



Terms of Reference

Energy Auditing Services to Alliance Ginneries Ltd.

1. Organization/ Project Background

SNV is a not-for-profit international development organization, working in Energy, Agriculture and Water, Sanitation & Hygiene. Founded in the Netherlands in 1965, we have built a long-term local presence in more than 27 countries in Asia, Africa and Latin America. Our global team of local and international advisors works with local partners to equip communities, businesses and organizations with the tools, knowledge and connections they need to increase their incomes and gain access to basic services. We support people to access and develop the capabilities, services and opportunities needed to live a healthy, productive and fulfilling life, while sustainably using the natural resources they depend on. More specifically, our work includes advisory services, evidence-based advocacy and implementation at scale.

Since 2019, SNV is implementing the INCREASE (Increasing Climate Resilience in Energy and Agricultural Systems and Entrepreneurship) project with funding from the Swedish International Development Agency (SIDA). The project aims to contribute to resilience in farming and agribusiness by working with the targeted private companies, to encourage the smallholder farmers to adopt climate smart agricultural practices and deploy decentralised energy systems to increase and stabilise production. The project will also work with mandated public institutions to influence formulation and/or implementation of policies that enable private enterprise in the 3 agricultural value chains to thrive. INCREASE is running from 2020 for an initial 3 years and will work with leading private sector companies in dairy, cotton and horticulture. The geographic focus is Southern, Lusaka, Central, Copperbelt and Eastern Provinces.

2. Purpose of the Consultancy

The purpose of the consultancy is to undertake a detailed energy audit of the partnering cotton value chain company - Alliance Ginneries Ltd. with operations in Kafue - towards identifying potential energy management opportunities (**renewable energy and energy efficiency**).

The specific objectives shall include:

- Identify feasible energy management opportunities (***renewable energy and energy efficiency***) in both electrical and thermal energy systems existing in the facility
- Undertake an economic and financial analysis of identified energy management opportunities
- Compile a detailed energy audit report including renewable energy and energy efficient technology and practice recommendations

3. Scope of work

The scope of the energy auditing assignment will include the following:

- 3.1 Undertake a detailed energy audit planning with a lens on both electrical and thermal energy use of the SME/facility
- 3.2 Review the existing and planned energy needs and services of the SME/ facility
- 3.3 Assess the existing historical energy utilization, energy cost data and load profiles of the facility
- 3.4 Undertake onsite measurements/logging for electrical and thermal energy systems in the facility with appropriate calibrated equipment
- 3.5 Conduct an energy utilization, economic and financial analysis based onsite energy use measurements and energy tariff structure
- 3.6 Quantify the total energy savings (kWh) and energy cost savings (ZMW)) as per energy efficient and renewable energy opportunities identified.
- 3.7 Prepare and submit a detailed energy audit report with a complete technology and economic analysis of the energy management opportunities (renewable energy and energy efficiency options)
- 3.8 Prepare a detailed draft implementation plan for the identified energy management opportunities including identification of potential vendors for RE and EE solutions
- 3.9 Prepare and present the audit findings and identified energy management recommendations to SNV and audited facility.

4. Methodology

A standard energy audit methodology shall be adopted from energy audit planning to closure. We propose that the energy audit be undertaken according to the ISO 50001¹ EnMS: Energy Management System in line with ISO 50002:2014 Energy Audits-Requirements with guidance for use methodology.

5. Proposed Energy Audit Equipment and Tools

In undertaking this assignment, the consultant is expected to ensure availability and demonstrate correct use of electrical and thermal energy auditing equipment and tools but

¹ <https://www.iso.org/iso-50001-energy-management.html>

not limited to: *Power quality analyzer (PQA); Clamp meter; Combustion analyzer (Flue gas analyzer); Thermographic camera; Infrared thermometer; Lux meter; Tachometer and Moisture meter.*

6. Duration and Deliverables

The consultancy is expected to be completed within 4 weeks of signing of contract with the key deliverables as indicated below.

- a) A presentation of the energy audit findings and energy management (*renewable energy and energy efficiency*) recommendations to the facility and SNV team
- b) Draft energy audit report (*template shared*) to be reviewed by SNV team
- c) A final detailed energy audit report with an investment appraisal on the identified renewable energy and energy efficient options

Indicative Level of Effort:

| # | Activities | Indicative Person-days |
|-----|---------------------------------|--|
| 6.1 | Drafting of inception Report | ½ person day |
| 6.2 | On site audit in Kafue | 1 person day travel / 2 person days actual audit |
| 6.3 | Drafting of Energy Audit Report | 1 person day |
| 6.4 | Presentation of Results | ½ person day |
| | Total | 5 person days |

7. Timelines and Key Milestones

| # | Milestone | Date |
|-----|---|---|
| 7.0 | Signing of Contract | 13.11.2020 |
| 7.1 | Final Inception report detailing the approach, tools, audit plan and audit team | 20.11.2020 – 1 week after signing contract |
| 7.2 | Draft energy audit report | 04.12.2020 – 3 weeks after signing contract |
| 7.3 | Presentation of the energy audit findings and recommendations | 04.12.2020 – 3 weeks after signing contract |
| 7.4 | Final Energy audit report and Dataset of energy use and economic analysis | 11.12.2020 - 4 weeks after signing contract |

8. Required Qualifications and Competencies

The energy audit shall be executed at least by two experts in electrical and thermal systems respectively with the following desired qualifications and competencies.

| # | Expert | Qualifications, Competencies and Experience |
|---|---------------------------------|--|
| 1 | Electrical systems Engineer | <ul style="list-style-type: none"> • Atleast BSc. Electrical Engineering • Demonstrated understanding of instrumentation and electrical systems • Atleast 6 years of experience with 3 years of hands on energy auditing • Demonstrated written and oral communication skills • Being a certified energy auditor by a recognised international Organization will be an added advantage |
| 2 | Thermal energy Systems Engineer | <ul style="list-style-type: none"> • Atleast BSc. in Mechanical Engineering/Agricultural/Chemical Engineering • Demonstrated understanding of material and energy flow analysis • Atleast 6 years of field experience and 3 years of hands on energy auditing • Demonstrated written and oral communication skills • Being a certified energy auditor by a recognised international Organization will be an added advantage |
| 3 | Measurement Technician | <ul style="list-style-type: none"> • Atleast a diploma in Electrical or Instrumentation • Demonstrated experience in calibration and use of energy audit tools and equipment • Demonstrated written and oral communication skills |

9. Payment Schedule

The payment for the services rendered shall be milestone-based with the agreed quality and timeliness of the deliverables. The proposed schedule is as follows:

- 20% upon submission of the inception report

- 40% upon submission of a draft energy audit report and presentation of onsite audit findings and recommendations
- 40% upon submission of a Final energy audit report and draft implementation plan

10. Supervision, reporting and compliance

The consultant shall report to the Project lead and S/he shall be the initial contact for the Organization in managing quality and effective delivery of this assignment.

The Consultant is expected to ensure utmost compliance with the general occupational health and safety guidelines and other ethical considerations that may be specific to the facility in undertaking this assignment.

11. Submission of technical and financial proposals

Interested firms or individuals can submit their technical proposal including CVs of experts and financial proposals to the email address below before zambiaprocurment@snv.org

Only successful applicants shall be contacted.

12. Criteria for Selection

All eligible technical proposal shall be evaluated based on consultants demonstrated capacity to undertake planned energy audit as per the following assessment criteria.

| # | Criteria | Max. score |
|---|---|------------|
| 1 | Professional experience in the energy and energy efficiency sector | 15 |
| 2 | Team expertise and experience in electrical and thermal energy systems (<i>education, competencies and experiences</i>) | 20 |
| 3 | Adequacy and completeness of the technical proposal | 20 |
| 4 | Demonstrated ability to access and use energy audit equipment and tools | 20 |
| 5 | Demonstrated proficiency in technical report writing | 10 |
| 6 | Demonstrated past energy audit experience | 15 |