LEAP to 11

Deliverable 2.1

Article 8 EED Implementation in the Participant Agencies' Countries: analysis of Practices to Collect, Store and Assess Information from Energy Audits and Energy Management Systems

Public Report

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List of Acronyms

ADENE	Portuguese Energy Agency
BAFA	German Federal Office for Economic Affairs and Export Control
CRES	Center For Renewable Energy Sources of Greece
CSRD	Corporate Sustainability Reporting Directive
DENA	German Energy Agency
EC	European Commission
EED	Energy Efficiency Directive of the European Union
EFRAG	European Financial Reporting Advisory Group
EIHP	Energy Institute Hrvoje Požа of Croatia
EMAS	Eco-Management and Audit Scheme
EMS	Environmental management system
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
EnMS	Energy Management System
EPIAs	Energy Performance Improvement Action(s)
ESRS	European Sustainability Reporting Standards
EU	European Union
EWA	Energy and Water Agency of Malta
ESAP	European Single Access Point
GDP	Gross domestic product
ISGE	Information system for energy management of Croatia (nacionalni informacijski sustav za gospodarenje energijom)
ISO	International Organization for Standardization

LEA	Lithuanian Energy Agency
MS	EU Member States
NECP	National Energy and Climate Plans
NECPRs	National Energy and Climate Progress Reports
PREn	Energy Consumption Rationalization Plans
REWS	Regulator for Energy and Water Services of Malta
RVO	Netherlands Enterprise Agency
SEAI	Sustainable Energy Authority of Ireland
SIEA	Slovak Energy and Innovation Agency
SMEs	Small and medium-sized enterprises

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Executive Summary

Energy audits and Energy Management Systems (EnMS) are effective tools for enterprises to identify and plan measures to save energy and mitigate greenhouse gas emissions. Thus, they contribute to reaching the European Union's climate neutrality targets. Accordingly, the European Energy Efficiency Directive (EED) contains provisions to increase the implementation rate of energy audits and EnMS which are implemented by corresponding national regulations.

Under Article 8 of the EED EU/2012/27, large enterprises were obligated to perform an energy audit at least every four years from the date of the previous energy audit, starting from 2015. Enterprises that had already incorporated a certified energy or environmental management system were exempt from the obligation. With the adoption of Article 11 of the amended EED EU/2023/1791, the target group of enterprises that are obligated to perform energy audits is no longer defined by the size of companies. Instead, the obligation applies to all enterprises recording an average annual energy consumption above 10 TJ per year in the previous three years. Furthermore, it is now mandatory for enterprises with an average annual energy consumption of more than 85 TJ in the previous three years to implement an EnMS. The EU Member States (MS) are now working on the transition from the prior Article 8 to the new Article 11.

This report was created within the project "Linking Energy Audit and EnMS Policies towards new EED Article 11", or in short "LEAPto11", which is a collaboration between ten European national energy agencies and co-funded by the European Union. Partner countries of the LEAPto11 project are: Croatia, Germany, Greece, Ireland, Italy, Lithuania, Malta, Netherlands, Portugal and Slovakia. The report explores how the transposition of Article 8 of the EED EU/2012/27 has been carried out in the countries of the participating energy agencies by looking deeper into the implementation rate and data situation. It analyses the practices to collect, store and assess information of energy audits and Energy Management Systems in these countries. Based on the analysis of the current situation, this report provides an overview on challenges and recommendations on how to proceed in the coming years of transposing Article 11 into national legislation.

The analysis shows that all partner countries fulfil the majority of the requirements set out in Article 8 EED EU/2012/27. However, it also becomes clear that further steps are required to implement Article 11 of EED EU/2023/1791.

The following challenges have been identified:

Identifying newly obligated enterprises under Article 11: Experts from all partnering energy agencies consider it as the most significant challenge to identify newly obligated enterprises according to the provisions of Article 11 EED EU/2023/1791 based on their energy consumption instead of enterprise size, as in the old Article 8. This is mainly because data on individual enterprises' total final energy consumption is not available in most partner countries. According to experts from the partnering energy agencies, main barriers for data collection on energy consumption at enterprise level include: lack of official mandate for data collection of the responsible public institution, data confidentiality, high data volume, complex and resource-intensive data verification and low data quality. At the time being, the Netherlands is the only country where data on all enterprises that meet the thresholds set out in the new Article 11 is already available. Most other partner countries rely on enterprises' sense

of duty to fulfil their legal obligations and proactively report their fulfilment. However, in order to make the enterprises aware of their obligation, extensive information and communication activities on the new requirements under Article 11 should be conducted. Furthermore, Member States should join forces for overcoming existing barriers for data collection on corporate energy consumption.

Developing corporate action plans: A new requirement of Article 11(2) EED EU/2023/1791 is that enterprises with an average annual energy consumption in excess of 10 TJ over the previous three years must draw up and publish a concrete and feasible "Action Plan" each year. Action Plans must encompass concrete measures to implement technologically or economically feasible audit recommendations. As this obligation did not exist under Article 8, countries must define requirements or standards for these Action Plans. In the European Commission's recently published Commission Recommendation (EU) 2024/2002 of 24 July 2024, the Action Plans are recommended to be aligned with reporting obligations and standards for enterprises under existing or upcoming regulations (especially Corporate Sustainability Reporting Directive, European Sustainability Reporting Standards and other voluntary reporting standards for small and medium enterprises currently under preparation). This approach seems appropriate to keep additional reporting requirements for enterprises as small as possible.

Reporting annual energy and water consumption: Article 11(4) of the new EED recommends that Member States encourage the publication of data on enterprises' annual energy and water consumption as well as a comparison to their respective consumption in previous years. At the time being, only one partner country (Croatia) encourages enterprises to disclose enterprise-specific data in a specialised database. In all other partner countries, energy consumption data are solely available in an aggregated form, mostly by sector or energy source. With regard to water consumption, seven out of ten countries make data available in an aggregated form. Only Ireland collects data at the level of individual enterprises. Croatia has established a database for energy- and water-related consumption data at enterprise level which, however, primarily covers public enterprises that are legally obligated to regularly monitor energy and water consumption of the buildings they own. Therefore, new structures and processes will have to be established in most partner countries to collect the required enterprise-specific consumption data for both energy and water. The database of Croatia could serve as a first example of good practice for this purpose.

Improving and harmonising data collection: The analysis shows that data quantity and quality on energy audits and Energy Management Systems strongly varies among the partner countries. Hence, there is a high need for improving and harmonising data collection, storage and assessment. In all partner countries, data on mandatory energy audits is collected, whereas only few partner countries systematically evaluate the data. Data on voluntary audits is generally not collected; only few countries collect data on Energy Management Systems. The data, however, stems predominantly from companies using Energy Management Systems to fulfil their audit obligation. Most countries have expressed interest to improve the collection and processing of data on energy audits and Energy Management Systems. This is highly recommended as a widely complete, harmonised and regularly updated data set would provide a very good basis to develop new policies, track the results of existing policies or monitor enterprises' energy-related performance.

Overall, the analysis shows that there is a high need for harmonization and standardization of reporting processes and data collection to implement the requirements of the new Article 11 EED EU/2023/1791. While it seems challenging at the first glance, it also offers an opportunity to build a data and knowledge basis which could help to design more effective and efficient energy policies in the future, tailored to the demands of enterprises. Therefore, the European Commission is recommended to encourage a more intensive collaboration and exchange among Member States on this regard.

1. Introduction

"Linking Energy Audit and Energy Management System (EnMS) Policies towards new EED Article 11", or in short "LEAPto11", is a collaboration between national energy agencies from ten Member States (MS) of the European Union (EU). The aim of LEAPto11 is to support the MS during the implementation phase of Article 11 of the revised European Energy Efficiency Directive (EED) EU 2023/1791[1] through cooperation between their energy agencies, focussing on energy audits[2] and Energy Management Systems (EnMS)[3].

The Energy Institute Hrvoje Požа of Croatia (EIHP), the German Energy Agency (dena), the Center For Renewable Energy Sources of Greece (CRES), the Sustainable Energy Authority of Ireland (SEAI), the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), the Lithuanian Energy Agency (LEA), the Energy and Water Agency of Malta (EWA), the Netherlands Enterprise Agency (RVO), the Portuguese Energy Agency (ADENE), the Slovak Energy and Innovation Agency (SIEA), and the Belgian communication agency REVOLVE work together under the leadership of ENEA. The project is financed by the EU LIFE programme and has a duration of 36 months (2024-2027). The results of the project include several public reports, the first being this present report.

Energy audits and EnMS have a long tradition in Europe, providing an excellent opportunity for enterprises to identify energy-saving potentials and company-specific energy efficiency measures. They are significant instruments to mitigate greenhouse gas emissions play a key role in reaching the European Union's energy efficiency targets.

Under Article 8 of the previous EED EU/2012/27[4], all enterprises that were not small and medium-sized enterprises (SMEs)[5] were to be subject to an energy audit by either qualified and/or accredited experts or an energy audit implemented and supervised by independent authorities as established under national legislation. Enterprises had to repeat these audits every four years. SMEs were to be encouraged to conduct energy audits, while enterprises that had already incorporated a certified energy or environmental management system were exempt from the obligation.

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[1] Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 (recast), OJ L 231, 20.9.2023, p. 1–111.
[2] In line with Article 2, point 32 of the EED EU/ 2023/ 1791, energy audits in this report mean a systematic procedure with the purpose of obtaining adequate knowledge of the energy consumption profile of a building or group of buildings, an industrial or commercial operation or installation or a private or public service, identifying and quantifying opportunities for cost-effective energy savings, identifying the potential for cost-effective use or production of renewable energy and reporting the findings. The focus in this report lies on energy audits regarding industrial installations.
[3] In line with Article 2, point 16 of the EED EU/ 2023/ 1791, EnMS in this report mean a set of interrelated or interacting elements of a strategy which sets an energy efficiency objective and a plan to achieve that objective, including the monitoring of actual energy consumption, actions taken to increase energy efficiency and the measurements of progress.
[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, OJ L 315, 14.11.2012, p. 1–56.
[5] The target group of large enterprises of Article 8 (4) 2012/ 27 EED was defined as "non-SMEs" in delineation from "small and medium-sized enterprises" which for the purposes of the EED are defined according to Title I of the Annex of the EU Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises0(OJ L 124, 20.5.2003, p. 36–41, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003H0361, last accessed 18 July 2024): enterprises which employ fewer than 250 persons and have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.

In the amended EED EU/2023/1791, Article 11 expands the requirements for an energy audit to all enterprises that record an average annual energy consumption above 10 TJ per year in the previous three years, regardless of their size. Furthermore, it is mandatory for enterprises with an average annual energy consumption of more than 85 TJ in the previous three years to implement an EnMS.

Since the previous EED EU/2012/27 came into effect, the MS have transposed the requirements of Article 8 into national legislation and are now working on the transition from Article 8 to Article 11. This report explores how the transposition of Article 8 of the EED EU/2012/27 has been carried out in the ten MS by looking deeper into the implementation rate and data situation. It analyses the practices to collect, store and assess information from energy audits and EnMS in the partner countries.

The report is divided into a chapter concerning the applied methodology (Chapter 2), a chapter on the analysis and comparison of findings (Chapter 3), on the overall status quo of Article 8 implementation (Chapter 3.1), the situation for energy audits (Chapter 3.2), EnMS (Chapter 3.3), and a chapter on other (voluntary) programmes to promote energy audits and EnMS (Chapter 3.4). These chapters are followed by an analysis of the implications for Article 11 of the revised EED, providing an overview and recommendations on how to proceed in the coming years of transposing the updated Article into national legislation (Chapter 4). The results are summarised in the conclusions (Chapter 5).

Within the project's work package 2, led by the German Energy Agency (dena), this report is Deliverable 2.1 and output of task 2.1. dena took the lead in developing this report. However, in this European project with many partner countries, the expertise of the partnering energy agencies was essential for the fulfilment of the Deliverable.

2. Methodology

This report is based on a qualitative and quantitative comparative analysis of the status quo in the countries of the ten partnering agencies in this project, hereinafter referred to as “partner countries”. The methodology was developed to make use of the know-how and support of all the agencies. The German Energy Agency developed a questionnaire with 52 questions divided into four topics: general questions regarding the implementation of the EED, questions about energy audits, questions about Energy Management Systems, and questions about other (voluntary) programmes. The questionnaire is provided in Annex 7.4. The requirements under Article 8 of the EED EU/2012/27 and the new requirements under Article 11 of the EED EU/2023/1791 served as the basis. All questions were formulated with the aim of investigating how the requirements of Article 8 were implemented and identifying any gaps with regard to the requirements outlined under Article 11. To achieve this, the questions systematically covered all paragraphs of Article 8 and Article 11, the only exception being questions related to the identification, evaluation and implementation of energy efficiency measures and the creation of “Action Plans” to implement such measures. Such questions are part of the preparation of the second public report within this project, which explicitly focuses on the implementation of energy efficiency measures in industry and tertiary sectors. Each question was connected to a table to be filled in. Different types of tables were used. The table either consisted of open fields for the answer or it consisted of predetermined answers that were either to be rated, answered with “yes” or “no” or marked with a cross. Each table was supplemented by a field to insert additional information and the source. Some tables included additional open fields to specifically gather information on any barriers in collecting, monitoring or verifying data.

The draft questionnaire was shared with all project partners for further feedback or clarifying questions and their remarks were incorporated. After the final review, the questionnaire was completed by all ten partners of the project within a period of one month. Two meetings including all project partners were organised to allow for clarifying questions. All partners completed the questionnaires from a country-specific perspective based on knowledge within their agency, desk research and with the assistance of other national institutions such as ministries, other national or regional agencies, and research centres. Once the completed questionnaires were submitted to dena and dena had completed its initial review, clarifying virtual meetings with individual partners were held to gain deeper insight into the situation in the partner countries. Thorough desktop research and written communication supplemented the collection of necessary information. It must be noted that the creation of the country-specific questionnaires was already finalised at the time of publication of the “Commission Recommendation (EU) 2024/2002 of 24 July 2024 setting out guidelines for the interpretation of Article 11 of EED EU/2023/1791 of the European Parliament and of the Council as regards Energy Management Systems and energy audits” (short: European Commission, Commission Recommendation (EU) 2024/2002 of 24 July 2024)[6], which provide further clarifications that were not available at the time the questionnaires were completed.

[6] European Commission, Commission Recommendation (EU) 2024/2002 of 24 July 2024 setting out guidelines for the interpretation of Article 11 of Directive (EU) 2023/1791 of the European Parliament and of the Council as regards Energy Management Systems and energy audits, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368 , last accessed 26 August 2024.

3. Analysis and Comparison of Findings

This chapter provides the results of the analysis and comparison of findings derived from the questionnaires and calls with the participating agencies and supplemental desktop research. First, the overall status quo of Article 8 EED implementation in the participant agencies' countries is presented (see chapter 3.1). Then, the chapter looks at the results regarding energy audits (see chapter 3.2), Energy Management Systems (see chapter 3.3) and programmes to support their implementation (see chapter 3.4).

3.1. Status Quo of Article 8 EED Implementation

All partner countries have taken measures to implement the provisions under Article 8 of the EED EU/2012/27 by passing national legislation and monitoring its implementation by national institutions. The analysis indicates that the ten partner countries, despite applying different methods, fulfil most of the requirements of Article 8 EED EU/2012/27.

All countries comply with the requirements under Article 8(4) in that they ensure that large enterprises carry out energy audits every four years. The practices of monitoring and verifying the implementation of the obligations under Article 8 vary across countries, but all of them have procedures in place. Moreover, all countries implement effective non-compliance processes. More than half of all countries have modified the target group of large enterprises which would be subject to the requirements as defined in Article 8, by passing legislation to include or exclude additional types of enterprises. Almost all countries avoid additional requirements for audited enterprises such as the implementation of energy efficiency measures or monitoring energy consumption. However, in some countries there is national legislation that mandates such requirements which also affects enterprises that are subject to the EED audit obligation. In almost all countries, exemptions or simplified procedures to the audit obligation are granted under specific circumstances.

All countries have taken measures to ensure the availability and quality of audits and experts to carry them out, as stipulated in Article 8(1) and (5). However, not all countries have encouraged the creation of additional training programmes for auditors as suggested in Article 8(3). The implementation of an energy or environmental management system to fulfil the audit obligation is permitted in all countries, as stipulated in Article 8(6). In four out of ten countries there are requirements to include an assessment of the technical and economic feasibility of connection to an existing or planned district heating or cooling network in an energy audit, as suggested in Article 8(7).

Five of the ten partner countries currently have programmes and policies to support the voluntary implementation of audits, and four of the ten partners have programmes and policies to support the voluntary implementation of Energy Management Systems. This shows that not all MS have responded to the requests of Article 8(2) and (3) to develop support programmes for the implementation of audits of non-obligated enterprises and to raise awareness about the benefits of audits.

3.2. Energy Audits

This section provides the results of the analysis and comparison of findings regarding the practices to collect, store and assess information from energy audits. Moreover, it investigates the procedures of monitoring and verification in the period during and after the performance of mandatory energy audits. It also points out identified barriers with regard to these practices and processes.

3.2.1. General Results

Under Article 8(4) of the EED EU/2012/27, large enterprises[7] were required to carry out an energy audit by 5 December 2015 and at least every four years from the date of the previous audit. The results from the analysis show that this requirement was fully implemented by all partner countries. With the adoption of the EED EU/2023/1791, the target group of this obligation is no longer linked to the enterprise size but to the amount of energy consumed. Enterprises[8] with an average annual energy consumption of 10 TJ (2.77 GWh) over the past three years must carry out an energy audit at least every four years from the date of the previous audit. MS must ensure that all enterprises that are now subject to this obligation have carried out an audit by 11 October 2026. All partner countries have created framework conditions that will ensure that this new requirement is implemented.

Numbers of conducted audits

In their National Energy and Climate Progress Reports (NECPRs), MS must report the total number of energy audits carried out in year three and year two before the report is due. MS are also required to report the total estimated number of enterprises within their territory falling under the audit obligation and the number of energy audits carried out in the obligated enterprises in year three and year two before the report is due.[9] All countries implemented a national framework under Article 8 EED EU/2012/27 mandating that enterprises must report to the responsible institution that an energy audit was conducted.

Notably, there are major differences in the data that is collected and available in the partner countries. All countries collect the number of mandatory audits. The number of audits carried out by non-obligated enterprises is not systematically collected in any of the partner countries. In the countries where data on audits carried out by non-

[7] The target group of large enterprises of Article 8 (4) EU EED/2012/ 27 was defined as “non-SMEs” in delineation from “small and medium-sized enterprises” which for the purposes of the EED are defined according to Title I of the Annex of the EU Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (OJ L 124, 20.5.2003, p. 36–41, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003H0361, last accessed 18 July 2024): enterprises which employ fewer than 250 persons and have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.
[8] Article 2 (30) of the EU EED/2023/1791 refers to Title I of the Annex of the EU Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (OJ L 124, 20.5.2003) in which an “enterprise” is “any entity engaged in an economic activity, irrespective of its legal form. This includes, in particular self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity”. In its Commission Recommendation (EU) 2024/2002 of 24 July 2024, the European Commission interprets this to mean that enterprises, which are partly or wholly owned or controlled by public bodies are covered by the obligations of Article 11 (1) and (2). Moreover, it concludes that only enterprises within the territory of a Member State are obliged but when assessing their energy consumption, all linked enterprises within the territory of the EU should be considered.
[9] Annex IX, part 2, Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, OJ L 328, 21.12.2018, p. 1–77.

obligated enterprises is collected, it stems from programmes supporting the voluntary implementation of audits or is based on voluntary self-declarations. The verification procedures on audits performed by obligated enterprises vary in the individual countries (see section on monitoring and verification processes in Chapter 3.2.2). Therefore, the reliability of the data varies. Moreover, more than half of the countries made use of the discretion provided by the EED and altered the target group of the obligation (see section on exemptions from and additional requirements for the audit obligation below). The audit obligation is thus implemented differently in the countries and there are different understandings which audits should be counted as “obligatory audits”. This also leads to varying figures.

Not all countries have historical or the most recent data. In Lithuania and the Netherlands, records are only available from 2019 on and in Ireland only from 2020 on. The reason the data is missing from Lithuania and the Netherlands is that the authorities responsible for data collection have changed over the years. In Ireland, the data was not collected prior to 2020 as the applicable data collection system was established in that year. In Portugal, the data for 2023 has not been submitted by enterprises yet. In Germany, the methodology of data collection has changed over the years. For the years 2015 to 2019, only the number of mandatory audits verified by random checks is available. Since 2020, the number of audits corresponds to the number of online self-declarations submitted by enterprises. In six out of ten partner countries, information on the annual number of mandatory energy audits is available starting from 2016 or even 2015, when the obligation was introduced. In some countries, like Germany, Italy, Malta and Slovakia, the peaks in the number of energy audits reflect the EED obligation for enterprises to carry out audits every four years, that is in 2015, 2019 and 2023.

Figure 1 shows the number of mandatory audits in the partner countries in the years 2019 to 2023 according to their national transposition of Art. 8. This also includes adjusted target groups of the obligation under Article 8 in some countries. For example, the given number of energy audits in Italy encompasses, on the one hand, large companies which are obliged to conduct energy audits according to the provisions of Article 8 EED EU/2012/27. In addition, the national transposition of Article 8 includes energy-intensive companies (so-called “Energivori”) which must carry out energy audits in return for tax concessions. The number of “mandatory” audits increases accordingly. The share of “Energivori” in the total amount of audits carried out in Italy between 2019 and 2023 is around one quarter. In contrast, the figures for Germany correspond to the original target group of Article 8.

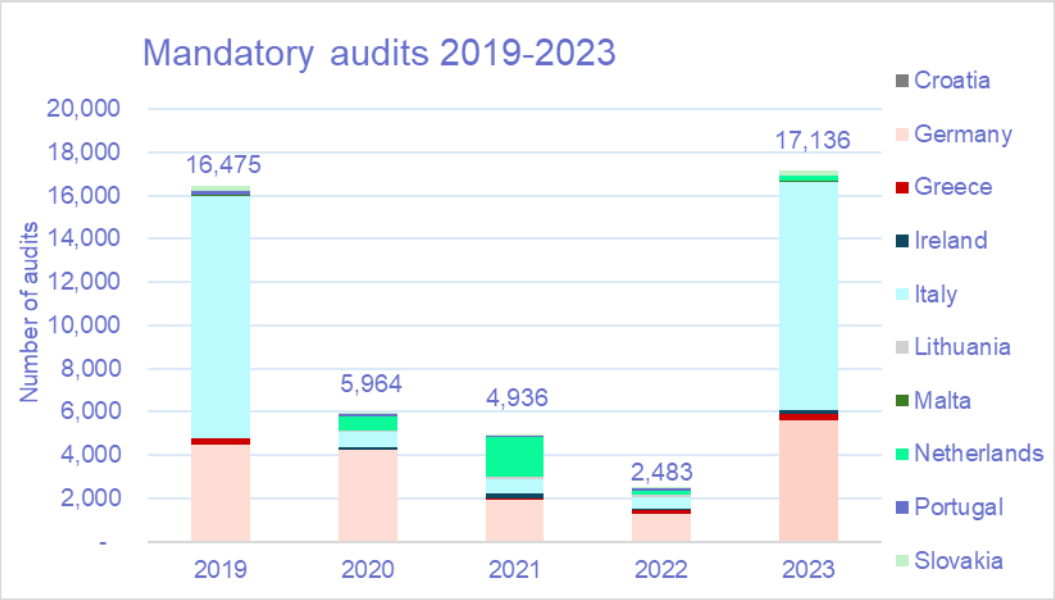
Due to their different sizes, economic structures and number of obligated enterprises, there is a high variation in the number of audits in the partner countries. Table 1 presents the number of audits in every partner country. The data was provided by the national energy agencies, most of which are responsible for monitoring energy audit implementation in their countries. However, as mentioned above, the quality and range of data varies significantly. The Portuguese energy agency ADENE stated that it was not possible to segregate mandatory from non-mandatory audits. Therefore, the given figures for Portugal include both types of audits. Overall, the presented figures should be considered as approximate values. This demonstrates that there is a high potential and need to improve and harmonize data quality on energy audits as will be further elaborated in the following sections.

	Number of mandatory audits per year, according to the national transposition of Article 8				
	2019	**2020**	**2021**	**2022**	**2023**
Croatia	22	35	26	44	40
Germany	4,447	4,187	1,929	1,237	5,572
Greece[10]	320	50	50	160	320
Ireland	no data[11]	72	228	92	136
Italy[12]	11,172	759	629	553	10,559
Lithuania	15	16	153	72	28
Malta	62	0	0	0	56
Netherlands	20	661	1825	207	206
Portugal[13]	169	118	69	89	no data[14]
Slovakia	248	66	27	29	219

Table 1. Number of mandatory audits per year, according to national transposition of Article 8

[10] Data not officially confirmed
[11] Not available
[12] Figures include large enterprises and further energy-intensive enterprises ("Energiviori") which must carry out energy audits in return for tax concessions which is part of the national transposition of Article 8 in Italy.
[13] Figures also include non-mandatory audits as it is not possible to segregate the number of mandatory from non-mandatory audits, according to the Portuguese Energy agency ADENE
[14] Not puplished yet

Figure 1. Number of mandatory audits in the partner countries in the years 2019 to 2023, according to the national transposition of Article 8



Exemptions from and additional requirements for the audit obligation

Exemptions from the audit obligation

In only four out of the ten countries (Croatia, Ireland, Lithuania, Malta) there are no provisions to include or exclude any additional type of enterprise (e.g., enterprises with energy consumption higher than a specific threshold or specific target sectors) from the mandatory energy audit obligation under Article 8 of the EED EU/2012/27. Thus, more than half of the countries altered the target group of the obligation.

Except for Portugal, all countries grant exemptions or simplified procedures in special cases under the provisions of the EED EU/2012/27 Article 8 obligations. These include inter alia clustering of sites with similar features, exemptions linked to minimum energy consumption, and simplified procedures for enterprises that are part of an enterprise network.

Additional requirements for the audit obligation

In eight out of the ten countries, there are no additional requirements that need to be met by the enterprises carrying out mandatory audits such as implementing measures to improve energy efficiency, implementing energy performance improvement action(s) (EPIAs) or monitoring energy consumption. In Greece and Italy, enterprises

are required to monitor their energy consumption.[15] In Italy, enterprises are required from their second audit onwards to install dedicated meters to base their audit on real data rather than estimates. This obligation was derived from the requirement in Annex VI (a) of the EED EU/2012/27 that the audit shall "be based on up-to-date, measured, traceable operational data on energy consumption and (for electricity) load profiles". The Italian ENEA published general and sector-specific guidelines defining the monitoring criteria to obtain a representative overview of the energy consumption of the audited site. The guidelines suggest a minimum coverage of monitoring based on the sector (industrial or tertiary) and on the total energy consumption for main energy sources. Continuous data collection is preferred, but no obligation is set in the guidelines.[16] If the enterprises can demonstrate that their monitoring is in line with Annex II of the national Decree (Annex VI of the EED EU/2012/27), they can choose not to implement the ENEA guidelines. In Greece, there are no specific rules or minimum requirements on how to implement the monitoring obligation and enterprises do not have to submit proof. The aim in both countries is to effectively identify and increase the implementation of energy efficiency measures. With the information on energy consumption of audited enterprises, the loads that consume the most energy can be detected and inefficiencies in the system as a whole can be identified. Alerts can be set up to notify the appropriate contact person(s) when excessive or abnormal consumption happens, which allows for quick identification of inefficiently operated or faulty system components. Another goal is to increase the reliability of data from the audit reports.

Some enterprises obliged to fulfil the audit obligation stemming from Article 8 EED EU/2012/27 also fall under national provisions stipulating additional requirements. Under the national legislation for energy savings in the Netherlands, enterprises are obliged to implement all energy saving measures with a payback period of five years or less. Independent of their size, enterprises that consume more than 50,000 kWh (0.18 TJ) of electricity/year or 25,000 m^3 gas/year must undergo a simplified version of an audit to identify and implement energy-saving measures. To fulfil their obligation, enterprises can choose to use a system prepared by the RVO to submit a form indicating their energy-saving activities. The RVO prepared a list with approximately 200 measures that differentiates between company branches and field of activities and contains only measures with a payback period of five years or less. When using the form, enterprises can choose their branch or field of activity and will see the measures that have been identified as having a five-year payback period. Enterprises are obliged to implement these measures. Within the form, enterprises can provide information on which of the energy-saving measures have already been taken and which of these measures must still be implemented by ticking boxes within the form. This way, the enterprises receive an overview of all the measures that have been implemented or still need to be implemented.[17]

[15] Decision of the Minister of Environment and Energy of Greece YPEN/DEPEA/ 51153/387/09.05.2023 (Government Gazette Issue B´3187/15.05.2023); Legislative Decree 102/2014 and subsequent amendments and modifications, https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2014-07-04;102, last accessed 01 July 2024.
[16] Santino, D., Biele, E., Salvio, M., Guidelines for Energy Audits under Article 8 of the EED: Italy's Implementation Practices and Tools; ENEA: Rome, Italy, 2019, available at https://www.efficienzaenergetica.enea.it/component/jdownloads/?task=download.send&id=377&catid=40&Itemid=101, last accessed 01 July 2024.
[17] Netherlands Enterprise Agency (RVO), Energy Saving Obligation, available at https://english.rvo.nl/topics/energy-saving-obligation, last accessed 06 September 2024; Netherlands Enterprise Agency (RVO), Dutch Energy Saving Notification Obligation, 29 May 2019, available at https://english.rvo.nl/topics/energy-saving-obligation/energy-saving-notification-obligation#how-to-report, last accessed 06 September 2024; Netherlands Enterprise Agency (RVO), Dutch Energy Saving Investigation Obligation, 29 April 2024, available at https://english.rvo.nl/topics/energy-saving-obligation/energy-saving-investigation-obligation, last accessed 06 September 2024; Environmental Activities Decree (Besluit activiteiten Leefomgeving), available at https://wetten.overheid.nl/BWBR0041330/2024-01-01/#Hoofdstuk5_Afdeling5.4_Paragraaf5.4.1_Artikel5.15b, last accessed 06 September 2024; Environmental Buildings Decree (Besluit bouwwerken leefomgeving), available at https://wetten.overheid.nl/BWBR0041297/2024-01-01/, last accessed 06 September 2024.

In Germany, a prior draft version of the Energy Efficiency Act (Energieeffizienzgesetz – EnEfG)[18] included an obligation for enterprises to implement energy efficiency measures that had been identified as being economically feasible in the previous audit.[19] However, this obligation was ultimately not adopted and therefore not introduced in Germany.

In Croatia, some enterprises fall under the provisions of the Croatian Energy Efficiency Obligation System adopted to implement the national energy savings obligation under Article 7 EED EU/2012/27. These enterprises must achieve additional annual and cumulative energy savings by implementing energy efficiency measures. This specifically concerns enterprises that sell energy to end customers and deliver a total of more than 50 GWh of energy per year, as well as those responsible for putting biofuels on the market, i.e., distributors that put diesel fuel or motor gasoline on the market for powering motor vehicles.

Under the Management System for Intensive Energy Consumption in Portugal, all enterprises, except the ones under the European Emissions Trading System, with an annual consumption of over 500 toe (20.93 TJ)/year must carry out energy audits at least every eight years. Moreover, they must elaborate and implement Energy Consumption Rationalization Plans (PREn) establishing agreements with the Portuguese Environment Agency and the General-Directorate for Energy and Geology to decrease their energy consumption. These agreements include minimum energy efficiency objectives and link compliance with incentives. The PREn is designed based on the reports of mandatory energy audits. It should consider the implementation, in the first three years, of all measures identified with a return investment period of less than or equal to five years in the case of installations with an energy consumption of equal to or greater than 1,000 toe (41.87 TJ/year). For other installations, the required return investment period is less than or equal to three years. The PREn also sets targets for energy intensity and specific energy consumption reduction[20] and stipulates that historical values of carbon intensity are maintained and not exceeded.

Non-compliance procedures

One mechanism for ensuring implementation is to apply penalties for non-compliance. EED EU/2012/27 article 13 requires Member States to “lay down the rules on penalties applicable in case of non-compliance with the national provisions adopted pursuant to Articles 7 to 11 and Article 18(3)”. Following this obligation, there are rules for penalties in case of non-compliance with the national provisions in all ten partner countries. Penalties have been imposed in five out of the ten partner countries. The penalties applied range from EUR 500 to EUR 100,000. In Portugal, the penalty within the national framework of the “Energy Consumption Rationalization Agreement” is linked to unavoided toe/year so that the penalty is higher the less energy consumption has been avoided. In

[18] German Energy Efficiency Act (Gesetz zur Steigerung der Energieeffizienz und zur Änderung des Energiedienstleistungsgesetzes vom 13. November 2023, Bundesgesetzblatt Jahrgang 2023 Teil I Nr. 309, 17. November 2023), Chapter 3, Articles 8-10, https://www.recht.bund.de/bgbl/1/2023/309/regelungstext.pdf?__blob=publicationFile&v=2, last accessed 18 July 2024.
[19] Bundesministerium für Wirtschaft und Klimaschutz, Referentenentwurf der Bundesregierung: Entwurf eines Gesetzes zur Steigerung der Energieeffizienz und zur Änderung des Energiedienstleistungsgesetzes, available at: https://www.bmwk.de/Redaktion/DE/Downloads/E/entwurf-eines-gesetzes-zur-steigerung-der-energieeffizienz-u-aenderung-des-energiedienstleistungsgesetzes.pdf?__blob=publicationFile&v=6, last accessed 18 August 2024.
[20] Energy consumption must at least decrease by 6% in eight years in the case of energy-intensive installations of 1000 toe/ year or more, equivalent to11,630 MWh/ year or more, or 4% for the remaining installations.

Lithuania, the amount of the penalty is linked to the income of an enterprise and goes up to 0.5 percent of its gross annual income.

In most countries, non-compliant enterprises are contacted by the responsible institution and given the possibility to submit their audit report, to submit additional information or to improve their audit report. Only enterprises that do not comply with such a request will be fined. In most countries, only a very small proportion of enterprises do not fulfil this request and are subsequently fined. This indicates that the level of penalties is generally high enough to exert a deterrent effect.

Not all agencies have data on the costs of energy audits in their countries. The costs are generated on a free market and typically depend on the size and type of the enterprise. In Germany, data on the costs of energy audits is collected through a mandatory field in the online self-declaration form to be filled in by enterprises falling under the audit obligation. In addition, the data is collected and published as part of an annual study on the energy services market, commissioned by the BfEE (German Federal Agency for Energy Efficiency, subordinate to BAFA). Collecting information on the costs of energy audits could be valuable for other EU MS because the data can be used to publish information on the usual appropriate costs for energy audits, including the services to be provided by an auditor, which can help enterprises navigate the energy services market.

Quality criteria for energy audits and auditors

Criteria for audits

Both Article 8(1) of EED EU/2012/27 and Article 11(2) EED EU/2023/1791 stipulate that MS must promote the availability of high-quality, cost-effective energy audits. To ensure that energy audits and EnMS are of high quality, MS must establish transparent and non-discriminatory minimum criteria for energy audits in accordance with Annex VI. In seven out of the ten participating agencies' countries (Croatia, Greece, Ireland, Italy, Malta, the Netherlands, Slovakia), there are no significant deviations from the minimum criteria for energy audits as laid out in Annex VI of EED EU/2012/27. In Germany, Lithuania and Portugal, the national requirements exceed those minimum criteria.

In four out of the ten countries (Croatia, Greece, Ireland, Italy), there are requirements to include an assessment of the technical and economic feasibility of connection to an existing or planned district heating or cooling network in an energy audit, as suggested in Article 8 EED EU/2012/27 and Article 11(12) EED EU/2023/1791. In six out of the ten countries (Germany, Lithuania, Malta, the Netherlands, Portugal and Slovakia), no such requirements are given. The most frequently named reason for this is that there are too few or no such networks in the country or that the burden to include such an assessment seems too high for the obligated enterprises. In Germany, the introduction of a mandatory assessment for enterprises that fall under the audit or EnMS obligation is planned for the 2024 amendment of the Energy Services Law.[21] The introduction of such a requirement is also currently being considered in Slovakia.

The status quo indicates that the countries, although they apply different quality criteria for audits, fulfil the requirements of Article 8 EED EU/2012/27.

[21] Draft Version of the new Energy Services Law § 8 a (as of June 2024), BT Drucksache 20/11852 vom 17.06.2024, available at https://dserver.bundestag.de/btd/20/118/2011852.pdf, last accessed 01. July 2024.

With regard to the requirements of Article 11 EED EU/2023/1791, the countries should examine whether an update to their national provisions is necessary.[22]

Criteria for auditors

According to Article 8(4) EED EU/2012/27 and Article 11(2) EED EU/2023/1791, MS must ensure that energy audits are carried out "by qualified and/or accredited experts or implemented and supervised by independent authorities under national legislation". Table 2 shows the entities that currently carry out audits in the partner countries. It is evident that, except for the Netherlands, all countries have implemented this requirement. Instead of specific quality control of the experts carrying out the audits, the Netherlands has adopted a comprehensive control system for the audit obligation that includes the verification of all audit reports and even on-site controls of the implementation of energy efficiency measures.

[22] In its guidelines for the interpretation of Article 11, the EC provides guidance on the requirements and level of detail for energy audit reports and indicates for example that it is necessary to define how the energy consumption of buildings and transport is included in an energy audit, see section 6.3.1 and 6.3.2, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 06 September 2024.

Country	Entity that carries out audits
Croatia	The energy audit for large enterprises is carried out by a natural or legal person who has the authority to do so by receiving permission from the ministry responsible for energy for a period of seven years.
Germany	All persons accredited and authorised by the Federal Office for Economic Affairs and Export Control (BAFA) to conduct energy audits according to defined criteria under § 8 b of the German Energy Services Law. The auditors must prove the maintenance of their competences through regular trainings to the BAFA.
Greece	Qualified experts according to Article 10, par. 2 of Law 4342/2015 (Government Gazette A´143).
Ireland	Registered auditors under the national energy audit scheme which are fulfilling the qualification requirements laid out therein.
Italy	Energy service companies (ESCos), energy management experts or energy auditors certified by accredited bodies, pursuant to Article 8(2) of Legislative Decree 102/2014.
Lithuania	Certified energy auditors fulfilling the qualification requirements specified in the Lithuanian Law on Energy and Order No. 56-2770 of 15/05/2010 by the Minister of Energy of the Republic of Lithuania.
Malta	Energy auditors or qualified in-house experts who have completed a training by the Regulator for Energy and Water Services.
The Nether-lands	Commercial energy advisors without any requirements. Quality control is ensured by the fact that all audit reports are reviewed by the RVO.
Portugal	Qualified or accredited auditors under national legislation laying out requirements for the industrial, building and transport sectors.
Slovakia	Accredited energy auditors with a certificate of professional competence. The requirements to be met are specified in § 12 of the Act No. 321/2014 Coll. on Energy Efficiency.

Table 2. Entities permitted to carry out audits in the participating countries

Except for the Netherlands, there are specific qualification or certification requirements for auditors in all partner countries. In almost all countries, national quality requirements are applied instead of certification requirements. Proof of training and experience is standard in most countries, while proof of certification renewal must only be submitted in half of the countries. An overview of the requirements is given in Table 3.

In five out of the ten countries (Croatia, Germany, Greece, Ireland and Portugal), the auditors must self-register online and submit their qualifications as proof to the institution that is responsible for maintaining the list of energy auditors (for more information on the list of energy auditors, see below). The submitted documents are verified by representatives of the responsible institution. An additional requirement in terms of registration is set in Ireland,

where auditors must either register with one out of two specified associations prior to the registration with SEAI or be already registered with SEAI by having completed a designated training course.[23]

The status quo indicates that, although the MS apply very different quality criteria for auditors, they take the requirement to ensure that energy audits are carried out by experts under Article 8(4) EED EU/2012/27 seriously because they have taken extensive measures for quality assurance. Based on this finding, and since the EED does not contain any definition of “qualified and/or accredited experts”, it can be concluded that the current implementation fulfils the requirements under these Articles. However, with regard to the requirements of Article 11(2) EED EU/2023/1791, the countries should examine whether an update to their national provisions is necessary. In its guidelines for the interpretation of Article 11, the EC recommends minimum criteria for the admissibility of experts (see Table 3).[24]

Requirements for auditors in the partner countries	Mandatory in the countries	Recommended minimum criteria for the admissibility of experts by the EC (According to Article 11(2) EED EU/2023/1791)
Prove education	Croatia, Germany, Greece, Ireland, Italy, Lithuania, Portugal, Slovakia	x
Prove experience	Croatia, Germany, Greece, Ireland, Italy, Lithuania, Portugal, Slovakia	x
Complete a training	Croatia, Germany, Lithuania, Malta	x
Pass an exam	Italy, Lithuania, Slovakia	x
Prove certification	Italy	x
Prove the possession of equipment	Portugal	
Complete periodic training to keep status	Croatia, Germany, Ireland, Slovakia	
Renew permission or certification	Croatia, Italy	
(Self-)register and submit proof to institutions	Croatia, Germany, Greece, Ireland, Portugal	x

Table 3. Requirements for auditors in the countries analysed

[23] Any one of the following registrations completed are deemed to have fulfilled the requirement: Energy Institute Chartered Energy Engineer, Energy Institute Chartered Energy Manager, Association of Energy Engineers Certified Energy Manager, Association of Energy Engineers Certified Energy Auditor, Practicing Non-Domestic BER Assessor in Republic of Ireland with SEAI.
[24] Section 6.4, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 06 September 2024.

List of energy auditors

A publicly available list of energy auditors is maintained in almost all ten countries either by the responsible agency, the ministry, or by a national accreditation body. In the Netherlands, there is no such list of publicly available auditors because there are no qualification requirements for auditors that are examined by such an institution. Maintaining a public list of the auditors provides an overview for both the government and enterprises of the nationally available energy consultants that are qualified to carry out energy audits. This promotes the goal of Article 8(3) and (4) EED EU/2012/27 and Article 11(2) and (5) EED EU/2023/1791 in that it facilitates the search for qualified consultants and increases transparency on the availability of experts in the country.

Training programs

In seven of the ten countries, there are training programs for the qualification of energy auditors to facilitate sufficient availability of experts. Training programs are offered by a range of actors such as the participating agencies, branch-specific associations, universities, polytechnical institutes and other public or private enterprises such as certification bodies. In Greece, there are no training programs, while in Ireland and Slovakia the agencies offer training programmes only for already approved auditors wanting to maintain their status. This is of particular interest with regard to Article 8(3) of EED EU/2012/27 and Article 28(1) of the new EED EU/2023/1791, wherein the goals are to raise awareness and promote the availability of expert energy auditors. Under Article 8 of EED EU/2012/27, MS were requested to “develop programmes to raise awareness among households about the benefits of […] audits through appropriate advice services” and to “encourage training programmes for the qualification of energy auditors in order to facilitate sufficient availability of experts”. This request was not taken into consideration by all countries. According to Article 28(1) of the new EED EU/2023/1791, MS must now “ensure that training programs are available for energy efficiency-related professions”. Countries without training programs should therefore consider promoting the establishment of such.

Availability of energy auditors

Under Article 8(1) of EED EU/2012/27 and Article 11(2) EED EU/2023/1791, Member States must promote the availability of energy audits. This availability depends heavily on the presence of energy auditors. Data on the numbers of qualified energy auditors in the market is available in all countries. The numbers indicate that none of the countries faces a shortage of trained specialists who can carry out mandatory audits.[25] The ratio of audits per auditor based on the number of performed mandatory audits in the years 2023 and 2022 is provided in Table 4 below. In the partner countries, the number of available auditors is distributed over the number of audits carried out in such a way that one auditor would have to carry out less than one (< 1) or between one and three audits (1-3). Analysing these figures, it needs to be noted, that the already described data uncertainty resulting from adjusted target groups in some countries (see chapter 3.2.1) reflects on these figures as well. If voluntary energy audits would be included into the numbers in the table below (4), the ratio would vary in some of the Member States, leading to an increase of the number of audits per auditor. For example, figures show that in Ireland the ratio of mandatory audit to auditor is < 1 (as shown below). However, counting in voluntary audits as well, the ratio ends up at a relatively high number of more than six audits per auditor. For this reason, it is only possible to draw limited conclusions about the utilization of the auditors on the basis of this data. The numbers indicate a sufficient availability of experts to conduct mandatory audits under Article 8 EED EU/2012/27. If the number of mandatory

[25] The numbers of trained auditors do not give an indication on the number of auditors who actually offer their services.

audits to be carried out in each country under Article 11 EED EU/2023/1791 remains at a similar level or decreases, it can be assumed that there is no shortage of experts required to comply with Article 11. If the number increases, the countries may have to take measures to ensure the availability of experts.

Country	Ratio between number of mandatory audits and auditors in 2023 (audits per auditor)	Ratio between number of mandatory audits and auditors in 2022 (audits per auditor)
Croatia	1-3	1-3
Germany	1-3	< 1
Greece	< 1	< 1
Ireland	< 1	< 1
Italy	> 3	< 1
Lithuania	< 1	1-3
Malta	< 1	No data available
The Netherlands	< 1	< 1
Portugal	No data available	< 1
Slovakia	1-3	1-3

Table 4. Number of energy auditors available in the market

3.2.2. Data and Processes

The current practices for collecting, storing and assessing data gained through energy audits and EnMS in the MS is of particular interest with regard to the transposition of Article 11(3) EED EU/2023/1791. This paragraph is new and has no equivalent in the previous EED. Its purpose is to gather information on the implementation of energy audits and EnMS at the national level. It stipulates that obligated enterprises must submit the relevant information to the responsible national authorities. MS may promote the use of a new or existing platform to facilitate the collection of the required data at the national level.

Institutions involved and their tasks

National ministries are responsible for the regulatory and legal framework on energy audits and for the transposition of Article 11 EED EU/2023/1791 in all countries, except for Malta, where these tasks are divided

between the Ministry of Environment, Energy and Regeneration of the Grand Harbour and the Regulator for Energy and Water Services (REWS). When it comes to collecting data on energy audits, (energy) agencies are responsible in most countries, followed by ministries. The data on EnMS is collected by various institutions (see Table 5). In five out of the ten countries (Croatia, Germany, Greece, Ireland and Slovakia), the institution in charge of collecting and evaluating information on energy audits is also responsible collecting and evaluating data on EnMS.

Responsi-bility	Ministry	(Energy) agency	National accreditation body	Other national authorities	Private entities	None
Institution responsible for regulatory framework on energy audits	Croatia, Germany, Greece, Ireland, Italy, Lithuania, the Netherlands, Portugal and Slovakia	-	-	Malta[26]		-
Institution responsible for collection of information on audits	Croatia, Greece, Portugal (transport)	Ireland, Italy, Lithuania, Malta, the Netherlands, Portugal (buildings and industry), Slovakia	-	Germany[27]		-
Institution responsible for collection of information on EnMS	Croatia, Greece	Ireland, Slovakia	Italy, Portugal	Germany[28]	Nether-lands[29]	Lithuania, Malta

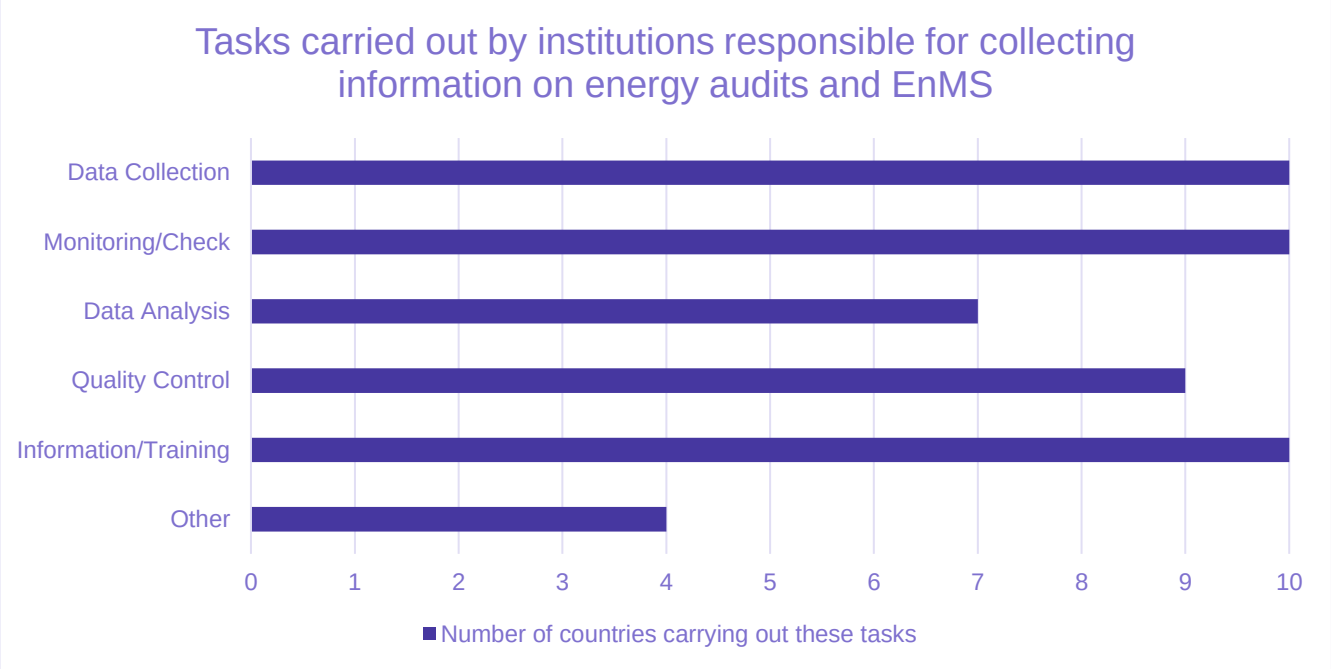
Table 5. Overview of the responsibilities of different institutions in the partner countries

In all countries, the institutions responsible for collecting data on audits perform additional tasks. Almost all of them analyse the collected data and carry out quality control of audits, including random checks. They also provide information on audits to companies and offer trainings to energy consultants. Other tasks include identifying

[26] In Malta, the Regulator for Energy and Water Services (REWS) is responsible for the regulatory framework on energy audits. The REWS is responsible for the regulation of practices, operations and activities in the energy and water sectors.
[27] In Germany, another state institution, namely the Federal Office for Economic Affairs and Export Control (BAFA) carries out that task.
[28] In Germany, the Federal Office for Economic Affairs and Export Control (BAFA) carries out this task. In the Netherlands, a private entity collects data on EnMS
[29] In Germany, the Federal Office for Economic Affairs and Export Control (BAFA) carries out this task. In the Netherlands, a private entity collects data on EnMS

obligated companies, maintaining a list of energy auditors, providing formation and consulting services to national governmental departments, and imposing penalties on companies in case of non-compliance. Figure 2 shows how many countries carry out the tasks listed above.

Figure 2. Tasks carried out by institutions responsible for collecting information on energy audits and Energy Management Systems in the partner countries



The list of tasks performed indicates that the countries have created good conditions for implementing the requirements of Article 11 2023/1791 EED. As the responsibility for collecting data on audits and EnMS is currently divided between different institutions, countries might consider either ensuring that communication and data transfer processes between the existing institutions run smoothly or consolidating these responsibilities to one institution.

Monitoring and verification processes

How mandatory energy audits are monitored and verified is of interest as it shows how Article 8(1) EED EU/2012/27 and Article 11(5) EED EU/2023/1791 are implemented. These articles stipulate that MS must ensure timely and high-quality energy audits. All surveyed countries implement processes that contribute to the objectives of these articles. However, the quality control process varies between MS. In some, monitoring includes the verification of all audit reports by the responsible institutions and even on-site controls of the implementation of energy efficiency measures. In half of the countries, only a statistically relevant number of audit reports is verified. One country uses a mixed approach. While it only reviews a certain percentage of audits carried out by external consultants, it reviews all audit reports of certified auditors that are also employed by the audited enterprise. There are also countries where the monitoring takes place only via an online self-declaration form without an in-depth verification of audit reports. In these countries, subjects who are authorised to conduct energy audits are deemed

qualified enough to conduct quality energy audits in accordance with the rules of the profession and best practices. In most countries, missing information or corrections can be submitted by the enterprises or auditors. Further steps regarding penalties will be taken only if the non-conformity is not remedied. Despite the difference in processes, it can be concluded that the monitoring and verification processes are sufficient to fulfil the requirements of Article 8 EED EU/2012/27. Updating these processes does not seem necessary with regard to the requirements laid out in Article 11 EED EU/2023/1791.

Data collection, data storage and data assessment

While data collection is similar in most countries, there are major differences in storage and the range of collected data. In seven out of the ten countries, enterprises upload the data to a digital platform. Table 6 provides an overview of the platforms used. In Croatia, Lithuania and Malta, the energy audit reports must be sent to the responsible agency or ministry. In Croatia, the data is stored in an Excel spreadsheet. In Ireland, Italy, the Netherlands and Portugal, it is stored in an online portal accessible to the applicable agency. In Greece, Germany and Slovakia, it is stored in an internal database from which Excel spreadsheets can be exported for analyses or assessments. In Malta and Lithuania, no database is in place and the audit reports and further information are stored individually in the applicable agency's internal document storage. In the opinion of experts from project partners where no database is in place yet, the establishment of such would be a valuable investment. The fact that most countries use a database to collect and store information from audits provides a good basis for adding types of information or adding data stemming from the new EnMS obligation. For the MS not yet using a platform for data collection and dissemination, it might be feasible to introduce one in the course of the EED transposition process. Article 11(3) invites MS "to promote the use of a new or existing platform to facilitate the collection of the required data at national level". In its Commission Recommendation (EU) 2024/2002 of 24 July 2024, the European Commission also refers to summary reports and benchmarks, which could be created based on data collection and analysis on energy audits.[30] Standardisation of the systems and databases would be desirable to facilitate data exchange and the creation of benchmarks within the EU.

[30] Section 8, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

Country	Name of the digital platform in English	Website link
Germany	Portal for submitting the online energy audit declaration	https://fms.bafa.de/BafaFrame/orea
Greece	Energy audit platform[31]	https://www.buildingcert.gr/audits/
Ireland	Energy audit notification system S.I.426/2014	https://www.seai.ie/plan-your-energy-journey/public-sector/energy-auditing/eed-compliance-form/
Italy	Audit 102 Web Portal	https://audit102.enea.it/
The Netherlands	My report for the EED audit obligation	https://mijn.rvo.nl/eed-auditplicht
Portugal	SGCIE Industry Portal	https://portal.sgcie.pt/Paginas/default.aspx
Slovakia	Energy Efficiency Information System	https://isee.siea.sk/

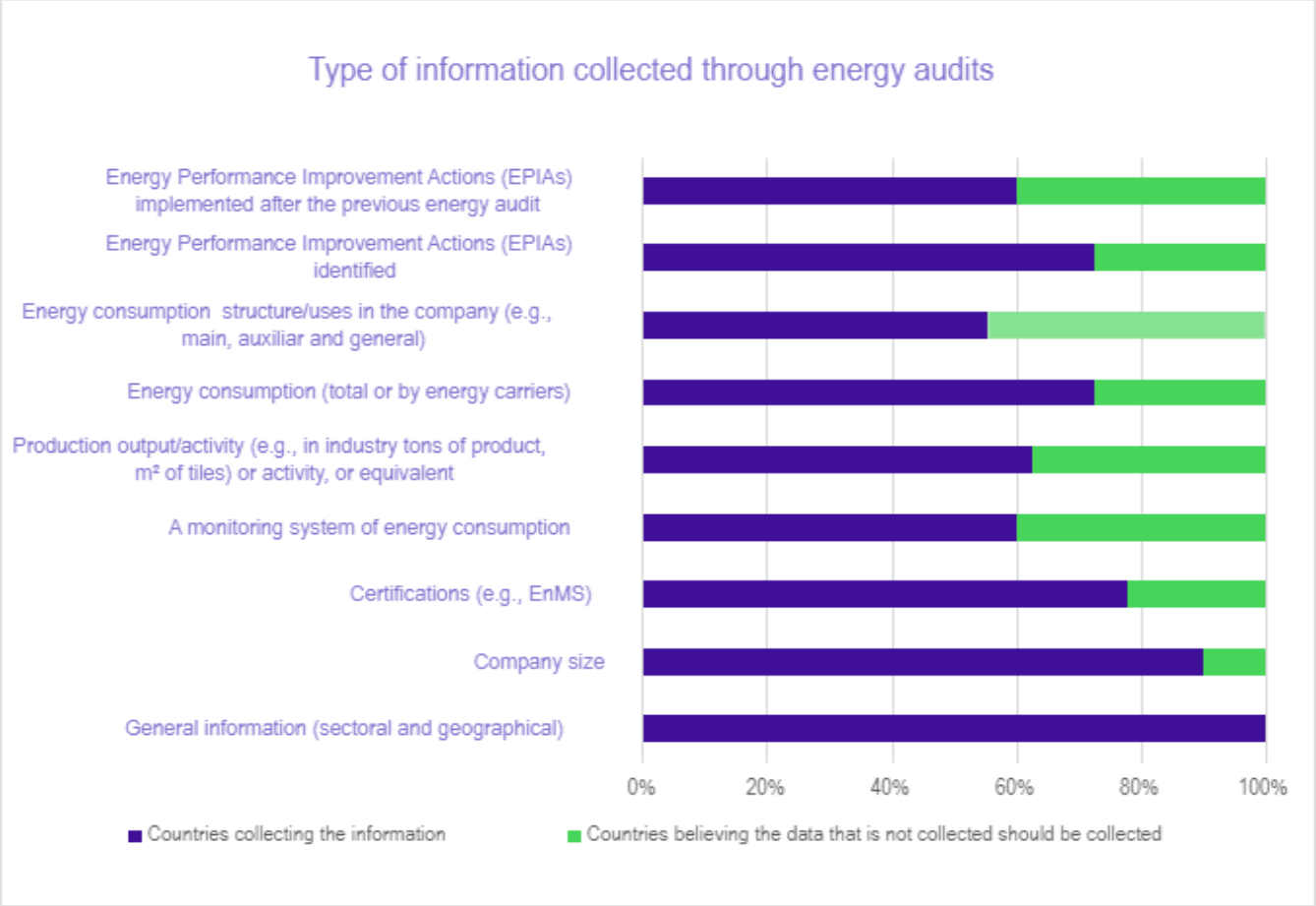
Table 6. Overview of the digital platforms used to collect data on energy audits

In all countries, data is collected on different aspects covered by energy audits. However, the range of collected data varies. While general sectoral and/or geographical information on enterprises is collected by all MS, information on the energy consumption structure/uses and production output/activity of the enterprises is only collected by half of the countries. Almost all of the countries collect data on the enterprise size, energy consumption and identified energy efficiency measures. Seven out of the ten countries collect information on certifications (e.g., EnMS) and on efficiency measures implemented after the previous audit. Several agencies are interested in improving data availability and the evaluability of data on implemented energy efficiency measures.

Six out of the ten countries collect data on a system for monitoring energy consumption in the audited enterprises. Figure 3 provides an overview of the type of data collected through energy audits and shows how many countries collect each type of data.

[31] In Greece, the "Energy Audit Platform" was introduced by Ministerial Decision No. 175275/30.05.2018 (Government Gazette Issue 1927/B' 30-05-2018) in 2018 and presented as a good practice in the third plenary meeting on the Concerted Action for the EED, see presentation of Minas Iatridis, CRES, *The Energy Audit Platform in Greece*, available https://www.ca-eed.eu/ia-document/the-energy-audit-platform-greece/, last accessed 19 July 2024. Based on the input data, energy efficiency indices such as energy intensity reduction, simple payback time and other are created for proposed energy saving measures.

Figure 3. Type of information collected through energy audits in the partner countries



Further information collected under national regulations implementing the audit obligation are inter alia:

- Methodology of data collection,
- Data on water consumption and water-saving opportunities,
- Information related to sites' sampling procedures for multi-site enterprises,
- Information regarding the energy auditor and the costs of the energy audit,
- Enterprise information (name, address, contact person and details),
- Energy costs (euro/year per energy carrier),
- Data on life-cycle cost analyses to present the immediate and future costs of alternative proposed energy-saving plans.

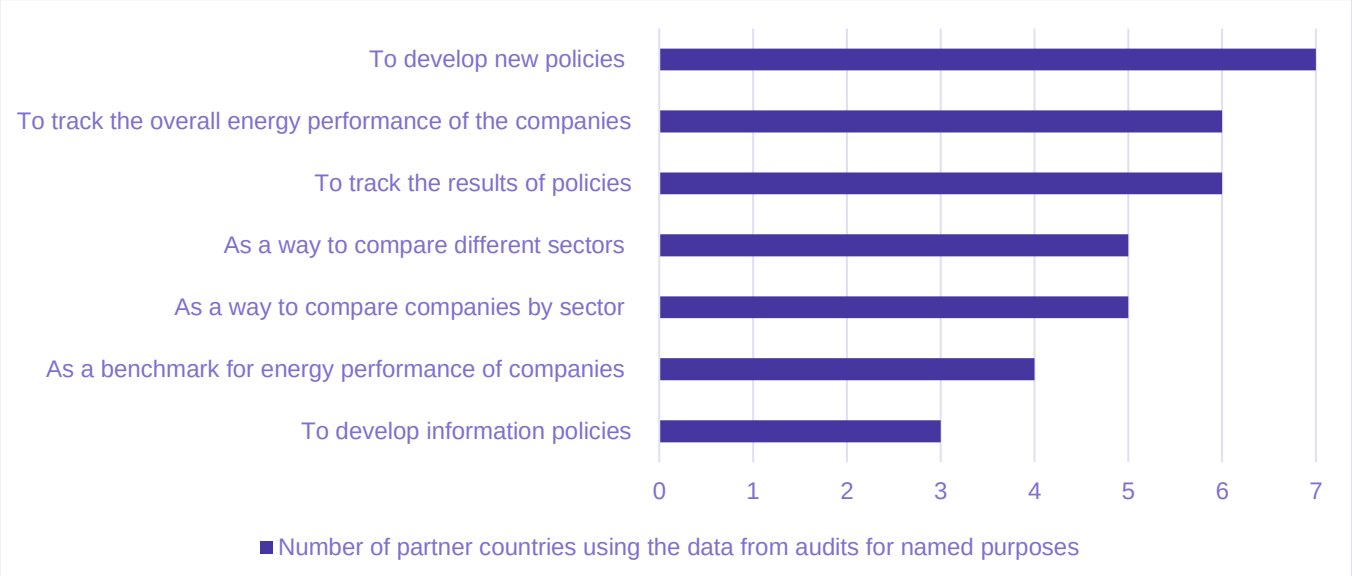
Most institutions in the partner countries would like to broaden the range of collected data. In the opinion of the institutions, almost all types of information shown in Figure 3 that are not being collected should be collected. The collection of some parameters, such as the energy consumption structure or the production output, is not considered necessary by all countries. This could be because the collection of this data is likely to be very complex and resource-intensive for the enterprises concerned. However, if all countries collected the same information,

better comparisons and evaluations would be possible. More comprehensive data availability would contribute to determining the status quo of compliance with European energy savings goals under the EED and the impact of audits, EnMS and the implementation of energy efficiency measures.

A good example of a refined information gathering and evaluation system on the planned implementation of identified energy efficiency measures can be found in the Netherlands. Under national provisions, enterprises that consume more than 50,000 kWh (0.18 TJ) of electricity per year must identify and implement energy savings measures with a payback period of five years. The corresponding notification system contains a list of measures that have such a payback period in various business areas and fields of activity. When enterprises decide to make use of that list to fulfil their obligation, they must implement the measures that correspond to their field of activity. By ticking boxes within the form, enterprises can indicate which of the energy efficiency measures they have already taken and which of them still need to be implemented. This way, the enterprise has an overview of all the measures it has implement or still needs to implement. The agency collects all the data and can analyse the exact implementation rate.

Although there is a method in place to collect data through the audit obligation, only a few countries use it for systematic evaluations. As shown in Figure 4, some countries use the data to develop new policies or to track the results of policies or the overall energy performance of enterprises. In three of the ten countries, the data is only used for specific evaluations on request and there is no systematic usage of any type of data. The results show that there is great potential for improving the analysis and further use of the collected data in the MS.

Figure 4. Number of partner countries using the data from audits for named purposes



The analysis shows that establishing centralised databases in countries that do not have them yet is a valuable investment. However, even in some countries that maintain databases, the data collected is not systematically analysed, but only used for specific purposes on request. Leveraging the potential of data through systematic evaluations would support fulfilling the EED targets. This requires enabling simplified extraction of data sets and automatic data evaluation.

3.2.3. Barriers

The assessment of the status quo regarding the processes of data collection, monitoring and verification of energy audits differs greatly among the experts from the energy agencies of the partner countries. Some estimate that these processes are highly effective, while others identify shortcomings in the system. The following barriers have been identified in the survey.

There is a lack of systematic data collection that distinguishes between mandatory and voluntary audits. Confirming that data is complete and relevant also presents a challenge in countries that do not obligate enterprises to submit their energy audit reports, unless as part of a sample control. Inaccurate reporting of energy data or inconsistencies between audit reports and reported data is also an important issue. Information on implemented and non-implemented energy efficiency measures as a result of the audit is often not recorded.

As for the existing data collection platforms, most of them lack a quick analytics function, meaning the only possibility to gain useful insights from the system is to intervene manually. The existing systems lack automatic assessment of the benefits of the audit for enterprises in terms of potential savings, which could greatly contribute to further assessment of potential energy savings. A lot of potential for improvement is evident regarding the assessment of collected data. Simplified extraction of data sets and automatic evaluation functions are often lacking in the databases. Exchanging data between the existing databases and maintaining databases to ensure accuracy of the data are also barriers. The creation and maintenance of databases as well as the verification and control processes are costly and resource intensive, as trained experts are required.

The identified barriers show potential for improvement. The MS can address these challenges in the process of adopting new regulations to implement the requirements of Article 11 EED EU/2023/1791.

3.3. Energy Management Systems

This section provides the results of the analysis and comparison of findings regarding practices for the collection, storage and assessment of information from Energy Management Systems under Article 8 EED EU/2012/27. After discussing general results (see Chapter 3.3.1), it presents findings regarding the data and processes currently in place (see Chapter 3.3.2) and points out identified barriers to these practices and processes (see Chapter 3.3.3) in regard to Article 11 EED EU/2023/1791.

3.3.1. General Results

While implementation of an EnMS is not mandated under Article 8 EED EU/2012/27, Article 11(1) EED EU/2023/1791 requires enterprises with an average annual energy consumption of 85 TJ (23.6 GWh) or higher over the previous three years to implement an EnMS by 11 October 2027. This EnMS must be certified by an independent body in accordance with a recognised European or international standard. Most Member States refer primarily to the ISO 50001 Standard for Energy Management Systems. Depending on national regulations, alternative systems may also be accepted, such as the ISO 14001 Standard for Environmental Management Systems (EMS) and the European Management and Audit Scheme (EMAS). These requirements aim to enhance energy efficiency and sustainability across large energy-consuming enterprises in the EU.

Germany is the only country examined in this project that has integrated the EnMS obligation into national law to date. This was implemented in the German Energy Efficiency Act (EnEfG), which was adopted in 2023.[32] It stipulates the implementation of energy and environmental management systems as well as the implementation of "Action Plans" (see description in Chapter 4). Compared to the threshold of 85 TJ (23.6 GWh) specified in the EED, the German government has decided to significantly lower the threshold for the obligation to implement an EnMS. Germany's energy-intensive enterprises must implement an EnMS when they record an annual average total final energy consumption of more than 27 TJ (7.5 GWh) over the last three completed calendar years. They must meet this obligation by 18 July 2025. The law entered into force on 18 November 2023, giving the affected enterprises a year and a half to implement an EnMS.

Data collection

Not all countries collect data on EnMS or EMS. There are also significant differences in the approaches taken and the comprehensiveness of this data collection. Some national institutions gather data on the total number of enterprises that have implemented EnMS, whether by obligation or voluntarily. However, most countries do not systematically collect data on all EnMS certifications. Typically, countries know how many enterprises use an EnMS to meet their audit obligations but lack the complete numbers of enterprises that have a certified EnMS. Most national institutions derive the number of certifications through monitoring of the audit obligation. This data therefore corresponds to the monitoring and verification process. In Germany, for instance, enterprises subject to the audit obligation must report this via an online self-declaration system. If an enterprise is obligated to carry out an audit, it can simply submit the information that it has an EnMS in place. Enterprises are only required to submit corresponding certification if inspected as part of random sampling.

Data of the ISO

The International Organization for Standardization (ISO), the publisher and responsible institution for the EnMS 50001 standard, conducts an annual voluntary survey where certifiers can report their data on enterprises they have certified. To be able to certify an enterprise with any standard (ISO or EMAS), the certifier must be accredited. This ensures quality and comparability throughout all countries using the standards. In order to guarantee this requirement equally in all countries, there are national accreditation bodies in most countries. These national bodies are usually responsible not only for ISO standards but also for other standards, such as EMAS. Any institution wanting to be able to certify an enterprise in accordance with any standard must obtain accreditation from this body. All accredited certification bodies are listed in the ISO database and in the database held by the respective national accreditation body. The ISO asks all accredited certification bodies to report their figures as part of an annual voluntary survey. The more certification bodies participate, the more accurate and representative these figures will be.

In seven of ten partner countries, the figures reported to ISO are higher than those collected by state institutions. This could be due to many enterprises choosing to implement an EnMS voluntarily, as state authorities usually only register an EnMS if implemented to meet an audit obligation. Due to the voluntary nature of the survey, however, the ISO figures cannot be regarded as complete. The numbers of EnMS certifications in 2022 according to ISO are shown in Table 7.

[32] German Energy Efficiency Act adopted on November 13, 2023, available at https://www.gesetze-im-internet.de/enefg/BJNR1350B0023.html, last accessed 23 September 2024.

Country	Number of EnMS (ISO 50001) certifications according to ISO in 2022[33]
Croatia	310 companies with 372 sites
Germany	5,523 companies with 16,452 sites
Greece	178 companies with 280 sites
Ireland	255 companies with 255 sites
Italy	1,656 companies with 3,496 sites
Lithuania	8 companies with 11 sites
Malta	4 companies with 3 sites
Netherlands	112 companies with 216 sites
Portugal	98 companies with 109 sites
Slovakia	57 companies with 59 sites

Table 7. Number of EnMS (ISO 50001) certifications in the partner countries according to ISO in 2022

All countries permit alternative management systems to fulfil the audit or EnMS obligation. Four out of ten of the surveyed countries accept the ISO 14001 environmental management system as an alternative to an EnMS, combined with a specific requirement to consider energy as a distinct component – which means it must include an energy audit compliant with the EED standard.[34] Uniquely, Germany accepts the EMAS but not the ISO 14001 as an alternative EnMS. An overview of the recognised alternatives for fulfilment of the audit obligation is given in Table 8.

[33] ISO, ISO CASCO Survey 2022 and Past Surveys, https://www.iso.org/committee/54998.html?t=KomURwikWDLiuB1P1c7SjLMLEAgXOA7emZHKGWyn8f3KQUTU3m287NxnpA3DIuxm&view=documents#section-isodocuments-top, last accessed 18 July 2024.

[34] This state practice under Article 8 is in line with the recommendations of the European Commission in its Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

Country	EnMS accepted to fulfil audit obligation	EnMS or EMS accepted to fulfil audit obligation
Croatia	x	x (ISO 14001)
Germany	x	x (EMAS)
Greece	x	x (ISO 14001)
Ireland	x	-
Italy	x	-
Lithuania	x	-
Malta	x	x (ISO 14001)
The Netherlands	x	-
Portugal	x	-
Slovakia	x	x (ISO 14001 + EMAS)

Table 8. Alternatives accepted for fulfilment of the audit obligation in the partner countries

ISO data reveals that, in some countries (e.g. Italy, Portugal and Slovakia), the numbers of ISO EMS certifications are higher than EnMS numbers. Germany, however, shows significantly higher EnMS numbers. One reason for this could be Germany's industrial structure, which features many energy-intensive sectors such as steel and chemical production. In this context, the impact of introducing a monitoring system and energy reduction plans would be comparably high. Tax breaks and other financial benefits (see Chapter 3.4.2 for examples) offered to enterprises in Germany before introduction of the EnMS obligation[35] can further incentivise voluntary implementation of an EnMS.

As described above, the discrepancies between figures issued by the ISO and national authorities suggest that many enterprises voluntarily implement EnMS. However, few countries actively support voluntary implementation. Exceptions include:

- Ireland and Germany: These countries promote company networks that encourage voluntary EnMS adoption. The programmes are described in further detail in Chapter 3.4.2.
- Italy: Regional funding helps SMEs to cover certification costs (see Chapter 3.4.2).
- Germany: National frameworks provide financial benefits to enterprises with a voluntary EnMS or an approved alternative (EMAS).

The evaluation of this gap in figures and possible correlations with incentives needs to be investigated further to be able to draw conclusions on the precise total number of implemented EnMS in the Member States.

[35] Even though these assumptions were confirmed in an interview by an energy consultancy (Rödl & Partner, 17.7.2024), evidence on the reasons for significantly higher EnMS numbers in Germany needs to be collected and further analysed.

3.3.2. Data and Processes

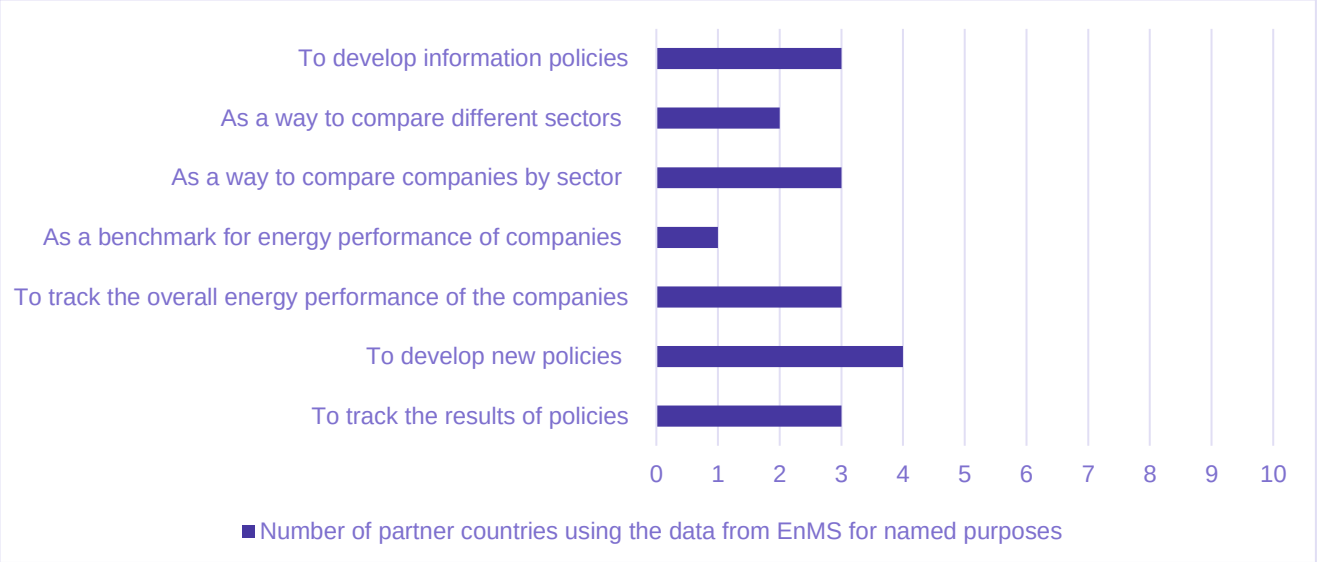
In most partner countries, the collection of data on enterprises' implementation of Energy Management Systems, whether voluntary, mandated or as a method to fulfil their audit obligation, is incomplete. Most national data on implemented EnMS figures is collected through the audit obligation processes performed by the national energy agency or an equivalent body (see Chapter 3.2.2). In some countries, such as Portugal and Italy, the national accreditation body (which is responsible for accrediting certification bodies) also collects data on the number of implemented EnMS (ISO 50001). However, in some countries, such as Malta and Lithuania, there are no data collection, monitoring or verification procedures currently in place regarding the implementation of EnMS.

The process and type of data collected under the audit obligation varies significantly between countries (where such procedures exist). This ranges from maintaining an Excel spreadsheet to adopting a strategic approach using an online platform or database. Where data on EnMS is strategically collected, most countries use an online interface. This collection often includes more than just the information required to demonstrate fulfilment of the audit obligation. Instead, institutions also track certification dates, validation, recertifications and additional data on implementation plans and measures. However, no institution collects data on all EnMS-certified enterprises within a country, instead focusing solely on enterprises using EnMS to fulfil audit obligations, which results in incomplete data at the national level. Although Germany has adopted an EnMS obligation, no strategic data collection method has been implemented to date because the enterprises subject to this obligation have until July 2025 to implement corresponding systems.

Monitoring processes

Furthermore, monitoring, verification and analysis procedures are rarely carried out. Most countries do not systematically use or analyse available data from EnMS, even where such data is collected. Exceptions include Ireland, Italy, Germany and Greece, where this data is used for evaluation purposes, policy development and comparisons between different sectors. Most partner countries do not fully exploit the potential of available data for analysis and evaluation. Experts from all project partners believe that plans should be developed in their respective country to improve the collection and processing of data from EnMS and voluntary programmes. Figure 5 shows the number of countries using the data from EnMS for different purposes.

Figure 5. Number of partner countries using the data from EnMS for named purposes



It must be noted that some national institutions may not be aware of EnMS data that exists at national level because EnMS data has not yet been integrated into the scope of their work or is not currently within their remit. This highlights a significant knowledge gap and a missed opportunity to leverage data to enhance energy management practices.

The collection and utilisation of data concerning EnMS implementation varies considerably and is incomplete across different countries. A more strategic and comprehensive approach to data collection and utilisation is needed to maximise the benefits of EnMS. This is necessary to ensure that the potential of available data is fully realised and thus supporting the implementation of legislation, as well as enabling analysis and policy development.

3.3.3. Barriers

The status quo regarding collection, monitoring and verification of data on the implementation of EnMS can be assessed as being less advanced compared to the status quo regarding energy audits. The data collection process, the range of information collected and the evaluation of EnMS data pose challenges, with scope for improvement in most countries. Member States that do not collect EnMS data should initiate processes and systems to facilitate information gathering on implementation at national level under Article 11(3) EED EU/2023/1791. A lack of technical infrastructure is one barrier identified by some institutions. Developing and maintaining digital solutions for structured data collection is resource intensive and costly. In the opinion of experts from Croatia, Italy and Portugal, existing data collection and monitoring systems in their countries are insufficient for deeper analysis. Even when such data is collected, it is often not sufficiently robust for thorough analysis or quality control.

Regarding the identification and control of obligated enterprises, a lack of data on the energy consumption of individual enterprises represents a further challenge. At present, where energy consumption is available, it is solely

collected as part of the processes related to the audit obligation and not as part of processes related to EnMS in the respective country (see Chapter 4 on the status of energy consumption data and identification of obligated enterprises).

Despite the current challenges, experts from the participating agencies recognise the significant potential of data that could be collected in the context of EnMS obligations, such as to enhance analysis and quality control processes.

The findings from the previous chapters highlight that the current implementation of previous requirements under Article 8 EED EU/2012/27 results in gaps in the implementation of EnMS requirements outlined in Article 11(1) EED EU/2023/1791. To effectively implement the EnMS obligations under Article 11, countries must address several challenges, including how they identify obligated enterprises, what steps they need to take to enhance data collection systems and where they must invest in technical infrastructure. Recognising and leveraging the potential of collected data is crucial for structured implementation and continuous compliance.

3.4. Voluntary programmes to support energy audits and EnMS

Article 8 EED EU/2012/27 required EU member states to develop programmes to encourage and support non-obligated SMEs in undertaking energy audits and implementing the resulting recommendations. As an example of such programmes, the EED listed voluntary agreements to cover the costs of conducting energy audits and implementing highly cost-effective recommendations. The EED recast extends this obligation to non-SMEs and highlights measures such as setting up energy audit centres. It also demands that programmes for SMEs include support in quantifying the benefits of energy efficiency measures as well as in the development of energy efficiency roadmaps and energy efficiency networks, facilitated by independent experts. Since the new EED includes an obligation to introduce EnMS, it also recommends developing solutions to bring its benefits to the attention of non-obligated SMEs.

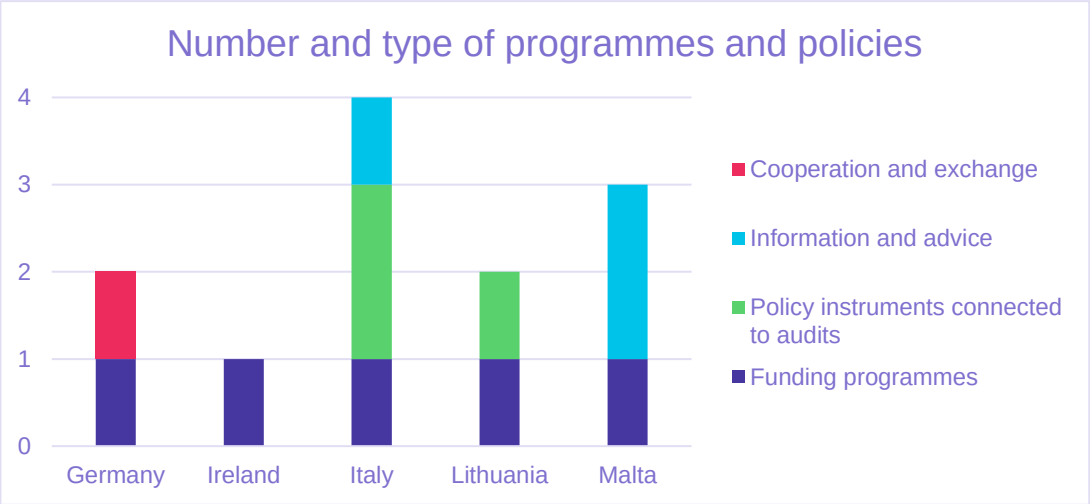
This section maps and analyses voluntary programmes of the ten partner countries aimed at supporting non-obligated enterprises in undergoing energy audits and introducing Energy Management Systems.

3.4.1. Programmes and Policies to Support Energy Audits

Overview of the existing programmes

Twelve programmes and policies specifically designed to motivate enterprises to undergo energy audits, or to provide assistance in this regard, were identified in ten partner countries (see Annex 7.2 for a detailed overview). Whereas some countries have several programmes providing various types of support, five countries (Croatia, Greece, the Netherlands, Portugal and Slovakia) have no active programmes of this kind at present (Figure 6).

Figure 6. Number and type of voluntary programmes and policies connected to energy audits in partner countries



Of the twelve identified programmes, five provide financial support to enterprises willing to undergo audits and/or implement identified energy efficiency measures. Three programmes define carrying out energy audits or implementing identified energy efficiency measures as a precondition to accessing financial support, while three programmes are aimed at providing information and advice and one involves setting up energy efficiency networks of enterprises to exchange experiences on implementing energy efficiency measures.

Funding programmes

Four of the five identified funding programmes provide a direct subsidy for audit costs, either as a fixed contribution (between EUR 1,000 and EUR 5,000) or a specific share of the audit costs (between 80% and 85%). This type of support is often combined with the obligation to implement at least one of the energy efficiency measures identified in the energy audit. Some countries – such as Malta, with its Promotion of Energy Audits in Small and Medium Sized Enterprises Scheme – provide tailored subsidies to enterprises according to their size and economic sector. Enterprises in Malta's manufacturing, food and accommodation sectors, for example, receive higher financial assistance to carry out an energy audit.

A Lithuanian programme – entitled Implementation of Energy Consumption Efficiency of Private Legal Entities on the basis of Energy Audit Reports – provides subsidies of up to EUR 1.5 million to enterprises willing to implement energy efficiency measures identified in an energy audit. The subsidy amount provided is inversely proportional to the size of the enterprise and covers 30% to 50% of eligible costs.

Policies connected to energy audits

The three identified policies connected to energy audits are linked to various exemptions from existing levies related to energy or environment. To qualify for these exemptions, energy-intensive enterprises in Italy that consume over 1 GWh/year over a three-year reference period (companies known as "Energivori") or gas consumption of more than 1 GWh/year or approximately 95,000 Sm^3/year (companies known as "Gasivori") are

obligated to carry out energy audits and implement at least one of the energy efficiency measures identified in the energy audit within the four-year interval between mandatory energy diagnoses[36] In case of compliance, “Energivori” receive a discount on/relief from levies financing environmental objectives, i.e. renewable power generation. From 2024, the amount of the relief will depend on the sector and if the enterprise has already benefitted from any relief in previous years. “Gasivori” receive a discount on/relief on the tariff fees for the natural gas transmission and distribution. The amount of the relief depends on the ratio between the costs of the gas consumed and the value added.

In Lithuania, energy-intensive enterprises must fulfil similar requirements. Enterprises with energy consumption of more than 1GWh/year can recover 85% of the price of public interest services[37] paid for the amount of electricity consumed in the previous calendar year. The payments must be allocated to the implementation of energy efficiency measures in an energy audit.

Information and advice programmes

Three programmes were identified that provide comprehensive information on the benefits and implementation of energy audits for enterprises. The Maltese MERCA and GUEST projects provided a number of enterprises in the food and accommodation sectors with information and advice on carrying out energy audits and implementing some of the identified measures. The results of the audits are going to be shared in an aggregated form with other enterprises from the respective sectors to facilitate an indirect sharing of experience.

As part of a training, information and awareness-raising campaign for SMEs, ENEA is carrying out a long-term programme (2021–2030) with two types of events each year: firstly, conferences to inform all stakeholders at enterprises potentially interested in undergoing audits and implementing the identified energy efficiency measures; and secondly, training workshops for the technical staff at SMEs. ENEA’s campaign also includes further tools to assist SMEs with energy audits, such as guidelines, IT tools and on-site visits to advanced peers.

Programmes designed to foster cooperation and an exchange of experience

In Germany, the Initiative for Energy Efficiency and Climate Action Networks (IEEKN) supports enterprises in forming networks of eight to fifteen enterprises to set self-imposed energy-efficiency goals and directly exchange experiences on the path to achieving them. In the first year of the network, the participating enterprises commission external support from energy consultants or auditors to identify potential energy savings. It is possible to use this consultation as an energy audit within the framework of the audit obligation. Conversely, existing energy audits can be used to replace or supplement the analysis of potential if such audits were carried out shortly before the network started its activities.

[36] The Minister of Economic Development, Ministerial Decree Dec. 21, 2017, Reorganization of the system of subsidies for electricity-intensive enterprises “Energivori”, 21.12.2017, available at https://www.mimit.gov.it/images/stories/normativa/decreto_ministeriale_21_dicembre_2017_%20agevolazioni_imprese_energivore.pdf, last accessed 06.09.2024.

[37] e.g. electricity generation from renewables or in combined heat and power (CHP) plants.

Best practice

Only one of the twelve analysed programmes – the Initiative for Energy Efficiency and Climate Action Networks (IEEKN) in Germany – corresponds to the examples of voluntary programmes highlighted in the EED recast and in the Commission Recommendation (EU) 2024/2002 of 24 July 2024 by the EU Commission[38]. In its recommendations, the European Commission outlines energy efficiency networks as a proven concept to foster the implementation of energy efficiency measures in enterprises. It provides a description of their goals and activities as well as a direct reference to the website of the IEEKN. Since this programme constitutes a best practice with a high level of replicability in other EU Member States, detailed information on the programme is presented in Table 9 below.

Initiative for Energy Efficiency and Climate Action Networks (IEEKN)	
Country	Germany
Implementing organisation	German Energy Agency (dena)
Description	The Federal Government of Germany, along with associations and organisations from the German industry, launched the Initiative for Energy Efficiency Networks (EEN) in 2014. It was extended in 2021, from then on as the Initiative for Energy Efficiency and Climate Action Networks (IEEKN). As the implementing organisation, the German Energy Agency (dena) supports companies in creating networks of at least five companies to analyse their energy-saving and greenhouse gas reduction potential, and then define a common network savings goal. Companies are required to set an energy savings goal and can choose to define a GHG savings goal. Although achieving these goals is not a prerequisite for participation in the network, the defined goal is important for successful network collaboration and realising tangible savings. All activities, such as the regular exchange of experiences or the implementation of measures, are supported and moderated by experts. The network's impact is monitored and reviewed to document the overall success of the IEEKN. The analysis of energy-saving potential (before companies define a goal) can be used as an energy audit under the audit obligation. Conversely, existing energy audits can be used to replace or supplement the analysis of potentials (provided the audit was carried out shortly before the start of the network's activities).
Main results	The initiative is subject to an annual monitoring process in which the activities of all networks that have completed their work in the previous year is evaluated. This means that the results

[38] Section 8.4, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

Initiative for Energy Efficiency and Climate Action Networks (IEEKN)	
	of the initiative become more meaningful from year to year as more and more networks are evaluated. The monitoring process for the first project period (2014-2020) showed the following results: 239 networks with 2,479 participating companies were evaluated; they reported a total of 10,525 implemented energy efficiency measures, of which 9,713 were quantifiable. These energy-saving measures resulted in total annual savings of 7,432 GWh of final energy, 9,350 GWh of primary energy (focusing solely on the non-renewable share) and 2,686 kt of CO_2. To date, 410 networks have been initiated since 2014, comprising approx. 3,350 companies and sites.
Barriers, lessons learned	The results of a survey of participating companies, network leaders and moderators demonstrate that, despite the many advantages of participating in the network, some hurdles still remain. For company managers, the main drawback is the effort and time that network activities require, especially in times of increasing skills shortages, which can double the workload for employees responsible for energy-related or environmental issues. The costs of network participation have also been raised as an issue. In response, the German government has introduced special compensation in the Carbon Leakage Regulation (BEHG-Carbon-Leakage-Verordnung – BECV). Membership of a network serves as an alternative to introducing an EnMS to access compensation payments. Moreover, the Federal Funding for Energy and Resource Efficiency in the Economy (Bundesförderung für Energie- und Ressourceneffizienz in der Wirtschaft – EEW) includes an additional bonus in Module 5 for companies that are registered and actively participate in an IEEKN network. This increases the funding rate by 10 percentage points and increases the maximum funding amount by EUR 30,000. This additional bonus is valid until 31 December 2028.
Website	https://www.effizienznetzwerke.org/ (in German) https://www.effizienznetzwerke.org/app/uploads/2023/04/Netzwerkinitiative_Infoflyer_EN.pdf (in English)

Table 9. Best practice: Initiative for Energy Efficiency and Climate Action Networks (IEEKN), Germany

Data management

All countries that have voluntary programmes related to energy audits collect data on the programmes' implementation. In most cases, this process is coordinated by the organisation that administers these programmes. While this generally concerns energy agencies, it also includes national and regional ministries as well as private

enterprises and research institutions. In some cases (e.g. the Initiative for Energy Efficiency and Climate Action Networks [IEEKN] in Germany), data collection and analysis are outsourced to third-party institutions to ensure transparent and unbiased analysis. When a programme provides financial support to enterprises, corresponding data management is usually coordinated by the organisation responsible for monitoring mandatory audits, and takes place through the same system. However, data collection and monitoring procedures are usually more thorough for programmes that include financial aid (Table 10).

Voluntary programmes	Type of support	Information gathered is the same as for obligated enterprises:	Collection procedure is the same as for obligated enterprises:	Monitoring procedure is the same as for obligated enterprises:
Federal funding for energy consulting for non-residential buildings, plants and systems (Germany)	Financial support	No[39]	Yes	No
Support Scheme for Energy Audits, SSEA (Ireland)	Financial support	No[40]	Yes	No
Energivori – Energy Intensive Industries – Electricity (Italy)	Policy connected to audits	Yes	Yes	No[41]
Gasivori – Energy Intensive Industries – Natural Gas (Italy)	Policy connected to audits	Yes	Yes	No[42]
Regional programmes for energy efficiency/ energy audits in SMEs (Italy)	Financial support	No	No	No
Public interest services measure (VIAP) (Lithuania)	Policy instruments	No[43]	No	No
Implementation of energy consumption efficiency of private legal entities according to energy audit reports (Lithuania)	Financial support	No[44]	No	No

Table 10. Comparison of information collection and monitoring procedures on obligatory energy audits and voluntary programmes connected to audits that imply financial support

[39] An energy audit report and an online self-declaration form must also be submitted. The self-declaration form includes company details, building size, energy consumption, energy costs, identified energy measures, details on performance of the energy consultation. By contrast to the information gathered in connection with obligatory audits, the submission of information on all the points listed is compulsory.
[40] Additional information is gathered to determine scheme eligibility, SME status and omissions regarding requirements for mandatory audits.
[41] The procedure is extended to the obligation to implement the identified energy efficiency measures.
[42] The procedure is extended to the obligation to implement the identified energy efficiency measures.
[43] Since this support programme is coordinated and evaluated by an institution other than the one coordinating the audit obligation, different data is gathered and a different procedure is implemented.
[44] Since this support programme is coordinated and evaluated by an institution other than the one coordinating the audit obligation, different data is gathered and a different procedure is implemented.

Organisations' responsibilities vary across different countries and programmes. While all organisations perform the standard task of data collection, not all of them analyse this data, e.g. to tailor their programmes in line with enterprises' needs. Most organisations monitor and control the implementation of energy audits and identified energy efficiency measures, especially those linked to financing. The Maltese EWA requires enterprises participating in the Promotion of Energy Audits in Small and Medium Sized Enterprises Scheme to submit a full audit report along with a summary. The full report is analysed to ensure that the audit meets the minimum requirements, verifying that the enterprise is eligible to receive the grant. Most programmes provide additional information and offer training to raise awareness of energy audits and increase their quality (Table 11).

Some organisations publish the collected and analysed data to present the benefits and details of audits to a wider audience. In Ireland, the SEAI administrates the Support Scheme for Energy Audits and has developed a template report. This aims to standardise the output of energy audits and present their findings to further SMEs in an accessible form that non-technical readers can understand.

Voluntary programme	Data collection	Monitoring / checks	Data analysis	Quality control	Infor-mation/ training	Other
Initiative for Energy Efficiency and Climate Action Networks (IEEKN) (Germany)	x	x	x	x	x	-
Federal funding for energy consulting for non-residential buildings, plants and systems (Bundesförderung für Energieberatung für Nichtwohngebäude, Anlagen und Systeme) (Germany)	x	x	-	-	-	-
Support Scheme for Energy Audits (SSEA) (Ireland)	x	x	x	x	x	x[45]
Large Industry Energy Network (Ireland)	x	x	x	x	x	-
Energivori – Energy Intensive Industries – Electricity (Italy)	x	x	x	x	x	-
Gasivori – Energy Intensive Industries – Natural Gas (Italy)	x	x	x	x	x	-
Regional programmes for energy efficiency/ energy audits in SMEs (Italy)	x	x	x	x	x	-
Training, information and awareness-raising campaign on energy efficiency for SMEs (Italy)	-	-	-	-	x	-

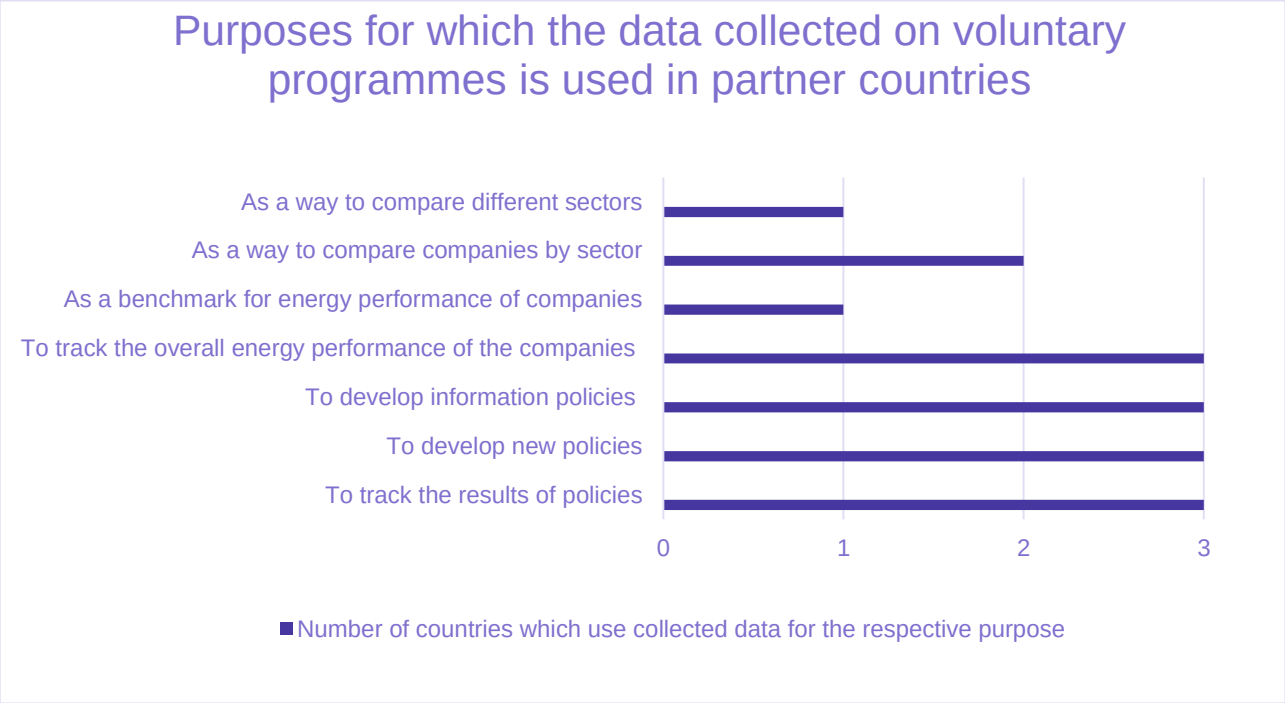
[45] SEAI manages the register of energy auditors for SSEA.

Voluntary programme	Data collection	Monitoring / checks	Data analysis	Quality control	Infor-mation/ training	Other
Public interest services measure, VIAP (Lithuania)	x	x	x	x	-	-
Implementation of energy consumption efficiency of private legal entities according to energy audit reports (Lithuania)	x	x	x	x	-	-
Promotion of Energy Audits in Small and Medium Sized Enterprises Scheme (Malta)	x	-	-	x	x	-
MERCA pilot project (Malta)	x	-	-	x	x	-
GUEST pilot project (Malta)	x	-	-	x	x	-

Table 11. Functions of the organisations administrating the voluntary programmes connected to energy audits in the partner countries

Almost all partner countries that have voluntary programmes related to energy audits confirmed that they use the data collected for different purposes. For the most part, this data facilitates the monitoring and improvement of the respective voluntary programmes and the development of new programmes. In some countries, this data is also used to track and benchmark enterprises' energy performance and compare different enterprises and sectors. Figure 7 provides an overview of the purposes for which the data collected on voluntary programmes is used.

Figure 7. Purposes for which the data collected on voluntary programmes is used in partner countries

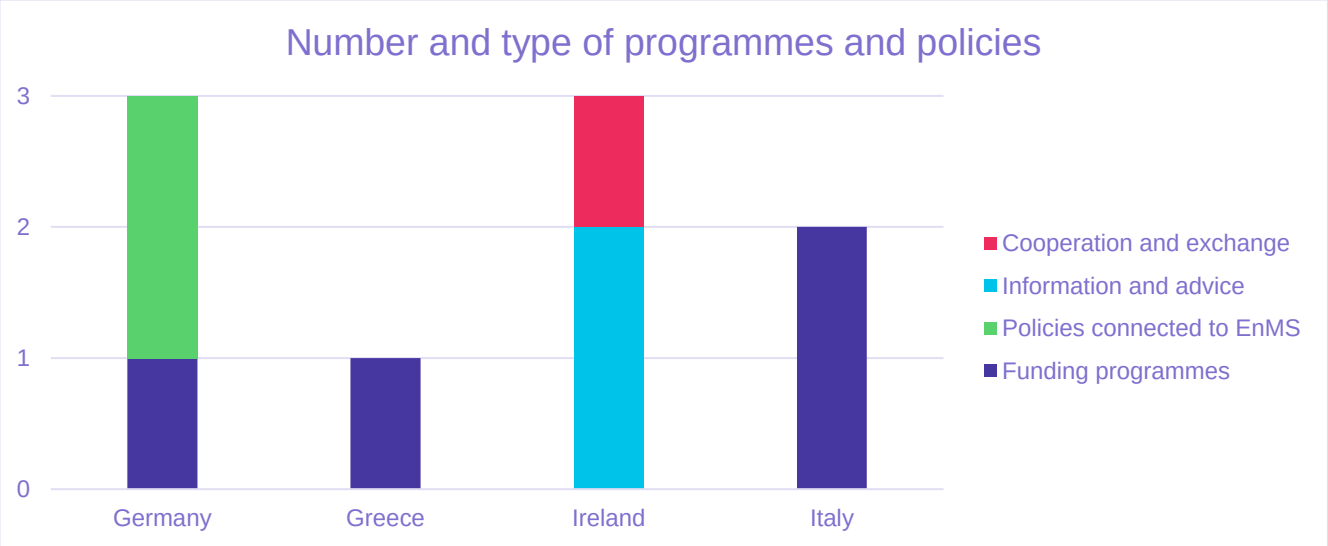


3.4.2. Programmes and Policies to Support Energy Management Systems

Article 11 EED EU/2023/1791 sets out an obligation for enterprises that exceed a certain energy consumption threshold to introduce Energy Management Systems, along with a recommendation for EU Member States to develop solutions to bring their benefits to the attention of non-obligated SMEs. With this in mind, this section analyses existing programmes and presents some of them as examples of best practice that can be replicated in other EU Member States.

Currently, only four out of ten partner countries (Germany, Greece, Ireland and Italy) have programmes to support the voluntary introduction of Energy Management Systems (Figure 8; see Annex for a detailed overview). Despite their low number, these programmes cover the entire spectrum of support measures identified in this report.

Figure 8. Number and type of voluntary programmes and policies connected to energy management programmes in the partner countries



Funding programmes

Two of the four funding programmes – the Greek ECCO Business programme and the Italian regional programmes for energy efficiency – directly finance the adoption of an ISO 50001-certified EnMS. The Greek programme covers up to 65% of the costs of introducing an EnMS, while its Italian counterpart provides a maximum subsidy of EUR 10,000. Another Italian programme, the Transition 5.0 Plan, provides a tax credit of 5% to 45 % for investment in staff training dedicated to the introduction of an Energy Management System or technologies and software that support effective energy management. The German Federal Programme for Energy and Resource Efficiency (EEW) subsidies the introduction of infrastructure for energy data collection, which can serve as a basis for the implementation of EnMS.

Policies connected to Energy Management Systems

In Germany, there are two policies that are directly linked to the introduction of Energy Management Systems. In the framework of the special equalisation scheme[46], enterprises with high electricity costs are entitled to a reduction in the electricity surcharge if they can provide evidence of an EnMS in accordance with ISO 50001 and demonstrate that they are addressing the requirements of the certification and are implementing corresponding measures. The German Carbon Leakage Regulation (BECV) and the electricity price compensation programme apply the same precondition for provision of direct subsidies to enterprises at risk of carbon leakage.

[46] See Table 18 in annex chapter 7.2 for more information on the programme.

Information and advice programmes

In Ireland, the SEAI provides different kinds of information and advice to enterprises interested in implementing an EnMS. The Energy Management Action Plan (MAP) programme offers public enterprises a whole range of information support and consulting services, starting from diagnostics of energy management practices and ending with developing an energy management action plan consistent with the principles of internationally certified EnMS. The implementation of that plan can serve as a basis for implementing ISO 50001. The SEAI Energy Academy offers free online courses, including on Energy Management Systems and energy efficiency technologies.

Programmes designed to foster cooperation and an exchange of experience

By contrast to the German IEEKN mentioned earlier, the Irish Large Industry Energy Network (LIEN) constitutes a single network bringing together around 200 Irish enterprises that each spend more than EUR 1 million per year on energy. One of the key prerequisites for participation is an existing ISO 50001 certification or a commitment to achieve one. As the network coordinator, the SEAI works with the members of the network to improve their energy performance and reduce absolute emissions. The LIEN members report annually on their energy consumption and projects undertaken to help increase efficiency. Special working groups within the network have developed best practice guides on how to manage energy performance.

Data management

Only Ireland provided information on data management and use in connection with its voluntary programmes. In Ireland, data is collected only for public sector organisations that are obliged to report energy management and performance data directly to the SEAI under the law transposing the EED EU/2012/27 into Irish legislation.[47] This reporting allows the SEAI to track the progress of the public sector organisations participating in the programme towards energy and policy targets. The monitoring and reporting system is not directly linked to the system collecting data on EnMS. It contains data on overall energy performance, greenhouse gas emissions, electricity and natural gas consumption and allows comparison between all public bodies in achieving the emission reduction and energy efficiency targets. This way, it indirectly reflects the effectiveness of the voluntary programmes, targeting public sector organisations, and allows data selection and analysis. According to the SEAI, this data is used to track the results of the existing programmes, to create new programmes, to develop information policies as well as to monitor and benchmark the overall energy performance of public bodies.

Best practice

In the survey preceding this report, the Leapto11 partner organisations were asked to assess the voluntary programmes in terms of their replicability in other EU countries (1= no potential, 5= very high potential). The programmes with the highest score (5) are presented as examples of best practice.

[47] SI 426 of 2014.

Large Industry Energy Network (LIEN)	
Country	Ireland
Implementing organisation	Sustainable Energy Authority of Ireland (SEAI)
Description	The LIEN is a single network uniting around 200 Irish enterprises that have annual energy consumption costs of EUR 1 million or more. The SEAI works with these enterprises to improve their energy performance and reduce absolute emissions. LIEN members report annually on energy consumption and projects undertaken to help increase efficiency.
Main results	LIEN special working groups help to provide meaningful feedback to government policymakers and can influence changes to grant schemes and eligibility.
Barriers, lessons learned	The barriers encountered include a lack of engagement from some LIEN members. Lessons learned include the industrial sector's strong focus on production volumes and profit, and that a top-down approach is necessary to drive an ethos of energy efficiency and decarbonisation.
Website	https://www.seai.ie/business-and-public-sector/large-business/lien/

Table 12. Best practice: Large Industry Energy Network (LIEN), Ireland

Energy Management Action Plan (Energy MAP)	
Country:	Ireland
Implementing organisation	Sustainable Energy Authority of Ireland (SEAI)
Description:	A primary energy management programme provided by the SEAI for public sector enterprises of all sizes. Its core element is tailor-made diagnostics of energy management practices at participating enterprises. The diagnostic tools range from a simple assessment for small organisations and schools to a 20-question Energy MAP diagnostic for larger organisations, which covers five pillars: commit, identify, plan, take action and review. The output from the diagnostic is an energy management score and a list of specific, tailored recommendations for next steps in improving energy management practices and aligning them with international best practice. If organisations score highly (70–80 %) then they should consider implementing ISO 50001. In the course of the programme, enterprises develop an Energy Management Action Plan (Energy MAP) either independently or in partnership with the SEAI (through training courses). Although it is not a formal Energy Management System, the Energy MAP is fully consistent with the principles set out in the ISO 50001 Energy Management Standard. In this way, organisations that are keen to eventually formalise their energy management programmes through certification can initially develop Energy MAP programmes before seamlessly progressing to ISO 50001.
Main results	The main result from the Energy MAP is up to 20% energy savings using the management solutions provided, along with reductions in greenhouse gas emissions. It also helps participating companies meet legal requirements.
Barriers, lessons learned	A barrier encountered is a lack of engagement at any level of an organisation, which requires continuous engagement and pushing from the institution managing the program. A lesson learned is that habitual processes are difficult to change within enterprises. When working on an energy management strategy, it is important to address the role of all staff in its implementation. The benefits to the company and the longevity of its energy savings are determined by the engagement and enthusiasm shown by all its employees. The following measures should be implemented to maintain long-term success: training courses, meetings, ensuring recognition and rewards, and suitable HR policies.
Website	https://www.seai.ie/publications/Public-Sector-Energy-Programme-Support-Manual.pdf

Table 13. Best practice: Energy Management Action Plan (Energy MAP), Ireland

4. Implications for Article 11

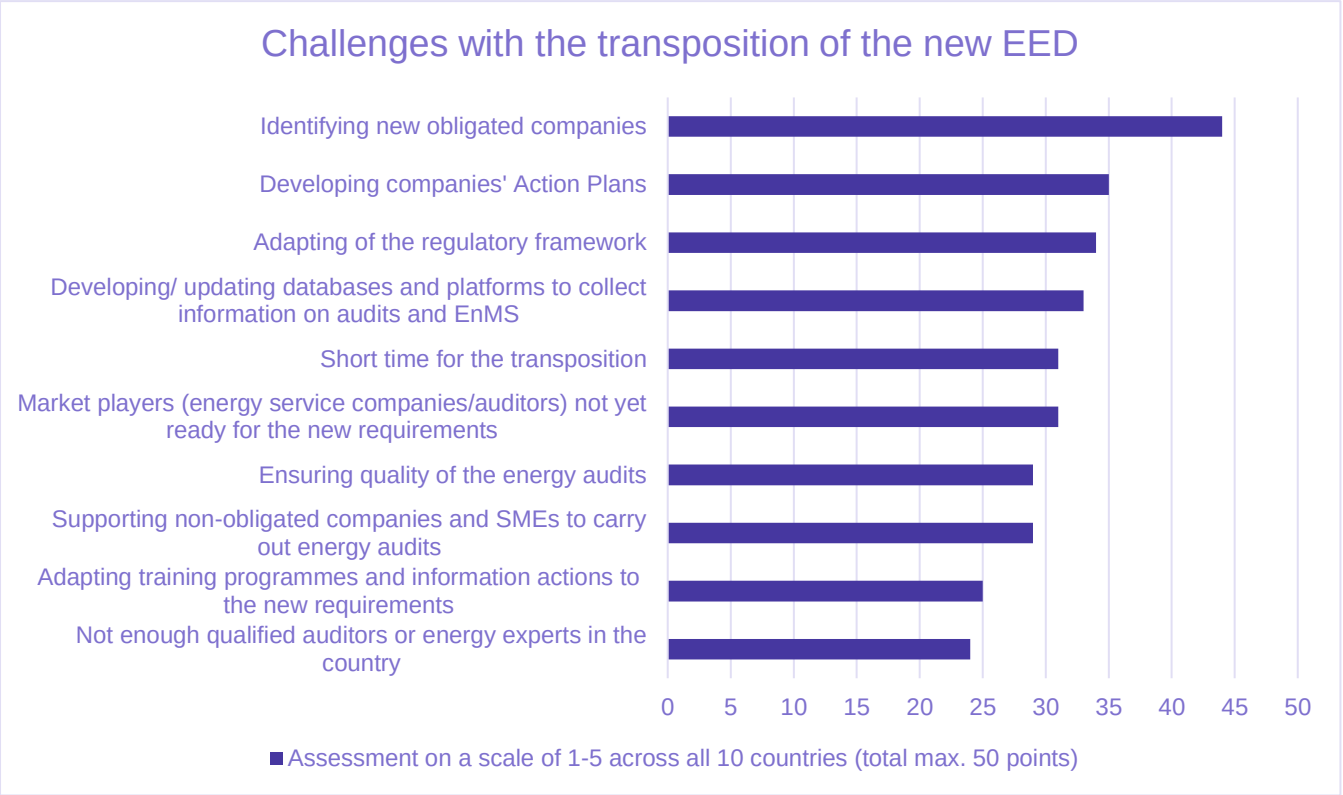
The status of implementation of Article 8 EED EU/2012/27, as analysed in Chapter 3 of this report, indicates which steps countries should take to fulfil the requirements set out in Article 11 EED EU/2023/1791.

As of September 2024, four of the ten partner countries (Ireland, Italy, Greece and Portugal) have not yet begun to transpose the new requirements of Article 11 EED. Germany has transposed the majority of the EED requirements and is currently working on a revision of national legislation to incorporate some of the Art. 11 requirements that are currently missing.[48] The amended legislation is expected to be adopted in November 2024. In the Netherlands, the responsible ministry and the Netherlands Enterprise Agency (RVO) have started the process, including by developing a list of necessary changes to existing regulations and an implementation plan. In Lithuania, a transposition plan is being prepared and work to align existing laws with the new requirements is underway. In Malta, Croatia and Slovakia, the transposition process has started but is still in its early stages.

Figure 9 shows the challenges that countries face regarding transposition of the requirements under Article 11 EED EU/2023/1791. It reflects the assessment issued by the respective agencies in June 2024, based on their own experiences and exchanges with other relevant national institutions. This assessment was completed before the European Commission issued its Commission Recommendation (EU) 2024/2002 of 24 July 2024, which offers further guidance on the transposition of Article 11 requirements into national law. In this assessment, respondents were asked to rate challenges on a scale from one to five, ranging from “not challenging at all” (1) to “critical challenge” (5). The figure shows the total rating across all agencies for each challenge. The minimum score for each challenge was 10 points if all participating agencies submitted a rating of 1 (“no challenge at all”), and a maximum of 50 points if all participating agencies submitted a rating of 5 (“critical challenge”).

[48] Draft Version of the new Energy Services Law § 8 a (as of June 2024), BT Drucksache 20/11852 vom 17.06.2024, https://dserver.bundestag.de/btd/20/118/2011852.pdf, last accessed 01. July 2024.

Figure 9. Challenges with the transposition of the new EED in the partner countries



All project partners reported that identifying newly obligated enterprises based on their energy consumption (see subsection below on the identification of obligated enterprises) presents the biggest challenge. As most countries do not maintain a register or database that contains information on the total final energy consumption of individual enterprises, the respective authorities struggle to identify which enterprises are required to carry out an audit or establish an EnMS. If Member States decide to establish such a database or expand existing databases, this requires adaptation of national legislation as well as work to create or expand the database – both of which entail further challenges.

The next most significant challenges highlighted by partner agencies are assisting enterprises in developing Action Plans under the provisions of Article 11(2) (see subsection below on Action Plans), adapting regulatory frameworks and developing/updating databases and platforms to collect information on audits and EnMS. The relatively short timeframe for transposition and the sense that market players are not yet prepared for the new requirements of Article 11 are also considered important challenges. This indicates that the institutions themselves believe it is just as important for private and governmental institutions to have sufficient time to prepare for implementation of the new regulations at national level.

Ensuring the quality of energy audits and providing support for non-obligated enterprises and SMEs to carry out audits finished in the middle of the rankings, these are ongoing tasks that each country strives to fulfil. One agency noted that the challenge of ensuring the required quality, depth and scale of assessments and recommendations

developed during energy audits is closely connected with the pricing plans of different service providers. Achieving this for some industrial and production-related sectors requires specific expertise that not all private and legal entities have, even when authorised to conduct energy audits. In addition, the enterprises obligated to conduct energy audits have often no established processes to monitor and measure the specific data required for detailed analysis and assessment.

Adapting training programmes and information campaigns to the new requirements as well as a lack of qualified auditors or energy experts nationally were rated as minor challenges. The sense that an insufficient number of experts nationally is not a significant challenge is consistent with the analysis presented in Chapter 3.2.1, Table 4, which details the ratio between energy auditors and audits per country. It is also not surprising that the adaptation of training programmes is not seen as a challenge. These programmes are either developed and managed by energy agencies directly and are therefore within the agencies' sphere of influence or are run by private providers who must ensure that their training is updated in their own economic interest. In countries where no training or information actions were introduced under Article 8 EED EU/2012/27, introducing such actions may pose a challenge.

In addition to the challenges outlined above, analysis of the implementation of Article 8 EED EU/2012/27 has revealed further hurdles to progress. Updating the verification and control procedures regarding the implementation of the EnMS obligation, and providing resources for these processes, poses a challenge due to a lack of data on EnMS in countries where comprehensive qualitative control takes place. Moreover, promoting the use of a new or existing platform to facilitate the collection of required data at national level, as proposed in Article 11(3), may require Member States to set up new databases or update existing ones, which could lead to technical and resource-related challenges. Gathering information and setting up databases on annual energy and water consumption of enterprises, as proposed in Article 11(4), will also pose a challenge since such data is generally not yet available (see the subsection below on data availability on water and energy consumption). Moreover, a challenge that existed under EED EU/2012/27 and will persist under EED EU/2023/1791 is promoting uniform standards and norms for the implementation of audits and EnMS across all EU Member States (see subsection on standards and norms below).

The following subsections discuss some of the identified challenges in more detail.

Identification of enterprises falling under the energy audit and EnMS obligation under Article 11

The survey participants were asked, in regard to identifying enterprises that are obligated to carry out energy audits or implement an EnMS based on their energy consumption under Article 11(1) and (2) EED EU/2023/1791, whether data on energy consumption at enterprise level is already being collected within the national implementation schemes of Article 8 EED EU/2012/27.

In all partner countries, with the exception of Lithuania, data is available at the enterprise level – but only for specific enterprises. In Germany, Greece and Malta, this data is only available for large enterprises that fall under Article 8 EED EU/2012/27. In Italy, Portugal, Ireland and the Netherlands, data stemming from the EED audit obligation is supplemented by data on SMEs. This data is collected on the basis of national frameworks, such as obligations to implement audits for SMEs based on their energy consumption or programmes to support the implementation of voluntary audits. In Italy and Portugal, this data is supplemented by data on SMEs with high energy consumption. In Ireland, it is supplemented by data from a voluntary support scheme for SMEs. In the Netherlands, data on energy consumption is available for all enterprises with an energy usage of 50,000 kWh (0.18

TJ) / year and higher. The Netherlands is therefore the only country where data on all enterprises that meet the thresholds set out in Article 11 EED EU/2023/1791 is already available. In Slovakia, data is only available for enterprises in the industrial sector. In Croatia and Lithuania, data on the energy consumption of enterprises which are obligated to conduct energy audits is not collected. However, due to other national obligations, data on energy consumption of public enterprises is available in Croatia. In Lithuania, data on energy consumption is not collected for any type of enterprise.

Barriers regarding the collection of data of energy consumption of individual enterprises include:

- Responsible institutions lack a mandate for data collection
- Data confidentiality
- Individual enterprises fail to comply with their reporting obligations
- Self-reporting systems make verification difficult
- High volumes of data requiring validation
- Low data quality
- No exchange between existing databases due to legal constraints

The lack of data and related databases poses a significant challenge to the identification of obligated enterprises under the new EED. At present, most countries do not have a clear understanding of which enterprises meet the energy consumption thresholds set under Article 11. As for the enterprises for which no data is available, several Member States rely on enterprises' sense of duty to fulfil their legal obligations and proactively report their fulfilment. The existing databases could then be supplemented with data from these proactive enterprises. However, the proactive implementation of the new obligations under Article 11 by such enterprises requires them to be aware of their new obligations. It is therefore recommended that national institutions are provided with resources to conduct extensive information and communication activities on the new requirements under Article 11. Moreover, relying on enterprises' self-commitment poses risks in terms of monitoring and enforcing implementation of the audit and EnMS obligation.

In some countries, either no database on energy consumption of individual enterprises has been established to date or, where databases exist, they must be expanded or adapted to facilitate communication and data exchange. Introducing an annual obligation for all enterprises to report on their annual energy consumption, and establishing a corresponding database, would be a potential solution – and is also proposed by the European Commission in its Commission Recommendation (EU) 2024/2002 of 24 July 2024.[49] If Member States decide to introduce such an obligation, and either create a new database or expand existing ones, national legislation must be adapted, with sufficient political, technical and economic resources allocated for this purpose. Both tasks require political, technical and economic resources. Due to the sensitivity of information on enterprises' energy consumption and concerns about data protection, it is also likely that many enterprises would be rather opposed to mandatory reporting of this data to government authorities.

[49] Section 4.4, Commission Recommendation (EU) 2024/2002 of 24 July 2024 setting out guidelines for the interpretation of Article 11 of Directive (EU) 2023/1791 of the European Parliament and of the Council as regards Energy Management Systems and energy audits, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

Estimating the number of obligated enterprises poses difficulties in most partner Member States due to a lack of data on energy consumption. However, in some Member States, institutions were able to estimate how the number of obligated enterprises under Article 11 EED EU/2023/1791 may differ from the current number under Article 8 EED EU/2012/27 based on the existing incomplete data.

It is estimated that the number of enterprises obligated to carry out an energy audit will increase in four Member States and decrease in two Member States. In one Member State, this number is expected to remain similar to the current number. For three countries, no estimates are available. These estimates are shown in Table 14.

Country	Change in the number of enterprises obligated to carry out an energy audit	Estimated number of enterprises obligated to carry out an energy audit under Article 11 EED EU/2023/1791	Number of enterprises obligated to carry out an energy audit under Article 8 EED EU/2012/27[50]
Croatia	Increase	> 400	~ 400
Germany	Decrease	~ 10,000 – 12,000	~ 50,000
Greece	No estimation available	No estimation available	~ 580
Ireland	Increase	No estimation available	~ 530
Italy	No estimation available	No estimation available	~ 7,100[51]
Lithuania	No estimation available	No estimation available	~ 530
Malta	Remain similar to the current number	~ 85	~ 85
The Netherlands	Decrease	> 1,800	~ 3,200
Portugal	Increase	~ 2,500 (number relates to industrial plants)	~ 740
Slovakia	Increase	No estimation available	~ 1,180

Table 14. Estimated changes in the number of enterprises obligated to conduct an energy audit with the introduction of EED EU/2023/1791

Compared to the enterprises that have already implemented an EnMS, the number of enterprises that are obligated to introduce an EnMS will increase in six countries and remain the same in one country. For three countries, no

[50] The estimated number of currently obligated enterprises corresponds to the total number of enterprises that carried out audits in the last four-year cycle between 2020 and 2024.
[51] Including large enterprises and energy-intensive enterprises (“Energivori”) in the four-years cycle 2020-2023, who were obligated to conduct audits in order to receive tax concessions, both included in the Italian transposition of Article 8 EED EU/2012/27.

estimate is available. The results of the estimated increase or decrease, and the estimated numbers of obligated enterprises, are shown in Table 15.

Country	Change in the number of enterprises obligated to implement an EnMS	Estimated number of enterprises obligated to implement an EnMS under Article 11 EED EU/2023/1791
Croatia	Increase	No estimation available
Germany	Increase	~ 12,400
Greece	No estimation available	No estimation available
Ireland	Increase	~ 300 – 400
Italy	No estimation available	No estimation available
Lithuania	No estimation available	No estimation available
Malta	Remain similar to the current number	~ 5 – 10
The Netherlands	Increase	> 1,000
Portugal	Increase	~1,000 (number relates to industrial plants)
Slovakia	Increase	~ 300 – 1,000

Table 15. Estimated changes in the number of enterprises obligated to implement an EnMS with the introduction of EED EU/2023/1791

The discussion of the methodology for identifying obligated enterprises and possible adjustments to national legal frameworks are part of the activities in work package 4 of this project.

Action Plans

A new requirement under Article 11(2) EED EU/2023/1791 is that enterprises with an average annual energy consumption in excess of 10 TJ over the previous three years, including all energy carriers, must draw up and publish a concrete and feasible “Action Plan” each year based on the recommendations arising from energy audits or EnMS. This Action Plan must identify measures to implement each technically or economically feasible audit recommendation and report on the implementation rate of such recommended measures. In its guidelines for the interpretation of Article 11, the European Commission recommends keeping the additional reporting burden on enterprises small and allowing the integration of Action Plans into annual reporting under the Corporate

Sustainability Reporting Directive (CSRD),[52] the European Sustainability Reporting Standards (ESRS)[53] and the voluntary sustainability reporting standard for SMEs,[54] which is currently under development by the European Financial Reporting Advisory Group (EFRAG). The European Commission also recommends that Member States set national requirements for Action Plans that are aligned with the disclosure requirements and data categories outlined in these reporting standards. Furthermore, the Commission states that enterprises must make the information available to national authorities and that existing or new platforms for data collection can be used for that purpose. The Commission also notes that the use of the future European Single Access Point (ESAP)[55] is a possibility but recommends that the detailed data requirements be defined by the Member States.[56] Given the possible use of a shared portal such as the ESAP, the respective national data requirements should be aligned as far as possible to ensure enhanced comparability of data for future analyses.

Only Germany has already transposed the requirement to publish Action Plans within its Energy Efficiency Act. However, it does not stipulate any minimum requirements regarding the form and content of these plans. The Federal Office for Economic Affairs and Export Control (BAFA) is set to release guidance for enterprises on this topic. Although Italy, the Netherlands and Portugal require certain enterprises to implement energy efficiency measures, these countries do not yet require publication of Action Plans.

As Article 8 did not require Action Plans, it is important that Member States define standards for them. The choice of similar requirements for companies across the EU regarding their content, format and place of publication is recommended. A discussion and exchange on the requirements for Action Plans is part of the activities in work package 4 of this project.

Data on energy and water consumption

Article 11(4) of the new EED recommends that Member States encourage the publication of data pertaining to annual energy consumption and annual water consumption as well as a comparison of enterprises' energy and water consumption levels in previous years. This report analyses the status quo in this regard to assess partner countries' readiness to implement this recommendation and to identify best practice.

[52] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, OJ L 322, 16.12.2022, p. 15–80.
[53] Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards, OJ L, 2023/2772, 22.12.2023.
[54] EFRAG, Voluntary Reporting Standards for SMEs (VSME), available at https://www.efrag.org/en/projects/voluntary-reporting-standard-for-smes-vsme/exposure-draft-consultation, last accessed 27 August 2024.
[55] The European single access point will provide centralised electronic access to information that must be made public pursuant to listed EU legislation or any information that MS decide to voluntarily publish via the access point. The service will be operating by 10 July 2027. However, MS can submit voluntary information such as the information collected within Article 11 of the EED only starting from 10 January 2030, see Articles 1 (1) and 3 (1) of the Regulation (EU) 2023/2859 of the European Parliament and of the Council of 13 December 2023 establishing a European single access point providing centralised access to publicly available information of relevance to financial services, capital markets and sustainability, last amended by Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859.
[56] Section 6.1, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

Energy consumption

In almost all partner countries, data on energy consumption is available to the responsible institutions. However, in most countries, this data is solely available in an aggregated form, mostly by sector or by energy source. Only in four countries is this data publicly available. In three of these four countries, it can be found on websites hosted and maintained by national agencies. Although aggregated data on energy consumption is available in most countries, only Croatia encourages its (public) enterprises to disclose enterprise-specific data or collects it in a specialised database. In seven countries, historical data is available.

Collecting data on energy consumption facilitates valuable analysis. For example, data on the total energy consumption of audited enterprises in a given sector[57] can be set in relation to the energy consumption of the sector[58]. This way, we can determine the proportion of energy consumption subject to a process to identify potential savings through audits. Table 16 provides an overview of the data available in each country. Based on this analysis, the overall Article 11 readiness level can be assessed as low.

Country	Is data on energy consumption available?	Is it publicly available?	In what form is it available?	Is historical data available?
Croatia	Yes[59]	No	At the level of individual enterprises	Yes
Germany	Yes	Yes	Aggregated by sector	Yes[60]
Greece	No	No	-	No
Ireland	Yes[61]	No	Available through the SEAI M&R system	Yes[62]
Italy	Yes	Yes	Aggregated by energy source	Yes
Lithuania	Yes	Yes	Data on final fuel consumption by economic activity	No
Malta	Yes	No	Aggregated by sector	No

[57] Most partner countries collect data on the energy consumption of enterprises that carry out audits as part of the audit obligation under the EED (see Figure 3).
[58] Eurostat publishes data on the final energy consumption by sector, see Eurostat, Final Energy Consumption by Sector, 24.05.2024, available at https://data.europa.eu/data/datasets/vrjbnpjpeaowlunrht6tg?locale=en, last accessed 20 August 2024.
[59] Data on energy consumption is only available for public companies that implement the ISGE system.
[60] Energy consumption of economic sectors in shares, by energy source (for energy sector and industry), compared to other sectors.
[61] Data on energy consumption is only available for the public sector.
[62] Historical data on energy consumption of the public sector is available to the SEAI, starting from 2013.

Country	Is data on energy consumption available?	Is it publicly available?	In what form is it available?	Is historical data available?
The Netherlands	Yes	No	Total gas and electricity consumption	Yes
Portugal	Yes	Yes	Final energy consumption figures, by year, aggregated by economic activity	Yes
Slovakia	Yes	No	Tailored information can be provided to the SIEA on request	Yes

Table 16. Availability of data on energy consumption in the partner countries

Water consumption

Data on water consumption in the partner countries is even harder to obtain than data on energy consumption (see Table 17). Only seven out of ten countries make this data available in an aggregated form (i.e. by sector, purpose of use or region). This data is publicly accessible in three countries. Historical data is available in five countries. Based on this analysis, the readiness level of most partner countries to monitor water consumption as requested in Article 11 can be assessed as very low.

Country	Is data on water consumption available?	Is it publicly available?	In what form is it available?	Is historical data available?
Croatia	Yes	No	Aggregated by sector	Yes
Germany	Yes[63]	Yes	Aggregated by purpose of use	Yes[64]
Greece	No	No	-	No
Ireland	Yes	No	At the level of individual enterprises	Yes
Italy	Yes[65]	No	-	No
Lithuania	Yes	Yes	By region	No
Malta	No	No	-	No
The Netherlands	No	No	-	No
Portugal	Yes	Yes	Indicator referring to non-domestic billed water	Yes
Slovakia	Yes	No	Volume of water distributed and energy intensity of water distribution	Yes

Table 17. Availability of data on water consumption in the partner countries

Best practice

So far, Croatia is the only country that maintains a database of energy and water-related data at the enterprise level. However, this database primarily comprises public enterprises that are legally obligated to both regularly

[63] The quality of data on water consumption is not as good as on energy consumption. It is both not as detailed (not always differentiated by industry sector) and not as recent (latest data points are from 2021).
[64] Water consumption by sector and by consumer groups (in shares).
[65] Since 2023, enterprises can report their water consumption on a voluntary basis to the Italian “Audit102” portal.

monitor the energy and water consumption of the buildings they own and to enter the relevant data into the information system for energy management (ISGE). On the one hand, the data from the system can be used by public companies to monitor their energy and water consumption and introduce efficiency measures. On the other hand, governmental organisations can use it to develop and improve local, regional and national strategies and policies on energy and water efficiency. The system carries out consumption analyses and automatic checks. If critical results are identified (e.g. drastic increase in energy or water consumption), it notifies the employees responsible. Although not all obligated enterprises use the ISGE system at present, it leads to a reduction in energy and water consumption of up to 5% per year in the participating enterprises.[66] The system has already been adopted by some other EU and non-EU countries.

An exchange on this topic could take place in the context of the Leapto11 project, e.g. under work packages 3 or 4. It is also worth noting that an integrated audit methodology for assessing energy, water and materials consumption will be developed and tested in work package 3. The methodology includes an assessment of the results of resource efficiency measures and of their direct and indirect benefits to enterprises. This methodology could also help EU Member States to fulfil requirements of the EED guidelines for implementing Article 11 regarding the collection and disclosure of data on energy and water consumption by enterprises.

Strengthening the implementation of European standards and norms

Our analysis shows that there is potential to strengthen the use of European standards and norms, and that Member States could improve the inter-state harmonisation of data collection, storage and assessment. Only Germany requires that energy audits explicitly follow the standards of the European norm EN 16247-1. In Croatia, an audit in accordance with EN 16247 is also accepted, though this is not a binding requirement. In Italy, an audit is also considered compliant when carried out according to both EN 16247 and fulfilling the requirements stated in the transposed EED EU/2012/27 Annex VI. Such recognition could be included in the legislation of other EU Member States to promote more uniform implementation of European norms. In the opinion of experts from all project partners, it would be beneficial to introduce a requirement mandating the use of coherent standards in EU Member States, such as either EN 16247 for implementing the energy audit obligation or ISO 50001 for the EnMS obligation. In its Commission Recommendation (EU) 2024/2002 of 24 July 2024, the European Commission also recommends referring to international and European standards and emphasises that this would help to create a level playing field for enterprises with activities in several Member States.[67]

Most partner countries only accept an EnMS as defined by ISO 50001 as an alternative to fulfilment of the audit obligation under Article 8 EED EU/2012/27. Recognising EMS as an alternative is currently not considered. It is believed that EMS fall under a different category of management system due to their broader scope, which includes not only energy aspects but also environmental parameters. In many Member States, administrative responsibilities for energy and environment are distributed between different institutions. However, in some EU Member States, EMS such as ISO 14001 and EMAS have proven to be a good alternative to EnMS. Their value could be reassessed in the transposition process of the audit and EnMS obligation under Article 11 EED

[66] Croatian Government Real Estate Agency, Energy Management Information System, 2024, https://www.interregeurope.eu/sites/default/files/2024-03/Presentation%20by%20Davor%20Pinturic%CC%81%20on%20Smart%20Energy%20Information%20System.pdf
[67] Section 5.1, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

EU/2023/1791. In addition to their impact on energy savings, the introduction of EMS may lead to additional positive environmental effects. Introducing EMS as an alternative option to EnMS would, therefore, emphasise the general value of such systems.

Another area in which greater harmonisation could be beneficial concerns practices for collecting, storing and assessing information from energy audits, EnMS and voluntary programmes. The results of this report show that such practices are quite heterogenous across partner countries. The information collected, the systems used for data storage and processing and their functions are different in different partner countries. While the fact that countries are not yet collecting data on EnMs represents a gap in current practice, it also offers an opportunity to harmonise data collection practices and improve compatibility of Member States' databases as part of the EED transposition process. If Member States adopt standardised tools with similar features for data collection and storage of information on energy audits, EnMS and energy efficiency measures, this will facilitate an exchange of technical and benchmarking information. A continuous exchange through highly functional data systems and ongoing improvements could contribute to further harmonisation.

Improving data collection and assessment processes regarding energy audits

With regard to Article 11(5) EED EU/2023/1791 on the quality of energy audits, the EC guidelines for the interpretation of Article 11 proposes the use of national databases for "formal checks of the completeness and structure" of energy audits or energy audit summaries. The EC suggests that "the main data of the energy audit should be collected in a machine-readable format to allow the detection of possible errors and to check the plausibility of the figures". The EC also states that MS should provide guidelines on how to conduct audits and use a template for audits "to facilitate and standardise the reporting process, thus contributing to quality improvement". Moreover, the EC recommends that MS should facilitate correct data entry by setting up hotlines or helpdesk services or providing information on the websites of the portals.[68] All partner countries collect data on mandatory energy audits and fulfil the minimum requirements both under the EED and for the reporting requirements under the NECPR. However, the results of the analysis in Chapter 3.2 indicate that the partner countries could take steps to improve data collection and assessment processes. In particular, automatic error detection and plausibility checks have not yet been introduced in most partner countries. The systems in place lack simplified data extraction and automatic evaluation functions. As Annex VI EED EU/2023/1791 requires that "the data used in energy audits shall be storable for historical analysis and tracking performance", the EC recommends "defining the structure and format of the data that needs to be reported to the authorities". In the opinion of the EC, Member States should implement this because the data can be used nationally to monitor the identification and implementation of energy saving measures.[69] Six of ten partner countries collect data on EPIAs implemented after the previous energy audit (see Figure 3). An assessment of this data has not yet been carried out in all these countries. The EC also makes suggestions regarding the type of data collected. It proposes that Member States collect a summary of the energy audits and a summary list of recommendations for EPIAs, "including the resulting figures for the economic assessment (payback period or similar indicators) of energy savings".[70] Such data is not yet collected in all partner

[68] Section 8.1, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.
[69] Ibid.
[70] Section 5.4, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

countries.[71] However, as also recognised by the EC, requesting this information and requiring the enterprises to include this information in their Action Plans can increase the implementation rate of EPIAs.[72] The provisions of Art. 11(3) EED EU/2023/1791, and the recommendations by the EC, indicate that analyses based on data collected from energy audits and EnMS on EU level are future aims. In order to achieve this, the compatibility of data should be strengthened by harmonising data collection methods and the type of data collected. In addition to automatic data processing, functions for data extraction and communication between databases should also be set up.

Setting up data collection, storage and assessment processes regarding EnMS

The results of the analysis in Chapter 3.3 indicate that the partner countries need to adjust their processes to collect, store and assess data from EnMS due to the new EnMS obligation under Article 11(1). As no monitoring and verification processes are currently in place, Member States should also introduce these processes to control the implementation of this obligation. Existing institutional structures and applied practices from the implementation of the audit obligation under Article 8 can be used for this purpose. In the transposition process, Member States should consider harmonising not just the type of information collected, but also the data collection methodologies and the development of databases that facilitate detailed and efficient assessments. Databases set up in this way might also facilitate data exchange in the future.

Establishing and reviewing programmes for the voluntary implementation of EnMS and audits

As only half of the assessed countries currently have programmes and policies to support the voluntary implementation of audits, and only three support the voluntary implementation of Energy Management Systems, Member States should consider establishing new programmes to encourage enterprises to conduct voluntary audits and implement EnMS. Furthermore, a revision of existing programmes is required, as the target group of obligated enterprises is changing under Article 11. The evaluation, review and revision of these programmes could occur in connection with the transposition of other Article 11 requirements, such as the publication of enterprises' Action Plans or annual energy and water consumption data. This way, the same requirements and reporting duties could also be applied to programmes supporting voluntary implementation. Making data from voluntary programmes available and usable for detailed evaluations could represent a significant improvement in this context. The Member States should engage in an ongoing exchange of experiences between Member States on the challenges encountered and lessons learned in the implementation of such programmes, and learning from best practice examples. Such an exchange is also an objective of this project. One focus of task 2.2 within work package 2 is the evaluation of previous programmes that target implementation of energy efficiency measures.

[71] An in-depth analysis of the data situation on EPIAs is part of Task 2.2 of this project.
[72] Section 6.1, Commission Recommendation (EU) 2024/2002 of 24 July 2024, OJ L, 2024/2002, 26.7.2024, available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024H2002&qid=1719245800368, last accessed 26 August 2024.

5. Conclusions

The analysis indicates that, while the partner countries apply different methods, they fulfil the majority of the requirements set out in Article 8 EED EU/2012/27. The current state of implementation of Article 8 EED EU/2012/27 highlights which steps countries must still undertake to fulfil the requirements of Article 11 EED EU/2023/1791. According to experts from all partner countries, the most significant challenge is identifying newly obligated enterprises based on their energy consumption instead of enterprise size, as data on individual enterprises' total final energy consumption is not available in most countries.

Another challenge relates to the development of publicly available Action Plans. Enterprises are required to develop such plans and base them on recommendations resulting from energy audits or EnMS. As this obligation did not exist under Article 8, countries must define requirements and standards for Action Plans to close the gap with regard to Article 11. A discussion of the methodology for identifying obligated enterprises and the requirements for Action Plans is part of the activities in work package 4 of this project. Another gap stems from the new requirement under Article 11 to encourage enterprises to publish their annual energy and water consumption, including comparisons with previous years, as this is not yet established practice in the Member States.

The status quo analysis of Article 8 EED EU/2012/27 shows that the partner countries could improve and harmonise current practices of data collection, storage and assessment through the implementation of European standards and norms. To achieve this, the countries could adopt corresponding regulations and guidelines in the transposition process of Article 11 EED EU/2023/1791.

Most countries systematically collect data on mandatory energy audits. In many countries, the data collected is not used for systematic evaluations but rather for specific assessments upon request. The countries which systematically evaluate data on mandatory energy audits use it to develop new policies, track the results of existing policies or monitor companies' overall energy-related performance. Data on voluntary energy audits is generally not collected, while only few countries collect data on EnMS. The data available on EnMS stems predominantly from monitoring the audit obligation. Most countries do not systematically use or analyse the available data. However, most partner countries have expressed an intent to improve the collection and processing of EnMS-related data.

Almost all partner countries that have voluntary programmes related to energy audits confirmed that they make use of the data collected in this context. This data is mostly used to monitor and improve existing programmes and to develop new ones. In some countries, this data is also used to track and benchmark enterprises' energy performance and to compare different enterprises and sectors. Data on the few existing programmes related to EnMS is not systematically collected or assessed in most countries.

While data collection processes are similar in most partner countries, there are major differences in what type of data is collected and how it is stored and evaluated. Most institutions would like to broaden the range of collected data; some are seeking to improve their data storage systems. Some institutions would also like to upgrade the analysis functions of their existing databases, as those currently in use often do not allow for easy and efficient data evaluation. While monitoring and verification processes are usually in place when it comes to the implementation of audits and within voluntary programmes, they are rarely carried out in regard to the implementation of EnMS.

The provisions of Article 11, and the recommendations issued by the EC, indicate that enhanced data analysis on EU level is a future aim. In order to achieve this, the compatibility of data should be strengthened by harmonising data collection methods and the type of data collected. In addition to automatic data processing, functions for data extraction and communication between databases should also be set up. This will require an increased exchange and willingness to harmonise existing practices between Member States. Overall, there is significant potential for improvement in the way in which national governments and affected enterprises use data generated from audits, EnMS and voluntary programmes. At present, Member States are not fully leveraging the value of this data to improve national policies and programmes or to maximise the benefits of audits and EnMS.

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7. Annexes

7.1. List of National Regulatory Frameworks Implementing the Requirements of Article 8 of the Energy Efficiency Directive EU/2012/27

Country	Regulatory frameworks implementing the requirements of Article 8 of the Energy Efficiency Directive EU/2012/27
Croatia	• Energy Efficiency Act; Official Gazette 127/2014, (2399); 29.10.2014 • Energy Efficiency Act, Amendments; Official Gazette 116/2018, (2291); 21.12.2018 • Energy Efficiency Act, Amendments; Official Gazette 25/2020, (601); 6.3.2020 • Energy Efficiency Act, Amendments, Official Gazette 41/2021, (811); 16.4.2021 • Ordinance on Energy Audits for Large Enterprises; Official Gazette 123/2015, (2340); 11.11.2015 • Ordinance on Energy Audits for Large Enterprises, Amendments and Supplements; Official Gazette 5/2020, (63); 15.1.2020 • Ordinance on Energy Audits for Large Enterprises, Amendments and Supplements; Official Gazette 97/2021, (1761); 3.9.2021
Germany	• Act on Energy Services and Other Energy Efficiency Measures of 4 November 2010; Federal Law Gazette Volume 2020 Part I p. 1483; 11.11.2010 • Act to Increase Energy Efficiency and to Amend the Energy Services Act of 13 November 2023; Federal Law Gazette Volume 2023 Part I No. 309; 17.12.2023

Country	Regulatory frameworks implementing the requirements of Article 8 of the Energy Efficiency Directive EU/2012/27
Greece	• Law. 4342/2015, Government Gazette Issue 143/A; 9.11.2015 • Law 4409/2016, Government Gazette Issue A 136/2016; 28.07.2016 • Decision of the Minister of Environment and Energy, YPEN/DEPEA/ 51153/387/, 09.05.2023; Government Gazette Issue B´3187; 15.05.2023
Ireland	• S.I. No. 426/2014 - EU (Energy Efficiency) Regulations 2014 Amended by S.I. No. 626/2016 and S.I. No. 599/2019.
Italy	• Legislative Decree 102/2014 and Legislative Decree 73/2020 • Ministry of Economic Development (MISE) clarifications on the audit obligation – 2016 Reporting procedure according to article 7 paragraph 8, Legislative Decree 102/14 • Ministerial Decree Dec. 21, 2017: Reorganization of the system of subsidies for electricity-intensive enterprises – “Energivori”, 2017 • MISE clarifications for the application of the provisions provided for in Article 8, Legislative Decree 102/2014, 2018 • Law Decree 131/2023 Article 3: Reform of the incentive scheme for companies with high electricity consumption costs, 2023
Lithuania	• Energy Law of the Republic of Lithuania; Gazette 2022 56-2224 • Law of the Republic of Lithuania on Increasing Energy Efficiency • Description of the procedure and conditions for conducting audits of energy consumption in buildings, facilities and technological processes and the procedure for training and certification of specialists performing audits of energy consumption in buildings, • Methodology for auditing energy, energy resources and water consumption in technological processes and facilities
Malta	• Subsidiary Legislation (S.L.) 545.33, Energy Efficiency Regulations

Country	Regulatory frameworks implementing the requirements of Article 8 of the Energy Efficiency Directive EU/2012/27
The Netherlands	• Besluit energie-audit. BWBR0045194. wetten.nl, overheid.nl. S.L. 545.33 • Regeling energie-audit. BWBR0046029. wetten.nl, overheid.nl. • Wet implementatie EU-richtlijnen energie-efficiëntie. BWBR0029672. wetten.nl, overheid.nl
Portugal	• Decree-Law No. 68-A/; Law No. 7/2013, 2015, of 30 April
Slovakia	• Act No. 321/2014 Coll. On Energy Efficiency, as amended by the Decree No. 179/2015 Coll. of the Ministry of Economy of the Slovak Republic (MoE) on Energy Audit, Article 8

7.2. Voluntary Programmes Connected to Energy Audits in the Partner Countries

Table 18. Voluntary programmes connected to energy audits in the partner countries (a dash indicates no data available)

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Germany	Initiative for Energy Efficiency and Climate Action Networks (IEEKN)	2014–2025 (A project extension until the end of 2030 is currently being negotiated)	German Energy Agency (dena)	Cooperation & exchange	Enterprises of all sectors and sizes	Energy efficiency and climate action networks is an instrument that enables enterprises to exchange experiences with one another and implement measures to increase energy efficiency. The initiative supports enterprises in uniting into networks of 5 to 12 enterprises to set self-imposed energy efficiency and GHG saving goals and cooperate in their achievement. Participating in such a network enables exchange of experiences,	Who is collecting: adelphi, Fraunhofer ISI What is collected: The number of companies taking part in the IEEKN, their network's goal, the energy and GHG savings achieved of individual companies within each network, verification of the method used to

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						gives access to professional support and paves the way to more ambitious energy and GHG savings. To record and analyse the current situation and determine the potential for energy savings and greenhouse gas reductions in the enterprise, an analysis of saving potentials is conducted by an energy consultant or auditor. It is possible to use the consultation as an energy audit within the frame of the audit obligation. Conversely, existing energy audits can also be used to replace or supplement the analysis of potentials (if carried out shortly before the start of the network work).	calculate these targets

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Germany	Support programme "Federal funding for energy consulting for non-residential buildings, plants and systems"	-	Federal Ministry of Economic Affairs and Climate Action (BMWK), Federal Office of Economics and Export Control (BAFA)	Funding programme	Enterprises of all sectors and sizes	The funding programme supports inter alia the performance of energy audits that meet the criteria defined in Section 8a of the Energy Services Act and in particular the requirements of DIN EN 16247. Depending on annual energy costs, enterprises receive a subsidy for the consultancy fee of up to 80% and up to a certain sum.	Who is collecting: BAFA What is collected: a self-declaration form that confirms that the enterprise underwent an energy audit (this includes: enterprise details, size of the building, energy consumption and energy costs, the identified energy efficiency measures as well as the audit report

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Ireland	Support Scheme for Energy Audits (SSEA)	Since 2021	SEAI	Funding programme	SMEs who spend a minimum of EUR 10,000 on their electrical and thermal energy annually	The Support Scheme for Energy Audits (SSEA) provides SMEs with a EUR 2,000 voucher towards the cost of an energy audit. The audit must be undertaken by a SEAI Registered Energy Auditor (managed register of professionals established under SI 426).	Who is collecting: SEAI is the administrating organisation. What is collected: The scheme uses a template report to standardise output and has been developed to present audit findings to the SME in an accessible way that can be understood by a non-technical reader. Templates can be accessed at the following link.

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Italy	Energivori – Energy Intensive Industries (Electricity)	Since 2017, with a relevant update starting in 2024	National Regulator (ARERA), Environmental Energy Services Fund (CSEA), ENEA, GSE, ISPRA	Policy instrument connected to audits	Enterprises with high energy consumption relatively to their internal costs and higher than 1GWh/y from specific industrial sectors (large or SMEs)	All the energy-intensive enterprises (large or SMEs) subjected to a discount on / relief from certain levies connected to renewable energy (registered in the list of the Environmental Energy Services Fund - CSEA, a government agency) are obliged to carry out energy audits. These enterprises are named in Italian - “Energivori”. They represent large energy consumptions (relatively to their internal costs and higher than 1GWh/y), and must be part of some specific industrial sectors (mainly Annexes 3 and 5 of EU Guidelines 2014/C 200/01). Energy intensive industries, according to the Legislative Decree 73/2020	Who is collecting: within the Energivori programme, ENEA manages the database related to the energy audit and EPIA aspects What is collected: The database includes the registry of the audited enterprises and the auditors, the date the audit was performed and the audit itself

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						are obliged to implement at least one of the energy efficiency measures identified in the energy audit in the 4-year time interval between mandatory energy diagnoses. Energy audits of Energy Intensive SMEs are submitted to ENEA as per D.Lgs. 102/14. In case of compliance, “Energivori” receive a discount on/relief from levies financing environmental objectives, i.e. renewable power generation. From 2024, the amount of the relief will depend on the sector and if the enterprise has already benefitted from any relief in previous years.	
Italy	Gasivori – Energy Intensive	2021	National Regulator	Policy instrument	Enterprises with high gas	Since 2021 the programme to Energy Intensive Industries	Who is collecting: within the Gasivori

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
	Industries (Natural Gas)		(ARERA), Environmental Energy Services Fund (CSEA), ENEA	connected to audits	consumption higher than 1GWh/y or 95,000 sm^3/ year (large or SMEs)	with high electricity consumption has been replicated and extended to natural gas under similar conditions. In case of compliance, “Gasivori” receive a discount on/relief from the tariff fees for the natural gas transmission and distribution. The amount of the relief depends on the ratio between the costs of the gas consumed and the value added.	programme, ENEA manages the database related to the energy audit and EPIA aspects What is collected: The database includes the registry of the audited enterprises and the auditors, the date the audit was performed and the audit itself
Italy	Regional programmes for energy efficiency/ energy audits in SMEs	Since 2015	Local governments (Regions)	Funding programme	SMEs	According to the Decree, the regions and autonomous provinces could present programmes aimed at supporting the implementation of energy audits in small and medium-sized enterprises. The	Who is collecting: funding bodies (regional agencies) Data collection was carried out in different ways by the

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						Ministerial Call for co-financing (Diagnosi energetiche | Ministero dell'Ambiente e della Sicurezza Energetica (mase.gov.it)) consisted of a financial support divided at 50% between individual Region and Ministry of Economic Development, to finance the implementation of energy audits in SMEs (with a maximum contribution of EUR 5,000 per audit) or the adoption of an ISO 50001 certified Energy Management System (with a maximum contribution of EUR 10,000). In these calls, the realisation of at least one intervention of those identified in the audit is binding for obtaining the contribution.	regions that co-funded the different calls. In some cases, the data went into the national portal of energy audits dedicated to obligated parties (audit102) managed by ENEA, while in some cases the sending was done directly to the regions. What is collected: Energy audits and business information

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Italy	Training, information and awareness-raising campaign for SMEs	2021–2030	ENEA	Information and advice	SMEs	As part of a training, information and awareness-raising campaign for SMEs, ENEA is carrying out a long-term programme (2021-2030) with two types of events each year: conferences to inform all stakeholders potentially interested enterprises in undergoing audits and implementing the identified energy efficiency measures as well as training workshops for the technical staff of SMEs. ENEA's campaign also includes further tools to help SMEs on energy audits, such as guidelines, IT tools, or on-site visits to advanced peers.	Who is collecting: ENEA What is collected: The campaign is financed by the Ministry of Environment and Energy Security and is managed by ENEA. What is collected: technical feedback from the Observatory sessions, list and information on the registered participants (e.g., job sector, geographical area). The number of downloads of

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
							guidelines and IT tools is also monitored.
Lithuania	Public interest services measure (VIAP)	2019 – present	BALTPOOL	Policy instrument connected to audits	Enterprises that consume more than 1 GWh of electricity per year (large or SMEs)	The Public interest services measure (VIAP) for the recovery of part of the price of public interest services for industry enterprises. Enterprises that do not have overdue VIAP fund payments and consume more than 1 GWh of electricity per year can recover 85 percent of the part of the price of AEI VIAP paid for the amount of electricity consumed in the previous calendar year exceeding 1 GWh. The enterprises allocate the recovered AEI VIAP funds to the implementation of the energy efficiency improvement	Who is collecting: Baltpool What is collected: Baltpool collects data related to these questions: • Does the applicant qualify for the scheme? • Whether the applicant has paid the electricity bill? • Did the applicant already install energy

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						measures, which are recommended in the energy audit.	consumption measures? • How much has been invested in energy efficiency measures?
Lithuania	Climate change program measure "Implementation of energy consumption efficiency of private legal entities according to energy audit reports"	2020 – present	Environmental Projects Management Agency (APVA)	Funding programme	Legal entities registered in the territory of the Republic of Lithuania and operating in its territory, which are final consumers of energy, i.e. acquire energy for final consumption.	The maximum subsidy amount per applicant is EUR 1,500,000. Funding intensity: does not exceed 30 percent eligible costs when supporting large enterprises; does not exceed 40 percent eligible costs when supporting medium-sized enterprises;	Who is collecting: APVA What is collected: Available indicators by installed equipment (lighting equipment; multiple devices; heating system equipment; technological process equipment); municipality, financing.

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						does not exceed 50 percent eligible costs when supporting small and micro-enterprises. Eligible expenses: new, unused and installed lighting, heating system or technological process equipment, implementing energy efficiency improvement measures specified in the energy consumption audit report, which help to use energy more efficiently. Conditions for receiving the subsidy:	

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						the applicant must have completed an energy consumption audit; the energy consumption audit report approved by the auditor must be carried out from 2019. January 1 and later.	
Malta	Promotion of Energy Audits in Small and Medium Sized Enterprises	2018 – present	Energy and Water Agency (EWA)	Funding programme	SMEs	SMEs may apply for a subsidy to carry out an energy audit. Enterprises from particular branches, e.g. manufacturing and food and accommodation service, receive higher subsidies. The energy audit must comply with certain requirements in terms of content and detail and be done by a certified energy	Who is collecting: Energy and Water Agency which administers the scheme What is collected: Once the energy audit is complete and submitted to the Agency (both the summary template and the full report are

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						auditor listed in a special register.	required), the latter will ensure that the report meets the minimum requirements. If the report meets the minimum requirements set out, the enterprise will receive the grant.
Malta	MERCA / GUEST pilot projects (count as two separate programmes)	2021–2023		Information and advice	Enterprises of different size and from specific sectors	Through the pilot projects MERCA and GUEST a number of energy audits were carried out within the food, retail and accommodation sectors, respectively to help the enterprises identify improvements and best practices to be shared within the whole sector. The audits were funded by the state. Such	Who is collecting: Energy and Water Agency which administers the scheme What is collected: Best practice will be compiled by the Energy and Water Agency and shared

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						projects aim to gain insights into the energy and water efficiency potentials of particular sectors creating collaborative and learning environments within the sectors. The MERCA project is also aiming to support the participating enterprises to implement some of the measures identified through the audits.	with enterprises operating in the sector.

7.3. Voluntary Programmes Connected to Energy Management Systems in the Partner Countries

Table 19. Voluntary programmes connected to Energy Management Systems in the partner countries (a dash indicates no data available)

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Germany	Special equalisation scheme in the Energy Financing Act (EnFG)	Since 2023	Federal Office of Economics and Export Control (BAFA)	Policy connected to Energy Management Systems	Enterprises with high electricity costs	The special equalisation scheme is a special provision according to which enterprises with high electricity expenses and other entitled enterprises can receive a reduction of electricity surcharges. Energy Management Systems are taken into account for the application of the reduction of surcharges for electricity generators (only from co-generation gas) and enterprises with high electricity costs (e.g., chemical production, mining, cement production) who have an electricity consumption of over 1 GWh in	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						the last financial year. For enterprises, the surcharge is limited if they can provide evidence of an EnMS in accordance with ISO 50001 and prove that they are addressing the requirements (Action Plans) of the certification and are implementing measures.	
Germany	Granting of subsidies under the Carbon Leakage Regulation and electricity price compensation funding guidelines	Since 2021	German Emissions Trading Authority (DEHSt) at the Federal Environment Agency (UBA)	Policy connected to Energy Management Systems	Enterprises with high electricity costs	The regulation applies within the framework of the Fuel Emissions Trading Act (BEHG, national carbon market) and regulates measures set out in the BEHG to avoid carbon leakage and to maintain the cross-border competitiveness of affected enterprises. Eligible enterprises (definition in the BECV, specific carbon-intensive sectors, such as cement, steel or paper and pulp industry) must provide proof for countermeasures against carbon leakage.	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						Energy Management Systems are taken into account as a countermeasure to achieve the subsidies. If enterprises provide evidence of an EnMS in accordance with ISO 50001 or EMAS and additionally prove that they are addressing the requirements (Action Plans) of the certification and are implementing measures/ are investing in climate protection measures they are eligible for subsidies.	
Germany	Funding as part of the federal programme for energy and resource efficiency (EEW), module 3	Since 2019	Federal Office of Economics and Export Control (BAFA), KfW bank	Funding programme	Enterprises of all sizes and sectors	The federal funding programme for energy and resource efficiency in the economy contains 6 modules and aims to support investments in climate friendly, resource and energy efficient measures. Module 3 funds sensor technology, measurement and control technology as well as energy management software. This module incorporates a former	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						funding programme for the introduction of EnMS. The present module itself does not fund the introduction of EnMS, but the infrastructure for the data collection. Through this the basis to implement an EnMS is funded. Approx. 60% of enterprises with funding in module 3 have an EnMS or EMS.	
Greece	ECCO – Business programme	Since 2024	Ministry of the Environment and Energy (MEE-YPEN)	Funding programme	SMEs	This subsidy program is aimed at improving energy efficiency through the renovation of buildings in the tertiary sector. The program offers subsidies of up to 65% depending on the category of business. Eligible for a subsidy are businesses in the trade, services and tourism sectors. Key pillars of the program's actions are:	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						• Energy upgrade of the building infrastructure with interventions in the building shell, upgrade of internal electrical installations, upgrade of cooling/heating systems, upgrade or integration of new materials and equipment to reduce energy losses, upgrade lighting equipment, etc. • Introduction and certification of Energy Management Systems and automation devices.	
Ireland	Large Industry Energy Network (LIEN)	Since 1995	SEAI	Cooperation & exchange	Enterprises with an annual energy spend of EUR 1 million or more	The LIEN programme facilitates a variety of special working groups and training events that aim to support public and private organisations to introduce EnMSs. These include ISO 50001 certification support training, energy data management SWGs & energy performance indicator training (EnPI).	Who is collecting: SEAI What is collected: SEAI collects data on energy consumption, CO2 emissions and energy saving

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						All LIEN members are paired with expert advisors who provide ongoing mentoring, support and advice towards ISO 50001.	projects and publishes it at the website of the project.
Ireland	Energy Management Action Plan (MAP)	/	SEAI	Information and advice	Public enterprises of all sizes	A primary energy management programme of the SEAI for public sector enterprises of all sizes. Its core element is tailor-made diagnostics of energy management practices of participant enterprises. The diagnostic tools range from a simple assessment for small organisations and schools, to a 20 question Energy MAP diagnostic for larger organisations covering the five pillars: Commit, Identify, Plan, Take Action, Review. The output from the diagnostic is an energy management score and a list of specific, tailored recommendations for taking the next steps in improving energy management practices and aligning those with international best practice. If	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						organisations score highly (70–80%) then they should consider implementing ISO 50001. In the framework of the programme, enterprises can individually or together with the SEAI (in the framework of trainings) develop an Energy Management Action Plan. Although it is not a formal Energy Management System, Energy MAP is fully consistent with the principles set out in the ISO 50001 Energy Management Standard. In this way, organisations that are keen to eventually formalise their energy management programmes through certification can initially develop Energy MAP programmes before seamlessly progressing to ISO 50001.	

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
Ireland	SEAI Energy Academy	Since 2020	SEAI	Information and advice	Enterprises of all sectors and sizes	Developed and managed by SEAI's Business Supports Programme, the SEAI Energy Academy is a free, online, e-learning platform designed to help businesses increase their energy efficiency and reduce their energy related costs. The SEAI Energy Academy allows anyone to learn with short, interactive, animated 15 to 20-minute modules. It's mobile friendly and offers flexible, self-paced learning with access available 24/7. There are currently 33 modules available ranging from Energy Management Systems to office energy efficiency, energy audits, heat pumps, bills analysis, behavioural change, solar PV, EVs, energy in hotels amongst others. Modules and courses are at an introductory level and are a mix of technical and non-technical subjects. Some modules are grouped into specific courses - leaners who successfully	Who is collecting: SEAI What is collected: Energy Academy data is stored in SEAI database. A monthly report is created for users and completion rate.

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						complete an Energy Academy course receive a Certificate of Completion. Courses are assigned to learners automatically at time of registration based on their business sector.	
Italy	Piano Transizione 5.0	Since 2024	Ministry of Enterprises and Made in Italy, GSE (Gestore dei Servizi Energetici)	Funding programme	Enterprises of all sectors and sizes	The plan is dedicated to all enterprises that make "new investments in production facilities located in the territory of Italy, as part of innovation projects that achieve a reduction in energy consumption". There are specific requirements regarding the subject of investment and energy consumption rate. The enterprises that fulfil these requirements can receive a tax credit of 5% to 45% depending on the size of the investment. One of the investment subjects that is entitled to a tax credit is staff training dedicated to the introduction of an Energy Management System, technologies and systems for effective energy management, technical-economic	/

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						analysis for energy consumption, energy efficiency and energy saving as well as plant engineering and renewable sources (production and storage of energy from renewable sources). The minimum duration is 12 hours, but at least 4 hours must be dedicated to one of these four topics.	
Italy	Regional programmes for energy efficiency/ energy audits	Since 2015	Regional administrations	Funding programme	SMEs	The programme is aimed at stimulating SMEs towards a more efficient and conscious energy consumption. According to the Decree, the regions and autonomous provinces could present programmes aimed at supporting the implementation of energy audits in small and medium-sized enterprises. The Ministerial Call for co-financing consisted of a financial support divided at 50% between individual Region and Ministry of Economic Development, to finance the implementation of energy audits in SMEs	Who is collecting: funding bodies (regional agencies) Data collection was carried out in different ways by the regions that co-funded the different calls. In some cases, the data went into the national portal of

Country	Name of voluntary programme	Start and end date	Implementing organisation	Type of support	Target group	Summary of programme objective	Data management
						(with a maximum contribution of EUR 5,000 per audit) or the adoption of an ISO 50001 certified Energy Management System (with a maximum contribution of EUR 10,000). In these calls, the realisation of at least one intervention of those identified in the audit is binding for obtaining the contribution.	energy audits dedicated to obligated parties (audit102) managed by ENEA, while in some cases the sending was done directly to the regions. What is collected: Energy audits and business information

7.4. Questionnaire to Gather Information for Deliverable 2.1 from All Partner Countries

part (T2.1): deadline 10/05/2024

COUNTRY: please insert country name

Contact person: please insert contact person and email

1. General information

1.1. Which national energy efficiency targets have been set in your country regarding energy efficiency for the sectors covered by EED EU/2012/27 Article 8 and new EED Article 11 (Industry, Tertiary, Transports)? Please specify if these targets are stated in legal documents or in the NECP.

Insert answer indicating also the sectors:	
Other/additional information or comments:	
Source:	

1.2. Which regulatory (legal) frameworks (e.g. decrees, laws) are currently used or were used to implement the EED requirements under Article 8 of the EED EU/2012/27 in your country? Which regulatory frameworks are used or might be used to implement the requirements under Article 11 new EED in your country? Please name these and provide a link, if possible.

Insert answer:	
Other/additional information or comments:	
Source:	

1.3. Has the national transposition of the new EED Article 11 requirements in your country started yet? If yes, how and to what extent? Which are the authorities in charge of the transposition and future implementation once transposed?

Insert answer:	
Other/additional information or comments:	
Source:	

1.4. Do you have an estimation about how many companies in your country will need to carry out an energy audit under the new EED? If not, in your opinion, will the number of companies increase, reduce or remain similar to the current number? (Art. 11 (2) new EED)

Insert answer:	
Other/additional information or comments:	
Source:	

1.5. Do you have an estimation about how many companies in your country will need to implement an EnMS under the new EED? (Art. 11 (1) new EED)

Insert answer:	
Other/additional information or comments:	
Source:	

1.6. What are the main challenges with the transposition of the new EED? (Art. 11 (1) new EED)

Please assess the challenges from 1 to 5: *1: Not challenging at all* *2: Not very challenging* *3: Both challenging in some aspects and not challenging in other aspects* *4: Challenging* *5: Critical challenge*	Identification of new obligated companies (obligation linked to energy consumption now instead of company size)	
	Adapt training programmes and information actions to the new requirements	
	Market players (energy service companies/auditors) not yet ready for the new requirements	
	Short time for the transposition	
	Developments of companies' action plans	
	Support for non-obligated companies and SMEs to carry out energy audits	
	Develop/update databases and platforms to collect information on audits and EnMS	
	Ensure quality of the energy audits	
	Not enough qualified auditors or energy experts in the country	
	Adaptation of the regulatory framework (legislations, regulation, etc.)	
Other/additional challenges:		
Other information or comments:		
Source:		

2. Energy Audits

2.1. Which institution is responsible for the regulatory (legal) framework on energy audits? What are specifically its activities?

Insert answer:	
This entity is also responsible for the transposition of the new Art. 11 *(Yes/No):*	
Other/additional information or comments:	
Source:	

2.2. Which institution is responsible for the collection of information on energy audits (i.e., Energy Agency, Regulatory Authority)? What are specifically its tasks (i.e., data collection, monitoring, analysis, quality control)?

Insert answer:						
Tasks: *Please mark "X", if applicable*	Data collection	Monitoring / check	Data analysis	Quality control	Informa-tion/ Training	Other
Other/additional information or comments:						
Source:						

2.3. Which other institutions are involved? How are they involved?

Insert answer:	
Other/additional information or comments:	
Source:	

2.4. Do the current provisions in your country include or exclude any additional type of enterprises (e.g. SMEs or specific target sectors) from the mandatory energy audit obligation under Art 8 of the EED EU/2012/27? If yes, please specify the typology of enterprises or the conditions under which these rules apply.

Insert answer:	
Other/additional information or comments:	
Source:	

2.5. Do the obligated companies have to report that an energy audit was conducted? If yes, when, how and to whom do the obligated companies have to report that an energy audit was conducted? (Art. 8 (4) EED EU/2012/27 and Art. 11 (3) + (5) new EED

Insert answer:	
Other/additional information or comments:	
Source:	

2.6. Are there additional obligations to the audited companies (i.e. implementation of Energy Performance Improvement Actions (EPIAs), monitoring of energy consumption, etc.)?

Insert answer:	
Other/additional information or comments:	
Source:	

2.7. Are there exceptions or simplified procedures in special cases under the provisions of EED EU/2012/27 Article 8 obligations (i.e. sites clustering, EnMS, exemptions linked to minimum energy consumptions, etc.) in your country?

Insert answer:	
Other/additional information or comments:	
Source:	

2.8. Is the number of conducted energy audits (that have to be executed according to the EED-audit obligation) collected (in general)? If not, why not? If yes, how and by whom?

Insert answer:				
Please specify how this information is collected: *Please mark with "X" or specify*	Mailbox	Web Application	Predefined template	Other

Please specify how this information is stored:	
Please specify any barriers when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.9. What is the number of total conducted energy audits since the reference date of 05 December 2015 to implement the audit obligation under Art 8 (4) EED EU/2012/27?

Insert answer: If relevant, please segregate between obligated companies and non-obligated companies.	
Other/additional information or comments:	
Source:	

2.10. What is the number of conducted energy audits per year? If relevant, please segregate between obligated companies and non-obligated companies. Please provide an estimation if the exact number is not available, and please state if it is an estimation

Insert answer for 2023:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2022:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2021:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2020:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2019:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2018:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer for 2017:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ

Insert answer for 2016:	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ
Insert answer (Other):	No. of Energy Audits	No. of Enterprises	No. of not compliant Enterprises	Total energy consumption of all audited enterprises in TJ?
If this information is not available, please explain the reasons:				
Other/additional information or comments:				
Source:				

2.11. Is there a quality control procedure regarding the execution of energy audits? If yes, who is monitoring? What is the exact procedure of data verification/control? What are the barriers? (Art. 8 (4) EED EU/2012/27 and Art. 11 (3) + (5) new EED)

Insert answer:	
Please specify any barriers when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.12. What data and information on the conduction of energy audits is collected in specific?

Please mark with "X" or specify details:	General information (sectoral and geographical)	
	Company size	
	Certifications (e.g. EnMS)	
	A monitoring system (or other) of energy consumption	
	Production output/activity (e.g. in industry tons of product, m2 of tiles) or activity, or equivalent	
	Energy consumption (total or by energy carriers)	
	Energy consumption structure/uses in the company (e.g. main, auxiliar and general)	
	Energy Performance Improvement Actions (EPIAs) (energy efficiency measures) identified	
	Energy Performance Improvement Actions (EPIAs) (energy efficiency measures) implemented after the previous energy audit	
	Other, please specify:	
Please specify any barriers when collecting this data:		
Please specify any barriers when monitoring and/or verifying this data:		
Other/additional information or comments:		
Source:		

2.13. What are the rules on penalties applicable in case of non-compliance with the national provisions? Which is the amount or range of the penalties? Have they been imposed (if so, please provide details? (Art. 8 (3) EED EU/2012/27)

Insert answer:	
Other/additional information or comments:	
Source:	

2.14. Is some data not being collected that should be collected from your perspective? Why is this data not being collected?

Please mark with "X" or specify details:	General information (sectoral and geographical)	
	Size of company	
	Certifications (e.g. EnMS)	
	The existence of a monitoring system of energy consumption	
	Production output/activity (e.g. in industry tons of product, m2 of tiles) for the purpose of benchmarking the relation between energy and production output/activity	
	Energy consumption (total or by energy carriers)	
	Energy consumption structure/uses in the company (e.g. main, auxiliar and general)	
	Energy Performance Improvement Actions (EPIAs) (energy efficiency measures) identified	
	Energy Performance Improvement Actions (EPIAs) (energy efficiency measures) implemented after the previous energy audit	
	Other, please specify:	
Please specify any barriers		

when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.15. How is the information collected through energy audits being used by institutions? Is this data used for assessments/evaluations/reports? Is this data used to improve policy making or support programmes?

Insert answer: *Please mark with "X" or specify details*	To track the results of policies	
	To develop new policies	
	To develop information policies	
	To track the overall energy performance of the companies	
	As a benchmark for energy performance of companies	
	As a way to compare companies by sector	
	As a way to compare different sectors	
	Other, please specify:	
Other/additional information or comments:		
Source:		

2.16. Is there data available on the energy consumption of companies of all sizes? What data is there and how is that data being collected? How often is that data being collected? If not, to what extent and how could that data be collected? (Art. 11 (1) + (2) new EED)

Insert answer:	
Please specify any barriers when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.17. If the previous question on availability of data on the energy consumption of companies was answered with "no", to what extent and how could that data be collected?

Insert answer:	
Other/additional information or comments:	
Source:	

2.18. Are there any requirements in your country to include an assessment of the technical and economic feasibility of connection to an existing or planned district heating or cooling network in an energy audit? If yes, is there any data on such energy audits? What kind of data is available? (Art. 8 (7) EED EU/2012/27 and Art. 11 (12) new EED)

Insert answer:	
Please specify any barriers when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.19. Which requirements or standards for audits are applied in your country? Are there deviations to the Annex VI EED criteria and if yes, what are the deviations? (Art. 8 (1) + (5) EED EU/2012/27 and Art. 11 (2) + (9) + (5) new EED)

Insert answer:		
Other/additional information or comments:		
Source:		

2.20. Who is carrying out energy audits in your country? (Art. 8 (4) EED EU/2012/27 and Art. 11 (2) new EED = "qualified or accredited experts and/or independent authorities under national legislation")

Insert answer:	
Other/additional information or comments:	
Source:	

2.21. Are there qualification or certification requirements for auditors? If yes, what are the requirements? Is there a verification process? If yes, what kind of process and what kind of data is collected in the process? (Art. 8 (1) + (4) EED EU/2012/27 and Art. 11 (2) + (5) new EED)

Insert answer:	
Please specify any barriers when collecting this data:	
Please specify any barriers when monitoring and/or verifying this data:	
Other/additional information or comments:	
Source:	

2.22. How many energy auditors are available in the market (estimation)? Is there a public list of energy auditors available in your country? Who is responsible for such a list?

Insert answer:	
Please specify any barriers when collecting this data:	
Other/additional information or comments:	
Source:	

2.23. Are there any training programmes for the qualification of energy auditors in order to facilitate sufficient availability of experts? If yes, what kind of programmes? (Art. 8 (3) EED EU/2012/27)

Insert answer:	
Other/additional information or comments:	
Source:	

2.24. In relation to this section, please include any good practice in your country you think may be useful for exploitation/replication in other EU Member States

Name of the programme/policy/practice/ example in country language:	
Name of the programme/policy/practice/ example in English language:	
Description: please include quantitative results, number of companies involved, years of start and/or end of the	

programme/policy/practice, indicators, cost-effective assessments, if available:	
Relevance of the programme to other EU States:	
Degree of replicability/exploitation to other EU States: Please specify with a number from 1 to 5 with 1= no potential, 2= low potential, 3= depends, 4= high potential or 5= very high potential for replicability/exploitation	
Website link (if available):	
Website link to any publication, description, piece of information available in English:	

2.25. What is your general assessment of the status quo in your country regarding the procedures of data collection, monitoring and verification of energy audits? Is there anything you want to add?

Insert answer:	
Other/additional information or comments:	
Source:	

2.26. Is there anything else you would like to add?

Insert answer:	
Other/additional information or comments:	
Source:	

3. Energy Management Systems (EnMS)

3.1. Is there currently an obligation to implement an EnMS for any type of enterprises in your country? If yes, please specify the typology of enterprises or the conditions under which these rules apply.

There is currently an obligation to implement an EnMS (Yes/No):	
The obligation applies to the following types of enterprises/under the following conditions:	
Other/additional information or comments:	
Source:	

3.2. Is there a data collection, monitoring and/or verification procedure regarding the implementation of EnMS? If yes, which institution is responsible for the collection of information (i.e., Energy Agency, Regulatory Authority.)? What are specifically its tasks (i.e., data collection, monitoring, analysis, quality control)?

Insert answer:						
This entity is also responsible for the transposition of the new Art. 11 *(Yes/No):*						
The institution is the same institution that is in charge of collecting and evaluating information on **energy audits** (Yes/No):						
Tasks: *Please mark "X", if applicable*	Data collection	Monitoring / check	Data analysis	Quality control	Informa-tion/ Training	Other
Other/additional information or comments:						
Source:						

3.3. If the previous question on data regarding EnMS was answered with "yes", what data is being collected and how is that data being collected? (Art. 8 (4) EED EU/2012/27 and Art. 11 (2) + (5) new EED)

Please specify what kind of data is being collected:				
There is a template to be filled in to fulfil Article 8(6) provisions (Yes/ No): Please provide us with a link (preferred), the template or screenshots.				
Please specify how this information is collected: *Please mark with X or specify*	Mailbox	Web Application	Predefined template	Other
Other/additional information or comments:				
Source:				

3.4. Is the number of certified EnMS collected (from an institution other than the central certification institution ISO)? If not, why not?

Insert answer:	
Other/additional information or comments:	
Source:	

3.5. What is the total number of implemented certified EnMS since 05 December 2015 (cumulative number of the years 2016-2023)? Please provide an estimation if the exact number is not available, and please state if it is an estimation.

Number of total implementations:	Number of ISO 50001 certifications	Number of certifications under a standard different from ISO 50001 (Name of additional standard(s), if any)
Source:		

3.6. What is the number of implemented certified EnMS per year?

Year	Number of ISO 50001 certifications	Number of ISO 50001 Sites certified
2023		
2022		
2021		
2020		
2019		
2018		
2017		
2016		
Source:		

Name of additional standard(s), if any:

Year	Number of certifications under a standard different from ISO 50001 (Please specify)	Number of Sites certified
2023		
2022		
2021		
2020		
2019		

2018		
2017		
2016		
Source:		

3.7. Is the information collected about EnMS (independent country collection or standardised data from ISO, see question 3.4) being used? Is this data used for assessments/evaluations/reports? Is this data used to improve policy making or support programmes?

Insert answer: *Please mark with "X" or specify details*	To track the results of policies	
	To develop new policies	
	To track the overall energy performance of the companies	
	As a benchmark for energy performance of companies	
	As a way to compare companies by sector	
	As a way to compare different sectors	
	To develop information policies	
	Other, please specify:	
Other/additional information or comments:		
Source:		

3.8. In relation to this section, please include any good practice in your country you think may be useful for exploitation/replication in other EU Member States

Name of the programme/policy/practice/ example in country language:	
Name of the programme/policy/practice/ example in English language:	
Description: please include quantitative results, number of companies involved, years of start and/or end of the programme/policy/practice, indicators, cost-effective assessments, if available:	
Relevance of the programme to other EU States:	
Degree of replicability/exploitation to other EU States: Please specify with a number from 1 to 5 with 1= no potential, 2= low potential, 3= depends, 4= high potential or 5= very high potential for replicability/exploitation	
Website link (if available):	
Website link to any publication, description, piece of information available in English:	

3.9. What is your general assessment of the status quo in your country regarding the procedures of data collection, monitoring and verification of EnMS? Is there anything you want to add?

Insert answer:	
Other/additional information or comments:	
Source:	

3.10. Is there anything else you would like to add?

Insert answer:	
Other/additional information or comments:	
Source:	

4. Other (Voluntary) Programmes (to be further assessed in T2.3)

4.1. Are there other (voluntary) programmes regarding the implementation of energy audits in your country

Insert answer (Yes/No):	
Please specify details of the programme #1 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Please specify details of the programme #2 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Please specify details of the programme #3 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Other/additional information or comments:	
Source:	

4.2. Is there a procedure of data collection regarding the implementation of (voluntary) programmes related to energy audits? If yes, which institution is responsible for the collection of information (i.e., Energy Agency, Regulatory Authority.)? What are specifically its tasks (i.e., data collection, monitoring, analysis, quality control)?

Insert answer:						
Tasks: *Please mark X, if applicable*	Data collection	Monitoring / check	Data analysis	Quality control	Information/ Training	Other
Other/additional information or comments:						
Source:						

4.3. What kind of data on (voluntary) programmes related to energy audits is being collected and how?

Please specify what kind of data is collected, how this information is collected and what kind of monitoring procedure is applied:	The information gathered is the same as for obligated companies (Yes/No:)	The collection procedure is the same as for obligated companies (Yes/No:)	The monitoring procedure is the same as for obligated companies (Yes/No:)	Other:
	If no, please specify:	If no, please specify:	If no, please specify:	Please specify:
Please specify any barriers when collecting this data:				
Please specify any barriers when monitoring and/or verifying this data:				
Other/additional information or comments:				
Source:				

4.4. How is the information collected through (voluntary) programmes related to energy audits being used by institutions? Is this data used for assessments/evaluations/reports? Is this data used to improve policy making or support programmes

Insert answer: *Please mark with X or specify details*	To track the results of policies	
	To develop new policies	
	To develop information policies	
	To track the overall energy performance of the companies	
	As a benchmark for energy performance of companies	
	As a way to compare companies by sector	
	As a way to compare different sectors	
	Other, please specify:	
Other/additional information or comments:		
Source:		

4.5. Are there other (voluntary) programmes regarding the implementation of EnMS in your country?

Insert answer (Yes/No):	
Please specify details of the programme #1 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Please specify details of the programme #2 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Please specify details of the programme #3 (i.e., scope of the programme, examples of good practice, relevance to other EU countries):	
Other/additional information or comments:	
Source:	

4.6. Is there a procedure of data collection regarding the implementation of (voluntary) programmes related to EnMS? If yes, which institution is responsible for the collection of information (i.e., Energy Agency, Regulatory Authority.)? What are specifically its tasks (i.e., data collection, monitoring, analysis, quality control)?

Insert answer:						
Tasks: *Please mark X, if applicable*	Data collection	Monitoring / check	Data analysis	Quality control	Information/ Training	Other
Other/additional information or comments:						
Source:						

4.7. What kind of data on (voluntary) programmes related to EnMS is being collected and how?

Please specify what kind of data is collected, how this information is collected and what kind of monitoring procedure is applied:	The information gathered is the same as for obligated companies (Yes/No:)	The collection procedure is the same as for obligated companies (Yes/No:)	The monitoring procedure is the same as for obligated companies (Yes/No:)	Other:
	If no, please specify:	If no, please specify:	If no, please specify:	Please specify:
Please specify any barriers when collecting this data:				
Please specify any barriers when monitoring and/or verifying this data:				

Other/additional information or comments:	
Source:	

4.8. How is the information collected through (voluntary) programmes related to EnMS being used by institutions? Is this data used for assessments/evaluations/reports? Is this data used to improve policy making or support programmes?

Insert answer: *Please mark with X or specify details*	To track the results of policies	
	To develop new policies	
	To develop information policies	
	To track the overall energy performance of the companies	
	As a benchmark for energy performance of companies	
	As a way to compare companies by sector	
	As a way to compare different sectors	
	Other, please specify:	
Other/additional information or comments:		
Source:		

4.9. Is there any data available on annual energy and water consumption of companies (aggregated and/ or individual) in your country? If yes, is it publicly available? If yes, what kind of data is available? Is there any historical data available that allows a comparison of energy and/or water consumption with previous years by companies? (Art. 11 (4))

There is any data available on annual energy consumption of companies in your country (Yes/No):	
The data on energy consumption is publicly available (Yes/No):	
Please specify the information available on annual energy consumption:	
There is any data available on annual water consumption of companies in your country (Yes/No):	
The data on water consumption is publicly available (Yes/No):	
Please specify the information available on annual water consumption:	
There is any historical data available that allows a comparison of energy and/or water consumption with previous years by companies (Yes/No):	
Other/additional information or comments:	
Source:	

4.10. Is there anything else you would like to add?

Insert answer:	
Other/additional information or comments:	
Source:	