedule

1 The project will be implemented over a period of three years. It is estimated that the project shall become effective by September 2021 and close on August 2024. The detailed implementation schedule is outlined below:

Activities/Years	2021			2022				2023				2024				Action by
	Q2	Q3	Q 4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Project Processing and Management																
Grant Approval		X														AfDB
Signing Grant Agreement		X														AfDB/GoN/GoA
Project Effectiveness		X														AfDB/GoN/GoA
Project Launching			X													AfDB/GoE/GoA
Project Implementation			X													
Procurement																GoN/GoA/AfDB
Training																GoN/GoA
Technical Assistance																GoN/GoA
Supervision			X		X		X		X		X		X			AfDB
Mid-term Review								X								AfDB
Project Completion													X			AfDB/GoA/GoN
Audits			X				X				X			X		GoN/GoA
Project closure (August 2025)																AfDB/GoA/GoN