

Sample Terms of Reference for Energy and Cooling Audits at Health Care Facilities

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1- About the project

This section should be a short description about the project addressing:

- **Background:** General background about cooling and energy efficiency. The reasons and motivations for implementing the project.
- **Objective:** Brief explanation of the final goal of the project and the co-benefits that might be achieved.
- **Opportunities:** Ways to use the results. Tackling present problems and proposing future applications.

2- Objectives of the consultancy

Set clear objectives stating the information needed. Establish a main objective and list specific goals according to the facility's requirements.

The health care facilities should be committed to provide the information that the auditors request, as well as assign specific personnel to accompany the auditors during the process.

Example

General objectives:

Carry out an energy audit that should focus on the air conditioning and refrigeration equipment, in addition to providing a general overview of the energy consumption of the health facility and establishing the equivalent greenhouse gases (GHG) emissions derived from the total energy consumption and from the cooling system in particular.

Specific objectives:

- Describe the facility's potential for the implementation of energy efficiency measures (EE) in refrigeration and cooling equipment.

Provide a general analysis of the potential of EE implementation regarding thermal performance of the building.

- Provide energy efficiency recommendations and describe technical and economic details of the proposal.
- The results and indicators should allow comparisons with other health care facilities, considering sociocultural, infrastructure, climatic, and other differences.

3- Product of the consultancy and expected results

Describe the expected output and deliverables, including the specific information requested and the format/s wanted, the audience who will receive it and the data to back it up.

Example

The selected consultant team must deliver a report in digital format with the details and conclusions according to the expected results, as well as a spreadsheet with data collection for the preparation of the report. In particular, it should include:

3.1 About the health care facility

- Level of complexity
- Areas: total area, covered area
- Number of beds
- Number of health care workers and employees
- Number of annual patients
- Number and name of the services

3.2 About building conditions

- List of national regulations related to hygrothermal behavior and energy efficiency of the building.

- Geographic coordinates of the health center.
- Bioclimatic zone in which it is located and reference climatic data as established by the country's regulations.
- Building condition, regarding its conditions and thermal performance, transmittance of the protective structure, glazed surface.
- Summer thermal balance according to national regulations.
- Characterization of the building's energy efficiency according to the regulations of each country
- Building's orientation regarding sunshine.

3.3 On energy consumption

- Recognition and characterization of the energy sources used in the health facility.
- If the facility uses renewable energy, provide a description of the system and its use.
- Baseline generation of at least 3 years of total electricity consumption and gas consumption (in equivalent unit of energy).
- Generation of a baseline from another energy source if it is used (firewood, charcoal, etc.).
- Electric energy generated in the health facility (emergency generators) and fuel consumption for electric power generation in the health facility (in volumetric units and energy equivalent in kWh, MWh, etc.).
- Energy consumption of cooling and air conditioning equipment.
- Build energy consumption matrix (lighting, sanitary hot water, heating, air conditioning, others).
- Distribution of energy costs, electricity, gas, others.
- Construction of annual base indicators:

Total energy (electricity + gas + others) and indicators of total energy per unit of covered area, per bed, per health care worker, per employee, and per patient.

Total electrical energy and indicators of total electrical energy per unit of covered area, per bed, per health care worker, per employee, and per patient

Total gas [kWh or MWh] and indicators of total gas per unit of covered area, per bed, per health care worker, per employee, and per patient

CO₂ equivalent emissions due to total energy consumption, electricity consumption and gas consumption.

CO₂ equivalent emissions per patient, and per bed.

- Review of refrigerant gases used in cooling equipment:

CO₂ equivalent emissions from cooling gases used in cooling equipment.

Classification of refrigerant gases according to Montreal Protocol and the Kigali Amendment.

Indicator about the percentage of refrigerant gases that comply with the Montreal Protocol and the Kigali Amendment over the total refrigerant gases used in the facility.

3.4 On refrigeration and air conditioning equipment

- List national regulations that establish energy efficiency levels for refrigeration and air conditioning equipment.
- Inventory and characterization of air conditioning equipment.
- Efficiency level of the inventoried equipment.
- Useful life of the inventoried equipment.

3.5 Energy efficiency

- Regarding the inventory of refrigeration and air conditioning equipment, establish energy saving potential, specifying the methodology (exchange of equipment, maintenance measures, etc.).
- Describe if the health facility has personnel trained in energy efficiency and / or energy management.
- Describe if the health facility implements energy efficiency measures or has projects in this regard.
- Describe if the incorporation of an energy consumption monitoring system for refrigeration systems is technically feasible. What type of system and investment should be made in it.

4- Economic proposal

Interested parties should submit a work proposal specifying:

- Economic proposal.
- Plan and schedule of the project and delivery of reports.
- Equipment that will be used to carry out the audits.
- Details of the work team that will participate in the development of the audit, including name, surname, brief description of their professional career, and CV of the members.
- Background of works of similar scope.