

D.2.3 Analysis of existing framework conditions

WP2, T2.3

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Project Summary

The INNOVEAS project is an initiative promoted by 10 partners from 6 EU countries, to build and deliver a capacity building programme, aiming at addressing the major non-technical barriers that most often hamper the adoption the energy auditing practice, in particular among those actors, such as SMEs where such audits are not required by law.

The ultimate goal is to consolidate a structured, permanent and expandable offer to help develop continuous self-sustainable services to raise awareness and build capacity in the field of energy auditing and related energy saving measures in SMEs.

The project therefore aims at designing and deploying staff trainings and capacity building programmes to enhance corporate policy towards energy efficiency, energy culture (motivations, behaviour change, mitigation of perceived risks and barriers) and sustainable supply-chain initiatives. It therefore intends to:

- Advanced analysis of behavioural barriers to energy audits, to identify and analyse the enabling conditions and non-technical barriers hindering the adoption of energy auditing practice;
- Delivery of self-sustainable capacity building programmes, in order to systematise awareness raising procedures to overcome the psychological and organisational barriers to energy audits in SMEs, deliver a training offer to SMEs and formulate a capacity building programme targeting stakeholders such as intermediaries, policy makers and financing institutes;
- Create an institutional structure to sustain the project's objectives and results and lay the basis for the creation and consolidation of a pan-European network of enablers likely to support in the coming years the growth and expansion of the training offer to on energy efficiency for European business.

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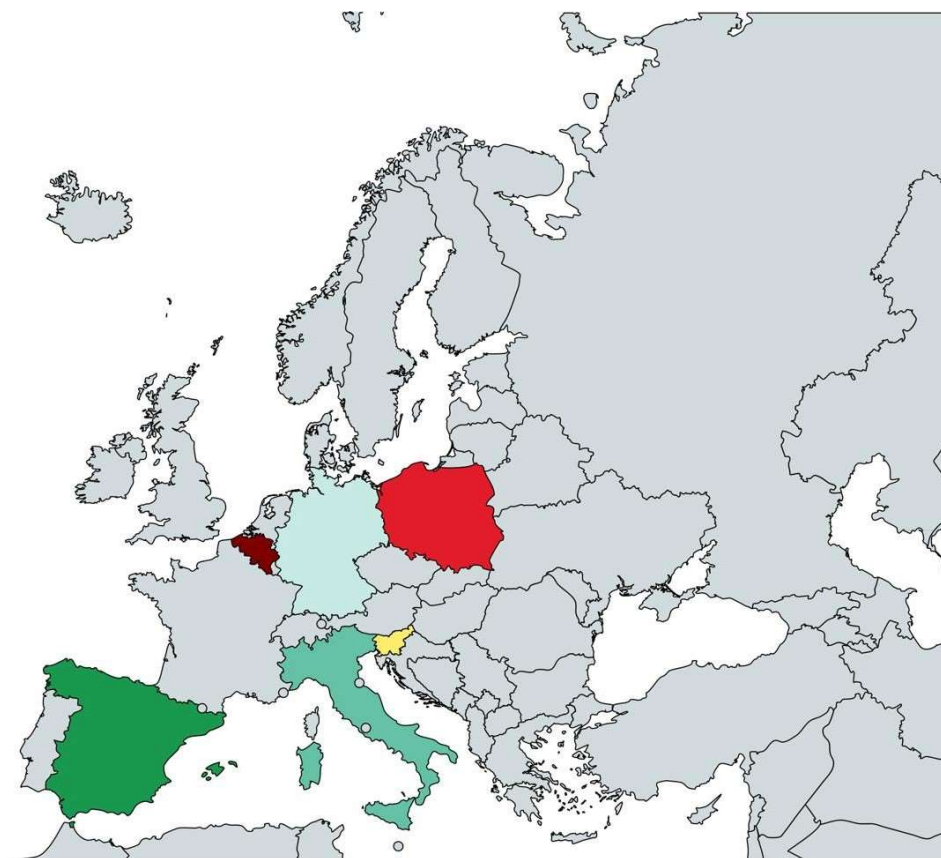




Partners

innoveas partners

- IIPLE, CBG, K&I
- A3E
- CKA
- LEAG
- NAPE
- UTBW, JER, ESCI



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Description of work package

- In the framework of the project, the WP2 on “State of the art, needs and barriers assessment”, to be implemented from June 2019 to February 2020, is devoted to carrying out an analysis of:
 -
 - The current attitude towards energy efficiency and the perception of energy audits as an instrument to abate costs
 - The non-technical barriers that hinder the diffusion of energy audits as a common praxis in SMEs in the participating countries, and
 - The existing regulatory and financial conditions that influence the use of energy audits and the uptake of energy-saving measures.
 - For attaining these objectives, WP2 develops through three tasks:
 -
 - An analysis of the current state of the art of energy culture in SMEs in the participating countries, entailing, among others, the attitudes of involved actors about energy audits implementation (T2.1)
 - An analysis of the state of the art in EU countries (taking specifically into account the partners’ countries, i.e., Germany, Italy, Poland, Belgium, Spain and Slovenia) regarding the existing non-technical barriers, that hinder the use of energy audit to uptake energy- saving measures (T2.2) and
 - An analysis of the state of the art for what concerns external factors that are currently in place at EU level and which aim at encouraging the adoption of energy-saving measures in SMEs (T2.3).
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Description of task

The Task 2.3 consists of monitoring the reception of the 2012 Energy Efficiency Directive a national level and analysing other existing incentives for SMEs.

The task is devoted to an analysis of the state of the art for what concerns external factors that are currently in place at EU level and which aim at encouraging the adoption of energy saving measures in SMEs. The task will therefore aim at monitoring the reception of the 2012 Energy Efficiency Directive at national level and analysing other existing incentives for SMEs.

Since there are numerous support programmes for energy efficiency measures and the actual aim is to propagate the energy audit, we would like to focus the questionnaire mainly on the external conditions for the use of energy audit or energy management systems for energy efficiency in SMEs.





Description of deliverable

This Deliverable shows the current situation of the implementation of the European Energy Efficiency Directive in the selected individual European countries (Germany, Italy, Poland, Belgium, Spain and Slovenia).

Chapter 1 "Executive Summary" provides an overview of the main content of the document. In Chapter 2 an overview of the possible management systems which serve to fulfil the objectives of the EU Directive (EED) is given. A classification of the legal framework is also included in this chapter. As the focus of this task is on Article 8 of the EU Directive, it will be examined in more detail.

A short description of the methods is described in chapter 3. For this purpose, a questionnaire was developed which was sent to the project partners. The questions can also be found in chapter 3.

Chapter 4 shows the results of the questionnaire. Here, each of the selected countries describes which set of instruments of energy audits is currently implemented in its country. It also shows where external hurdles still exist and why companies are still struggling to implement energy audits.

Chapter 5 "Conclusions" shows identified gaps for example legal hurdles, or missing offers for companies in the respective countries. Ideas for training can be derived from this.





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1. Executive summary

The Energy Efficiency Directive EED (Directive 2012/27/EU) is intended to help reduce dependence on energy imports and scarce energy resources, halt climate change and overcome the economic crisis. Energy efficiency is considered as an important tool to address these challenges.

As a European directive, the EED is a legal instrument that requests the implementation of its requirements into national law by the EU Member States.

The EED covers a large variety of approaches and measures to achieve these aims.

Focus in this deliverable is the current implementation status of energy audits and energy management systems (Article 8 of EED) in the selected individual European countries (Germany, Italy, Poland, Belgium, Spain and Slovenia).

An Energy Audit generally includes an analysis of energy consumption and a potential analysis. In contrast, the systematic introduction of an energy management system enables a sustainable and continuous improvement of energy efficiency in the company.

In task 2.3 a monitoring of the reception of Article 8 of the 2012 Energy Efficiency Directive at national level has occurred. Therefore, a questionnaire, which is replied by the respective partner countries, was developed. Within this, it is asked what external factors exist at EU level to motivate SMEs for energy audits and what incentives for SMEs do exist.

The aim is to identify legal gaps or obstacles, to analyse the state of implementation and acceptance of incentive programmes used by SMEs, and to derive training needs for SMEs.

The results of the questionnaire show that all of the selected individual European countries have, in addition to the requirements, voluntary agreements and many instruments that promote the implementation of energy audits and energy management systems in companies. Various Member States use a mix of policies to address SMEs, for example funding programs, networks for companies or guidelines for the implementation of energy audits.

With regard to funding programmes in particular, there are currently still some hurdles in almost all partner countries. Several reasons like high bureaucratic burden, intransparency of programmes, large regional differences and many other reasons were named.

Relating to these hurdles, a training concept should be developed to address these aspects. On the one hand, these can be set up as stakeholder dialogues. This refers to structured discussions between company representatives and stakeholders to determine the constellation of interests of the concerned parties. On the other hand, these can also be workshops in SMEs, which inform companies about existing programmes and how to apply them. These are the steps for the next task.





2. Principles of Energy Audits and Energy Management Systems

2.1. Directives of the European Union

Within the framework of an energy management system, companies are called upon to inform themselves about the energy law provisions applicable to them and to assess these for the necessity of their application in their company.

At European level, the following guidelines need to be considered:

- Internal Energy Market Package
- Energy Tax Directive¹
- Renewable Energy Directive²
- EU Building Directive³
- Energy Efficiency Directive⁴

In task 2.3 we deal with the implementation of the Energy Efficiency Directive (EED) in particular Article 8. A short description of the EED is given in chapter 2.1.1.

2.1.1. Energy Efficiency Directive (EED)

The Energy Efficiency Directive, or part of its predecessors 2004/8/EC and EDL Directive 2006/32/EC, aims, according to Article 1(1) of the Energy Efficiency Directive, to establish a common framework for energy efficiency measures in the Union "to ensure that the Union's overall energy efficiency target of 20 % by 2020 is achieved" and "to prepare for further energy efficiency improvements thereafter".

This will be done through rules set out in the Energy Efficiency Directive to remove "barriers in the energy market and market failures that hinder efficiency in energy supply and use".

¹ Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

² Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

³ Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

⁴ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.





The setting of "indicative national energy efficiency targets for 2020" is an important part of implementing the requirements of the European Energy Efficiency Directive, whereby the requirements of the Directive are to be minimum requirements and the Union Member States are not to be prevented from "maintaining or adopting more stringent measures", provided that these measures are compatible with Union law (Article 2 (1) of the Energy Efficiency Directive).

Objectives of the Energy Efficiency Directive

The main objectives are:

- to set national energy efficiency targets for 2020
- a 3 percent annual renovation rate for central government buildings
- obligatory energy savings by Member States of 1.5 percent per year on average over the period 2014 to 2020
- mandatory implementation of regular energy audits in large companies
- combined heat and power: mandatory implementation of a cost-benefit analysis for new construction or modernization of power stations and industrial plants

The Energy Efficiency Directive is therefore intended to produce several effects:

- reduction of energy costs through less consumption
- improving security of supply by reducing and diversifying energy imports
- economic stimulus through investment
- climate protection through reduced consumption and increased efficiency.

As a European directive, the EED is a legal instrument that requires the implementation of its requirements into national law by the member states. The Member States have a certain amount of leeway in national implementation, provided that national implementation meets the minimum requirements of the Directive. The implementation of the EED including Article 8 by the Member States was required by 5 June 2014.

The EED covers a large variety of approaches and measures to achieve these aims. In its Article 8, it addresses the requirements and promotion of energy audits and energy management systems.⁵

⁵ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.





Amendment

New rules for energy efficiency will apply in Europe in the future: The amended Energy Efficiency Directive (European Energy Directive, or EED for short) was published in the official EU Official Journal on 21 December 2018 and came into force on 25 December 2018. The member states now have until 25 October 2020 to transpose the EED requirements into national law. The overall objective of the directive is to reduce energy consumption in the EU by 32.5 percent by 2030 compared to the consumption forecast in 2007. In addition, the member states have committed themselves to annual savings of 0.8 percent. "An important factor for energy efficiency in buildings is the consumption behavior of residents: In the future, they should be able to understand much better how their behavior affects energy costs."⁶

2.1.2 Energy Audits and Energy Management Systems according to Article 8 of the EED

In 2012, the European Commission stipulated in Article 8 of the Energy Efficiency Directive (EED) that all 28 member states of the European Union must implement mandatory energy audits for large companies into national law by June 5, 2014. The companies concerned are to conduct an energy audit by 5 December 2015 and repeat it every four years in future.

Alternatively, the companies can introduce an energy management system. In addition, the directive stipulates that member states must encourage SMEs to implement energy audits and introduce energy management systems.

The Directive offers Member States some leeway for the national implementation of these requirements. According to a study by Dr. Simon Hirzel, this has led to a situation where the basic principles of implementation in the Member States are quite similar, but important aspects have been designed differently.

Dr. Simon Hirzel, lead author of the study, explains: "Certain requirements for an energy audit are handled differently in the countries, for example the proportion of energy consumption covered or the inclusion of consumption for transport or buildings."⁷

⁶ Minol (2020). Energy efficiency directive adopted: Europe switches to remote reading and monthly consumption information. Available at: <https://www.minol.de/presse/energieeffizienz-richtlinie-verabschiedet-europa-stellt-auf-fernablesung-und-monatliche-verbrauchsinformationen-um.html>

⁷ Hirzel, S., Nabitz, L., Wohlfarth, K., Rohde, C., Behling, I., Clarke, D., Perera, N., Turner, R. (2016). A study on energy efficiency in enterprises: energy audits and energy management systems. European Commission Report.





2.1.3 Definition “Energy Audit” and “Energy Management System”

With the help of an **energy management system**, energy saving potentials are identified and raised. First of all, energy flows in the company and the associated energy sources are recorded and analyzed. Based on this, ideas for improvement are developed, evaluated for economic efficiency and then implemented. In this way, energy management helps in the decision to invest in energy efficiency.

An **energy audit** generally includes an analysis of energy consumption and a potential analysis. In contrast, the systematic introduction of an energy management system enables a sustainable and continuous improvement of energy efficiency in the company.⁸

The implementation of the energy audit or an energy management system and the resulting report with recommendations for efficiency measures are based on the following standards:

- EN ISO 50001 (energy management system)
- EN ISO 50002 (energy audit)
- EN 16247 (energy audit)

Or the issue of energy efficiency is dealt with in the context of an Eco-Audit in accordance with the following standards

- ISO 14001 (management system)
- EMAS (management system)

For further investigation we should focus on energy audits that meet the above standards and consider other approaches only marginally.

2.2.1. Benefits of Energy Management Systems and Energy Audits

In principle, energy management or energy audit is a suitable instrument for systematically anchoring the reduction of energy consumption and thus of energy costs in the company on a long-term basis. It sets the structural framework for the continuous implementation of holistic energy efficiency measures in the company. The aim of energy management is to optimize the use of energy in a company both economically and ecologically, from energy purchasing to energy consumption. Energy management aims to improve the energy efficiency of processes, plants and equipment in order to reduce costs, energy consumption

⁸ Federal Environment Agency (2020). Energy management with system. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/energiemanagement-system#wie-funktioniert-ein-energiemanagement>





and CO₂ emissions. It comprises the sum of all measures that are planned and implemented in order to ensure minimum energy use for the required benefit.⁹

2.2.2. ISO 50001

With the ISO 50001 standard published in 2011, an international standard for an energy management system was created. ISO 50001 is a management system standard. It is not sector-specific and can be applied by a wide range of organizations, from small and medium-sized enterprises to large companies or public authorities. The standard sets a framework within which individual commitment of the company or organization is required. It is the responsibility of each company to tailor and implement the requirements formulated in ISO 50001 to its own needs in an appropriate manner.

Amendment of ISO 50001

In 2018, the amended version of ISO 50001 was published, focusing on adapting the standard to the uniform basic structure for ISO management system standards (so-called "High-Level Structure" - HLS). ISO 50001 now follows the same structure as the quality management standard ISO 9001, the environmental management standard ISO 14001, which is also part of EMAS, and the standard ISO 45001 for occupational health and safety management. Basic definitions and generally applicable texts have also been harmonized with the other management system standards as part of the amendment. As a result, the various management systems can be better linked with each other.

In addition to numerous detailed changes, the amended ISO 50001:2018 now places greater emphasis on the responsibility of the top management of an organization for effective energy management and provides for better integration of energy issues into strategic management processes. As in other management systems, ISO 50001 requires that companies and organizations take a closer look at their environment. This includes identifying relevant internal and external issues that may have an impact on energy management and understanding the needs and expectations of stakeholders. The resulting risks and opportunities for energy management must also now be considered.

UBA/BMU Guide to the Application of ISO 50001

Special attention is paid to companies that are already legally obliged to carry out an energy audit. For these companies it will be shown which steps are necessary to achieve an energy management system that meets the requirements of ISO 50001:2018. The guide also addresses companies that already operate an energy management system and need to convert it to the amended standard, in which it takes up the innovations and makes them visible. For companies with little experience in energy management, the guide contains good arguments and a "trial run". This enables smaller companies in particular to check whether an energy management system is worthwhile for them with a manageable amount of effort. Many practical examples and tips show how efficiency potentials can be identified,

⁹ Federal Office of Economics and Export Control (2020). Energy audit. Available at: https://www.bafa.de/DE/Energie/Energieeffizienz/Energieaudit/energieaudit_node.html





evaluated and implemented and how the associated cost savings can be realized. Last but not least, the guide also gives advice to companies and organizations that want to take into account other environmental aspects such as water, materials or greenhouse gas emissions in addition to energy with the help of an EMAS environmental management system.

Development of ISO 50001 worldwide

Since the publication of ISO 50001 in December 2011, the number of certifications has grown steadily throughout the world. Although the increase varies widely across the continents. The reason for this is, for example, the linking of an ISO 50001 certificate as proof of compliance with legal obligations and/or the right to tax refunds. This has led to a comparatively disproportionate increase in certifications in Germany.^{10,11}





2.2.3. ISO 50002

On 1 July 2014, ISO 50002 was published with the title "Energy audits - Requirements with guidance for use".

This standard is very similar to EN 16247-1.

In both standards many sections are the same - be it the general structure, the procedure of an audit or basic definitions. ISO 50002 is based on the older European EN 16247-1.

Implementation and qualification requirements:

ISO 50002 sets out its requirements for energy audits and energy auditors more clearly than DIN EN 16247-1. Many questions must be clarified by the auditor and the client at the beginning of the audit: These include the respective roles, responsibilities and authorities.

These include the respective roles, responsibilities and authorities. This also includes companies appointing a permanent contact person for the auditor before the planning phase.

With regard to the qualification of the auditor, the ISO standard states: "Anyone who is not familiar with the energy uses audited, does not know the important regulations and standards and has no technical skills in the relevant areas may not carry out energy audits.

Measurement plan according to ISO 50002

A new section 5.5 of ISO 50002 provides concrete specifications for measuring equipment and measuring methods. The following information must be recorded in a "measurement plan":

- a list of the existing measuring points and measuring equipment
- possible further measuring points, suitable measuring equipment and the feasibility of the equipment
- Requirements for accuracy and reliability of measurements
- Duration and frequency of measurements
- the frequency of recording the measurement results
- appropriate periods of time for temporary measurements
- data to be provided by the audited organization, e.g. production quantities or other parameters
- Responsibilities for carrying out the measurements

Compared to the European standard, the requirements for documentation and verification of measurements are also broader.^{12,13}

¹⁰ Federal Environment Agency (2020). Energy management with system. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/energiemanagement-system#wie-funktioniert-ein-energiemanagement>

¹¹ ISO 50001:2018-08. Energy management systems - Requirements with guidance for use. Beuth-Verlag.





2.2.4. EN 16247

The DIN EN 16247 is a European standard that specifies requirements for good quality energy audits. Part 1 "General requirements" was published in June 2012, in October 2012 also as DIN standard DIN EN 16247-1. Since 2014 all five parts have been published:

- EN 16247 - Part 1: General requirements
- EN 16247 - Part 2: Buildings
- EN 16247 - Part 3: Processes
- EN 16247 - Part 4: Transport
- EN 16247 - Part 5: Competence of energy auditors

The standard EN 16247-1:2012 defines requirements for an audit itself, but also for the responsibilities within the audit process. The aim of the standard is to bring more clarity and transparency to the market of service offerings for the performance of energy audits in the commercial, industrial and public sectors.

It contains general requirements, methods and results of energy audits:

- Terms:
By defining essential terms, a uniform understanding of the requirements is to be ensured. The definitions of adjustment factor and energy audit are particularly important.
- Requirements for the quality of energy audits:
This requirement contains above all regulations on the qualification and objectivity of the energy auditor and on secrecy regulations.
- Requirements for the audit process:
These essentially consist of three areas: Requirements regarding the initial contact, Requirements concerning the information duties of the energy auditor, Staff involved in the energy audit.
- Requirements for the kick-off meeting:
The energy auditor, but also the company to be audited, have the opportunity in the kick-off meeting to formulate goals and expectations of the energy audit again and to specify the final procedure.
- Requirements for the data collection:
In order to carry out a meaningful energy audit, a wide range of information must be obtained and evaluated. The result of the energy audit depends decisively on the available information basis.
- Performance of the energy audit on site in the company (field work):
The aim of the field work is to give the energy auditor an authentic overview of the company or system to be evaluated. From the knowledge gained in this way, the current procedure can be questioned and suggestions for optimization can be developed.
- Requirements for the analysis:
The energy auditor condenses the information provided and the knowledge gained during the on-site visit and produces a comprehensive evaluation and analysis of the data.





- Reporting requirements:
The energy audit is concluded with a results report and, if necessary, with a presentation of the results. During a final meeting, the results are presented, the report is handed over and any questions arising are answered.
- Special requirements:
e.g. for carrying out energy audits in industrial processes, will be added in separate parts and will supplement the general requirements in the future.
^{14,15}

¹² Weka Media GmbH & Co. KG (2017). Differences in energy audits according to ISO 50002 and DIN EN 16247-

2. Available at: <https://www.weka.de/energie/iso-50002/>

¹³ ISO 50002:2014. Energy audits – Requirements with guidance for use. Beuth-Verlag.

¹⁴ Weka Media GmbH & Co. KG (2020). Energy management and energy efficiency: The information portal on energy in companies. Available at: <https://www.energiemanagement-und-energieeffizienz.de/energie-lexikon/din-en-16247-12012/>.

¹⁵ EN 16247-1:2012-10. Energy audits - Part 1: General requirements; German version EN 16247-1:2012. Beuth- Verlag.





2.2.5. ISO 14001

Contents of ISO 14001

The international standard specifies requirements for an environmental management system that enables an organization to improve its environmental performance, meet legal and other obligations and achieve environmental objectives. The key elements of ISO 14001 are:

- Planning: the establishment of environmental objectives and targets and the corresponding measures, responsibilities and procedures
- Implementation: implementation of the measures and procedures established
- Control: review of responsibilities, procedures and actions in relation to the organization's environmental objectives and policy
- Improvement: adaptation of responsibilities, procedures and measures and, where appropriate, of environmental objectives and guidelines

ISO 14001 is applicable to organizations of all types and sizes and to different geographical, cultural, social or environmental conditions. However, it does not set absolute requirements for environmental performance. For example, two organizations that carry out similar activities but have different environmental performance may still both meet the requirements of ISO 14001.

Global application of ISO 14001

Around 300,000 companies and organizations of all sizes and in all sectors - from small service providers to large industrial companies and government agencies - are certified to ISO 14001 worldwide. The European EMAS Regulation (Eco-Management and Audit Scheme) contains the contents of ISO 14001 at a central point. For this reason, the EMAS registration certificate also confirms compliance with ISO 14001.

Development of ISO 14001

The standard was first published in 1996. The first revision of the standard was adopted in June 2000. The main objectives were to achieve greater compatibility with the ISO 9001 quality management standard and to eliminate any ambiguities. In this context, UBA and BMU commissioned an evaluation of the German experience with the standard to determine a German position within the revision process. The experiences and wishes of German companies, organizations and bodies that apply ISO 14001 or have been certified to ISO 14001 are reflected in the study by UBA and BMU.

International negotiations on the second revision of ISO 14001 began in February 2012, and the following key issues were discussed during the revision process:

- Environmental management systems as a component of sustainable development and social responsibility against the background of ISO 26000
- Environmental management systems for increasing/improving environmental performance and an associated environmental performance evaluation based on key indicators





- environmental management systems and compliance with applicable legal requirements and other external regulations
- Environmental management systems and their integration into the overall strategic corporate management
- Environmental management systems and the environmental impacts within the value and supply chain
- Environmental management systems and the involvement of stakeholders, for example customers and suppliers
- Environmental management systems and external communication

In September 2015 the amended version of the ISO standard was published. New version of ISO 14001

Many of the topics discussed in the revision process have been incorporated into the revised version of ISO 14001. The main new features are:

- Introduction of the uniform basic structure for ISO management system standards, (so-called "high-level structure")
- Strengthening of management responsibility for environmental management and integration into the organization's business processes
- greater emphasis on environmental performance improvement and its measurement through appropriate indicators
- Conducting a contextual analysis to identify overarching issues and developments relevant to the organization and its environmental management system, including the extent to which the environment may affect the organization (e.g. through climate change or overuse of natural resources)
- Analysis of stakeholders to determine and take into account their expectations and requirements
- Identify and consider the risks and opportunities that may be associated with significant environmental aspects, binding commitments and other issues and requirements
- increased consideration of the life cycle, i.e. the upstream and downstream environmental impacts, whereby the preparation of comprehensive life cycle assessments is not a requirement

The amended standard has been in force since its publication on 15.09.2015. Certified companies and other organizations have been granted a transitional period of three years to change over to the new standard. ^{16,17}

¹⁶ Federal Environment Agency (2020). ISO 14001 - Environmental management system standard. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/iso-14001-umweltmanagementsystemnorm#neue-fassung-der-iso-14001>

¹⁷ EN ISO 14001:2015-11. Environmental management systems - Requirements with guidance for use (ISO 14001:2015). Beuth-Verlag.





2.2.6. EMAS (EU 1221/2009)

The Eco-Management and Audit Scheme (EMAS), also known as the EU Eco-Management and Audit Scheme or Eco-Audit, was developed by the European Union and is a Community eco-management and audit scheme for organizations that want to improve their environmental performance. The EMAS Regulation (Eco-Management and Audit Scheme) assigns a crucial role to the self-responsibility of business in managing its direct and indirect environmental impacts. Companies, service providers, administrations etc. can be certified, but also other types of organizations, including supranational organizations.

EMAS is one of the so-called New Environmental Policy Instruments (NEPI)

In consultation with the Member States, the EU Commission has revised the reporting requirements in accordance with Annex IV of the EMAS Regulation. With the current changes, EMAS organizations have more options for presenting environmental performance. Significant indirect environmental aspects and impacts must now be reported more extensively. The use of the EMAS environmental statement e.g. for other reporting obligations is also made easier.¹⁸

2.2.7. Differences between Audits and Management systems

Difference between EN 16247 and ISO 50001

An energy audit generally includes an analysis of energy consumption and a potential analysis. However, EN 16247-1 is not a management system standard, as management system structures such as those of ISO 50001 are not applicable and the audit therefore does not constitute certification. An energy audit is suitable for systematically uncovering and evaluating energy saving potentials. It shows the company the actual state of the energy situation, but does not support the continuous improvement process.

In contrast, the systematic introduction of an energy management system in accordance with ISO 50001 enables a sustainable and continuous improvement of energy efficiency in the company. Savings potentials are not only identified, as is the case with an energy audit, but implemented step by step. Nevertheless, it cannot be said in general terms that the introduction of an energy management system is the optimal recommendation for action in every respect. All advantages and disadvantages resulting from it should be weighed against each other.¹⁹

¹⁸ Council Regulation (EEC) No 1836/93 of 29 June 1993 allowing voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme.

¹⁹ Brumme M. (2015). Energy audit obligation: DIN EN 16247-1 versus ISO 50001 Energy audit or energy management system - Where is the key to success? Available at: <https://www.ib-brumme.de/2015/10/08/energieaudit-pflicht-din-en-16247-1-versus-iso-50001/>





Difference between EMAS and ISO 14001

In contrast to the EMAS Regulation, which is only valid in Europe, ISO 14001 is valid worldwide. The main difference is above all that public authorities are not involved in the certification process and that ISO 14001 does not require any obligation to inform the public. The conformity of an environmental management system with ISO 14001 can be determined by certification

Additional requirements of EMAS to ISO 14001:

- Environmental assessment: first comprehensive examination of the current state of affairs in connection with activities, products and services Proof of compliance with applicable legislation and permits
- Continuous improvement of environmental performance
- Employee participation through involvement in the process of continuous improvement and information of employees
- External communication with the public, interested parties, customers, etc.
- Regular provision of environmental information (environmental statement).

Lack of international acceptance of EMAS:

The international standard ISO 14001 is recognized worldwide and was applied by 285,844 companies and organizations worldwide in 2012. [12] EMAS has also been internationally applicable since the amendment in 2009 (EMAS III), [13] but with 10,447 registered sites of 3,341 companies and organizations it is far behind the number of ISO 14001 users.

Substitution by ISO 14001:

Particularly during the introduction phase of environmental management systems (EMS), the additional expense of EMAS has been an obstacle for most companies and organizations, so that EMAS and ISO 14001 were inevitably understood as substitutes. It turns out, however, that these two environmental management systems will increasingly be used in a complementary manner in the future. EMAS is increasingly seen as the "premium standard" of EMSs and is mainly used for self-initiated improvement of environmental performance.

ISO 14001, on the other hand, serves primarily to satisfy external demands. However, this development places a comparison of the two EMSs in a different context.²⁰

²⁰ Vorest AG (2020): Differences between EMAS and ISO 14001 Environmental management: The right system for your company. Available at: https://umweltmanagement.me/umweltmanagement_iso_14001/unterschiede_emas_iso_14001_umweltmanagement/





3. Methodological framework

Questionnaire about existing legislative and financial conditions

In this task a questionnaire was developed. The questionnaire is sent to all selected individual European countries (Germany, Italy, Poland, Belgium, Spain and Slovenia).

The partners from the respective countries answered the questionnaire and returned it to Umwelttechnik BW GmbH.

The following questions were asked: Legislative framework for energy audits

- a. What are the national regulations concerning energy audits?
- b. Have all rules of Energy Efficiency Directive, in particular Article 8, already been transposed into national legislation?
- c. What are the differences in the implementation of the energy audit between SMEs and non-SMEs?
- d. What other schemes or systematic guidance (beyond the audit standards 50001, 16247, 14001 or EMAS) exist at regional or national level on energy saving for small companies?

Funding programs

- a. What support programs are there for SMEs to carry out an energy audit?
- b. What are the hurdles to enjoy these support programs?

Incentives and Help

- a. Is there any financial benefit or relief from other government obligations for companies conducting an energy audit?
- b. Is there any subsidized advice for SMEs on the benefits of an energy audit?
- c. Are there any networks (Initiated by Cities, business associations, Chamber of Commerce etc.) for companies that help to save energy? If yes, are they supported with public money?

Additional remarks concerning this theme





4. Results

4.1. Responses from partner countries

4.1.1. Germany

Legislative framework for energy audits

a. National regulations concerning energy audits

Energy Service Act (EDL-G)

The German government is implementing the EED under the guidance of the Federal Ministry for Economic Affairs and Energy (BMWi).

With the implementation of the European Directive 2012/27/EU in the Energy Services Act (EDL-G), around 50,000 large German companies were obliged to carry out an energy audit for the first time in 2015. The energy audit is based on the requirements of the standard DIN EN 16247-1 and can be carried out either by expert internal or external persons.

As an alternative to the energy audit, obligated companies can introduce an energy management system according to ISO 50001 or an environmental management system according to the European EMAS regulation. The certificate or EMAS registration serves as proof of compliance with the legal obligation. **The Federal Office of Economics and Export Control (in German BAFA)** is responsible for enforcement and provides information sheets on its website.²¹

ISO 50001 and the Renewable Energy Sources Act²²

The introduction of an energy management system for energy-intensive companies is of particular relevance. On the one hand, they have the greatest potential for energy and cost savings. On the other hand, they are the ones who can currently benefit most from discounts. For example, energy-intensive companies in the manufacturing sector that are certified according to EMAS or ISO 50001 only have to pay a very limited **EEG levy**²³ under certain conditions. In order to be able to take advantage of the so-called special equalization scheme, companies must submit an application to the Federal Office of Economics and

²¹ EDL-G (2010). Energy Services and Other Energy Efficiency Measures Act of 4 November 2010 (Federal Law Gazette I p. 1483), last amended by Article 1 of the Act of 20 November 2019 (Federal Law Gazette I p. 1719). ²² EEG 2017. Renewable Energy Sources Act of 21 July 2014 (Federal Law Gazette I p. 1066), last amended by Article 3 of the Act of 20 November 2019 (Federal Law Gazette I p. 1719).

²³ The EEG levy serves to finance the expansion of renewable energies and is laid down in the Renewable Energy Sources Act (EEG). Under this Act, transmission system operators (TSOs) are obliged to purchase electricity from renewable energy systems (RE systems) that feed into the public grid at a fixed remuneration. <https://www.next-kraftwerke.de/wissen/eeg-umlage>





Export Control. The Federal Office of Economics and Export Control has published information sheets on its website.

ISO 50001 and peak compensation²⁴

Upon application to the responsible customs administration, energy-intensive companies in the manufacturing sector can reduce their electricity and energy tax burden by means of so-called peak balancing. To do so, they must prove that they operate or have operated an energy management system in accordance with ISO 50001 or an environmental management system in accordance with the European EMAS Regulation in the year in question. Small and medium-sized enterprises can also operate an alternative system for improving energy efficiency. Further information on the application requirements, the application procedure and how to provide proof is available from the Directorate General of Customs on its website.

Environmental Audit Act²⁵

Essential parts of the EMAS Regulation are implemented by the Environmental Audit Act (Umweltauditgesetz, UAG). Among other things, the UAG regulates the accreditation and supervision system for environmental verifiers. It also constitutes the Environmental Verification Committee (Umweltgutachterausschuss, UGA), which has the task of advising the Federal Ministry of the Environment in the field of this voluntary eco-audit, issuing guidelines for the application of the Environmental Audit Act and promoting the dissemination of EMAS throughout Germany. The following interest groups are represented in the UGA: industry, environmental verifiers, environmental and economic administration of the federal and state governments, trade unions and environmental associations. The 25 honorary members are supported in their work and commitment by a full-time office based in Berlin.²⁶

b. Implementation of Article 8 into national legislation

Article 8(4) of the EU Energy Efficiency Directive 2012/27/EU (EED) requires Member States to ensure that companies other than small and medium-sized enterprises (SMEs) are subject to an energy audit at least every four years from the date of the first energy audit, carried out in an independent and cost-effective manner by qualified or accredited experts or carried out and monitored by independent authorities in accordance with national law, until 5 December 2015.

²⁴ SpaEfV (2013). Spitzenausgleich-Effizienzsystemverordnung of 31 July 2013 (Federal Law Gazette I p. 2858), last amended by Article 1 of the Ordinance of 2 October 2019 (Federal Law Gazette I p. 1412)

²⁵ Act on the implementation of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 allowing voluntary participation by organizations in a Community eco-management and audit scheme and repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC (Environmental Audit Act - EIA).

²⁶ Federal Environment Agency (2020). Energy management with system. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/energiemanagement-system#wie-funktioniert-ein-energiemanagement>





How is the implementation of the energy audit verified?

After the deadline of 05.12.2015, the Federal Office of Economics and Export Control (BAFA) will approach the companies on a random basis and request proof of performance.

Companies do not have to inform BAFA proactively about the execution of the energy audit, but they will be contacted by BAFA within the scope of the random inspection.

The procedure of providing evidence is regulated in § 8c EDL-G. If a company is requested to provide evidence within the scope of the random inspection, the proof of the performance of the energy audit is provided by a confirmation of the person who performed the energy audit. BAFA will provide a form for simplified verification shortly.

Furthermore, BAFA may request the energy audit report within the scope of the random inspection.

Penalties

A penalty of up to 50,000 euros per company can be imposed if the energy audit:

- Has not been carried out,
- Has not been correctly carried out,
- Has not been completed,
- Has not been carried out in time

or where an enterprise falsely claims to be an SME.

c. Differences in the implementation of the energy audit between SMEs and non- SMEs

Table 3 – Differences between SME and Non-SME

	SME	Non-SME
Energy audit	EA is voluntary	EA is required
Audit time interval	No, voluntary	EN 16247: Audit every 4th year ISO 50001: Recertification every year EMAS: Declaration every year ISO 14001: Recertification every 3rd year





D.2.3 Analysis of existing framework conditions

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Resources	Often no available staff	Have internal departments dealing with energy-related topics
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	SME	Non-SME
Financial funding programs for EAs	Available	Not available
EA data and EA report	Do not have to upload any data or reports	Have to upload it not later than 2 months to the Federal Office of Economic Affairs and Export Controls (BAFA)





d. Other schemes or systematic guidance on energy saving for SME on regional or national level

National level

SME Initiative Energy Transition and Climate Protection

This initiative supports the craft trade sector in implementing the energy transition. The aim is to uncover the potential for savings in companies and to improve energy efficiency in order to increase profitability.

Since 2014, seven craft trade environmental centers have been working on various key issues throughout Germany. One of the results is a web guide on energy efficiency in the craft trades.

In an initial consultation, which is free of charge for the crafts enterprises, the large energy consumers are therefore particularly considered. First measures and procedures are identified in order to increase the existing potentials in the company and to create a solid basis for decisions for investments in efficiency technology or renewable energies with as little effort as possible. At the same time, if necessary, the companies are guided towards external programmes.

The initiative is a joint project of the Association of German Chambers of Industry and Commerce. (DIHK) and the German Confederation of Skilled Crafts (ZDH) with support from the Federal Ministry of the Environment and the Federal Ministry of Economics.²⁷

Concept Mari:e (Make it right: energy efficient!)

The concept of the efficiency model Mari:e is aimed at small and medium-sized enterprises (with annual energy costs between 30,000 and 500,000 EURO). They should be enabled to realize the existing energy efficiency potentials more easily and to participate in the peak balancing of the energy and electricity tax (producing companies).

Mari:e is the answer to requests from some chambers of industry and commerce, trade associations, state governments and smaller companies to set up a "little sister" of the already established "energy efficiency networks" (for larger companies with annual energy costs of up to 20 million EURO), but which will enable small companies to achieve comparable success.

²⁷ Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2019). SME Initiative Energy system transformation and climate protection 3.0.





- The initial and/or detailed consulting brings the potential to the attention of the company.
- The identification of profitable energy efficiency measures results in the list of measures. This and the multi-year target for energy efficiency and CO2 reduction give the management a framework for action for its energy management, which is possible on a small scale.
- The exchange of experience on the efficient use of energy in the network of 10 to 15 (resident) participating companies in a Marie Region during a period of (initially) 3 years is a central component of the concept.
- Accompanying support during the implementation phase ("hotline"; energy controlling manual)
- The annual monitoring reminds of the planning of energy cost reduction in everyday business, shows the management the annual progress and makes investment proposals for the coming years (reminder consulting).
- Training tips and regular information from the Marie partners or the multiplier center (chambers of industry and commerce, business associations, etc.) on best practice solutions via the Internet and newsletter (on request) keep the company well informed about new technical and organizational possibilities.²⁸

Regional level (Baden-Wuerttemberg) KEFF-Check:

The Regional Centers of Competence Network Energy Efficiency (KEFF) support as an independent contact partner especially small and medium-sized enterprises in successfully implementing energy efficiency measures. The KEFF efficiency facilitators initiate, launch, support and accompany efficiency measures in a targeted manner from the first discussion, through implementation in the company, to the identification of concrete efficiency successes. In addition to the building envelope and infrastructure, the production process and cross-sectional technologies are also taken into consideration.

All KEFF offers are free of charge.²⁹

²⁸ Fraunhofer ISI (2020). Marie.e. Available at: <https://www.energie-effizienz-netzwerke.de/een-de/netzwerktypen/marie.php>

²⁹ European Union, Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg. Regional Competence Centres Network Energy Efficiency (KEFF). Available at: <https://keff-bw.de/de>





Funding Programs

a. Support programs for SME to carry out an energy audit

National level

Funding program “Energy efficiency in the economy”

The BMWI will simplify the promotion of energy efficiency and renewable heat in companies as of 1 January 2019. The new programme is open to all sectors and technologies and offers plenty of scope for implementing a suitable solution. From now on, Companies will always have the choice between a subsidy and a credit with partial repayment (repayment subsidy).

Another funding option is the BMWI Energy Efficiency Competition. Here companies can decide for themselves how high their share of the funding (maximum 50%) is, but you must assert themselves in competition with other funding applications. A ranking is established according to the amount of funding per tonne of carbon dioxide saved. Approximately half of the applications will be funded. There are several awarding procedures per year, which take place independently of each other. So, they apply several times, even with different funding rates.

The following topics will be supported:

- Cross-cutting technologies (Module 1)
- Renewable process heat (Module 2)
- Energy measurement, control and regulation (Module 3)
- Energy-related optimization of plants and processes (Module 4)

Module 3 of the funding programme includes measurement equipment and Software solutions to support an energy management system.

Funding rate up to 40% of net investment, Maximum 10 Mill EUR. Who can join in?

- private companies
- communal enterprises
- freelancers, if the permanent establishment is mainly used for freelance work³⁰

³⁰ Federal Office of Economics and Export Control (2019). Federal funding for energy efficiency in the economy.





Federal funding for energy consulting in SMEs

The support programme "Energy Consulting for SMEs" contributes to the implementation of the energy and climate policy goals of the German government, in particular to significantly reduce primary energy consumption and greenhouse gas emissions.

Support is provided for qualified energy consultancy services in small and medium-sized enterprises (SMEs), which identify energy saving potential in the companies, increase the number of energy efficiency measures implemented and thus achieve additional energy savings.

The aim is to achieve an energy saving of 10 to 20% per advised company in order to achieve a total annual energy saving of 400 GWh.

Support will be given to energy consultancy services which, through a systematic process, obtain sufficient information on the existing energy consumption profile of a building or group of buildings, an operational process or an industrial or commercial installation, identify and quantify opportunities for economic energy savings and report the results.

All energy advisers with the required professional qualifications may be admitted to the support programme. The energy consultants have to commit themselves by self-declaration towards BAFA and the respective company to give advice in a manufacturer-, supplier-, product- and sales-neutral way

The energy consultancy must meet the requirements of a high-quality energy audit as defined in the Energy Services Act (EDL-G).

Who can join in?

- Small and medium-sized enterprises (SMEs)
 - Members of the liberal professions
- Type of funding
- For companies with annual energy costs exceeding EUR 10 000, 80 % of eligible consultancy costs, up to a maximum of EUR 6 000 EUR,
 - For companies with annual energy costs of up to EUR 10 000, 80 % of eligible consultancy costs, up to a maximum of EUR 1 200 EUR.³¹

³¹ Federal Office of Economics and Export Control (2019). Federal funding for energy consulting for small and medium-sized enterprises





Regional level (Baden -Wuerttemberg) Program „Climate Protection Plus“³²

In order to support communities, companies, church institutions and non-profit organizations in achieving climate protection goals, the Ministry for the Environment, Climate and Energy of Baden-Württemberg is launching the "Climate Protection Plus" program.

The programme will be relaunched for the year 2020.

The programme consists of three pillars:

- CO2 reduction program
The aim of the funding is to reduce carbon dioxide emissions in the long term. Support is provided for measures such as investments in the energetic renovation of the building envelope, technical building equipment and in heat generation from renewable energies.
- Structural, qualification and information programme
The aim of the funding is to support further climate protection activities, for example, creating optimized structures, qualification measures, education and information.
- Sustainable, energy-efficient renovation
Over the next few years, many buildings will be renovated with subsidies from the state. In order to encourage energy-efficient refurbishment and support the climate protection plan, supplementary funding is provided for projects that achieve special efficiency standards.

Funding

Will be provided for external technical support and, if not available, for the procurement and installation of necessary measuring equipment and consumption meters as well as the procurement and implementation of relevant energy management software.

In addition, the first-time certification of an energy management system according to DIN EN ISO 50001 can be supported.

b. Hurdles referred to support programs

Applications for funding programs are often only to be completed with the help of an energy consultant. The eligibility conditions are complicated and failure to comply with them will lead to subsequent exclusion.

Other barriers in the funding context may include the following aspects:

- Funding confusion (non-transparency or lack of awareness)
- Lack of practical relevance or insufficient consideration of business interests

³² Ministry for the Environment Baden-Württemberg, Climate and Energy (2019). Climate Protection Plus.





- Inertia of political processes and the one-sided environmental policy focus on individual technologies or individual actors
- High bureaucratic burden
- Accuracy of support, advice and education is not always guaranteed.

Incentives and Help

a. Financial benefit from other government obligations for companies conducting an energy audit

Electricity tax refund (about 2 ct per kWh)

The electricity tax is refunded if the company has passed an energy audit according to DIN EN ISO 50001 or an ecological audit according to EMAS. For SMEs there is also the alternative of an energy audit according to DIN EN 16247 or a highly simplified scheme according to Annex 2 of SpaEfV.

Reduction of EEG and CHP levy

For electricity cost-intensive industries (according to an official list), the EEG and CHP levy is reduced provided that an energy audit according to DIN EN 50001 or an eco-audit according to EMAS has been carried out. For SME also, an audit according to DIN EN 16247 is also possible.

b. Subsidized advice for SMEs on the benefits of an energy audit

See program “Federal funding for energy consulting for small and medium-sized enterprises” and “Climate Protection plus”.

c. Networks for companies that help to save energy

There is an initiative from the Federal government and some National Association of companies to initiate Energy and Resource Efficiency Networks.

The establishment and operation of networks will be supported. Learning Energy Efficiency Networks (LEEN)

The Learning Energy Efficiency Networks are based on a regular, professionally moderated exchange of experience between about ten to 15 companies that form a network. The process of a LEEN network is divided into three phases:

In the start-up phase (three to nine months) a network provider (for example an energy agency) invites to an information event and to the foundation of the network. The participants in the network solemnly sign a Letter of Intent.

In phase one (six to ten months) first meetings and joint company visits take place. The participating companies identify profitable energy efficiency measures with the help of energy technology consultants (etB). The data collection form developed for this purpose is





the first step towards the energy audit. The etB generate a full energy evaluation with an overview of measures, and the companies identify possible energy and CO₂ savings together with the etB.

In the second phase, the companies meet three to four times a year at one of the sites and discuss their experiences. Here the companies can present the measures they have implemented or discuss technical issues. A certified moderator chairs the regular meetings and coordinates appropriate technical presentations.

In this way, the participants build up a relationship of trust with each other and are inspired by pioneering companies.

The LEEN network management system is the uniform quality standard. It supports the companies in making decisions and in the annual review of the savings targets. After two to four years, the participating companies decide whether to continue the network - some have been in existence for up to ten years.

Mari:e (Make it right, do it energy efficient)

See definition in part d. (Other schemes or systematic guidance on energy saving for SME on regional or national level).

Fraunhofer ISI, the Foundation for Resource Efficiency and Climate Protection (STREKS) and the Institute for Resource Efficiency and Energy Strategies (IREES)

They offer free consulting services for the initiation of a new network of companies. The consulting services of these institutions are 100% funded from the Federal Ministry of Economics and Energy. In addition, a collection of working aids is provided for organizational work.

<https://www.effizienznetzwerke.org/arbeitshilfen/foerdermoeglichkeiten/>

Currently there are 256 networks with 2158 companies in Germany actively working to improve energy and resource efficiency.³³

Funding from the Climate Protection Plus program for companies with a location in Baden- Württemberg (SME status required)

Definition of Climate Protection Plus program see (Support programs for SME to carry out an energy audit)

50% of the total eligible expenditure, with a maximum of EUR 4 000 per company.

That concerns the following costs:

- ☐ Initial energy efficiency consulting
- ☐ Monitoring and evaluation of the measures
- ☐ Moderation of the exchange of experience with the network

³³ Federal Ministry of Economics and Energy. Initiative Energy Efficiency Networks.





Regional networks

Two thirds of the energy demand in the public sector is generated in the approximately 12,000 municipalities and districts. These therefore offer high potential for savings, so that the German government launched a funding programme for regional energy efficiency networks for local authorities on 1 January 2015 (via BAFA). BAFA supports the establishment and operation of about 20 municipal energy efficiency networks. The funding levels are following:

- in the winning phase, up to 100 percent of the eligible material expenses, but a maximum of 3,000 euros per network
- in the network phase, up to 50 percent of the eligible personnel and material expenses, up to a maximum of EUR 10,000 per year per network participant
- in the first year of the network phase, up to 70 percent for the energy technology consultant, with a maximum of 20,000 euros per network member

The funding period is nine months per network in the winning phase and three years per network in the network phase. A concept for the generation and implementation of municipal energy efficiency networks is available at IREES, which was developed from the LEEN management system for companies.

Objects of funding:

- Acquisition of participants
- Network Manager
- Consultation with energy and resource efficiency experts³⁴





d. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

BAFA - Support Programme - Cross-sectional Technologies

BAFA promotes investments in highly efficient cross-sectional technologies, including electric motors and drives, pumps, fans, compressed air generators, heat recovery systems and plant insulation.

Eligibility to apply:

Companies of all sizes in trade and industry with a permanent establishment or branch in Germany as well as energy service providers (contractors) are eligible for funding. Funding is available for investment measures to increase energy efficiency through the use of highly efficient cross-sectional technologies available on the market.

Eligible applicants:

Companies of all sizes in trade and industry with a permanent establishment or branch office in Germany and energy service providers (contractors) are eligible for funding.

Type of funding:

Funding is available for investment measures aimed at increasing energy efficiency through the use of highly efficient cross-sectional technologies available on the market.³⁵

Credit Program 295 and 292 from KfW (Credit Institute for Reconstruction)
“Efficiency in economy” and “efficiency in production”

The KfW Energy Efficiency Programme supports energy efficiency measures in the production facilities/processes of commercial enterprises with inexpensive loans.

In addition to the promotion of energy efficiency measures in the area of production facilities/processes, the KfW Energy Efficiency Programme co-finances energy-efficient new construction and energy rehabilitation of non-residential buildings as well as individual measures on the building envelope and technical building equipment.





Eligible measures Investments:

All investment measures that achieve energy savings of at least 10 % are eligible for support, for example in the following areas Machinery/plant/process technology Compressed air/vacuum/extraction technology Electrical drives/pumps Process heat Process refrigeration, cold stores, cold rooms Heat recovery/waste heat utilisation (for production processes) Measurement and control technology Information and communication technology Combined heat and power plants Modernisation investments must lead to a specific final energy saving of at least 10 % measured on the average consumption of the last 3 years In the case of a change in production capacity, the calculation must be based on the capacity before the measure is implemented.

New investments must lead to specific final energy savings of at least 10 % compared to the industry average.

The savings resulting from the investment measure have to be determined by the company or an energy consultant when the application is submitted. The calculation can be done, for example, by means of manufacturer certificates and product data sheets.

Furthermore, in connection with an eligible operational energy saving investment, expenses for planning and implementation support as well as for energy management systems can be subsidized.

Maximum credit:

Amount EUR 25 million per project.

Up to 100% of the eligible costs will be financed.

Value-added tax can be co-financed, provided that there is no entitlement to deduct input tax.

The credit limit may be exceeded if the project is particularly worthy of funding.

Additional remarks

There are no additional remarks.

³⁴ Federal Office of Economics and Export Control (2015). Energy Efficiency Networks Municipalities.

³⁵ Federal Office of Economics and Export Control (2019). Promotion of energy efficiency and process heat from renewable energies in the economy (EEW).





4.1.2. Slovenia

Legislative framework for energy audits

a. National regulations concerning energy audits

Slovenia has adopted the regulation for methodology and content of energy audit according to the Directive 2012/27/EU.

It is necessary for large companies to adopt energy audit every 4 years.

Regulation on the methodology for the production and content of the energy audit states minimal requirements and mandatory content of energy audits.

Energy audits must be carried out in accordance with European or international standards, e.g. SIST EN 16247-1 (Energy audits) or ISO 50002 (Energy audits) or SIST EN ISO 50001 (Energy management systems) or - where they also include energy audits - EN ISO 14000 (Environmental management systems). The application of those standards ensures that the minimum requirements set out in Annex VI to Directive 2012/27 / EU are met.

The Energy audit is defined in so called Energetski zakon (energy law)³⁶, which is a key legislation in Slovenia regarding energy related topics.

In this document there is specified that:

- large companies need to make energy audit every 4 years
- Ministry of infrastructure needs to encourage implementation of energy audits
- Ministry of infrastructure needs to define methodology of Energy audits (this is defined in other documents).

An energy auditor is a legal or natural person or internal auditor who meets the criteria for knowledge, experience and personality, in accordance with SIST EN 16247-5.

Compliance with the proposed measures, identified after an energy audit, reduces energy costs for the final customer, as well as reduces the burden on the environment.

b. Implementation of Article 8 into national legislation

In Slovenia all rules of Energy Efficiency Directive, in particular Article 8, has already been transposed into national legislation. But actually, there is a lack of promotion.





c. Differences in the implementation of the energy audit between SMEs and non-SMEs

Non-SMEs are obliged to prepare energy audit every 4 years, while SMEs are not.

If the company approaches to preparation of energy audit, the process of the implementation is the same in both cases.

SMEs are entitled to obtain subsidies for preparation of energy audit on occasional public tenders. While bigger companies often have personnel that is in charge of energy efficiency and other issues.

a. Other schemes or systematic guidance on energy saving for SME on regional or national level

The audit standards 50001, 16247, 14001 or EMAS are the only guidelines/obligations for preparation of energy audits.

Slovenia has the EUREM (European Energy Manager) educational system, which educates experts in the field of energy efficiency in companies. This educational program is well established in Slovenia (more than 200 EU energy managers in Slovenia).

This program prepares experts for better implementation of energy audits. The programme certificate is not necessary for experts to carry on energy audits.

³⁶ Energy Act - EZ-1 (2014). Official Gazette RS, No. 17/14 of 7 March 2014. Available at: https://www.energetika-portal.si/fileadmin/dokumenti/zakonodaja/energetika/ez-1/ez-1_energy_act_proposal.pdf





Funding Programs

a. Support programs for SME to carry out an energy audit

Eco Fund offers subsidies for small and medium enterprises to prepare energy audit. Eco Fund is an independent legal entity, with the Ministry of the Environment and Spatial Planning, being represented as majority in the Supervisory Board.

The subject of the public call is non-reimbursable financial incentives to carry out an energy audit of the building, processes and transport in that undertaking (hereinafter referred to as an energy audit). The energy audit must be prepared in accordance with the Rules on the methodology for the production and content of the energy audit (Official Gazette of the Republic of Slovenia, no. 41/16; hereinafter: Rules on the methodology), and the introduction of the energy management system in accordance with the standard SIST EN ISO 50001.

The purpose of the public call is to encourage the implementation of an energy audit in companies, in order to familiarize the company with the existing profile of energy use, the possibility of introducing targeted change of energy use, the identification and evaluation of cost-effective energy saving options and the possibility of using modern technologies to improve energy efficiency and increase employee awareness, company competitiveness and environmental benefits. An energy audit provides the basis for the development of a strategy in the area of energy use in the company, the basis for deciding on priority investments in terms of risk, payback and complexity.

Public call's maximum subsidy is 50 % on eligible costs of energy audit.

Note: In Eco Fund only, few subsidies were given for energy audits, so Eco Fund is not so well known. Much could be done regarding promotion. Eco fund has been targeting companies only for a short time now. In the past they were only subsidizing municipalities and residents. It will probably take some time for this information to spread through company sector.

b. Hurdles referred to support programs

There aren't that many hurdles.

The Application form is quite straight forward and not so demanding.

The basic condition for awarding a non-refundable financial incentive is a timely submission and full application.





An application is timely if submitted during the duration of this public call.

The application is complete when the applicant submits a fully completed Application form and mandatory attachments for each measure.

When deciding on the grant of the right to a non-refundable financial incentive to an investor, the procedure laid down in the General Administrative Procedure Act shall apply, unless otherwise provided by ZVO-1.

The basis for the preparation of the energy audit shall be up-to-date, measured and traceable operational data on the energy consumption of the building, process or transport of the company, and a load diagram for the previous period of at least three years on a monthly basis, if necessary.

Within the framework of the energy audit, a final report must be prepared, a presentation of the energy audit carried out to the company, and the management of the company must make a decision on further activities regarding the implementation of the proposed solutions in part or in full.

The energy audit should include:

- a detailed review of the energy use of the building or group of buildings (including analysis of the thermal envelope and energy systems in the building), of the technological process or of the industrial plant, including transport or transport itself.
- an analysis of the cost of the entire life cycle of a building, process and / or transport, taking into account long-term savings, the residual value of long-term investments and discount rates where possible.
- a set of possible energy efficiency measures (organizational and investment measures).
- an analysis of energy efficiency measures to improve energy efficiency, including economic analysis, savings and environmental impacts.
- economic indicators of recommended energy efficiency measures (net present value, internal rate of return, payback period).

On the basis of detailed calculations made in the context of the energy audit, the company must obtain information on possible measures, savings in energy costs or payback periods of investment in the measures.





Incentives and Help

a. Financial benefit from other government obligations for companies conducting an energy audit

There is no financial benefit. However, for some public calls (subsidies) energy audits are obligatory, so it is a plus if company already has one.

b. Subsidized advice for SMEs on the benefits of an energy audit

Slovenia does not have subsidized services for SMEs. They only have free of charge offices for citizens in larger Slovenian cities. This office gives advice on energy efficiency. Anyone can go there, even SME's owners. But they are mainly targeting citizens (residential sector) not companies. There is the EUREM program, but it is not subsidized.

c. Networks for companies that help to save energy

Slovenian Enterprise Fund (hereinafter referred to as SPS) is a public financial institution of the Republic of Slovenia established for the purpose of awarding financial support and incentives to the corporate sector in Slovenia.

SPIRIT Slovenia, as an executive agency of the Ministry of Economic Development and Technology, promotes entrepreneurship, development, and innovation in the Slovenian economy. It implements the orientations of Slovenia's development programs with the aim of achieving an entrepreneurial, innovative, technologically developed, export-oriented and attractive to foreign investor's destination.

SPIRIT Slovenia operates on a one-stop-shop principle, with the aim of receiving prompt and useful free information from local or foreign entrepreneurs in the most comprehensive way possible by the agency or in cooperation with the supportive environment.

SPIRIT Slovenia, public agency is funded by the Ministry of Economic Development and Technology of the Republic of Slovenia.

Center for Energy Efficiency Solutions - CER is a network of advanced businesses and organizations from different sectors, playing a leading role in promoting a climate-neutral economy and green technologies, focusing on increasing energy efficiency, the use of renewable energy sources and reducing waste and greenhouse gas emissions. Currently, this network consists of 37 Companies and 6400 employed.





d. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

- EUREM
- Eco fund
- Slovenian Enterprise Fund (SPS)
- CER

Additional remarks

There are no additional remarks.





4.1.2. Poland

Legislative framework for energy audits

a. National regulations concerning energy audits

1. **The Energy Efficiency Act of 20 May 2016³⁷** introduces energy audits into Polish law. The Act implements requirements of Article 8 of EU Directive 2012/27/EC on Energy Efficiency (the Energy Efficiency Directive). This document determines, inter alia:

- the principles for the development of a national energy efficiency action plan,
- the tasks of public sector entities in the field of energy efficiency,
- rules for implementing the obligation to achieve energy savings (the “white certificates” scheme) and
- **principles of conducting an energy audit of the company.**

According to Article 36 of the Energy Efficiency Act, every entrepreneur within the meaning of the Act of 2 July 2004 on freedom of economic activity (except for micro, small and medium enterprises), must perform an energy audit every 4 years.

2. **Announcement of the Minister of Energy of 23 November 2016 on the detailed list of projects aimed at improving energy efficiency** defines the types of modernizations which can be supported by the State (within the “white certificates” scheme), and needs energy efficiency audit as proof of energy savings.

3. **Regulation of the Minister of Energy of 5 October 2017 on the detailed scope and manner of preparing an energy efficiency audit and methods of calculating energy savings.** The Regulation determines, inter alia, the detailed scope and manner of preparing the energy efficiency audit (within the “white certificates” scheme), the template of the audit sheet and the detailed manner and procedure of random verification of the audit (in accordance with the Energy Efficiency Act of 20 May 2016).

4. **ISO 50001:2018** –Energy Management System including energy review procedure understood as similar to energy audit.

5. **PN-EN 16247 Energy audits.**

³⁷ AEE (2016). The Energy Efficiency Act of 20 May 2016.





Energy audit of the building:

6.Regulation of the Minister of Infrastructure of 17 March 2009 on the detailed scope and forms of the energy audit and parts of the renovation audit, models of audit cards, as well as the algorithm to assess the cost-effectiveness of the thermo-modernization project. The Regulation defines the detailed scope and forms of energy audit and renovation audit in the part specified in Article 14 of the Act of 21 November 2008 on support for thermo- modernization and renovation, as well as the algorithm for assessing the profitability of a thermo-modernization project and templates of audit cards.

a. Implementation of Article 8 into national legislation

Article 8 - Energy audits and energy management systems states are already transposed into national legislation but not completely.

Polish law up to date is lacking any kind of official mechanism to determine the quality of the audits. Theoretically entrepreneurs are obliged to store the energy audit of the company for 5 years for possible control. No energy audits of enterprises have been verified yet.

Within the energy efficiency audits under white certification scheme (there is legally required verification) audits are being verified. White certification schemes are a complement to energy audits of enterprises. But there is no legal mechanism for verification of the energy audits of enterprises.

Note: There is no database for tracking energy efficiency measures identified in audit but there is a register of implemented measures under white certificates scheme, mainly implemented by large enterprises.

Energy audit of the enterprise according to Polish law must meet general requirements:

1. be based on up-to-date, representative, measured, traceable operational data on energy consumption and (for electricity): power demand;
2. comprise a detailed review of the energy consumption profile of buildings or group of buildings, industrial installations and transport, which together account for at least 90% of the company's total energy consumption;
3. build, whenever possible, on life-cycle cost analysis of buildings or group of buildings and industrial installations instead of Simple Payback Periods in order to take account of long- term savings, residual values of long-term investments and discount rate.

Poland do not have any long-term programs directly encouraging SMEs to perform energy audits and implement recommendations from these audits. However, the Ministry of Energy, together with Polish partners, launched on 20 November 2018 a two-year project promoting energy audits of enterprises in SMEs.





D.2.3 Analysis of existing framework conditions

The aim of the project is to perform activities aimed at SMEs in the field of raising awareness on energy efficiency improvement, in particular to promote energy audits of enterprises and investments in energy efficiency.

The project also aims to gain knowledge about energy consumption and potential of energy efficiency in SMEs and to propose solutions and tools to raise awareness of energy management, including encouraging companies to implement energy audits.

In Poland, the profession of energy auditor is officially defined. Competences of the auditor auditing the company can be indirectly drawn from the PN-EN 16247-5 standard.

According to Article 36 of the Energy Efficiency Act, every entrepreneur within the meaning of the Act of 2 July 2004 on freedom of economic activity, except for micro, small and medium enterprises, must conduct an energy audit every 4 years.

The energy audit does not have to be performed by the enterprises that are not SMEs, which have implemented the Environmental Management System ISO 14001, EcoManagement and Audit Scheme EMAS or the Energy Management System ISO 50001.

Poland do not require that an assessment of the technical and economic feasibility of connection to an existing or planned district heating or cooling network shall be part of the energy audit, however such analyses have to be performed during obtaining construction permit.

b. Differences in the implementation of the energy audit between SMEs and non- SMEs

There is no officially binding detailed procedure for energy audits in SME and non-SME included into Polish Law. Audits for all types of company size may be carried out in a similar procedure based on EN-16247 standard. Practically each audit's scope and methodology is fitted to the type of company and the profile of its activity.

c. Other schemes or systematic guidance on energy saving for SME on regional or national level

“White certificates”

In Poland, there is officially defined an energy efficiency audit. It is a study which includes energy intensity analysis before and after implementing energy efficiency measure.

This Audit verifies how much energy investor can save due to implementing energy efficiency measure. With such audit investor can apply for a bonus “white certificates”, depending on the volume of saved energy. The bonus can be granted to anyone (any size of company) who intends to implement energy efficiency investment reducing energy consumption by at least 10 toe (tons of oil equivalent) per year. Next, these certificates can be sold on the Polish Power Exchange to the obliged entities (usually to energy companies).

Funding Programs



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°847095



D.2.3 Analysis of existing framework conditions

a. Support programs for SME to carry out an energy audit

There are examples of regional support programs like “Loans for Energy Efficiency for SMEs in the Opolskie Voivodeship”. The loan may be used, among others, for energy audits for SMEs, as a comprehensive element of a project. Those programmes are not long-term solutions available for all the regions.

These programs are regional and different for each voivodeship, programmes propose loans or direct funding. What is more, not every voivodeship is running such programmes. The programmes are not well known and usually calls are open with short deadline and there is not enough time to prepare good proposals.

Current loans programmes are directed to SME's:

1. Thermo-modernization Loan in Podlaskie voivodaship, up to 1 mln pln
2. Loans for Energy Efficiency for SMEs in the Opolskie Voivodeship, up to 1,3 mln pln
3. Loans for Energy Efficiency for SMEs in the Lower - Silesia Voivodeship, from 200 thousand to 3 mln PLN

Currently open call for applications for funding directed to SME's:

1. Renewable energy production in enterprises in Lubelskie Voivodeship – total budget 2,5 mln pln, call open 13.01.2020-28.02.2020, funding rate 80%
2. Increasing the use of renewable sources, RPO West Pomeranian, call open 02.01.2020-27.03.2020, funding rate 85%
3. Emission reduction, Pomorskie – call open 27.01.2020 – 28.02.2020, funding rate 85%

b. Hurdles referred to support programs

The programs are available for relatively short period of time in different regions. Therefore, the market of auditing services cannot develop well under stable conditions. On the other hand, the companies which could benefit from such program have also limited chances to identify the real need for the energy audit and possibility to obtain financial support.

Incentives and Help

a. Financial benefit from other government obligations for companies conducting an energy audit

There is no financial benefit from other government obligations for companies conducting an energy audit.

b. Subsidized advice for SMEs on the benefits of an energy audit

There were few examples of subsidized energy advice for SME, but at present there is no long-term state program in this regard. There are emerging sometimes short-term or small- scale initiatives like the Project "Technical support for the promotion of energy audit and investments in energy efficiency in small and medium-sized enterprises": The project is financed by the European Commission. It was described in details in section 1b.





c. Networks for companies that help to save energy

There is state-initiated “energy clusters” program. The energy-cluster has to be composed of local energy producers and consumers and aim to develop local energy management agreements. Such energy-clusters may be subject of future preferential state financing. At present the State activities in this regard concentrate on facilitation of the legal aspects allowing the development of local energy markets.

Energy clusters are solutions aimed at developing distributed energy to improve local energy security while maximizing economic efficiency. Energy clusters implement the abovementioned goal in an environmentally friendly manner by creating optimal organizational, legal and financial conditions enabling the implementation of the latest technologies taking into account local resources and the potential of domestic energy. The project is continuous.

The concept of energy clusters was introduced for the first time in 2016 together with the definition of the concept of energy clusters in the Act on renewable energy sources.

An energy cluster is an agreement of various entities regulating activities related to:

- power generation
- demand balancing, distribution or trade in energy from renewable energy sources or from other sources or fuels, as part of a distribution network with a voltage lower than 110 kV, within the boundaries of one poviát or 5 communes.

Besides, there are several organizations supporting the networking, support and trainings for the SMEs regarding energy efficiency.

Polish Agency for Enterprise Development – (State organization) the aim of the Agency is to implement programmes of economic development supporting innovative and research activities of SMEs, regional development, increase of export, development of human resources and use of new technologies in business activity.

The National Fund for Environmental Protection and Water Management - (State organization) it is the pillar of the Polish system of financing environmental protection. The basis of the National Fund's operation as a State legal person is the Act on Environmental Protection Law. The mission of the Fund is to support environmental action effectively and efficiently. The Fund offers loans, grants and other forms of financing for projects implemented by local governments, enterprises, public entities, social organizations and natural persons.

The Fund is a state legal entity financing environmental protection and water management in the scope specified in the Act of 27 April 2001. Environmental Protection Law.

Union of Entrepreneurs and Employers - it associates employers of small and medium-sized enterprises from each sector.

Association of Energy Auditors - is an NGO, association of persons conducting activities in the field of energy auditing and interested in rationalizing the use of energy in Poland. The aim is, among others, to represent energy auditors to authorities and public institutions by expressing a common opinion on the creation of legal acts. The Association runs the List of Recommended Auditors.

Note: In Poland there is no legal obligation for energy consultant to be certified.





The Association List of Recommended Auditors is a good reference for choosing a professional energy consultant – if you would like to be included in the list there are certain proof of experience and work in field of energy efficiency required for verification.

National Fund for Environmental Protection and Water Management announced in February 2020 new **initiative of platform for certified energy efficiency experts**. The energy efficiency expert platform will consist of an online register of certified energy efficiency experts who will be categorized based on their specialist knowledge or location. This will allow potential beneficiaries to easily find and contact one of the registered professionals. The platform will also provide information on funding options for eco-renovations. Project completion is scheduled for the end of 2021.

Energy Conservation Foundation - conducts and supports all kinds of activities aimed at rationalization of energy use and development of renewable energy sources. The Foundation trains energy auditors and energy users, publishes manuals and spreadsheets, gives advice, provides expertise and helps to implement innovations in enterprises.

National Association “Respect for Energy and the Environment” - the aim of the Association are to: support activities for energy conservation, environmental protection and sustainable development, organize the exchange of experience and cooperation between the members of the Association, cooperate with national and foreign government and self-government institutions in the field of creating legal, organizational and financial framework conducive to energy conservation, environmental protection and sustainable development.

d. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

Actual:

In Poland is valid Act of 20 February 2015 on Renewable Energy Sources (the "RES Act").³⁸ According to the amendment to the "RES Act" (2019 year), entrepreneurs in Poland may become prosumers (from 29 August 2019). Enterprise can produce energy from RES micro- installation (according Polish law), use it to own need and surplus electricity enter into the grid. Next, company can take back part (usually 70% - 80%) of this energy for free.

Past:

The National Fund for Environmental Protection and Water Management carries out projects related to energy saving and environmental protection:

Measures 1.2 Promotion of energy efficiency and use renewable sources of energy in companies. The last recruitment was carried out in the period from 31 January to 27 April 2018.

Additional remarks

There are no additional remarks.

³⁸ RES (2015). Valid Act of 20 February 2015 on Renewable Energy Sources





4.1.2. Italy

Legislative framework for energy audits

a. National regulations concerning energy audits

Over the years, numerous rules have followed, aimed at defining on the one hand the correct criteria for executing a DE, on the other from time to time to push, up to certain cases to oblige some specific subjects, to execute the DE. The following are the main laws and regulations to which we generally refer (source:

- Law 10/91 Rules for the implementation of the National Energy Plan on rational use of energy, energy savings and development of renewable energy sources³⁹
- Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises and the subsequent User Guide to the definition of SMEs⁴⁰
- UNI EN 15459:2008, "Energy performance of buildings - Procedure for the economic evaluation of building energy systems". This law has been replaced by the law UNI EN 15459-1:2018 in 2018⁴¹
- D.lgs. 115/2008 concerning energy end-use efficiency and energy services;
- UNI CEI 11339:2009 " Energy management. Energy management experts. General qualification requirements "⁴²
- D.Lgs. 28/2011 On 01.08.2013 the legislative decree 3 March 2011 came into force 28 laying down "Implementation of Directive 2009/28/EC on the promotion of the use of energy from renewable sources (wind, solar, aerothermal, geothermal, hydrothermal and oceanic, hydraulic, biomass, landfill gas, residual gas from purification processes and biogas)"⁴³
- UNI CEI EN ISO 50001:2011 "Energy management systems - Requirements and guidelines for use". This law has been replaced by the law UNI CEI EN ISO 50001:2018
- Directive 2012/27 / EU on energy efficiency.
- UNI CEI EN 16247-1:2012

³⁹ Law 10/91 (1991). Rules for the implementation of the National Energy Plan on the rational use of energy, energy saving and development of renewable energy sources. (GU Serie Generale n.13 del 16-01-1991 - Suppl. Ordinario n. 6)

⁴⁰ C(2003) 1422. COMMISSION RECOMMENDATION of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:124:0036:0041:EN:PDF>

⁴¹ UNI EN 15459:2008, "Energy performance of buildings - Procedure for the economic evaluation of building energy systems". Available at: http://store.uni.com/catalogo/uni-en-15459-1-2018?josso_back_to=http://store.uni.com/josso-security-check.php&josso_cmd=login_optional&josso_partnerapp_host=store.uni.com

⁴² UNI CEI 11339 (2009). Specific requirements for the certification of the skills of energy management experts (EGE – UNI 11339)

⁴³ Legislative Decree n. 28 (2011). Implementation of Directive 2009/28 / EC on the promotion of the use of energy from renewable sources, amending and subsequent repeal of Directives 2001/77 / EC and 2003/30 / EC (Official Gazette No. 71 of March 28, 2011)





- ☐ UNI CEI EN 16247-1:2012. "Energy Audits, part 1: general requirements"
- ☐ UNI CEI EN 16247-2:2014, "Energy Audits, part 2: buildings"
- ☐ UNI CEI EN 16247-3:2014, "Energy Audits, part 3: process"
- ☐ UNI CEI EN 16247-4:2014, "Energy Audits, part 4: transport"
- ☐ UNI CEI EN 16247-5:2015, "Energy Audits, part 5: Energy auditor competences"
- UNI CEI 11352:2014 "Energy management - ESCo - General requirements and checklist for verification of requirements"⁴⁴
- D.lgs. 102/2014 - introduces the obligation for all large companies and energy-intensive enterprises to carry out an energy audit. It also provides that annually the Ministry of Economic Development issues a call for proposals co-financed with the Regions to incentivize the execution.⁴⁵
- Following D.lgs. 102/2014, a set of formal clarifications have been issued by the Ministry of economic development:
- "Chiarimenti in materia di diagnosi energetica nelle imprese ai sensi dell'articolo 8 del Decreto Legislativo N. 102 Del 2014, Novembre 2016". This document defines subjects obliged to perform Energy audits, methods to develop the analysis and experts with proper title to deliver the expertise.⁴⁶
- "Chiarimenti in materia di diagnosi energetiche e certificazione ISO 50001, Dicembre 2018". This document defines obligations on Energy audits in case of Firm adopting certification ISO 50001.

b. Implementation of Article 8 into national legislation

Article 8 is completely transposed in national law.

c. Differences in the implementation of the energy audit between SMEs and non- SMEs

For large enterprises the energy audit is mandatory. Among SMEs, it is mandatory only for energy-intensive enterprises.

Energy- intensive enterprises, according to Decree of April 5th 2013(Ministry of economy and finance), are those that:

- consume more than 2,4 GWh of electricity or other Energy source;
- their Energy cost exceeds 3% of their turnover.

⁴⁴ UNI CEI 11352 (2014). Accreditation and certification scheme, in accordance with UNI CEI 11352: 2014 "Companies providing energy services" (ESCO), drawn up pursuant to art.12, paragraph 1, of Legislative Decree 4 July 2014, n. 102. Available at: https://www.mise.gov.it/images/stories/normativa/schema_certificazione_Esco_UNI_11352.pdf

⁴⁵ Legislative Decree n. 102 (2014). Implementation of Directive 2012/27 / EU on energy efficiency, which amends directives 2009/125 / EC and 2010/30 / EU and repeals directives 2004/8 / EC and 2006/32 / EC (Official Gazette No. 165 of 18 July 2014). Available at: http://www.bosettiegatti.eu/info/norme/statali/2014_0102.htm

⁴⁶ Legislative Decree n. 102 (2014). Implementation of Directive 2012/27 / EU on energy efficiency, which amends directives 2009/125 / EC and 2010/30 / EU and repeals directives 2004/8 / EC and 2006/32 / EC (Official Gazette No. 165 of 18 July 2014). Available at: http://www.bosettiegatti.eu/info/norme/statali/2014_0102.htm





There are no differences in the implementation for SMEs or non-SMEs: also, for SMEs the Energy Audit must be appropriate, complete, representative, traceable, useful and verifiable. It should be implemented according to the UNI CEI EN 16247, even if this requires an economic and resource commitment that not all SMEs can support. According to these rules the Governmental Agency ENEA prepared in June 2018 the “LINEE GUIDA ALLA REALIZZAZIONE DELLE DIAGNOSI ENERGETICHE NELLE PMI” (GUIDELINES FOR THE IMPLEMENTATION OF ENERGY AUDITS IN SMEs).

d. Other schemes or systematic guidance on energy saving for SME on regional or national level

According to the Governmental Agency ENEA (see the specific guidelines for the implementation of energy audits in SMEs – June 2018) Energy Audits in SMEs should be implemented according to the UNI CEI EN 16247. ISO 50001 applies for the adoption of energy management systems.

Funding Programs

a. Support programs for SME to carry out an energy audit

Ordinance dated 12 May 2015 of the Ministry of Economic Development related to the co- financing of programs presented by the Regions and aimed at supporting the implementation of energy audits in small and medium-sized enterprises (SMEs) or the adoption, in the SMEs, of energy management systems compliant with the ISO 50001 standards pursuant to Article 8, paragraph 9 of the legislative decree 4 July 2014, n. 102 (15 million of Euro the first year). Therefore, funds should go from the Central level to the Regions (or autonomous Provinces) that must prepare a specific call to which SMEs can access. The incentives are paid following the actual realization by each SME of at least one energy efficiency intervention, among those with an economic return time (payback) of less than or equal to 4 years suggested by the energy audit, or following the obtaining of the conformity of the energy management system to the ISO 50001 standard. The allowed energy diagnoses are financed up to a maximum of 25% of the eligible expenses, up to a maximum of € 5,000, VAT excluded. The procedures for implementing a management system compliant with the ISO 50001 standard are financed up to a maximum of 25% of eligible expenses, up to a maximum of € 10,000, VAT excluded. Beyond the incentives to SMEs, this rule finances to the Regions and Autonomous Provinces the expenses incurred in carrying out awareness-raising activities for SMEs on the importance of energy audits (10% of the global amount); and the governmental Agency ENEA up to € 75.000 for monitoring activities.

A similar ordinance was issued by the Ministry of Economic Development on 7 November 2017. Through this note the allowed energy audits are financed up to a maximum of 35% of the eligible expenses, up to a maximum of € 8,000, VAT excluded. The procedures for implementing a management system, compliant with the ISO 50001 standard, are financed up to a maximum of 35% of eligible expenses, up to a maximum of € 16,000, VAT excluded. In relation to these notes, the following Italian Regions have issued calls to support the implementation of energy audits in the





D.2.3 Analysis of existing framework conditions

SMEs of their own territory. Consider that the co-financing quota is usually higher (compared to the above) since the Regions, in addition to the resources of the Ministry of Economic Development, can also benefit from those of the European Regional Development Fund (through respective Regional Operational Plans).

Usually, 50% of eligible expenses: Campania, Veneto, Toscana, Emilia Romagna, Sardegna, Sicilia, Lombardia, Lazio, Molise and Piemonte.

b. Hurdles referred to support programs

The main hurdle is that not only the Italian Regions have issued such a Calls and that some of the Regions that did it, did it only in one or more years and not permanently. A second hurdle is represented by some limits in the dissemination of information.

Then, there are many specific barriers directly linked to the implementation of an energy audit which lead many SMEs not to implement energy audits and therefore not to benefit from the available support measures (see D2.1).

Incentives and Help

a. Financial benefit from other government obligations for companies conducting an energy audit

There is no financial benefit from other government obligations for companies conducting an energy audit.

b. Subsidized advice for SMEs on the benefits of an energy audit

For companies that are interested in obtaining Energy efficiency certificates, called also “white certificates” - that certify the achievement of energy savings in the final uses of energy through the implementation of energy efficiency increase interventions – there is the possibility to receive free advice. The advice is provided by GSE (Gestore dei Servizi Energetici), which is a public entity fully owned by MISE (the Ministry of the Economy and Finance).

Also, ESCo gives a preliminary advice for free to companies that are interested in achieving higher energy efficiency. The first step of this procedure is doing an energy audit. Companies will have the opportunity to be financed for the efficiency measures implementation (Finanziamento Tramite Terzi-Third Party Financing) by the so called “National Fund for Energy Efficiency” (Fondo Nazionale per l’Efficienza Energetica).

c. Networks for companies that help to save energy

The Covenant of Mayors for Climate and Energy (“Patto dei Sindaci”) requires that cities adopt a Sustainable Energy Action Plan (SEAP) - Piano d’Azione per l’Energia Sostenibile (PAES). Such plan foresees the creation of public “energy desks” (Sportelli energia) that provide consultancy to citizens and small enterprises on energy efficiency and transition towards a decarbonised society. In Emilia Romagna almost every municipality can benefit of it.





Many other initiatives can be found all over Italy. e.g.

- The Cosenza Chamber of Commerce has issued a Call for grants for direct investments in energy saving and re-use of materials, supporting micro, small and medium enterprises in improving environmental conditions through the assignment of vouchers for up to 50% of direct investments for energy efficiency and re-use of materials. The voucher can have a maximum value of € 5,000.00. The total financial allocation is € 1,000,000.00. The eligible expenses are: A) Investments aimed at saving and achieving energy efficiency, also through the use of renewable energy systems; B) intelligent systems for the management, efficient use and monitoring of energy consumption; C) systems for the reuse of production waste and production factors; D) machinery reuse systems; E) Investments aimed at introducing water consumption and water recycling in company systems according to the different technologies applicable to the different production sectors
- The Chamber of Commerce of Avellino has issued a tender for the granting of contributions to SMEs for the adoption of energy saving measures. Available financial resources amount to €150,000. The contribution granted to each applicant company is 50% of the eligible expenses, up to a maximum of € 3,000. The contribution is granted for: purchase and installation of LED lighting bodies; purchase and installation of intelligent lighting system management systems; purchase and installation of electrical power factor correction systems; purchase and installation of electricity consumption accounting devices; technical report prepared by a qualified technician and registered as a professional (could be an Energy Audit?).
- Lombardy Energy Cleantech Cluster (LE2C) is a cluster devoted to help companies in fostering innovation, technology transfer and create business opportunities. The cluster represents the Lombardy production system for energy and the environment. Its main competence areas are: 1) Smart Energy Systems 2) Sustainable Manufacturing 3) Green Building 4) Water Energy 5) Clean Air 6) Circular Economy.

d. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

e.g.

Lombardia Region (2019) - call for proposals for the promotion of Research and Development Projects aimed at innovation carried out by SMEs, including new ones, capable of guaranteeing positive effects on the Lombard competitive and territorial system.

Research, development and innovation projects will have to deal with the Macro-themes of the Areas of Specialization (1. aerospace; 2. agro-food; 3. Eco-industry; 4. creative and cultural industries; 5. health industry; 6. advanced manufacturing 7. sustainable mobility). In particular, the following calls are open:

- “National Fund for Energy Efficiency” for project aiming at improving the energy efficiency of processes and services; the installation or upgrading of district heating and district cooling networks and systems.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°847095



D.2.3 Analysis of existing framework conditions

- “purchase of new vehicles for transporting people and/or goods” for renewing the obsolete vehicles.
- “Circular Economy” for the implementation of circular economy projects in terms of: 1) product and process innovation for the efficient use of resources; 2) tools for improving product durability and recyclability; 3) tools and methodologies for the rational use of natural resources.

Abruzzo Region (2019) – call for proposal for investments for self-consumption, aimed at energy efficiency or the production of energy from renewable sources by SMEs

Sicilia Region (2018) - € 37 million, of which 75% reserved for SMEs for energy efficiency measures; and installation of plants from renewable sources (as well as for energy audits implementation)

Molise Region (2018) - € 3,177,028 to SMEs for investment programs aimed at the rational and efficient use of energy in production context (as well as for the implementation of energy audits).

Marche Region (2018) - € 9.836.644 for (among others) installation / modification of systems and equipment functional to the containment of energy consumption in the processing and / or service delivery cycles, such as to determine a significant annual saving of primary energy (also in SMEs).

Lazio Region (2017) - € 10.000.000 for (among others) "Smart grid" technological innovations, focused on the modernization of energy storage and distribution systems; innovative and better performing systems for the generation of energy from renewable sources, also in the field of Energy Community, with a view to implementing self-production of energy and optimization of consumption, as well as reducing the environmental impact of the most common technologies (wind, photovoltaic, etc.); Development of "biofuel" and "bioenergy" technologies to improve efficiency, diversification, storage and procurement costs of raw materials.

Puglia Region (2017) - incentive Call for proposal for SMEs for energy efficiency improvements in production activities

Basilicata Region (2017) - € 20,000,000 in favor of SMEs related to a Call for proposals for "Energy efficiency of companies" (projects for the energy efficiency investment of production plants and local business units and use of renewable energy sources for the production of energy destined only to self-consumption of the local productive unit).

Campania Region (2017) - call for tenders for grants in favor of SMEs for the implementation of a business investment plan for energy efficiency.





Emilia Romagna Region a stable “Energy fund” has been set since 2016: “Fondo Energia - Por Fesr 2014-2020, Asse 4, Azione 4.2.1 - Contributi per imprese in forma singola o associata”. It’s a multipurpose financing instrument to sustain the improvement of enterprises energy efficiency and promote the use of renewable energy sources, both for a transition towards green economy and to increase competitiveness.

The financial facility consists of a loan agreement based on 0% of interest on the 70% of the total and contained interest rate for the other 30%.

100% of the money requested for the intervention can be delivered up to a sum of 750'000 euros. The funding application requires an initial energy audit as a mandatory preliminary step.

e. Additional remarks

All the Italian regions operate only in convention with the unique Italian institution because the energy topic is managed with national competence.

Also, ENEA – that is the Italian national agency for new technologies, energy and sustainable economic development – is a strongly bureaucratic entity and even if it has a partnership with the national general Confederation of Italian Industry (Confindustria Nazionale), its projects of innovation about energy topics are generally not known and exploited by companies.





4.1.3. Spain

Legislative framework for energy audits

a. National regulations concerning energy audits

Royal Decree 56/2016 of 12 February, transposing Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency with regard to energy audits, accreditation of service providers and energy auditors and promotion of energy supply.⁴⁷

The energy audit is applicable to large companies, considered those with more than 250 employees and/or a turnover exceeding 50 million euros and a balance sheet total exceeding 43 million euros. Similarly, it will apply to social groups established in Article 42 of the Commercial Code. SMEs and micro-enterprises are excluded.

Large companies must carry out an energy audit every 4 years from the date of the previous energy audit. Failure to comply with this Royal Decree may result in penalties of up to 60 million euros.

Article 80 of Law 18/2014 of 15 October⁴⁸

Sanctioning regime established for those companies that fail to comply with the provisions of Royal Decree 56/2016.

Article 80. Infringements of energy audits, accreditation of service providers and energy auditors, promotion of energy supply efficiency and accounting of energy consumption.

1. The following constitute very serious infractions in the areas of energy audits, accreditation of service providers and energy auditors, promotion of energy supply efficiency and energy consumption accounting:

- a) Failure to conduct the energy audit within the legal or regulatory time frame.
- b) Accreditation as a provider of energy services or an energy auditor by providing false documentation.
- c) Non-compliance by energy service providers with the obligation to maintain the validity of the civil liability insurance contract or financial guarantee that covers the risks that may arise from their actions.

2. The following constitute serious infringements in the areas of energy audits, accreditation of service providers and energy auditors, promotion of energy supply efficiency and accounting of energy consumption

⁴⁷ Royal Decree 56 (2016). Royal Decree 56/2016, of 12 February, transposing Directive 2012/27/EU of the European Parliament and of the Council, of 25 October 2012, on energy efficiency, with regard to energy audits, the accreditation of service providers and energy auditors and the promotion of energy supply efficiency. Available at: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2016-1460

⁴⁸ Law 18 (2014). Of 15 October on the approval of urgent measures for growth, competitiveness and efficiency. Available at: <https://www.boe.es/buscar/act.php?id=BOE-A-2014-10517>





- a) Conducting energy audits without meeting the minimum legal or regulatory requirements and criteria
- b) Failure to comply with the obligation to carry out cost-benefit analyses in the cases established in the promotion of energy efficiency in the production and use of heat and cooling.
- c) Failure to comply with the obligation to install individual consumption meters (for heat, cold and/or domestic hot water) or alternative solutions where this is economically and/or technically feasible.
- d) Exercising the activity of service provider without complying with legal or regulatory requirements.
- e) The exercise of the activity of energy auditor without complying with the legal or regulatory requirements.

3. The following constitute minor infringements in the areas of energy audits, accreditation of service providers and energy auditors, promotion of energy supply efficiency and accounting of energy consumption:

- a) Failure to report the audit to the appropriate competent body for subsequent inclusion in the Administrative Energy Audit Register
- b) Any other failure to comply with the duties and obligations established for energy audits, accreditation of service providers and energy auditors, promotion of energy supply efficiency and accounting of energy consumption that does not constitute a very serious or serious infringement.

UPDATED DRAFT OF THE NATIONAL INTEGRATED ENERGY AND CLIMATE PLAN 2021-2030.⁴⁹

The EU requires each Member State to draw up a National Integrated Energy and Climate Plan 2021-2030 (PNIEC).

In order to incorporate renewable energies in the industrial sector, subsidies are being considered for studies, reports and energy audits to help industry move towards less carbon- intensive processes.

The audits to be carried out under RD 56/2016 must pass inspections that must be carried out on a random selection of at least a statistically significant proportion carried out in each four-year period. In order to facilitate the inspection, the Administrative Registry of Energy Audits has been created, which is public and free of charge, and has received information on 35,000 energy audits as of 3 December 2018.

The public aid and funding support programmes with a sectoral approach will use the mandatory energy audits as the main diagnostic tool for the definition of eligible investments needed to achieve the savings. They will also promote energy audits in small and medium-sized enterprises that are not affected by the mandatory nature of the Directive.

⁴⁹ PNIEC (2019). National Integrated Energy and Climate Plan (PNIEC) 2021-2030





DRAFT CLIMATE CHANGE AND TRANSITION LAW⁵⁰

ENERGY- This law aims to ensure compliance with the objectives of the Paris Agreement, to facilitate the full decarbonization of the Spanish economy, so as to guarantee the rational and supportive use of our resources, and the implementation of a development model sustainable and decent employment generation.

One of its goal is to improve energy efficiency by reducing primary energy consumption by at least 35% compared to the baseline under Community legislation.

One of the public award criteria will be energy efficiency that will lead to a high level of thermal insulation in buildings, energy renewable energy and low emissions from installations.

the requirements for operational energy audits and Strategic Environmental Sustainability Plans to be carried out by airlines, airport managers of general interest and air traffic service providers shall be established, to identify opportunities for improvement aimed at reducing emissions and implementing its contribution to energy and climate objectives.

Technical Building Code - Basic Energy Saving Document

This Basic Document (DB) aims to establish rules and procedures to meet the basic requirements for energy saving. This new version of the DB-HE (December 2019) will be compulsory for new construction and for interventions in existing buildings for which, in both cases, a municipal building permit is requested as from 28 June 2020. For those for which the municipal building permit is requested before that date, its application is voluntary, and the previous version of the document can also be applied.

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Regulation of Thermal Installations in Buildings (RITE)⁵¹, establishes the conditions that must be met by installations designed to meet the demand for thermal comfort and hygiene through heating, air conditioning and domestic hot water, to achieve a rational use of energy.

⁵⁰ Draft Climate Change and transition law. Available at: http://www.congreso.es/public_oficiales/L13/CONG/BOCG/B/BOCG-13-B-48-1.PDF

⁵¹ Royal Decree 1027 (2007). Of 20 July, approving the Regulation on Thermal Installations in Buildings. Available at: <https://www.boe.es/buscar/pdf/2007/BOE-A-2007-15820-consolidado.pdf>





b. Implementation of Article 8 into national legislation

Article 8 is completed however, it hasn't been included Articles 9 and 10 of the directive on the accounting of energy consumption.

c. Differences in the implementation of the energy audit between SMEs and non- SMEs

There are differences between audits in different industries but not that much between big and small companies.

Non-SMEs are obliged since 2016 to implement energy audits every four years unless they have an Energy Management System implemented.

After the deadline for submitting energy audits, in 2016, 34% of the companies obliged by RD 56/2016 would not have carried out the EA. 1292 large companies would face possible sanctions. Only 66% of large companies would have carried out EC. 29% of audited companies would implement measures in 2017.

This information is extracted from Energy audits from Castilla y León Region: 7.8% of industrial facilities account for 84.5% of energy consumption, while 81% of service facilities account for only 1.1% of energy consumption.

From all companies that had to make the energy audit in 2016, just 16,3% companies and 28,1% facilities (in Castilla y León) has verified and just 26% of the energy audits made are positive, the rest of them don't comply.

d. Other schemes or systematic guidance on energy saving for SME on regional or national level

Manual (tips):

- Energy Saving Guide for Industrial Installations⁵²
- Guide to energy saving and efficiency in offices⁵³
- Guide for the implementation of the Energy Management System in industrial SMEs in the city of Madrid⁵⁴
- Practical Energy Saving Guide for Retailers⁵⁵
- Manual of good practices for the improvement of energy efficiency in hotels in the Canary Islands⁵⁶
- Energy Audits Scope⁵⁷

⁵² "Guía de ahorro energético en instalaciones industriales". Fundación de la Energía de la Comunidad de Madrid"

⁵³ "Guía de ahorro y eficiencia energética en oficinas y despachos". Fundación de la Energía de la Comunidad de Madrid"

⁵⁴ "Guía para la implantación del Sistema de Gestión Energética en pymes industriales en la ciudad de Madrid". CEIM"

⁵⁵ "Guía práctica de ahorro energético dirigida al comerciante". MINISTERIO DE INDUSTRIA, TURISMO Y COMERCIO

⁵⁶ "Manual de buenas prácticas para la mejora de la eficiencia energética de los hoteles de Canarias". Gobierno de Canarias.

⁵⁷ "Alcance de las Auditorías Energéticas". A3e.





Funding Programs

a. Support programs for SME to carry out an energy audit

Real Decreto 263/2019, de 12 de abril.

Aid program for energy efficiency measures in SMEs and large industrial companies". (NATIONAL) This Program aims to facilitate the implementation of savings and efficiency measures proposed by the energy audits of the installations in order to reduce energy consumption in industrial processes, either through the use of energy through the replacement of equipment, or through the implementation of systems of energy

management. (It doesn't include the energy audit itself but it includes the energy audit as costs of external consultancy services when implementing energy efficiency measures.

Calls are beginning to open at the regional level to include subsidies to the cost of an energy audit among a bigger energy efficiency or renewable energy project. Some of these

programmes are closed now (like "Pyme Sostenible" in Andalucia) but it seems they will be more soon.

Aid program for investments in energy efficiency and solar thermal in the tertiary sector 2019 (Basque Government).

This program includes Comprehensive Energy Efficiency Audits on Buildings in the Tertiary Sector. (Ended in 31st October 2019).

b. Hurdles referred to support programs

- Each region publishes their own program based in the national law and there could be differences among each other. It gets confusion to the people.
- There is a little deadline to request. You have to be able not to miss it.
- SMEs have to pay in advance and wait for their proposition to be accepted and the money to come. It is not sure they will receive it.
- It usually covers around 30-40% of the project, never 100%.

Incentives and Help

a. Financial benefit from other government obligations for companies conducting an energy audit

There is no financial benefit from other government obligations for companies conducting an energy audit. Maybe it will be with the new measures of the Government.

b. Subsidized advice for SMEs on the benefits of an energy audit

There is no subsidized advice for SMEs on the benefits of an energy audit. Maybe it will be with the new measures of the Government.





c. Networks for companies that help to save energy

- A3e could be a network for companies that help to save energy but so far our service is more for ESCOs and students registered in our courses. We are not supported by public money.
- IDAE and Local Energy Agencies: Manage public subsidies for energy savings and efficiency. Promote energy efficiency being the intermediary between SMEs and authorities.
- Chamber of Commerce: Research programs related to energy efficiency within the companies.
- Forética: The mission of Forética is to promote the integration of social, environmental and good governance aspects in the strategy and management of companies and organizations. They disseminate good business practices.
- ISTAS- Autonomous foundation of a technical-union nature with the general objective of promoting social progress activities for the improvement of working conditions, the protection of the environment and the promotion of the health of workers in the Spanish State.
- Fundación Laboral de la Construcción

There are many business organizations, in some cases they are not well coordinated.

d. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

Climate protection:

Aid for adaptation to climate change is beginning to appear (for example, Fundación Biodiversidad) and specifically for the livestock and agricultural industry.

Some regions have local subsidies for the environmental protection (non-energy audits or energy related directly):

- (Basque Country) -Subsidies to companies for the implementation of investments for the protection of the environment)

Energy efficiency:

- (Every region) Subsidies from the aid programme for energy efficiency actions in SMEs and large industrial enterprises (RD 263/2019).
- (Cantabria) Subsidies for actions in renewable energies and energy saving and efficiency.





- (Galicia) Subsidies for projects of equipment for the use of renewable energies and for energy efficiency in primary agricultural production companies
- (Extremadura) Elaboration or modification of sustainable urban mobility plans that promote the integration of the electric vehicle in the local entities of Extremadura.
- (Every region) Support for the programme of incentives for efficient and sustainable mobility (Moves programme)
- (Madrid) Aid aimed at reducing energy demand, reducing the energy bill of users and promoting the development of a technology that uses renewable energy.
- (Extremadura) Aid under the Programme for the promotion of energy rehabilitation of existing housing
- (Castilla y León) Improving energy efficiency in the business sector (2016)

Additional remarks

There are subsidies to implement energy efficiency measures in the companies but not so much for implementing energy audits.

When subsidies are managed by different administrative agencies it makes it more difficult for companies in some cases.

Aid is largely dependent on the state budget. These have been on hold for a couple of years now and with the new government everything is starting to move.





4.1.4. Belgium

Legislative framework for energy audits

Belgium legislation is different in each region (Flanders, Wallonia and Brussels Capital). In the case of Wallonia a compulsory energy audit, as required by the EU directive, is required for all companies listed in the company register maintained by the Banque Carrefour des Entreprises. Companies that satisfy any of the following criteria are exempted from carrying out this audit.

- SMEs
- Companies that carry out an energy audit as part of the requirements for certification under
 - ISO 50001
 - ISO 14001
 - EMAS
- Companies that participate in the AMURE program (of Wallonia)

74 organizations and 742 sites are registered as undergoing EMAS audits. Nevertheless, by far the most important contribution in terms of share of total energy consumption, is based on audits conducted under the AMURE program.⁵⁸

AMURE program

The AMURE program for energy audits and energy studies is associated with Belgian energy policy going back to 1993. It is based on a series of sectoral strategies agreed with the federations representing each sector. These strategies are negotiated between the government of Wallonia and the sectoral federations, in negotiations that are led by the most energy intensive companies of the sector. The first wave of agreements known as AdB1 or “Accord de Branche 1” covered various periods up to 2013. They involved 16 sectors, 173 companies and 203 sites, representing 90% of (industrial) energy consumption of the region. The contracts lay-out on a sector by sector basis, the strategies, targets and audit mechanisms for each sector. They included audits of both energy and CO₂ emissions. The audits of companies taking part in the scheme are carried out and updated on an annual basis. By 2013 this process had achieved an overall energy efficiency gain of 16.5% and an overall CO₂ reduction of 19.3%.

The contracts were re-negotiated for the period 2014-2020. These AdB2 contracts include updated targets and audit mechanisms, along with a third element, the life-cycle analysis of main products and services of each company. Annual reports on progress exist for 2014 to 2016. Annual reports since then, have not been published and an overall report on progress for the period 2014-2020 has not yet been carried out.

Work is currently on going to determine the approach to be adopted for the next wave of contracts post-2020.

⁵⁸ Audits et études énergétiques (AMURE). Available at: <https://energie.wallonie.be/fr/audits-et-etudes-amure.html?IDC=6374>





To support companies in their efforts the AMURE program has trained and certified several hundred auditors to carry out these audits. The same auditors are also qualified to carry out the compulsory audits referred to by EU Directive.

The AMURE program makes no a-priori distinction between large and small companies. The initial audit is followed upon an annual basis. The program contains a series of “simplified audit” mechanisms.

The overall umbrella though is the AMURE program and its sectoral “Accords de Branche.” The Wallonian government considers that these sectoral plans provide the main instrument for implementation of the 2012/27/UE.

The second phase of the AMURE program is currently under way. A total of 14 sectoral agreements (Accords de Branche or AdB2) have been concluded.

These include agreements with 4 big companies:

- Carmeuse: A global mining company with HQ in Belgium. It carries out the Mining and processing of lime and limestone related products.
- Crystal Computing aka Google Technology Belgium: This contract is with a single company, Crystal Computing, who’s main activity is the establishment of data-farms to serve Google.
- GSV: The Belgian Steel Federation a group of 10 companies providing more than 25,000 direct and indirect jobs.
- Lhoist: This is a global producer of building materials based on lime, dolomite and other minerals.

They also include agreements with 10 industry associations / federations

- Agoria Wallonie: An industry association representing 542 members in the following sectors:
 - Aeronautics, Space, Security & Defence Industries
 - Building, Contracting & Technical Services Industries
 - Digital Industries
 - Manufacturing Industries
 - Materials Industries
- COBELPA: An industry association with 8 members representing wood Pulp, paper, cardboard and related businesses
- ESSENSCIA: An industry association representing 720 companies involved in chemicals, plastics, pharma and life-sciences.
- FBB-FEDICER: An industry association representing 5 major companies involved in ceramics and brick, as well as SMEs, professionals and craftsmen working in the sector
- FEBELCEM: The federation of Belgian cement producers. It has 3 members, CBR, CCB and Holcim. These are global players, producing over 6M tonnes a year with a combined annual turnover of almost €500M.
- FEDIEX: The federation of more than 60 quarrying and mineral extractive companies of Belgium.





- FEDUSTRIA: The federation of textile, wood and furniture companies in Belgium. It represents over 2,700 companies, large and SME, with a combined turnover of more than €12B
- FETRA-FEBELGRA: This is a union of two federations. FETRA which used to represent companies involved in the transformation of paper and cardboard, and FENELGRA which represents the graphics and prints industry of Belgium.
- FEVIA: The federation of food and drinks companies of Belgium. The sector is made up of 26 sub-sectors with more than 700 companies.
- FIV: The glass industry federation of Belgium. It has over 40 members and a turnover of just under €2.5B per year.

As a general rule, the terms of the agreement refer to

- The Kyoto Protocol
- The energy and climate pact and the 20-20-20 goals
- The EU energy efficiency directive

The objectives of the accord cover

- Concrete actions to improve energy efficiency
- Concrete actions to reduce CO₂ (specifically CO₂ reduction and not GHG CO₂ equivalent)
- An undertaking to analyse the potential for a switch to renewables
- An undertaking to map out the potential for reducing off-site CO₂ emissions
- An undertaking to reflect upon how to meet ambitious climate goals by 2050

It is worth noting that the main substance of the agreement is contained in the first two lines above.

In some cases, the CO₂ reduction strategy is limited to reductions that are proportional to reduction in energy consumption and eschew other possibilities such as the use of carbon credits, the planting of trees either in Belgium or abroad.

In each case the agreements consist of

- The terms of the agreement covering a period up to 31 December 2020, and
- The sectoral plan (or company plan) elaborated after the initial energy audit

The sectoral plans provide an outline of the projects retained for implementing the energy efficiency measures. It is interesting to note that whereas as some of these are discarded on the basis of the non-existence of the technology or the non-feasibility of its implementation, many are also discarded on the basis of the non-rentability of the investment. In other words, the approach totally ignores the existence of benefits beyond cost savings, such as those demonstrated by the CO₂ auditors CO₂ Strategy and CO₂ Logic.

At the start of implementation of the AdB, the company or organization undertakes an initial energy audit, led by an independent, government certified auditor, working with an Energy





Action Team. The audit employs the “EPS methodology” for carrying out an Energy Potential Scan, which comprises two elements...

- The ECA or Energy Consumption Analysis which provides a detailed description of all forms of energy consumed by all aspects of the business, its buildings and industrial processes.
- The ES or Efficiency Scan

This process leads to the definition of a series of improvement “pathways” based on the potential saving, the availability of the technology and the size of investment required. These pathways are classified based on a code comprised of the form LN where L is one of 5 letters and N is one of 3 numbers.

The letter codes used are as follows

- R for already done (project realized)
- A where the technology is available by the implementation is feasible
- B where the technology is available, and the feasibility is unsure
- C where the technology is not available, but the project merits attention and follow- up
- Z where the project is hard to evaluate due to lack of data or some other reason

The number codes are

- 1 when PBT (the pay-back time, aka time to break even) is less than 2 years
- 2 when PBT is between 2 and 5 years
- 3 when PBT is over 5 years

The implementation of the sectoral plans is based government issued guidelines that are in conformity with article 8 of the EU directive on energy efficiency, in particular with annex VI on “minimum criteria...” as well as with the ISO50001 norm for energy management.

The development of the EPS guidelines has a long history. They are originally based on energy efficiency improvement guidelines developed by NOVEM of the Netherlands in the ‘80s.

Wallonia bought the rights to the use of these guidelines in 1997. These were successively adapted to the needs of Wallonia with the help of the ICEDD and 3J in 2012. They have since been revised and updated on the basis of experience, most recently in 2016 with the assistance of Pirotech, for the purpose of supporting the implementation of the sectoral agreements under the AMURE program by a company called Pirotech.

The Wallonian government considers the management of CO₂ emissions as an integral part of the energy management process.

The initial EPS audit to carry out an “Energy Potential Scan” is based on what it calls the CAFE method for “Comptabilité Analytique des Fluides et Energies.” It is not limited to energy efficiency but also covers potential for savings in CO₂ emissions. This provides the quantitative basis for the sectoral action plan, with specific targets and deadlines.





This is one component of the complete audit which is described in the general guidelines covering all of the audit and reflection processes required by the sectoral agreements of the AMURE program

- Energy efficiency as required under the EU directive, in a way that is fully compatible with ISO 50001
- The switch to renewables
- Direct CO₂ emissions by the site
- Indirect CO₂ emission beyond the audited site
- The development of a 2050 roadmap

In addition to the initial audit, the guidelines also cover the annual audits required to follow up on the implementation of the sectoral action plan.

The AMURE audit process is broader in scope and more comprehensive than what is required by the EU energy efficiency directive. It was conceived before many of the events of recent years and before the rise in climate related activism and the declaration of a climate crisis by the UN.

The program is in its final year and one can expect that its successor will be quite different and convey a greater sense of urgency than what has gone before.

a. National regulations concerning energy audits

The EC directive article 8.4 to 8.7 and Annex VI of the Directive 2012/27/UE on energy efficiency, which are themselves a modification of 2009/125/CE et 2010/30/UE, repealing

Directives 2004/8/CE and 2006/32/CE... is “partially” transposed into the law of Wallonia, on the basis of:

- Décret wallon du 26 mai 2016... concerning aid and interventions for promoting the rational use of energy, energy efficiency and renewable energy.⁵⁹

This decree concerns “the promotion of the rational use of energy, energy savings and renewable energy in Wallonia.”

This updates and modifies previous legislation concerning the rational use of energy, energy efficiency and renewable energy sources namely

- Decree of the Government of Wallonia dated 8 September 2016
- Decree of the Government of Wallonia dated 9 December 1993

In particular

- It introduces the definition of an energy audit as “any systematic process intended to acquire adequate knowledge of the energy consumption of a building or of a group of buildings or of a commercial or industrial system or private or public services, so as to determine and quantify the energy savings that can be made in a profitable manner and report on its results.

⁵⁹ Walloon Decree of 26 May 2016 (2016). Decree on the compensation of certain damages caused by public natural calamities





- It specifies the criteria for determining which companies must carry out an energy audit and the use of independent auditors qualified by the government.
- It specifies the type of sanctions to be used against companies that do not comply.
- It specifies with reference to Annex VI of the EU directive, the minimal criteria to which an audit must comply.
- It refers to “transport” as an industrial process.
- It specifies conditions such as the need to retain related data for at least 10 years after the audit.

The AMURE decree of the government of Wallonia dated February 27, 2014 related to the awarding of grants to companies and the associations that represent them, for the improvement of energy efficiency and for the promotion of the rational use of energy.

b. Implementation of Article 8 into national legislation

Although the legislation refers to a “partial” transposition of Articles 8.4 to 8.7 it is hard to see what has been left out from these articles.

Although the legislation does not refer to articles 8.1 to 8.3 these are being effectively addressed in the Belgian energy system.

Article 8.1 dealing with promotion of energy audits to all final customers: Apart from industry actors, many programs exist and are available to public sector organizations (via the UREBA program) and private individuals, though it is hard to know if they are available to “all” final customers or if some sector has been left out.

Article 8.2 concerning the development of programmes to encourage SMEs to undergo energy audits and implement the recommendations from these audits: Although there is no SME specific program the AMURE program does not distinguish between SMEs and other companies, they are free to participate in the AdB on a voluntary basis. Since 2014 the grants available to provide support for energy audits and studies have been restricted to SMEs. In general, programs that are open to private individuals, especially those intended to improve the energy efficiency of buildings, are open to sole traders, professional and small businesses.

The Brussels City Carbon Challenge 30-30-30 launched in late 2019, started with a focus on the 30 largest companies in the Brussels region appears to be shifting its attention to SMEs in the region. This was a voluntary move adopted by the City of Brussels, and led by BECI the Brussels chamber of Enterprise, Commerce and industry, in line with other initiatives supported by the covenant of mayors.

Article 8.3 concerning programmes to raise awareness among households about the benefits of such audits through appropriate advice services: Despite the absence of legislation to this effect, the main energy providers have been carrying out campaigns aimed at households to encourage the rational use of energy. The private sector has also playing a role. A start-up called “Kill My Bill” founded in 2014, has had a lot of success offer price comparisons and facilitating change of contract for consumers of energy, telecoms, insurance, credit and other financial products across all regions of Belgium and more recently France. In terms of





energy in Belgium is provided a very easy way for clients of 16 gas, electricity and gas + electricity to compare providers and terms and change contract if they so desire. Its vision is to enable them to optimize based not only on price but on the energy mix in line with their ecological convictions.

Article 9 dealing with metering: This is not mentioned in the legislation but is being dealt with on a regional basis. On this Flanders has been active and has planned to complete the installation of smart metering by the end of 2019. Wallonia has not yet made a start on this.

c. Differences in the implementation of the energy audit between SMEs and non- SMEs

From the point of view of the AMURE program there are no a-priori differences between SMEs and large companies.

The main differences in “audits” or “studies” are at sectoral level.

In principle there are no differences. The AMURE methodology is the same for all companies subject to agreement.

The audits and studies are not limited to energy efficiency. They also include direct and indirect CO₂ emissions and the switch to renewables. In this sense there is great scope for difference from one company to another, especially in the case of direct CO₂ emissions.

From a Wallonian point of view the management of CO₂ emission is an important part of an overall energy management strategy.

Reference is made to “simplified” audit procedures, though it is not clear what exactly this means.

Programs that are “simple” and primarily aimed at private individuals are also open to sole traders, professional and small businesses (mainly small family run shops and retailers). In these cases, the small company is subject to a simplified audit or one that is aimed at a specific issue such as energy efficient building, efficient lighting or gains to be made from better insulation.





d. Other schemes or systematic guidance on energy saving for SME on regional or national level

The main ones are the AMURE audits referred to above. These are specific to the case of Wallonia. They are different for each sector and they are the result of negotiations between the government of Wallonia and the biggest energy consumers in each sector, via the federations representing each sector.

These programs not only concern energy usage, but also CO2 emissions. More recently they also deal with the life-cycle energy and CO2 emissions of products and services.

The government offers a comprehensive and free energy audit “pre-check” service to any company that requires one. Any company is eligible, but it is especially aimed at SMEs.

More specially a government energy advisory desk (URE = Rational Use of Energy) provides advice to industry based on free on-site visits on a wide range of issues, to answer typical questions such as:

- How can I save energy without losing money?
- How can I do this in my industrial processes?
- How can I do this in my buildings?
- Who can help me carry out my energy projects?
- How can I prioritize my energy projects?
- Is it worthwhile investing in renewable energy?
- What kind of financial assistance is available?
- Can you help me fill out the forms to request assistance?

These services are provided for free by the ICEDD (Institute for Studies and Advice on Sustainable Development) which is organized under the following main departments

- Natural resources and waste
- Mobility and transport
- Climate and the Energy Transition
- Buildings and Sustainable Industry

There are a number of voluntary Audit services that focus on CO2 emissions reduction and CO2 sequestration, in particular CO2 sequestration by planting trees. Companies that do this based their audits on a standard developed by ADME in France, where it is obligatory for companies with more than 500 employees to carry out periodic CO2 audits.





Although there is no program to support these audits and they are purely voluntary, demand for such Audit services is growing and most of the clients are SMEs. CO2 audits also included audits of energy use and share of renewables. They sometimes direct clients to undertake a dedicated energy Audit where efficiencies seem feasible and financially worthwhile. They focus less on arguments that rely on economic gain through energy saving, and more on fundamentals such as

- The energy transition
- Its impact on consumer behavior
- Its impact on the business model
- The switch to renewables
- Its impact on communication and marketing

Two such providers interviewed for T2.2 are CO2 strategies and CO2 Logic of Belgium.

Funding Programs

e. Support programs for SME to carry out an energy audit

The second phase of the AMURE program is currently under way. A total of 14 sectoral agreements (Accords de Branche or AdB2) have been concluded.

These include agreements with 4 big companies:

- Carmeuse: A global mining company with HQ in Belgium. It carries out the Mining and processing of lime and limestone related products.
- Crystal Computing aka Google Technology Belgium: This contract is with a single company, Crystal Computing, who's main activity is the establishment of data-farms to serve Google.
- GSV: The Belgian Steel Federation a group of 10 companies providing more than 25,000 direct and indirect jobs.
- Lhoist: This is a global producer of building materials based on lime, do-lime and other minerals.

They also include agreements with 10 industry associations / federations

- Agoria Wallonie: An industry association representing 542 members in the following sectors:
 - Aeronautics, Space, Security & Defence Industries
 - Building, Contracting & Technical Services Industries
 - Digital Industries
 - Manufacturing Industries
 - Materials Industries
- COBELPA: An industry association with 8 members representing wood Pulp, paper, cardboard and related businesses
- ESSENSCIA: An industry association representing 720 companies involved in chemicals, plastics, pharma and life-sciences.





- FBB-FEDICER: An industry association representing 5 major companies involved in ceramics and brick, as well as SMEs, professionals and craftsmen working in the sector
- FEBELCEM: The federation of Belgian cement producers. It has 3 members, CBR, CCB and Holcim. These are global players, producing over 6M tonnes a year with a combined annual turnover of almost €500M.
- FEDIEX: The federation of more than 60 quarrying and mineral extractive companies of Belgium.
- FEDUSTRIA: The federation of textile, wood and furniture companies in Belgium. It represents over 2,700 companies, large and SME, with a combined turnover of more than €12B
- FETRA-FEBELGRA: This is a union of two federations. FETRA which used to represent companies involved in the transformation of paper and cardboard, and FENELGRA which represents the graphics and prints industry of Belgium.
- FEVIA: The federation of food and drinks companies of Belgium. The sector is made up of 26 sub-sectors with more than 700 companies.
- FIV: The glass industry federation of Belgium. It has over 40 members and a turnover of just under €2.5B per year.

Many of the members of these federations are SMEs, some are even micro-enterprises.

Since 2014, the AMURE program provides grants to companies that want to carry out studies and audits. They can cover tasks such as the performance of global, partial and simplified energy audits, prefeasibility and feasibility studies as well as annual follow up studies. Since August 3, 2017 these are reserved for

- SMEs
- Companies that take part in AdB (sectoral agreements or Accord de Branche).

In summary the current situation is that

- Large companies that are not part of an AdB are not eligible for grants.
- Both large companies and SMEs that are part of an AdB are eligible.
- SMEs that are not part of an AdB are eligible for most of these, except for tasks that are specific to and required by the AdB.

That means that:

- There is no assistance for large companies that carry out the obligatory audit required by the EU directive.
- There is assistance in principle for SMEs that want to carry out an audit of this type
- There are other less burdensome audits they might prefer instead and from which they can also avail of grant-aid.

The grant applies to the partial recovery of eligible costs up to a total eligible cost of €4k. It covers 50% of costs of large companies and up to 70% for small companies with an average of 60% for SMEs.





Note that we are now in the very last year of AdB2 and a new AdB and budget will need to be negotiated for the period 2021 onwards. It is not clear just yet how different this will be from AdB1 and AdB2.

On a general note, SOWALFIN acts as a one-stop shop for SME financing in Brussels region and Wallonia. It promotes circular economy projects and ventures providing loans and sometimes in exchange for equity in its client companies. Its actions include support for renewable energy and CO2 reduction projects.

A subsidiary of SOWALFIN called NOVALIA focuses more specifically on helping SMEs manage the energy transition. To do so it manages two financing programs

- The “Easy’up” program is a general instrument for financing the innovation projects of SMEs and micro-enterprise. It is based on a face-to-face interviews and site visits where program experts provide assistance to the company to evaluate and cost their project and submit the required documentation. In the case of Easy’up financial assistance takes the form of a subordinated loan, at low interest rate, with quarterly repayments and the possibility of equity participate in lieu of guarantee. The amount of the loan cannot exceed €500K for 40% of the total cost of the project. It is possible to combine this with other kinds of public finance in which case the total amount of financing cannot exceed 75% of total financial needs. The general goal of the program is to accelerate the adoption of innovations by the company and its clients. Where projects have an ostensible eco-logical dimension such as CO2 reduction, they are referred to the Easy’green program.
- The “Easy’green” program provides help in the form of loans. These are provided on favorable terms such as low interest rate, capital reduction and quarterly repayment terms, in addition to flexible formats including un-secured loans, subordinated loans and loan guarantees. The loans can also be covered by equity to be recovered on the basis of negotiable terms. Participants in this program benefit from free assistance in the costing of their energy projects and reducing their energy bills, as well as advice on improving the energy efficiency of their commercial buildings and industrial processes, the production of energy from renewable energy sources, and the reduction of their CO2 footprint.

It is interesting to note that the energy projects tend to focus on

- Switching to renewable energy production based on the prosumer model
- Energy efficiency of industrial processes and commercial buildings
- Reduction of CO2 emissions

No explicit mention is made of

- The energy transition or energy efficiency in transport and mobility
- The use of carbon sequestration for example based on tree planting
- Benefits beyond financial savings, for example in terms of supply chain and collective measures, or the provision of benefits in terms of marketing and communication, community and stakeholder engagement as well as recruitment and human resource management





Small business may also avail of grants available to individuals for building related energy efficiency measures and small-scale energy production based on the prosumer model and the installation of PV panels.

Energy audits are required for access to grants to assist with renovation, insulation and efficient glazing, lighting, connected building technology, transport (biking, e-bikes and electric cars) as well as the installation of photo-voltaic panels. In general, these are available to private individuals, building owners, sole traders, professionals and small businesses. They require an audit or feasibility study and can lead to the award of a green energy certificate and the right to claim fiscal advantages.

These programs recognize the fact that many small businesses occupy spaces or buildings that are owned or rented from their owners, resulting in these business owners being able to pass on savings in their privately-owned building to their business.

Wallonia is host to a wide range of programs and tools aimed at professionals of the sector. In the case of construction these include

- Energie+: An online tool to help builders and building owners decide on the best way to improve the energy efficiency and performance of their buildings. This includes the potential for improvement using technologies for smart buildings, energy production and energy storage.
- Project Carnet: An online “project notebook” tool aimed at architects and other construction professionals involved in the planning and implementation of energy projects.
- Opti-Maison: A tool aimed at architects, engineers and construction project managers intended to help them design buildings with a view to attaining higher energy performance from their designs. Now in its 4th upgrade.
- Opti-Bureau: Another tool similar to Opti-Maison.

There are many other programs and tools dealing with a wide range of issue such as building classification, energy related renovations and upgrades as well as access to grants, related audits, certificates and fiscal measures.

f. Hurdles referred to support programs

Grants available under the AMURE program are open to SMEs.

- They are awarded on a first-come first-serve basis
- They total amount allocated is limited
- The amounts awarded are modest
- They are primarily aimed at companies that are party to an AdB
- They only cover “studies” and “audits”, not implementation on the basis that cost savings alone should justify the cost of implementation





A difficulty with schemes aimed at private individuals and households, but also of interest to and open to small businesses is that the award of the grant often leads to a revision of the cadastral value of the property and increased cadastral charges.

Accountants often advise their clients not to apply for such grants on the basis that when the increase in cadastral charges is taken into account the grant will cost more than the savings it is intended to provide.

On a positive note it is worth noting that an increasing number of SMEs are availing of the audit services of companies like CO₂ Strategy and CO₂ Logic, on a voluntary basis and

without grant aid, presumably on the basis of a perceived “better” or more “comprehensive” business service.

Incentives and Help

g. Financial benefit from other government obligations for companies conducting an energy audit

There is no financial benefit from other government obligations for companies conducting an energy audit.

Unless you want to count fiscal advantages related to energy efficient, passive or zero carbon buildings. In these cases, an “audit” is required to obtain the certificate and the certificate can be used as a basis for a variety of fiscal deduction.

These programs exist but there is no assistance provided to companies to avail of these possibilities.

h. Subsidized advice for SMEs on the benefits of an energy audit

There is no subsidized advice for SMEs on the benefits of an energy audit.

There is in some cases assistance for carrying out an audit. But there are no general campaigns encouraging companies to do so.

Such marketing efforts are undertaken by the auditors themselves. Their approach differs from one auditor to another.

Sectoral associations can play a role in this, but it is hard to evaluate overall, and seems to be limited in general.

The main issue is that energy is very specific and very technical, and energy costs are a

limited part of most company's costs. It is more meaningful to talk about broader issues such as climate change, CO₂, sequestration, business models and marketing.

i. Networks for companies that help to save energy

The main networks are the sectoral networks of the AMURE programs, and other networks that are emerging on a city by city basis or thanks to the efforts of owners of business parks.





The latter initiatives are fragmented and local and hard to keep track of in general.

The AMURE “networks” were 17 for AdB1 and are now 16 for AdB2. There is one per sectoral association that has signed an AdB with SPW (Services Publiques Wallonie).

The most important city network is the 30-30-30 City Carbon Challenge led by BECI, the Brussels Chamber of Enterprise, Commerce and Industry, along with the city of Brussels. This initiative was launched in late 2019 by 30 biggest companies operating in the Brussels region. Their focus is on CO₂. The 30-30-30 stands for 30 projects to reduce the CO₂ footprint of Brussels by 30% in 2020. So far they have decided that the large companies will find it difficult to make significant gains, that they have already picked the low hanging fruit and that other gains will rely on working with their suppliers and clients and seeking synergies with the behaviors of companies close-by. This is still at the level of a general idea. There is consensus on the need to engage much more strongly with SMEs, but no clear idea as to how to do so.

There are a variety of ad-hoc initiatives conducted at the level of the cluster or business park. These include an initiative started by the Chamber of Commerce of Leuven la Neuve, which led a CO₂ audit initiative for the chamber but also on behalf of the 400 or so SMEs in their business park. The park is called the AXIS park and the audit led to an initiative called Plant your Business Tree. It involved all of the companies in the park, to plant trees in an urban forest to neutralize their carbon footprint. Since then, the owner of the park has undertaken to plant 500,000 trees (in Madagascar) over a period of 3 years, to neutralize all of the carbon emitting the construction of the park, removing not only currently emitted CO₂, but all of what it estimates it has emitted historically since the creation of the b park. This audit looks at things like energy usage, share of renewables, and opportunities for energy savings, but this information is embedded in an approach that starts with CO₂. In addition to energy savings and energy efficiency measures, it identifies opportunities for reducing emissions that are good for the environment, but which go beyond the direct savings to be made based on energy management alone.

j. Other subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs without aiming directly at an energy audit?

There are essentially no schemes that aim at a general energy audit of the kind needed to fulfill the EC directive.

The existing schemes such as AMURE deal with a portfolio of measures. Currently these include

- Energy efficiency and renewables
- CO₂/GHG emissions
- Lifecycle analysis of products

The smaller schemes aimed at occupiers and owners of buildings are more specific and include:

- Building audits (with a view to getting some kind of green certification)





- Studies related to lighting, insulation, renovation, PV installation, e-mobility

Then there are the voluntary ad-hoc CO₂ audits, such as those carried out by CO₂ Logic and CO₂ Strategy, which are based on a French standard developed by ADME of France and required by French law of all companies with more than 500 employees.

k. Additional remarks

The main remarks concern

- Energy is rarely treated on its own. It is usually treated as part of a package involving CO₂ or other kinds of efficiency such as resource efficiency based related to waste management (including plastics, food and other resources such as land and water etc.) which could involve energy from biomass
- The CO₂ audits include but go beyond the scope of the energy audit. They offer advantages or benefits that go beyond cost savings due to energy efficiency, but address issues such as the need to deal with changes in business model, branding, marketing and communication that must accompany the energy transition and a new set of emerging employee and consumer values.
- In this case price need not be a problem as the growing number of SMEs that currently avail of CO₂ audits (as in Belgium) do so voluntarily and for reasons that go beyond and are deeper than direct savings in energy costs.
- Many savings can be realized at the level of the company, but more can be realized at a collective level, where leadership is an issue, as well as at a systemic level where good collaboration with the public sector is often essential for success. Transport is a case in point, where there is great scope for companies, the SME populations of business districts, industry parks and clusters, as well as public administration working together to realize further levels of savings.
- It is possible that first generation programs such as AMURE have helped companies that take part, reach the low hanging fruit in terms of energy efficiency and that further gains based on company efforts alone will be harder to realize and maybe even smaller in scale. If this is true, then the next big efficiencies will come from efforts that are collective and or systemic in nature.
- SMEs can benefit from programs that are primarily aimed at private individuals and households, but which are more closely adapted to the needs of small business than industry scale initiatives. The question is whether or not they are counted and recorded in the statistics.
- On building efficiency there appears to be conflict between savings to be made from efficiencies and the use of grants, eroded by increased costs due to a jump in the cadastral value of the building.





5. Conclusion

National regulations concerning energy audits

The EU Energy Efficiency Directive requires large companies in the EU to carry out energy audits. In all of the EU member states within this project, the obligation has been transposed into national legislation.

In Poland, Article 8 is not completely transposed into national legislation. Currently there is no official mechanism of any kind in Polish law to determine the quality of energy audits. In theory, entrepreneurs are obliged to keep the company's energy audit for 5 years for possible control. So far, no energy audits of companies have been verified.

In all EU member states within this project the implementation of the audits is carried out in accordance with European or international standards, EN 16247-1 or EN ISO 50001 or EN ISO 50002. Exemptions from mandatory energy audits are mainly based on the introduction of an energy or environmental management system as EN ISO 14000 (Environmental management systems) or EMAS the European Environmental Management and Audit Scheme.

In Belgium audits can also be carried out according to a special program, the so called AMURE. That is a program for energy audits which is very closely linked to the energy policy. The program is based on a series of sectoral strategies agreed with the associations representing each sector. It is possible that first generation programs such as AMURE have helped companies that take part, reach the low hanging fruit in terms of energy efficiency and that further gains based on company efforts alone will be harder to realize and maybe even smaller in scale.

Differences between SME and non-SME

The energy audit is mandatory for large companies. Large companies must conduct an energy audit every 4 years from the date of the last energy audit.

For small companies the energy audit is not yet mandatory but in Italy, however, there is also a regulation that requires "energy-intensive" SMEs to carry out an audit. The definition "energy-intensive" is based on a certain number of GWh or percentage of energy costs in turnover.

There is no different detailed procedure for energy audits in SMEs and non-SMEs. The audit processes are based on the standards. The scope and methodology of each audit is practically adapted to the type of company and the profile of its activity. The results also show that Non-SME have intern departments dealing with energy-related topics SME whereas SME often does not have available staff. This is an obstacle that explains why SME's are still having difficulty implementing a voluntary audit.





Funding and information policy instruments

The results show that all of the EU member states in this project have, in addition to the requirements, voluntary agreements and many instruments that promote the implementation of energy audits and energy management systems in companies. The subsidy instruments are aimed at SMEs and in some cases also at private households, associations, municipalities, etc. Large companies are not focused here. The specific type, implementation and design of the instruments depends on the situation in the individual Member State. Various Member States use a mix of policies to address SMEs.

Following instruments are:

- Schemes or systematic guidance on energy saving for SME
- Funding programs - Support programs for SME to carry out an energy audit
- Subsidized advice for SMEs
- Networks for companies
- Financial instruments
- Voluntary agreements
- Further subsidies and programmes promoting the implementation of climate protection and/or energy efficiency measures in SMEs

Schemes or systematic guidance on energy saving for SME

Guidelines for Energy Audits are based on the national law. They are in accordance with the statutory provisions. They can either be accessed at the Governmental Agency or they are defined in regulations. Energy Audits in SMEs should be implemented according to the EN 16247 or ISO 50002. ISO 50001 applies for the adoption of energy management systems.

Beside these regulations, in some Member States further guidelines do exist. The design of these guidelines varies in the different Member States. These can be, for example, handbooks, checklists and initial advice or educational programmes which are initiated, for example, by associations, ministries, chambers of commerce, etc.

These guidelines for example may be targeted at specific sectors, regions and industries

- Craft
- Hotel sector
- Retail
- Industrial SMEs

Or they are related to specific subject areas for example efficiency in offices etc.





Funding programs – Support programs for SME to carry out an energy audit

Every member state has special funding programs. These programs focus on the partial financing of energy audits or financial support for the implementation of energy-efficient technologies. There are also low-cost loans for SMEs. The covered part and the absolute limit of the audit cost varies in the different Member States. Relating to the funding programs in every Member State different hurdles do exist.

Following hurdles were identified and summarized:

- **High bureaucratic burden:**
Applications for funding programs are often only to be completed with the help of a consultant (High complexity). The eligibility conditions are complicated and failure to comply with them will lead to subsequent exclusion. The decisions about the grant often take many months.
If the subsidies are managed by different administrative authorities, this makes it difficult for the companies in some cases.
- **Lack of publicity and transparency:**
SMEs are not that well informed about possible subsidies. Furthermore, there is confusion on funding and programmes are often not tailored to specific needs
- **Too different programmes in the respective regions:**
Funding programmes are not implemented in every region. Missing database on the use of the funds; Each region publishes its own programme on the basis of national law, and there may be differences between regions. This is confusing people.
- **The programs are available for a relatively short time in different regions:**
Therefore, the market for audit services cannot develop well under stable conditions. On the other hand, the companies that could benefit from such a programme also have limited opportunities to identify the real need for energy auditing and to obtain financial support.
- **Funding is too low:**
In general, support programmes do not include 100% support. In some Member States the support programs cover only about 30-40% of the costs.
- **Short application deadlines:**
You have to be watchful not to miss the deadline, and actively follow many support programs in order to identify on time the ones fitting addressing your real needs.
- **Pay in advance:**
In some Member States SMEs have to pay in advance and wait for their proposal to be accepted and for the money to come. It is not certain that they will get it.
- **Subsidies in other subject areas:**
Often there are subsidies for the implementation of energy efficiency measures in the companies, but not so much for energy audits.





Financial benefit from other government obligations for companies conducting an energy audit

At the moment only in one Member State there is a financial advantage. Here, depending on size and energy consumption, companies can apply for tax relief under the so-called peak balancing and special compensation scheme when introducing an energy management system or an energy audit.

Subsidized advice for SMEs on the benefits of an energy audit

At present there is only one Member State Subsidized advice for SMEs. Here the federal government provides grants to support small and medium-sized enterprises (SMEs) in making use of qualified energy consulting services. At regional level, also there is a free initial check (so called KEFF-Check) that provides information about energy saving potentials in SME. In another Member State in the past there were few examples of subsidized energy consultancy for SMEs. Sometimes small initiatives emerge, such as the project "Technical assistance for the promotion of energy audits and energy efficiency investments in small and medium-sized enterprises".

Networks for companies that help to save energy

Energy efficiency networks are one approach to creating a continuous exchange of information between companies. The results show that all Member States have established several networks. These may take the following form.

- Networks of innovative companies and organizations from different sectors
- Cooperation with associations
- Public agencies on the orders of politics
- Energy clusters of local energy producers and consumers
- Association of persons carrying out activities in the field of energy auditing
- Foundation for Energy Saving
- National Association - Support of energy saving activities
- And many more

Furthermore, for many other areas such as climate protection, energy efficiency or renewable energies etc. support programmes, legal regulations and other instruments do exist in all Member States.





The results show that all Member States already use a number of tools to implement energy audits.

The next step is now to find out in the form of workshops and training courses which of the instruments work particularly well and which do not.

With regard to the identified hurdles, there are still many starting points, especially in the area of subsidies. These obstacles should be taken up in a workshop and joint approaches to solutions should be developed. Following questions should be addressed:

- How can the application of funding programs be simplified?
- How can the application be improved?
- Which programmes are attractive for SMEs and which are not?
- Is topic energy audit already sufficiently represented etc.?





6. Annex 1: Bibliography

Act on the implementation of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 allowing voluntary participation by organisations in a Community eco-management and audit scheme and repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC (Environmental Audit Act - EIA).

AEE (2016). The Energy Efficiency Act of 20 May 2016.

Announcement of the Minister of Energy of 23 November 2016 on the detailed list of projects aimed at improving energy efficiency

Audits et études énergétiques (AMURE). Available at: <https://energie.wallonie.be/fr/audits-et-etudes-amure.html?IDC=6374>

Brumme M. (2015). Energy audit obligation: DIN EN 16247-1 versus ISO 50001 Energy audit or energy management system - Where is the key to success? Available at: <https://www.ib-brumme.de/2015/10/08/energieaudit-pflicht-din-en-16247-1-versus-iso-50001/>.

C(2003) 1422. COMMISSION RECOMMENDATION of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:124:0036:0041:EN:PDF>

Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

Council Regulation (EEC) No 1836/93 of 29 June 1993 allowing voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme.

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

Draft Climate Change and transition law. Available at: http://www.congreso.es/public_oficiales/L13/CONG/BOCG/B/BOCG-13-B-48-1.PDF

EDL-G (2010). Energy Services and Other Energy Efficiency Measures Act of 4 November 2010 (Federal Law Gazette I p. 1483), last amended by Article 1 of the Act of 20 November 2019 (Federal Law Gazette I p. 1719).

EEG (2017). Renewable Energy Sources Act of 21 July 2014 (Federal Law Gazette I p. 1066), last amended by Article 3 of the Act of 20 November 2019 (Federal Law Gazette I p. 1719).

EN 16247-1:2012-10. Energy audits - Part 1: General requirements. Beuth-Verlag.

EN ISO 14001:2015-11. Environmental management systems - Requirements with guidance for use (ISO 14001:2015). Beuth-Verlag.





- Energy Act - EZ-1 (2014). Official Gazette RS, No. 17/14 of 7 March 2014. Available at: https://www.energetika-portal.si/fileadmin/dokumenti/zakonodaja/energetika/ez-1/ez-1_energy_act_proposal.pdf
- European Union, Ministry for the Environment, Climate and Energy Baden-Württemberg (2016). Regional Competence Centres Network Energy Efficiency (KEFF). Available at: <https://keff-bw.de/de>.
- Federal Environment Agency (2020). Energy management with system. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/energiemanagement-system#wie-funktioniert-ein-energiemanagement>.
- Federal Environment Agency (2020). ISO 14001 - Environmental management system standard. Available at: <https://www.umweltbundesamt.de/themen/wirtschaft-konsum/wirtschaft-umwelt/umwelt-energiemanagement/iso-14001-umweltmanagementsystemnorm#neue-fassung-der-iso-14001>.
- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2019). SME Initiative Energy system transformation and climate protection 3.0.
- Federal Ministry of Economics and Energy. Initiative Energy Efficiency Networks.
- Federal Office of Economics and Export Control (2015). Energy Efficiency Networks Municipalities.
- Federal Office of Economics and Export Control (2019). Federal funding for energy efficiency in the economy.
- Federal Office of Economics and Export Control (2019). Promotion of energy efficiency and process heat from renewable energies in the economy (EEW).
- Federal Office of Economics and Export Control (2020). Energy audit. Available at: https://www.bafa.de/DE/Energie/Energieeffizienz/Energieaudit/energieaudit_no_de.html.
- Fraunhofer ISI (2020). Marie. Available at: <https://www.energie-effizienz-netzwerke.de/een-de/netzwerktypen/marie.php>.
- Hirzel, S., Nabitz, L., Wohlfarth, K., Rohde, C., Behling, I., Clarke, D., Perera, N., Turner, R. (2016). A study on energy efficiency in enterprises: energy audits and energy management systems. European Commission Report.
- HK Nuremberg for Central Franconia Department Innovation. European EnergyManager. EUREM. Available at: <https://www.energymanager.eu/en/>
- ISO 50001:2018-08. Energy management systems - Requirements with guidance for use. Beuth-Verlag.
- ISO 50002:2014. Energy audits – Requirements with guidance for use. Beuth-Verlag.
- Law 10/91 (1991). Rules for the implementation of the National Energy Plan on the rational use of energy, energy saving and development of renewable energy sources. (GU Serie Generale n.13 del 16-01-1991 - Suppl. Ordinario n. 6)
- Law 18 (2014). Of 15 October on the approval of urgent measures for growth, competitiveness and efficiency. Available at: <https://www.boe.es/buscar/act.php?id=BOE-A-2014-10517>
- Legislative Decree n. 102 (2014). Implementation of Directive 2012/27 / EU on energy efficiency, which amends directives 2009/125 / EC and 2010/30 / EU and repeals directives 2004/8 / EC and 2006/32 / EC (Official Gazette No. 165 of 18 July 2014). Available at: http://www.bosettiegatti.eu/info/norme/statali/2014_0102.htm





- Legislative Decree n. 102 (2014). Implementation of Directive 2012/27 / EU on energy efficiency, which amends directives 2009/125 / EC and 2010/30 / EU and repeals directives 2004/8 / EC and 2006/32 / EC (Official Gazette No. 165 of 18 July 2014). Available at: http://www.bosettiegatti.eu/info/norme/statali/2014_0102.htm
- Legislative Decree n. 28 (2001). Implementation of Directive 2009/28 / EC on the promotion of the use of energy from renewable sources, amending and subsequent repeal of Directives 2001/77 / EC and 2003/30 / EC (Official Gazette No. 71 of March 28, 2011)
- Ministry for the Environment Baden-Württemberg, Climate and Energy (2019). Climate Protection Plus.
- Minol (2020). Energy efficiency directive adopted: Europe switches to remote reading and monthly consumption information. Available at: <https://www.minol.de/presse/energieeffizienz-richtlinie-verabschiedet-europa-stellt-auf-fernablesung-und-monatliche-verbrauchsinformationen-um.html>.
- PNIEC (2019). National Integrated Energy and Climate Plan (PNIEC) 2021-2030
- Regulation of the Minister of Energy of 5 October 2017 on the detailed scope and manner of preparing an energy efficiency audit and methods of calculating energy savings
- Regulation of the Minister of Infrastructure of 17 March 2009 on the detailed scope and forms of the energy audit and parts of the renovation audit, models of audit cards, as well as the algorithm to assess the cost-effectiveness of the thermo-modernization project.
- RES (2015). Valid Act of 20 February 2015 on Renewable Energy Sources
- Royal Decree 1027 (2007). Of 20 July, approving the Regulation on Thermal Installations in Buildings. Available at: <https://www.boe.es/buscar/pdf/2007/BOE-A-2007-15820-consolidado.pdf>
- Royal Decree 56 (2016). Royal Decree 56/2016, of 12 February, transposing Directive 2012/27/EU of the European Parliament and of the Council, of 25 October 2012, on energy efficiency, with regard to energy audits, the accreditation of service providers and energy auditors and the promotion of energy supply efficiency. Available at: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2016-1460
- SpaEfV (2013). Spitzenausgleich-Effizienzsystemverordnung of 31 July 2013 (Federal Law Gazette I p. 2858), last amended by Article 1 of the Ordinance of 2 October 2019 (Federal Law Gazette I p. 1412).
- UNI CEI 11339 (2009). Specific requirements for the certification of the skills of energy management experts (EGE – UNI 11339)
- UNI CEI 11352 (2014). Accreditation and certification scheme, in accordance with UNI CEI 11352: 2014 "Companies providing energy services" (ESCO), drawn up pursuant to art.12, paragraph 1, of Legislative Decree 4 July 2014, n. 102. Available at: https://www.mise.gov.it/images/stories/normativa/schema_certificazione_Esco_UNI_11352.pdf
- UNI EN 15459:2008, "Energy performance of buildings - Procedure for the economic evaluation of building energy systems". Available at: http://store.uni.com/catalogo/uni-en-15459-1-2018?josso_back_to=http://store.uni.com/josso-security-check.php&josso_cmd=login_optional&josso_partnerapp_host=store.uni.com
- Vorest AG (2020): Differences between EMAS and ISO 14001 Environmental management: The right system for your company. Available at:





D.2.3 Analysis of existing framework conditions

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https://umweltmanagement.me/umweltmanagement_iso_14001/unterschiede_ema_s_iso_14001_umweltmanagement/.

Walloon Decree of 26 May 2016 (2016). Decree on the compensation of certain damages caused by public natural calamities

Weka Media GmbH & Co. KG (2017). Differences in energy audits according to ISO 50002 and DIN EN 16247-1. Available at: <https://www.weka.de/energie/iso-50002/>.

Weka Media GmbH & Co. KG (2020). Energy management and energy efficiency: The information portal on energy in companies. Available at: <https://www.energiemanagement-und-energieeffizienz.de/energie-lexikon/din-en-16247-12012/>.

