



KenGen

Kenya Electricity Generating Company PLC

EXPRESSION OF INTEREST (EOI) FOR CONSULTANCY SERVICES FOR THE FEASIBILITY STUDY OF MAJOR HYDROPOWER PLANTS REHABILITATION

(OPEN INTERNATIONAL)

EOI REFERENCE NO.: KGN-BDD-018-2024

Terms of Reference

A. Project Background

Hydro energy is a cornerstone of Kenya's energy strategy, delivering substantial economic and environmental benefits. As a renewable energy source, hydro power ensures reliable electricity generation that enhances grid stability and bolsters energy security. By diversifying Kenya's energy mix, hydro power reduces reliance on imported fossil fuels, thereby mitigating the impact of fluctuating fuel prices on electricity tariffs. Moreover, hydroelectric plants leverage local water resources, fostering regional development and creating employment opportunities across construction, operation, and maintenance sectors. Environmentally, hydro energy supports Kenya's commitment to sustainability by producing clean electricity with minimal greenhouse gas emissions, contributing significantly to global climate change mitigation efforts. Overall, hydro power not only drives economic growth but promotes sustainable development and environmental stewardship nationwide.

Kenya boasts an estimated national hydropower potential of 3,000 to 6,000 MW, with about 900 MW currently harnessed through large installations predominantly owned by KenGen. These hydropower facilities constitute approximately 34% of Kenya's annual electricity production and include 8 power stations with capacities exceeding 10 MW, featuring reservoirs and classified as medium to large-scale plants. KenGen, with a total installed capacity of 1,830.19 MW, draws 825.69 MW from hydropower, complemented by geothermal (799.79 MW), thermal (180 MW), and wind energy (25.5 MW). The company operates 13 hydropower stations, including 4 small plants with a combined capacity of 11.73 MW dating back to pre-1958, alongside larger facilities pivotal to Kenya's energy infrastructure.

KenGen's major hydropower plants, covered under a 20-year Power Purchase Agreement (PPA) with Kenya Power expiring in June 2028, are vital to the nation's electricity supply. These plants, which include Tana, Masinga, Kamburu, Gitaru, Kindaruma, Kiambere, Sondu Miriu, and Turkwel, play a foundational role in providing base load power and ensuring grid stability. Notably, efforts to upgrade capacity, such as Kiambere's expansion and Tana's redevelopment, underscore KenGen's commitment to optimizing operational efficiency within existing PPA frameworks. Future plans include projects like the Masinga Dam raising initiative, aimed at enhancing energy storage capacity by 81 GWh annually, thus fortifying hydro power's role amidst Kenya's climatic challenges and expanding energy demands.

Looking ahead, KenGen's strategy encompasses the rehabilitation of major hydropower plants alongside the development of projects. As Kenya advances towards a greener future, the integration of intermittent renewable sources and the implementation of new hydro projects remain pivotal in meeting rising energy needs while minimizing environmental impact.

The hydro power plants to be rehabilitated are shown in table 1.

Table 1: Major Hydro Power Plants to be rehabilitated.

Hydro Power Plant Name	Region	County	Installed Capacity (MW)	Year of Commissioning
1. Tana	Upper Tana	Murang'a	14.4/20**	1954/2007*
2. Masinga	Eastern Hydros	Machakos	44	1981
3. Kamburu	Eastern Hydros	Machakos	94.2	1974
4. Gitaru	Eastern Hydros	Embu	225	1978
5. Kindaruma	Eastern Hydros	Embu	44/72**	1968/2012*
6. Kiambere	Eastern Hydros	Embu	144/168**	1988/2011*
7. Turkwel	Western Hydros	West Pokot	106	1991
8. Sondu Miriu	Western Hydros	Kisumu	60	2008
9. Sang'oro PS	Western Hydros	Kisumu	21	2012

*Commissioning year after rehabilitation

** Installed capacity after rehabilitation

B. Description of the assignment

B1. Global objective

The main objective of this feasibility study is to assess and determine the feasibility of extending the Major Hydro power plants economic life.

B2. Specific objective

1. Evaluate the performance of the major hydro power plants throughout the current PPA duration. Compare the initial PPA assumptions with the actual achieved performance and maintenance targets for these plants.
2. Comprehensively assess rehabilitation requirement for the nine power plants and define the scope and the rehabilitation costs.
3. Assess and recommend rehabilitation strategies for all major hydro power plants. Determine the expected extension of operational lifespan following the completion of these rehabilitation efforts with focus on the ancillary service support offered by the hydro power plants.
4. Determine the rehabilitation costs and analyse the implications of integrating the costs into the new major hydro PPA framework.
5. Conduct a detailed financial and economic assessment of the proposed new major hydro PPA. This includes devising a PPA tariff structure to meet the revenue requirements for all power plants involved.

C. Scope of the Study

The Consultant shall carry out a detailed feasibility Study for the rehabilitation project. The findings of the feasibility study should be detailed enough to form a basis for project financing by International Financing Institutions (IFI) including AFDB, KfW, The World Bank, AFD or other financiers and initiate PPA negotiations.

In the following, the specific activities to be carried out by the Consultant are described in detail.

Task 1: Project start with kick-off meeting and data collection.

The Consultant will initiate the project by convening a kick-off meeting with KenGen in Nairobi, Kenya, within two (2) weeks of the contract award. This meeting will serve to discuss the Terms of Reference (TOR) and develop a detailed Work Plan that outlines the study's timeline, milestones, and framework for evaluating the Consultant's monthly progress. During the kick-off meeting, the Consultant will establish reporting formats and a schedule for monthly updates with KenGen. In collaboration with KenGen, the Consultant will also identify points of contact and key project team members, clearly defining roles and responsibilities for everyone. To ensure comprehensive understanding and engagement, the Consultant will conduct a thorough site visit to all nine hydropower plants. This visit will involve data gathering and inspections to assess the current condition of each facility and identify rehabilitation needs. The Consultant will coordinate with KenGen to facilitate access to the sites and establish effective methods for data collection from various sources.

Additionally, the Consultant will identify key stakeholders, including the Energy and Petroleum Regulatory Authority (EPRA), Kenya Power and Lighting Company (KPLC), Tana and Athi Rivers Development Authority (TARDA), Kerio Valley Development Authority (KVDA), and the Ministry of Energy and Petroleum (MoE&P). An analysis of these stakeholders' interests and influence on project implementation will be performed, with particular attention to KPLC's role and requirements as the primary off-taker under the power purchase agreement (PPA) with KenGen.

KenGen will provide the Consultant with existing reports, including previous studies, along with electricity infrastructure models. The Consultant will review these materials to identify any information gaps and develop a plan to address them. Moreover, KenGen will assist in guiding the Consultant on accessing local sources of information and will review and approve the Consultant's plan for engaging with other project stakeholders to assess their interests and potential impacts on the project.

Task 1 Deliverable: *The Consultant will furnish KenGen with a report consolidating all findings and providing a comprehensive overview of Task 1 activities. This report will encompass, but not be limited to, the following: (i) A detailed Work Plan outlining the Study's timeline, milestones, Deliverables, and delineating the roles and responsibilities of both the Consultant and KenGen for ensuring the Study's successful completion. (ii) An assessment of key stakeholders and the outreach efforts undertaken to gather their feedback regarding the Project. (iii) An examination of Project materials and existing reports, identification of any information gaps, and a strategy for acquiring the necessary information. (iv) an inspection report detailing key observations for the nine power plants. The Deliverable for **Task 1** will be presented as a standalone chapter within the Final Report. Furthermore, the Consultant will issue an Inception Report detailing all activities conducted in this task within four (4) weeks from the start date.*

Task 2: Energy market overview

The consultant shall analyse the current and future situations of the Kenyan electricity market to classify and justify the need for the Project. The scope of the energy market overview shall include the following analysis:

- Review of legal and regulatory framework of Kenyan Electricity Market by analysing recent strategic documents such as Least Cost Power Development Plan (LCPDP) or Kenya National Power Master Plan
- Explain the justification for the rehabilitation projects based on the master plans, ancillary services requirements, planned generation/transmission projects and electricity demand

growth in Kenya. The analysis should include a quantitative analysis on the need for the major hydro power plants in the provision of ancillary services.

- Prepare an Energy and Power balance for selected years over the life horizon of the power plants, considering the other sources of power generation in the region and planned transmission lines.
- Evaluate the current and the projected demand for electricity; evaluate the costs of alternative sources of electricity comparing the generation costs and environmental impacts for various modes of generation at varied availability factors
- Evaluate the system requirements based the demand projections and load patterns. The Consultant shall thereafter recommend the appropriate implementation timelines for the proposed project.
- Analyse the dispatch for the proposed projects with and without battery storage option

Task 2 Deliverable: *The Consultant will furnish KenGen with a report consolidating all findings and providing a comprehensive overview of Task 2 activities. This report will encompass, but not be limited to, the following: review of the energy market and plans, justification of the project with relation to the energy demand and supply for the country and report detailing the requirements and opportunity in the provision of ancillary services.*

Task 3: Hydro Resource Assessment

The Consultant shall assess hydro resource data, including satellite-derived data and on-site measurements, to inform decisions on technology options, and conceptual designs of redevelopment of the existing hydro power plants. Additionally, the consultant shall perform a hydrological assessment using available data to:

- i. Assess the hydro-meteorological characteristics of the river catchments for each power plant.
- ii. Carryout flow duration analyses
- iii. Update flood hydrology for the power plants
- iv. Assess climate change resilience for the design and operation of the power plants under the different climate change scenarios as defined by the IPCC.
- v. Examine river sedimentation characteristics to evaluate future resource availability for the hydropower plants and propose measures for water catchment area conservation

The findings from this resource assessment will be integrated into the performance modelling in task 4. Where available, KenGen will provide the Consultant with on-site measured data, such as rainfall, streamflow, and any other relevant operational data for this assessment. If the Consultant deems the

on-site measured data to be insufficient, they will procure additional alternative data from reputable sources. The Consultant will present the data in a format consistent with industry standards for hydro resource assessment, acceptable to financial institutions.

***Task 3 Deliverable:** The Consultant shall provide KenGen with a report that contains all findings and provides a detailed account of all work performed under Task 3. The Deliverable shall detail the results from assessment of the hydro resource. If additional alternate data is acquired by the consultant, it shall be provided in a format that KenGen can easily follow and adapt for future projects. The Task 3 Deliverable shall be included as a stand-alone chapter in the Final Report. The report will detail the available hydro resource potential for each station versus the current installed capacity and status of the water catchment area with proposed conservation measures to be undertaken to assure KenGen hydropower generation sustainability.*

Task 4: Technical Assessment and Performance Analysis

The Consultant shall analyse the performance of the existing hydro power plants and compare the operational efficiencies of the plants in comparison to the set targets. The analysis shall:

- i. Evaluate the current performance and operational efficiency of the existing hydropower plant compared to the maintenance and PPA targets.
- ii. Identify any operational issues or inefficiencies affecting the plants' performances.
- iii. Assess the physical condition and functionality of key plant components.
- iv. Provide recommendations for improvements to enhance performance and reliability.

The assessment shall be conducted as follows:

1. Technical Assessment,

The Technical Assessment shall include:

Mechanical and Electrical Equipment: Inspect and evaluate the performance and condition of turbines, governors, generators, excitation systems, bearings, brakes, lube systems, cooling water systems & coolers, protection systems, station transformers, switchgear, HVAC, MV cables, MIV systems, pneumatic systems, DC systems, fire protection, metering systems.

2. Operational Assessment

Operational assessment shall include:

- Generation Performance: Review and analyse historical generation data to assess plant efficiency and capacity utilization.

- Operational Procedures: Evaluate the effectiveness of current operational and maintenance procedures and practices. This will include a comprehensive review of all major works/overhauls conducted on the major items identified in technical assessment, the recommended maintenance schedules for the major equipment.
- PPA Performance: Evaluate the performance of the power plants in relation to the Power Purchase Agreement (PPA) targets and initial tariff modelling assumptions. This includes analysing metrics such as Target Availability, Load Factors, Aailed Energy, financial performance of the power plants over the current PPA period and other performance indicators related to the mechanical availability of the power plants.

***Task 4 Deliverables;** The Consultant shall provide KenGen with a Performance Analysis Report indicating all works performed under Task 4. The Consultant shall provide the following deliverables: A comprehensive report detailing the findings from the performance evaluation, including assessment of current operational efficiencies compared to set targets, identification of operational issues and inefficiencies. A detailed report covering: Condition and performance evaluation of mechanical and electrical equipment, assessment of civil and structural integrity, and Analysis of hydraulic performance. A detailed list of rehabilitation requirements for each hydropower plant, specifying the necessary repairs or upgrades for critical components and systems. A comprehensive cost breakdown for all major systems identified for rehabilitation, including estimates for materials, labour, and any ancillary costs. A clearly defined scope of rehabilitation for each plant, outlining the specific actions to be taken, timelines, and any resources required for successful implementation. These deliverables will form the basis for making informed decisions regarding the rehabilitation of the hydropower plants and ensuring their long-term operational efficiency and reliability.*

Task 5: Ancillary Service

For the existing hydropower plants, the Consultant will perform a thorough evaluation on how the existing hydropower plants contribute to grid stability and reliability through ancillary services and to assess the impact on plant operations and performance. The analysis shall:

- Assess the role and effectiveness of the hydropower plants in providing ancillary services to the grid.
- Analyse the operational impacts of delivering ancillary services on hydropower plants.
- Provide recommendations for optimizing ancillary service contributions and improving plant performance.
- Quantify the benefits of ancillary service provision and how KenGen can be compensated

The Consultant will:

- Define and categorize the ancillary services provided by the hydropower plants, such as frequency regulation, voltage support, spinning reserve, and load following.
- Review relevant regulations, standards, and market mechanisms governing ancillary services.
- Analyse the historical and current performance of the hydropower plants in delivering ancillary services. This will include an assessment of the operations and dispatch of the hydro power plants, with particular attention to how the generation equipment respond to frequency fluctuations and provision of ancillary services over time, and the impact of these factors on the equipment.
- Evaluate the impact of providing ancillary services on the operational efficiency, wear and tear, and maintenance requirements of hydropower plant equipment.
- Examine the responsiveness and capability of each generation machines in the Major Hydro PPA in providing required ancillary services, including frequency regulation and load following.
- Assess the effectiveness of control systems and automation in managing ancillary service provision and maintaining grid stability.
- Simulate future scenarios of ancillary service requirements and their impact based on power sector projects' pipeline and plans.
- Develop strategies to enhance the contribution of the hydropower plants to ancillary services while minimizing operational impacts and provide recommendations for improving operational practices, control systems, and maintenance strategies to support ancillary service provision.
- Provide recommendations on the feasibility of expanding capacity and extending the operating range of existing plants through equipment upgrades and other mitigation measures. Include an analysis of the associated costs and their impact on enhancing the provision of ancillary services from the hydropower plants.

Task 5 Deliverable: *The Consultant shall deliver a report to KenGen that includes a comprehensive account of all findings and details of all work conducted under Task 5. This deliverable will encompass the results of the ancillary services analysis, the impact of providing these services, potential opportunities for ancillary services, and recommendations for improving the delivery of ancillary services from the existing hydropower plants. The findings from Task 5 will be presented as a separate chapter in the Final Report.*

Task 6: Cost Estimate Preparation, Financial and Economic Analysis

1. Cost estimates

The Consultant will:

- Estimate the costs for the rehabilitation work needed for each power plant.
- Calculate the operation and maintenance (O&M) costs for the rehabilitated hydropower plants.
- Assess the expenses related to major works or overhauls performed on the power plants that are not covered by the current PPA tariff.
- Incorporate the capital costs for the raising of Masinga project based on the findings of its Feasibility Study.

The Consultant's estimate shall include a detailed breakdown of equipment and materials for all major components, including major equipment, balance of plant¹, instrumentation and controls, and electrical interconnection for each power plant. The Consultant shall include in its analysis a cash flow analysis, Life Cycle Cost Analysis ("LCCA"), market conditions, raw material availability, supply agreements, the PPA, and competing alternative methods of achieving the same or similar Project objectives.

2. Financial and Economical Analysis

Based on information analyzed under previous Tasks, the Consultant shall analyze Levelised Cost of Energy ("LCOE") for all power plants. The analysis of LCOE is to provide a high-level estimation of the anticipated cost of the project based on the capital cost, O&M cost, taxes, and other cost factors for the Project over its entire lifetime

The Consultant shall include in its analysis a cash flow analysis, Life Cycle Cost Analysis ("LCCA"). The LCCA shall consider all initial capital costs (e.g., plan, design, rehabilitation, development, and construction) and long-term operational costs (e.g., warranties, operations, maintenance, spare parts, installation, refurbishment, and disposal). Other activities shall include but not limited to the following:

¹ Balance of plant will include all structural elements, cabling, wiring, switchgear, any equipment.

- Considering the Kenya Energy Sector regulated environment, international best practices and similar power plants, prepare assumptions to be used in the economic and financial analysis, clearly stating their sources.
- Carry out financial and economic analysis showing clearly the cashflow statement, income statement, balance sheet, financing profile among other financial statements over the lifetime of the plant.
- Carry out a cost Benefit analysis of the project

- Analyse and compute the Levelized cost of Energy for the proposed project, Equity and Project's Internal Rate of Return (IRR) and their corresponding Net Present Value (NPV), payback period and Debt service coverage ratio (DSCR)
- Analyse and compute proposed new major hydro tariff for the project to achieve the required Return on Equity (ROE)
- Carry out an economic analysis by modelling alternative project options especially with respect to provision of ancillary services and quantifying the benefits using an economic model.
- Analyse the Economic IRR and Economic NPV of the proposed project
- Estimate additional revenue from Certified Emission Reduction (CERs).
- Carry out sensitivity analysis on critical parameters e.g. Generation output, Capex, interest rate, discount rate, O&M costs etc. at different probabilities.
- Early estimates of the cost required to avoid, minimize and compensate E&S impacts throughout the life of the plant.

A live model with formulae and workings shall be submitted to KenGen for review. The model shall include a summary sheet which shall summarise the key results and sensitivities.

Task 6 Deliverable: *The Consultant shall provide KenGen a report of all work performed under Task 6, including, but not limited to, the rehab and EPC cost estimates, O&M cost estimates, cash flow analysis, economic analysis, electronic financial models with detailed documentation, LCCA, and sensitivity analysis necessary to advance the development of the Project and that can be presented to potential sources of implementation financing for the Project. The Task 5 deliverable shall be included as a stand-alone chapter in the Final Report.*

Task 7: Risk Analysis and schedule of implementation

The Consultant shall analyse project risks and prepare a risk matrix. The objective of this task is to ensure comprehensive risk management throughout the project lifecycle, from planning and construction to operation and decommissioning. The Consultant will determine potential risks that may impact the hydro power plant's performance, safety, and financial viability, evaluate the likelihood and impact of identified risks, develop and implement strategies to reduce or manage risks effectively, and establish a system for ongoing risk monitoring and management.

The Consultant will:

- Assess the performance of the hydro power plants with respect to risk allocation in the current PPA, these include availability, hydrology, dispatch and ancillary service risks.

- Identify risks related to design, construction, and operation of hydro power plants, including equipment failure, technology obsolescence, and technical errors.
- Assess risks related to environmental impacts, including changes in water availability, ecological disruption, and regulatory compliance.
- Identify financial risks such as cost overruns, funding shortfalls, and market fluctuations affecting revenue and operational costs.
- Evaluate risks associated with plant operation, including maintenance issues, workforce safety, and operational efficiency.
- Identify risks related to changes in regulations, permits, and compliance requirements.
- Assess potential social impacts, including stakeholder opposition, and social acceptance.
- Identify risks related to project planning, scheduling, and execution.
- Assess the Likelihood and Impact Analysis: Use qualitative and quantitative methods to assess the likelihood and potential impact of identified risks.
- Rank risks based on their severity and probability to focus on high-priority risks.
- Modify project plans or processes to avoid risks where possible.
- Implement measures to reduce the likelihood or impact of risks, such as enhancing design features or adopting best practices.
- Allocate risks to third parties through contracts, insurance, or partnerships.
- Identify risks that are acceptable and define the conditions under which they will be tolerated.

The Consultant shall prepare a comprehensive construction and rehabilitation planning and an implementation schedule, including all the required phases with milestones. The schedule shall be based on detailed analysis of the methods and procedures and shall rely on quantities for the major features of the project, considering the demand for the hydro power plants, the PPA timeframes, logistics of working in remote areas, environmental constraints, materials supply and control, manpower and equipment requirements and availability, and the sequence of construction operations.

The Consultant shall prepare with KenGen an implementation schedule including all the project phases from the start of Feasibility Study up to the commissioning of the project. It should include the following phases:

- Financial engineering for funding the future detailed (or basic) design study,

- Implementation of the rehabilitation projects for each power plant and procurement of contractors.
- Implementation of all administrative and environmental procedures such as Environmental Management Plan (EMP)
- Commissioning of the rehabilitation project.

The Consultant shall also develop a schedule showing the linking of these tasks and associated with an investment schedule derived from the cost estimate and schedule.

***Task 7 Deliverable:** The Consultant shall provide KenGen a report of all work performed under Task 7 including, but not limited to, a risk analysis, recommendations for risk mitigation and a comprehensive risk management. The report will also include a comprehensive implementation schedule as detailed in Task 7. The Task 7 Deliverable shall be included as a stand-alone chapter in the Final Report.*

Task 8: Capacity Building

The Consultant shall hold various workshops for capacity building during project duration of the Feasibility Study. The first workshop will be conducted 6 weeks after the commencement of the feasibility study. This workshop will be based on the inception report. The second virtual workshop shall be organized for the presentation of the Consultant's technical work carried out during the first three months of the project duration. The Consultant shall inform about the first study findings and the performance of the hydro power plants within the current PPA framework.

The third virtual workshop shall be arranged at half-time of the study after 6 months of project duration. The Consultant will update KenGen about the current progress of the study. The field works should be finalized at this time and the final results of the investigations will be presented. This workshop should also address the basic financial modelling and tariff calculation assumptions.

In consultation with KenGen, the Consultant shall develop and conduct a two-day training session for KenGen's staff that will address key aspects of the project development and implementation. The fourth workshop shall be held in Seven-Forks (Kamburu PS) for about thirty (30) participants from KenGen. The consultant should include in their proposal the cost for travel, logistics and accommodation for their representatives for this training. KenGen shall be responsible for providing the venue and arranging for its staff to attend the Training Session (including venue fees, potential staff accommodation, food/drink), while the Consultant shall be responsible for the providing the instructional content, handout materials and leading the Training Session. The workshop will be held after submission of the Draft Feasibility Report after 8 months of project duration. For the

presentation and discussion of the draft final results, the workshop shall be arranged for two full days. The Consultant should include in his proposal, a two (2) days training for the client’s staff on use of the software(s) for hydrological data and energy yield analysis. The software(s) used should be internationally accepted and widely used. This workshop will be used to discuss all tasks in the study and discuss comments on the draft feasibility study.

Workshop	Months after project start	Workshop No.
Inception Report,	6 weeks	1 (Virtual)
Performance assessment Workshop	3 months	2 (Virtual)
Technical assessment Workshop	5 months	3 (Virtual)
After finalization Draft Feasibility Report	8 months	4 (Physical)
Final Report presentation to KenGen	9.5 months	5 (Virtual)

Task 8 Deliverable: *The Consultant shall provide KenGen with a report of all work performed under Task 8. The Consultant shall also lead a two-day Training Session for KenGen’s staff and provide the necessary content and instructional materials. Written work product for the Task 8 Deliverable shall be included as a stand-alone chapter in the Final Report.*

Task 9: Final Report

The Consultant shall prepare a final report that includes all Deliverables, analyses, findings, and work performed under these TOR (“Final Report”). The Consultant shall present the complete findings of the Study to KenGen and provide an initial draft Final Report to KenGen for review and discussion.

Once KenGen has provided comments and revisions to the draft Final Report, the Consultant shall make the necessary changes and modifications. The Consultant shall prepare and deliver the Final Report to KenGen. The Final Report shall be organized according to the preceding Tasks and shall include all Deliverables and work product that have been provided by the Consultant to KenGen. The Final Report shall incorporate all the findings, recommendations, and conclusions of the Study and shall incorporate all other documents and reports provided pursuant to the Tasks described above. In addition to the TOR Deliverables, the Final Report shall contain an Executive Summary. The electronic version of the Final Report shall include:

- Adobe Acrobat readable copies of all documents;
- Source files for all drawings in AutoCAD or Visio format;
- Source files for all documents in Microsoft Office 2000 or later formats; and

- Sources files for any analytical tools used

Task 9 Deliverable: *The Consultant shall prepare and deliver the Final Report to KenGen in the manner set forth in Task 9. The Final Report shall be organized according to the above Tasks and shall include all Deliverables and documents that have been provided to KenGen.*

D. Required output

Based on the above, the Consultant is expected to provide the following reports:

- 1) Inception Report
- 2) Monthly Progress Reports
- 3) Draft Feasibility Study Report complete with all studies, technical design, financial and economic analysis
- 4) Final Feasibility Study Report and Executive Summary (Final Report)

E. Language

The language of the reports and all communication shall be English.

F. Subcontracting

Some activities like laboratory investigations may be subcontracted.

G. Expertise Required

The following expertise will be required for the study. An individual expert may cover more than one key position. In this case, his capabilities in each position will be evaluated individually. Therefore, CVs should clearly demonstrate the relevant experience.

H. Terms of Payment

The Consultant's total remuneration shall not exceed the Contract Price and shall be a fixed lump-sum including all staff costs, Sub consultants' costs, printing, communications, travel, accommodation, withholding tax, Value Added Tax and disbursements incurred by the Consultant in carrying out the Services.

The Contract Price may only be increased above the amounts stated if the Parties have agreed to additional payments in accordance with the public procurement guidelines.

All experts must show a perfect proficiency in English language, in writing, reading and speaking.

I. Reporting

The feasibility study shall take 10 months to complete from the contract signing date. During the duration of the project, the Consultant shall submit the following reports to KenGen and KfW:

Pos.	Report	Delivery date after project start
i	Inception Report, including initial site visit report	1 month after starting date
ii	Monthly progress Reports	5 th day of every month
iii	Interim Progress & Performance report	3 months after starting date
iv	Technical Review Report	5 months after starting date
v	Draft Feasibility Study Report	8 months after starting date
vi	Final Feasibility Study Report	10 months after starting date

The Consultant is expected to submit the proposed layout of the reports (in terms of chapters and annexes) for approval by KenGen. The latter shall incorporate any comments.

For the Inception Report, a period of two weeks will be allowed for the revision by KenGen. The Consultant will need to submit a revised version of the Inception Report within one week after receiving the comments.

By the monthly reports, the Consultant will inform KenGen about the progress of the study. Main findings shall be presented in the reports. Calculation sheets, preliminary drawings and reports shall be annexed to the monthly reports. Information about the next steps for the following month shall be given. In each monthly report an updated project schedule shall be presented. A period of one week will be allowed for the revision of the monthly reports by KenGen. Major comments have to be worked in by the Consultant. If there are only minor comments, the Consultant will incorporate them in the next monthly report and will not need to submit a revised version of the report. Any comments arising after the allowed one-week period shall be incorporated in the next monthly report.

For the Draft Feasibility Study Report, a period of three weeks will be allowed for the revision by KenGen. After submission of the comments by the Client, the Consultant will have two weeks for the incorporation of the comments and the preparation of the Final Feasibility Report. The consultant will also be expected to present the final findings to KenGen's top management team.

Additionally, the Consultant shall prepare an Executive Summary of the Feasibility Study, outlining the project's rationale, providing a generic description of essential features of the project and embracing a summary of findings and recommendations. The Executive Summary shall be designed as a bankable stand-alone document as it is intended to be used as a basis for seeking financing from lending institutions or attracting possible financiers to invest in the project.

J. Number of reports copies

Inception report, monthly progress reports and Draft Feasibility reports shall be submitted electronically.

The Final Feasibility report shall be submitted in 5 hard copies + 3 electronic copies on flash disks/CD.

Key Experts	Experience in Specialization	Professional Specialization and Role Description
Team Leader / Project Manager	15	<ul style="list-style-type: none"> - Master's degree or degree of equivalent level in Energy, Electrical, Mechanical Engineering or other relevant fields with extensive experience in hydro power sector. - Must have experience in project management, design, construction and operation of Hydro power plants. - Must have experience in at least five (5) Hydro feasibility study or owner's engineer consultancy as the team leader.
Operation and Maintenance Engineer Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in mechanical/electrical engineering or other relevant fields with proven track record in operation of Hydro power plants - Must have experience in at least five (5) Hydro feasibility study or owner's engineer consultancies as a Mechanical expert
Mechanical Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in mechanical engineering or other relevant fields with proven track record in design, construction, commissioning and operation of Hydro power plants - Must have experience in at least five (5) Hydro feasibility study or owner's engineer consultancies as a Mechanical expert
Electrical Engineering Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in electrical engineering or other relevant fields with proven track record in design, construction, commissioning and operation of Hydro power plants - Must have experience in at least five (5) Hydro feasibility study or owner's engineer consultancies as a Electrical expert
Power Purchase Agreement Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in engineering, energy, finance or other relevant fields with proven track record in PPA development, negotiation and implementation, Must have experience in at least two (2) Hydro feasibility study, projects or consultancies as a PPA expert.
Hydrological Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in meteorology, hydrology or other relevant fields with proven track record in climate change analysis and hydro resource assessment. - Experience in the assessment of at least five (5) hydro projects is desirable.

Civil Engineering Expert	10	<ul style="list-style-type: none"> - Bachelor's degree or degree of equivalent level in Civil Engineering or other relevant fields with proven track record in design of civil structures for hydro power plants. - Must have experience in at least five (5) hydro feasibility study or owners engineer consultancy as a civil engineering expert.
Financial and Economics Expert	10	<ul style="list-style-type: none"> - Bachelor's degree in, Finance, Economics or other relevant fields with proven track record in energy economics and financial modelling of renewable energy projects. - Must have experience in at least two (2) feasibility studies on hydro power plants.