

Standard EPC documents

II. Energy Audits

European Energy Service Initiative – EESI
IEE/08/581/SI2.528408

January 2011

Prepared by

SEVEN

***Disclaimer:** The sole responsibility for the content of this paper lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein.*

Supported by
INTELLIGENT ENERGY
EUROPE 

Energy Audits

1 Introduction

When preparing a project on energy savings in buildings and facilities, it is necessary to begin with determination of the initial situation of the facility. Based on such analysis (combination of) measures to improve the energy efficiency and effectiveness of the facility can be suggested. The final combination of measures that will be implemented depends mainly on the economic analysis of the suggested options.

Energy audit is one of the ways to carry out such initial analysis. Energy audit can also provide recommendation whether EPC is suitable for the respective facility. In the same time, if the customer decides to use EPC, energy audit cannot replace the in depth analysis, which an ESCO needs to carry out when implementing the measures under EPC. The reason is that the analysis carried out by the ESCO is very often more narrow than is usually the case in “regular” energy audits, and in the same time the analysis has to be much more thorough in the relevant areas.

Furthermore, if the energy audit has been prepared before the EPC, the ESCO may need to review all the data in the audit and may need to review other facts that may not have been included in the audit, but are necessary for the EPC.

With respect to EPC, the energy audit is therefore an important tool in the initial state of the project. However, if not carried out by the ESCO itself for the purposes of EPC (or by an external auditor, but with the view of the needs of EPC), it will always have to be complemented by further analyses.

2 Content of Energy Audits

Energy audit as a tool for evaluation of the existing levels of energy use and management in the facilities should contain:

- Identifying data
- Description of the initial situation
- Evaluation of the initial situation

The description of proposed measures is accompanied by calculation of the total amount of technically attainable energy savings. The selected option which is then recommended for realization should further contain

- Economic evaluation,
- Environmental evaluation.

Identifying data include:

- Identification of the client of the energy audit (including residence),
- Identification of the manager of the audited facility (if different from the client),
- Identification of the energy auditor,
- Identification of the subject under energy audit (company, business premises, facility or building).

Description of the initial situation of the audited subject should contain the following information:

- Subject of the energy audit (description, site plan, etc.),
- Energy inputs and outputs,
- Own energy sources,
- Energy distribution system,
- Appliances, which are significant from energy point of view.

To evaluate the initial situation a yearly energy balance of the audited subject is prepared on the basis of data acquired through surveys carried out in the facility.

Check of existing information on energy balance entails mainly:

- Fuel and energy inputs,
- Fuel stock changes,
- Sale of energy,
- Operational indicators of energy sources (energy efficiency, load factor, installed capacity, etc.),
- Energy losses in energy distribution,
- Energy consumption for heating and hot water preparation,
- Thermal characteristics of the buildings and their constructions,
- Energy consumption of technological processes,
- Energy consumption of other processes (ventilation, cooling, lighting).

The energy audit contains a description of specific measures to realize the calculated attainable energy savings potential. Each measure includes calculation of:

- The level of energy savings in technical units together with financial evaluation,
- The level of investment and operation costs,

- Simple pay-back time.

For each alternative solution, energy balance is calculated and compared to the initial energy balance. In economic evaluation, energy cost savings from the adapted energy balance are further corrected with change in other operational costs (or energy related revenues), salaries, maintenance services, repairs, and other.

Environmental evaluation in energy audit means quantification of environmental burden of the proposed alternatives.

Outputs of the energy audit are:

- Evaluation of the existing energy management system,
- Total amount of attainable energy savings (in technical units),
- Proposal of optimum combination of measures (including economic evaluation),
- Recommendation of the energy auditor for realization of energy efficiency project,
- Evaluation of use of renewable energy sources and Energy Performance Contracting for the specific audited subject (including economic evaluation).