

Interreg



EUROPEAN UNION

Sudoe



COLEOPTER

European Regional Development Fund

**E 1.5.1 -
METHODOLOGICAL
STEPS FOR THE
ENERGY AND
WATER AUDIT
APPLIED TO THE PILOT
BUILDINGS UNDER
STUDY AND
TRANSFERABLE TO
BUILDINGS WITH
SIMILAR ENERGY AND
WATER USES**

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AUTHORS: ADENE

CITATIONS: Methodology for energy-water nexus audit

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COLEOPTER PROJECT

The COLEOPTER (*COncertation LocalE pour l'Optimisation des Politiques Territoriales pour l'Energie Rurale*) project develops an integrated approach to the energy efficiency of public buildings that links technical, social and economic challenges. COLEOPTER addresses two energy efficiency challenges in buildings: difficulties for rural municipalities to act and carry out work despite the positive local impact (i.e., energy savings and local employment) and a lack of awareness of building challenges, which leads to irrational use of energy/water and low renovation rates.

The COLEOPTER approach has three components:

1. Territorial dialogue with local actors to co-construct work plans of public buildings.
2. Use of Building Information Modelling (BIM) as a collaborative tool to support the dialogue.
3. Consideration of water efficiency issues along with energy challenges to better consider usage.

The approach will be tested on four public buildings, three to be renovated (in Póvoa do Lanhoso, Portugal; Cartagena, Spain; and Creuse, France) and one new building (in Creuse, France). It will be replicated in Escaldes-Engordany (Andorra) to validate its transferability.

The main contributions of the project, namely the COLEOPTER approach and the work conducted on the test sites, will benefit municipalities, citizens and small and medium-sized enterprises (SMEs), leading to better planning of energy and water efficiency policies and increased public and private renovation rates.

The COLEOPTER project (SOE3/P3/F0951) is financed by the Interreg Sudoe Programme that supports regional development in Southern Europe, financing transnational projects through the European Regional Development Fund. The Programme promotes transnational cooperation to solve common problems in Southern Europe, such as low investment in research and development, weak competitiveness of small and medium-sized enterprises and exposure to climate change and environmental risks.

Project leader	Céline Seince – contact@rurener.eu
Axis 3	Low-carbon economy
Objective 4C1	Improving energy efficiency policies and the use of renewable energy sources in public buildings and housing through the implementation of networks and joint experimentation
Total eligible cost	1 454 944.07 €
ERDF Grant	1 091 208.06 €
Duration	36 months (01/10/2019–30/09/2022)

Partners

RURENER
Agência para a Energia (ADENE)
Asociación Empresarial Centro Tecnológico de la Energía y del Medio Ambiente de la Región de Murcia (CETENMA)
Universitat Politècnica de Catalunya (UPC)
Comunidade intermunicipal do Ave
Ayuntamiento de Cartagena
Município da Póvoa de Lanhoso
Syndicat Mixte Ferme est Creuse



SIMPLIFIED METHODOLOGICAL STEPS FOR ENERGY AND WATER AUDITING

BACKGROUND

Water-energy auditing is a form of assessing where the building or plant consumes these two resources so that opportunities to reduce these consumptions can be efficiently achieved. Auditing is an important instrument for building owners and managers to know how water and energy are being used in different processes, their impact on the costs of running the building, and what measures and investments are required to improve the efficiency of their usage.

This document responds to Activity 1.5, deliverable E 1.5.1 *Methodological steps for the energy and water audit in the pilot buildings and those with similar energy and water uses*. It presents the main and indispensable steps for energy and water auditing in a very simplified way. It is a complementary document, and as such, should be used in complement to the main document *Methodology for energy-water nexus audits in public administration buildings*.

AUDITING STEPS

1. DEFINITIONS <ul style="list-style-type: none">• Definition of objectives and client validation• Task definition• Resource definition• Audit plan	2. INFORMATION <ul style="list-style-type: none">• Preliminary information analysis• Identification of water usage equipment• Identification of energy conversion equipment• In situ inspection
3. FIELDWORK - DATA COLLECTION <ul style="list-style-type: none">• Checklist for data collection• Identification of parameters to be monitored• List of auditing equipment• Field work	4. ANALYSIS <ul style="list-style-type: none">• Inventory of collected information• Consumption calculation• Identification of water & energy savings
5. PROPOSALS <ul style="list-style-type: none">• Improvement measures• Technical economic study• Report	6. PLAN <ul style="list-style-type: none">• Action plan definition• Action plan monitoring

Summary representation of audit steps

1. DEFINITIONS

Parallel administrative procedure

- Licenses and permits
- Miscellaneous records and inventories
- Communication

Main Parameters

- Water (Mains and DHW)
- Energy (Electricity, Natural Gas / LPG and other energy sources)

2. INFORMATION

Preliminary conditions for the audit

- Analysis of preliminary information
 - ✓ Historic data on water and energy consumption (Invoices)
 - ✓ Installation maintenance records history
 - ✓ History of the records of upgrading works developed
- Architecture and schemes of principle
 - ✓ Plans
 - ✓ The architecture of water and energy networks (for example, Electrical diagrams)
- Support documentation for the installation of technical systems
- Pre-definition of the parameters and measurement points

Audit Preparation

- Confirmation of parameters and measurement points
- Setting the calendar
- Definition of resources
 - ✓ Human resources (team and hosts)
 - ✓ Technical means, identification of instruments/equipment
- Tests, calibration, tuning, and prior testing of instruments/equipment
- Preparation of the equipment characterization sheet
 - ✓ Technology
 - ✓ Quantities
 - ✓ Year of installation
 - ✓ Technical references
 - ✓ Area affected
 - ✓ Usage (number of users, the period of usage)

Visits to the installation to be audited

- Objectives
- Confront the previously collected data with the actual data
- Definition of consumption and measurement points

- Get to know the people and the building
- Validation of preliminary information
- Identification of the energy and water consumption equipment
- Identification of the technical rooms

3. FIELDWORK

In Situ Inspection

- Detailed verification of the components
- Filling of the previously prepared forms

Auditing - Facility instrumentation

- Placement of measuring instruments
- Data transmission system placement
- Parametrization and testing

Audit - Data collection

- On site collection
- Remote / online collection
- Collection of memory cartridges
- Testing of collected data

4. ANALYSIS OF COLLECTED DATA

Analysis

- Detailed analysis of the data collected
- Miscellaneous calculations
- Determination of savings
- Identification of improvement measures
- Feasibility study of the measures presented

5. PROPOSALS

Conclusions

- Preparation of recommendations
- Preparation of the final report

6. PLAN

- Action plan
- Monitoring plan