

Terms of Reference (TOR)

for

**Energy Efficiency Audit in MSMEs (Production, Collection,
and Processing) on Dairy Value Chain**

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1. BACKGROUND

Practical Action is a global change-making group that consists of a UK registered charity with community projects in Africa, Asia and Latin America, an independent publishing company and a technical consulting service. It combines these specialisms to multiply its impact and help shape a world that works better for everyone. In Nepal, Practical Action is focused on putting ingenious ideas into work to contribute to poverty reduction and sustainable wellbeing through working in three expertise change areas: **Farming that works, Energy that transforms and Resilience that protects.**

Under the Energy that transforms, to achieve our pathway of productive use of energy (PUE) Practical Action will initiate a demonstration project on “**Integrating modern energy services on Dairy Value Chain**” in two districts (Makwanpur from Bagmati Province and Baglung from Gandaki Province) of Nepal from April 2023. The project will be funded by Practical Action’s internal fund.

There are many energy intensive enterprises such as dairy, which have not fully capitalised the opportunities of modern energy services, including energy efficiency improvement. The energy cost of the product value in the dairy industry is estimated to be around 5%. Energy saving potential for the sector is estimated to be 6% on the electrical side and 14% on the thermal side (AEPC, 2015). The dairy sector being the major contributor to the rural economy, PUE in the dairy value chain could be one of the scalable interventions. However, for this potential to be realized, there is a need for evidence, data from demonstrations, research, studies to promote and leverage larger investments.

Therefore, the main objective of the project is to demonstrate the economic and social benefits through the use of modern energy services in energy intensive enterprises. The project will support in accessing and using modern energy technologies and services by women, the poor and vulnerable households or smallholder farmers of the electrified communities in Nepal. The specific objectives of the project are:

- to showcase a business case of energy transition in energy intensive dairy value chain to have a better understanding of their current challenges and needs;
- to understand the appetite and incentivize green investment;
- to strengthen after sales services of modern energy equipment; and
- to generate evidence, and data for scaling of energy transition in the dairy value chain and expand in other sectors.

The project will work directly with dairy farmers, dairy farms, collectors, cooperatives, dairy enterprises, milk processors, suppliers/dealers/manufacturers of dairy equipment and machinery, and will collaborate with Nepal Electricity Authority (NEA), Alternative Energy Promotion Center (AEPC), Community Rural Electricity Entities (CREEs), business service providers, insurance companies, bank and financial institutions, development partners, and local governments.

2. NATURE OF ISSUE

Makwanpur and Baglung districts are diversified in terms of geography, social structure, and economy. Both districts are emerging and have potential for production and consumption of agricultural produce where milk is one of the major produces. Majority of the farmers there are member of milk producers’ cooperatives. A study carried out by Practical Action Nepal found

that there is a daily transaction of around 40,000 lit of milk in Makwanpur district and around 5,000 lit of milk in Baglung district (Rapid Market Survey, 2022). The major transaction of milk is through cooperatives and remaining from the informal sector. The majority of the cooperatives are limited to the collection of milk but four cooperatives as well as two district level cooperative associations from Makwanpur and Baglung are doing collection as well as processing of milk for product diversification. In this way, there are distinct features of production, collection, and processing of milk to reach consumers.

As far as the electrification status, there is electricity access for 75.32% of HHs out of the total HHs of 93,623 from Makwanpur district whereas it is 86.51% of HHs out of the total HHs of 64,572 from Baglung district (NEA, A Year Book, 2018/19). But this clean energy (electricity) is not fully utilized for the production, collection, and processing of milk in the dairy value chain. A major share of the energy in the production stage is biomass energy, followed by LPG (Liquified Petroleum Gas), and some solar energy whereas energy mix in collection and processing stage includes clean energy (electricity), followed by LPG (Liquified Petroleum Gas), and some biomass energy. It was found that there are very few suppliers of quality PUE products in the local market. Sub-standard products and underdeveloped after-sales service or warranty have a negative impact on the growth of PUE in the dairy value chain.

Energy efficiency is one of the key aspects of the dairy value chain. The over usage or under usage of energy might have affected the productivity of households and cooperatives, affecting to income and savings of these entities. Energy audit and energy efficiency will help to reduce energy costs, thereby increasing productivity, quality, and resource efficiency/conservation. The Dairy enterprise is expected to increase its production efficiency by implementing energy audit recommendations in selected dairy enterprises.

Therefore, Practical Action Nepal intends to conduct an Energy Efficiency Audit through certified auditors at the MSMEs level (Production, Collection, and Processing) on Dairy Value Chain.

3. OBJECTIVES OF THE ASSIGNMENT

The overall objective of the study is ***“to conduct an energy efficiency audit in MSMEs (production, collection, and processing) on dairy value chain”*** to achieve economic and environmental sustainability in two districts (Makwanpur from Bagmati Province and Baglung from Gandaki Province) of Nepal.

The specific objectives of the energy efficiency audit are:

- To analyse existing energy use in the dairy value chain (gaps, inefficiency, cost effectiveness, etc)
- To identify and recommend appropriate energy mix and minimize excessive use of energy.
- To recommend technically feasible solutions, improvement in practices for fuel saving, and minimize emission levels within a specified time frame.

4. SCOPE OF WORK AND RESPONSIBILITY OF THE CONSULTANT

This study aims to provide a better understanding of the productive use of energy (PUE) and energy efficiency in the proposed area. Based on the specific objective of this study, the following are the major scope of work. However, the detailed scope of the study will be discussed and finalized during an inception period. The consultant team shall:

- ❖ Coordinate with the Energy Theme team of Practical Action Nepal to understand the task.

- ❖ Consult with AEPC, Nepal Energy Efficiency Program (NEEP), and other entities as and when required.
- ❖ Make effective liaison with key stakeholders while conducting the assignment.
- ❖ Observe, measure, and collect complete and relevant data as per energy audit requirements.
- ❖ Synthesize market mapping of equipment.

The scope of the study will include but not be limited to :

- ❖ Source of fuel usage and technology for the dairy value chain
- ❖ Machinery and equipment for the dairy value chain
- ❖ Locations and layout of the dairy enterprises
- ❖ Financial analysis, cost benefit analysis, cost estimate, and recommendations on the dairy value chain
- ❖ Post audit support activities
- ❖ Prepare guidelines for a walk through audit, monitoring of energy audit recommendations, training and capacity development requirement, set KPIs for post implementation monitoring
- ❖ Presentation of energy audit outcomes, report writing, and report submission to Practical Action Nepal

5. STUDY AREA

The study will be carried out in two districts (Makwanpur from Bagmati Province and Baglung from Gandaki Province) of Nepal. At the end of this demonstration project, Practical Action intends to upscale its best practices in around ten districts of Bagmati and Gandaki Province of Nepal.

6. METHODOLOGY

Based on the objective and scope of this research study, an appropriate methodology must be proposed. The consultant team shall conduct observation, focus group discussions, and interviews with key MSMEs on the dairy value chain. The consultant shall organize workshops or events, if deemed necessary, to analyse the present context of energy efficiency in the proposed areas (paper presentation, research findings, etc., —the invitees can be from MSMEs, federal/provincial/local government, or concerned authorities). Apart from this, the consultant can advise appropriate study methodology to achieve the above mentioned broader and specific objective.

The sample size should adequately represent the existing and potential production, collection, and processing site of the proposed areas. The proposed methodology for conducting this research (both qualitative and quantitative) as well as other proposed methodology/tools will be finalized together with Practical Action. The following steps would guide the process. However, the external consultant and team can propose methods within this broad framework.

A. Inception Phase:

- After the formal agreement, the assignment will start with an inception phase.
- This phase will undertake coordination with Practical Action Nepal and a desk review of the relevant documents to have a clear understanding of the objectives and requirements of the study.
- Collect and analyse project related secondary data/information.
- Develop a checklist to collect relevant information.
- The consultant will also refine how s/he is going to undertake the assessment, analysis, and what sources of information they are going to use for this work.
- Based on the review and assessment, prepare an inception report proposing a clear-cut methodology, timeline, schedule, and steps to be followed to undertake this assignment.

- The inception phase will end with the submission of the inception report and finalize it after incorporating comments from the Practical Action team.

B. Interim Phase:

- After the inception phase, the assessment will then progress to the interim phase which includes the fieldwork, and collection of field information based on the checklist.
- The team will utilize different data collection tools such as: field observation, expert interviews, key informant interviews, Focus Group Discussions (FGDs), interaction meetings/workshops with MSMEs, cooperatives, local and provincial governments, business service providers and other stakeholders as well as validating information with the MSMEs and relevant stakeholders.
- The team needs to ensure the active participation of MSMEs during fieldwork.
- The consultants will present the brief progress reports/presentation with information on the tasks accomplished and the need to revisit tools and methodologies, the content of the report proposed if deemed so.

C. Reporting phase:

- A sharing meeting will be conducted after the completion of fieldwork. The consultant should submit the draft report of the study which will be reviewed by the technical team of both projects and Practical Action Nepal for feedback/suggestions.
- The consultant will incorporate input and submit the revised version.
- The full draft of the report will be reviewed by the Practical Action team.
- Finally, the consultant will submit the final report by incorporating all comments from reviewers.

7. DELIVERABLES

The followings are the expected deliverables from this assignment:

- **Inception report:** an inception report incorporating findings of the desk review, conceptual framework of the assessment, details of applicable tools and methodologies together with the details of the work plan, checklists, time schedules as well as a tentative table of content for the research study.
- **Draft and final reports:** Detail draft report meeting the objectives and scope of the ToR and with the methodologies in line with the table of contents developed and agreed upon in the Inception Report. The final study report will be the end product after the incorporation of all the comments from reviewers.
- **Raw findings/generated data/datasets:** The consultant needs to submit the data generated in the process of this study in excel as well as other field related photos during field observation in a well-organized format (revised, reformatted, if required) that can be easily decipherable to the Practical Action Team.
- **Guidelines:** Guidelines for a walk through audit, monitoring of energy audit recommendation, training and capacity development requirement, set KPIs for post implementation monitoring.

8. REQUIRED QUALIFICATIONS AND EXPERTISE

The consulting firm should have a good experience in qualitative and quantitative research, good experience of similar assignments, and having a clear understanding of similar studies (research studies, assessment). Consulting services are solicited from consulting firms having experience in carrying out studies for energy auditing and efficiency improvement for the dairy value chain. Consulting firms should also have the firm's capability, availability of appropriate

skills among key staffs, availability of required resources, and having relevant transactional experience. However, the consulting firm can propose as per the need and scope of the assignment. The proposer is expected to engage the categories of key experts for the study and CVs shall be submitted accordingly. The consultant should have following qualifications, and expertise in the following areas:

- **Energy efficiency audit expert** should have a minimum Bachelor's Degree in industrial/electrical/mechanical/process/chemical Engineering followed by a Master's Degree in the field of engineering or management or relevant sector with at least 8 years of professional experience in the field of energy efficiency and energy auditing.
- S/he should be a certified energy auditor. The certificate of energy audit training from credible institutions must be submitted.
- S/he should have also experience conducting similar studies related to energy finance, development finance, value-chain finance, and cooperative development.
- Strong understanding of research methodology and experience in using different research tools and techniques particularly targeted in the area of the energy sector.
- Proven analytical and report writing skills are a must.
- Prior experience of managing teams of similar consulting assignments.
- Strong organizational, written, and oral presentation skills.
- Demonstrate ability to work under deadlines, handle multiple tasks, and take initiative.

Apart from the above, the submission of the following will be taken into account during the selection process:

- a. A full technical and financial proposal along with the budget breakdown.
- b. A copy of Company Registration
- c. A copy of VAT certificate (obligatory)
- d. A copy of tax clearance for the last fiscal year from Inland Revenue Office; and
- e. All proposed professionals must sign a copy clearly mentioning their proposed position in this assignment.

9. BUDGET

The maximum available budget is **NPR 750,000** (In words: Nepalese Rupees Seven Hundred Fifty Thousand Rupees Only) **inclusive of applicable taxes**. This includes consultant's fee (including team members, and enumerators), workshops, lodging/accommodation, airfare/travel and stationaries including all other costs associated with this assignment. All applicable taxes will be deducted at the source.

The payment will be done in three installments: 40% of the total agreed amount shall be disbursed upon submission of the inception report, 30% will be disbursed upon submission of the draft report, and the remaining 30% will be paid after submission of the final report and all other deliverables mentioned in section 7 of ToR.

10. DURATION AND TIMELINE

The consultant is expected to complete the task within two and half months of the commencement of the assignment which is anticipated to be effective from **15 February 2023 and will be completed by 30 April 2023**.

11. EVALUATION CRITERIA

All received proposals shall be reviewed following different indicators. These will be but not limited to sound understanding of the assignment, competent methodology, consistency,

coherence and compliance, experience, and efficient budget planning.

12. INVITATION FOR THE LETTER OF INTEREST

Practical Action Nepal Office requests consulting firms (registered in VAT) to submit (i) an application highlighting the letter of interest (LoI) (ii) a brief technical proposal along with your proposed methodology (not more than 7 pages) (iii) recently updated CVs of consultant, and (iv) a financial proposal with detail cost breakdown to conduct the proposed work to proposals@practicalaction.org.np on or before 17:00 hrs., **05 February 2023** with a title "**To conduct an energy efficiency assessment in MSMEs (production, collection, and processing) on Dairy Value Chain**".

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Practical Action believes in and follows through a fair and competitive process to recruit the consultant for all of its assignments to ensure quality assurance.

**BIG
CHANGE**
starts small