

Terms of Reference (ToR)

Title of the Assignment: Rapid Assessment of Energy Consumption in the Selected High Energy Consuming Sectors of Nepal to Determine Sectoral Minimum Energy Performance Standards (MEPS)

1. Background

Alternative Energy Promotion Center (AEPC) is the focal agency to promote Renewable Energy and Energy Efficiency in the country. The development objective of AEPC is to improve living standards, increase employment and productivity of rural women and men, reduce dependency on traditional energy, and attain sustainable development by integrating alternative energy with the socio-economic activities of women and men in rural and urban communities.

Following the endorsement of the National Energy Efficiency Strategy 2018, AEPC was designated as the government entity responsible for energy efficiency (EE) efforts in Nepal, including coordination among national institutions and stakeholders engaged in EE programs. With this mandate, AEPC supports the Government of Nepal in achieving Sustainable Development Goal 7.3 — doubling the rate of improvement in energy efficiency by 2030 — and the broader goal of universal access to clean, sustainable, and reliable energy.

AEPC is dedicated to implementing policies and programs that support energy efficiency across industrial, commercial, residential, institutional, and transport sectors. Beyond the metal and steel sector, several other industrial and commercial sub-sectors are significant energy consumers with strong potential for efficiency improvement, notably cement, pulp and paper, dairy processing, and star-rated hospitality establishments. A structured, sector-wise assessment across these four sectors, conducted as a single integrated study, will enable AEPC to develop consistent, comparable Minimum Energy Performance Standards (MEPS) and Specific Energy Consumption (SEC) benchmarks.

Furthermore, the proposed Energy Efficiency Act, currently tabled in Parliament, aims to institutionalize energy efficiency practices, set regulatory frameworks, and create an enabling environment for energy-efficient solutions across sectors. This assignment will directly inform AEPC's sector-wise action plans and its alignment with the forthcoming legislation.

2. Objective

The main objective of this assignment is to conduct a rapid assessment of energy consumption in four (4) energy intensive industry/service sectors of Nepal — **Cement, Pulp and Paper, Dairy, and Star-Rated Hotels**, and to determine sector-wise Specific Energy Consumption (SEC) and recommend Sectoral Minimum Energy Performance Standards (MEPS) for each sector.

3. Study Approach

This is a single assignment covering four (4) sectors — Cement, Pulp and Paper, Dairy, and Star-Rated Hotels — that are unrelated to one another in terms of production process and operations. Each sector

shall therefore be assessed as an independent work stream, with its own sector briefing, facility sampling, walkthrough survey/audits, detailed energy audit, and SEC/MEPS analysis.

While the technical work in each sector is independent, the consultant/firm shall consolidate the outputs of all four work streams into a single set of study deliverables (Inception, Draft, and Final Reports), each comprising a short common part and four sector-specific parts, as detailed in Section 5. The common approach across all four independent work streams shall include: Energy Survey/inspections across a representative sample of facilities in each sector facilities per sector, covering a mix of small, medium, and large facilities where applicable.

- One (1) Detailed Energy Audit (DEA) conducted in one representative facility per sector (i.e., 4 detailed energy audits in total — one each for Cement, Pulp and Paper, Dairy, and a Star-Rated Hotel), selected in consultation with AEPC.
- Use of secondary data (utility bills, prior audit reports, production records) to supplement primary data collection where available.
- Stakeholder consultations and key informant interviews (KIIs) with industry associations, facility operators, and relevant government agencies for each sector.

4. Scope of Work

4.1 Cross-Sectoral / Common Tasks

- Prepare an inception report outlining the integrated methodology, sector-wise work plans, facility sampling criteria, and standardized data collection templates applicable across all four sectors.
- Develop a common but sector-adaptable framework for calculating Specific Energy Consumption (SEC), enabling cross-sector comparability of methodology while respecting sector-specific production units (e.g., kWh/tons clinker, kWh/tons paper, kWh/liter milk processed, kWh/room-night).
- Identify the main energy sources used in each sector (electricity, coal, biomass, furnace oil, LPG, diesel, etc.) and collect, measure, and calculate energy consumption against production/service output.
- Identify significant energy uses (SEUs) and categorize major energy-consuming equipment for each sector to inform sector-specific MEPS recommendations.
- Compare calculated SEC values against relevant Nepalese and international standards/benchmarks for each sector.
- Identify potential policy interventions and energy conservation measures (ECMs) to improve energy performance in each sector.
- Provide guidance for setting realistic, sector-specific energy consumption benchmarks for Nepalese industries and hospitality establishments.
- Document all findings, calculations, and assumptions in a structured, consistent format across all four sector reports.

- Identify key stakeholders — government agencies, industry/hotel associations, private sector actors, and international partners.

Note: The use of digital survey tool for data collection (especially for walkthrough survey) is highly recommended to complete in provided timeframe.

4.2 Sector-Specific Tasks

a) Cement Sector

- Brief overview of the cement sector in Nepal, including identification of major cement plants (clinker-based and grinding units) and their capacities.
- Assess overall energy/load across raw material preparation, pyroprocessing (kiln), clinker cooling, and cement grinding stages; evaluate thermal and electrical SEC separately.

b) Pulp and Paper Sector

- Brief overview of the pulp and paper sector in Nepal, including identification of major mills and their production capacities and processes (pulp, recycled-fiber based, etc.).
- Assess overall energy/load across pulping/stock preparation, chemical recovery (where applicable), paper machine/drying section, and steam and boiler systems.
- Evaluate SEC per tons of paper production.

c) Dairy Sector

- Brief overview of the dairy processing sector in Nepal, including identification of major dairy plants/cooperatives and their processing capacities.
- Assess energy/load use across pasteurization, refrigeration/cold chain, boilers, homogenization, and cleaning-in-place (CIP) systems.
- Evaluate SEC per liter of milk processed.

d) Star-Rated Hotels

- Brief overview of the star-rated hotel sector in Nepal, including identification of major hotels by star category, room count, and occupancy patterns.
- Assess energy/load across HVAC and chiller systems, hot water generation/boilers, kitchen and laundry operations, and lighting/common area.
- Evaluate SEC per available room-night and/or per occupied room-night, accounting for seasonal occupancy variation.

5. Deliverables

The consultant/firm is expected to submit the following deliverables. All deliverables shall present results for the four sectors with sector-specific chapters/annexes as needed:

S.N.	Deliverable	Indicative Timeline
1	Inception Report – methodology, sector-wise work plan, sampling frame, data collection tools/templates	Within 2 week of contract signing
2	Draft Consolidated Report – mid-term key findings, draft SEC benchmarks and draft MEPS for all 4 sectors	Within 7 weeks
3	Final Report – consolidated SEC's and MEPS recommendations for all 4 sectors, policy recommendations	Within 8 weeks

6. Duration of the Assignment

The assignment is expected to be completed within 2 months from the date of contract signing, covering all four sectors within a single, integrated timeline.

7. Qualification and Experience Requirements

The consulting firm should meet the following criteria:

- Proven experience in industrial/commercial energy audits (detailed energy audits and walkthrough energy audits), preferably across multiple sectors.
- Demonstrated experience in at least two of the four target sectors (Cement, Pulp and Paper, Dairy, Star-Rated Hotels); combined team experience must cover all four sectors.
- Previous experience in conducting rapid/sectoral energy assessments and developing SEC benchmarks and MEPS recommendations.
- Sound knowledge of production processes, technologies, and equipment relevant to each of the four sector.
- Experience working with government agencies, development partners, industry associations, and the private sector.
- Proven experience of conducting such assessment using digital survey tools (eg. Kobo Toolbox, Jotform, Qualtrics etc.) are required.

8. Reporting and Coordination

The consultant/firm will work under the overall guidance of AEPC and shall coordinate with relevant stakeholders, including government institutions, industry/hotel associations, facility owners/operators, and development agencies. A single Team Leader shall be responsible for overall coordination and quality assurance across all four sector components, ensuring methodological consistency and timely integration of sector-specific findings into the consolidated deliverables.

9. Team Composition

The proposed team structure below reflects the integrated, multi-sector nature of the study. Sector Energy Audit Specialists shall each be primarily responsible for their respective sector, working under the overall coordination of the Team Leader.

Position	No.	Minimum Qualification	Minimum Experience
Team Leader – Industrial Energy Efficiency Expert	1	Master’s degree in Energy/Mechanical/Industrial Engineering or related field	12+ years in industrial energy efficiency, audits, and policy/standards formulation; led multi-sector energy studies
Energy Audit Specialists (Cement, Pulp & Paper, Dairy, Hotel)	4 (1 per sector)	Bachelor’s degree in Mechanical/Electrical/Chemical/Industrial Engineering	7+ years of energy audit experience with demonstrated exposure to the respective sector
Energy Engineer (Field Support)	2	Bachelor’s degree in Mechanical, Electrical, or Industrial Engineering	2+ years in industrial/commercial energy audits, instrumentation and metering
Data Analyst	1	Bachelor’s degree in Statistics, computer science, Development Studies, Engineering or related field	7+ years in energy data analysis, SEC modelling, and benchmarking.
Research and Data Collectors	4	Bachelor’s degree in Engineering (Mechanical/Electrical/Environment/chemical)	Fresh graduates eligible

10. Required Documents from Consultant

- Cover letter for submission of Expression of Interest (EoI), need to indicate clearly about the applied assignment
- Firm/Company Registration Certificate (with updated renewed)
- VAT/PAN Certificate (For Domestic Consultants only)
- Tax Clearance Certificate of FY 2081/82 (For Domestic Consultants only)
- Power of Attorney for authorized signatory
- Self-declaration of eligibility
- Profile of Key Human Resources (During EoI Stage) and Signed CVs of proposed experts (During RFP Stage only)
- Documents to demonstrate:
 - General work experience within the last 10 years
 - Specific work experience within the last 10 years
 - Technical and Managerial capacity of the Consulting Firm including Audit Reports of last three years

11. Consultant Selection Method:

A Consultant for each cluster will be selected in accordance with the **Consultants Qualifications-based Selection (CQS)** method set out in the prevailing Procurement Regulations of the World Bank.