



Energy audits and analyses

Towards more economical energy use

IMPLEMENTING INSTRUMENTS OF ENERGY AUDIT PROGRAMME IN FINLAND

DEVELOPMENT AND IMPROVEMENT
OF THE ENERGY AUDIT PROGRAMME

MONITORING AND IMPACT ASSESSMENT
QUALITY CONTROL
ENERGY AUDIT MODELS AND OTHER TOOLS
QUALIFIED ENERGY AUDITORS
TRAINING OF ENERGY AUDITORS
PROMOTION AND MARKETING

ADMINISTRATION OF THE PROGRAMME
SUBSIDY POLICY
LEGISLATIVE FRAMEWORK

Energy audits and analyses

identify the most cost-effective areas for making savings, as well as concrete means of improving the efficiency of energy use and reducing costs.

They produce valuable information, helping to steer the operation towards continuously better energy efficiency. Prudent energy use takes the long-term impacts into account, it is responsible and financially profitable.



ENERGY AUDITS
AND ANALYSES

Produce information on the distribution of energy consumption based on measurements and calculations

Pinpoint the areas with potential for improved efficiency and saving in energy and water consumption

Present clear calculations on savings that are achievable and financially viable

Steer towards regular monitoring of energy use, which leads to sustainable savings

Guide technical staff in using equipment and systems in an energy-efficient way

Identify the opportunities for using renewable energy

Help to reduce carbon dioxide emissions created by the operation

RESPONSIBLE
ENERGY USE

Implementation of energy-saving measures reduces the carbon dioxide emissions that accelerate climate change. Appropriate and efficient energy use is part of the social responsibility of companies and communities.

The energy audits and analyses are thorough and comprehensive assessments of the energy and water usage of a building or a production process, as well as the feasible possibilities of making them more efficient.

The assessments are implemented in cooperation by an auditor and the client commissioning the audit. The result is reliable information on the distribution of energy consumption and ways of reducing energy use and the associated costs.

Tool for continuous improvement of energy efficiency

The Energy audits and analyses create the foundation for long-term and focused monitoring of energy consumption and taking active steps to improve energy efficiency. The company or community benefits from the energy efficiency activity accelerated by the energy audit and systematically aiming at improved performance.

Finland is operating a voluntary scheme of Energy Efficiency Agreements, which are in force 2008–2016. Companies and local

authorities that have joined agreements of various sectors carry out energy audits as part of the implementation of the agreements.

Valuable information that provides an impetus to action

The work results in a report provided for the client, containing the information on energy consumption and its distribution. The report includes suggestions on suitable measures and investments aiming to improve the efficiency of energy use. It also contains breakdowns of the energy-saving effects, costs and payback periods of the measures. When the energy audit or analysis is complete, the client decides on further actions based on the audit results and guides of the auditors.

Savings even without investments

The energy audits bring out the ways of reducing energy costs effectively.

In fact, investments are not always necessary to produce cost savings. For example, in the service sector roughly one-third of the measures identified in the audits can be imple-

mented purely by adjusting equipment and systems and by modifying practices.

Many investments repay themselves quickly as reduced energy costs, some as soon as during the first year.

Government supports energy efficiency

Government energy subsidies are available for carrying out energy audits and analyses. It is also possible to apply for grants for implementing measures suggested by them. Discretionary subsidies for energy-efficiency investments applying standard technology are only awarded to companies and municipal authorities that have joined Energy Efficiency Agreements.

The government is particularly willing to provide financial support for introduction of new technology. 'New technology' refers to technical and other solutions that have not previously been applied in Finland on a commercial scale.

ENERGY AUDIT AND
ANALYSIS MODELS

- Service sector
- Building Energy Inspection
 - Building Energy Audit
 - Post-acceptance Energy Audit
 - Follow-up Energy Audit

- Industry
- Industrial Energy Audit
 - Industrial Energy Analysis
 - Process Industry Energy Analysis

- Energy sector
- Power Plant Energy Analysis
 - District Heating Energy Audit

- Other
- Renewable Energy Municipal Audit
 - Energy Audit for the Logistic Chain

Audit models for various sectors' needs

Energy audits and analyses may be implemented in many kinds of organisations. The service, industrial and energy sectors each have their own energy audit models, specifically developed for each sector.

The Energy Inspection is suitable for energy auditing of small service sector buildings. The Building Energy Audit is designed for service buildings equipped with standard or advanced technology. The Post-acceptance Energy Audit on a property is utilised to optimise the energy use of new buildings or ones where the technical systems have been updated. To check the energy economy of previously audited properties, the Follow-up Energy Audit is carried out.

The Industrial Energy Audit is used to ascertain the energy efficiency of industrial buildings and factory service systems. For more extensive assessments, the Industrial Energy Analysis was developed, focusing on improving the energy efficiency of the production process, as well as factory service

systems and building service technology. The Process Industry Energy Analysis is a two-phase application based on the Industrial Energy Analysis, developed specifically for energy-intensive process industry.

The potential for improving the efficiency of energy generation in power plants is assessed with the help of the Power Plant Energy Analysis. The District Heating Energy Audit lends itself to ascertaining the energy efficiency of district heating production, transmission and distribution.

The Renewable Energy Municipal Audit seeks to identify alternatives of replacing fossil fuels with renewable energy that are financially viable in regional terms. It reduces the carbon dioxide emissions of the municipal authority or area under audit and boosts the production and use of renewable forms of energy.

The energy efficiency of the commercial logistics can be comprehensively scrutinised using the Energy Audit for the Logistic Chain. The aim of the method is to reduce the energy consumption, costs and carbon dioxide emis-

sions of the entire transport chain and to improve the logistics.

Guides for energy efficiency improvement

Motiva, in collaboration with experts in the field, has developed guidelines for assessment of the energy efficiency of compressed air and refrigeration systems. The Refrigeration Technology Analysis (KYTE) was developed for the needs of industry and the retail sector. The Compressed Air Analysis (PATE) can be utilised in all energy audits. It also lends itself to being used as a complementary analysis for the process industry, focusing specifically on compressed air.

Auditing requires professional qualifications

Energy audits and analyses are always carried out with full consideration of the client's special features and needs. In their work, the qualified energy auditors concentrate on identifying the most important and financially viable efficiency measures to reduce energy

consumption. Particular attention is paid to key equipment and systems with the most significant energy costs. Due to their expertise, qualified energy auditors are able to assess the feasibility of the measures and to illustrate the suggested measures in sufficient detail to set further actions into motion.

Qualified Energy Auditor – energy efficiency professional

Qualified energy auditors are professionals in energy, mechanical and electrical engineering, who have successfully passed the Motiva energy auditor training course. The qualification allows them to take charge of energy audits and analyses subsidised by the Ministry of Employment and the Economy. More than 1,500 Qualified Energy Auditors have been trained in Finland.

Motiva maintains a register of companies that have filed approved reports on audits. Consideration of the special needs of each audit site and selection of qualified auditors are the preconditions for a successful energy audit.

ENERGY AUDITING - STEP BY STEP

1. Selection of auditing object and budgeting
- Client becomes interested in potential for more efficient energy use.
 - Client obtains information on energy audits and analyses e.g. Motiva's website.
 - Client defines the possible focal points of the audit.
 - Client considers beforehand ways of utilising the results of energy audit or analysis as a tool for continuously improving energy efficiency.

2. Auditing organization
- Client prepares a call for tender with as much detail as possible on its operation and needs, followed by a tendering procedure between qualified auditing companies of its choice.
 - Client selects a company to carry out an energy audit or analysis. A pre-condition for an energy subsidy is nomination of two responsible auditors qualified by Motiva.

3. Applying for an audit subsidy
- Client submits the subsidy application to the local energy authority (Centre for Economic Development, Transport and the Environment, ELY Centre).
 - Client awaits subsidy decision.
 - Client starts the auditing project.

4. Starting energy audits
- Qualified energy auditors and client agree on the details, focal areas and scheduling of the audit.
 - Client provides the necessary data for the auditor's use.

5. Auditing fieldwork
- Qualified energy auditors examine the systems and equipment expending heating, fuel, power and water.
 - Auditors interview technical personnel and users of the premises.
 - Auditors analyse the current status of energy use and the potential for savings based on the starting data, measurements, interviews and calculations.
 - Auditors analyse the possibilities of using and increasing renewable energy forms.

6. Audit reports
- Qualified energy auditors prepare an audit report, clearly illustrating the distribution of energy use on the site, suggestions for actions, savings potentials with economical calculations.
 - Qualified energy auditors present the results and suggestions for action measures to client. Client considers feasibility of measures and makes decisions on further actions.

7. Energy audit subsidy payment
- Client submits the clearance documentation for the energy audit subsidy payment, client's quality control form, and the completed report with appendices to the ELY Centre.
 - The ELY Centre pays the subsidy to the client.

8. Implementation of saving measures
- Client implements the suggested measures in accordance with its schedule.
 - Client utilises energy audit results as an instrument of energy management.
 - Client adopts energy efficiency as a standard practice and endeavours constantly to improve it.



FINNISH ENERGY AUDIT PROGRAMME PARTIES

Ministry of Employment and the Economy

- promotes and develops energy audit and analysis activity in cooperation with experts in the field, Motiva, clients and energy auditors
- provides support for carrying out energy audits and analyses and implementation of measures suggested in them

Motiva Oy

- promotes and develops energy audit and analysis activity in cooperation with the ministries, experts in the field, clients and auditors
- gives training courses and recognizes qualifications for Qualified Energy Auditors
 - provides advisory services for energy audit and analysis clients and auditors
- fosters and monitors the quality of energy audit activity
 - monitors the results

Centre for Economic Development, Transport and the Environment (ELY Centre)

- provide advice in matters related to energy subsidies
- receive applications for energy audit and analysis subsidies and clearances for payment
- make decisions on awarding energy subsidies

www.motiva.fi/energyauditing