LEAP to 11

Deliverable 2.2

Implementation of energy efficiency measures in industry and enterprises

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
CO_2e	Carbon Dioxide Equivalent
DENA	German Energy Agency
EED	Energy Efficiency Directive of the European Union
EEMs	Energy Efficiency Measures
EIHP	Energy Institute Hrvoje Požа of Croatia
EMS	Environmental Management System
ENEA	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
EnMS	Energy Management System
ESCos	Energy service companies
ETS	Emissions Trading System
EU	European Union
EWA	Energy and Water Agency of Malta
ISO	International Organisation for Standardisation
LEA	Lithuanian Energy Agency
MS	EU Member States
NECP	National Energy and Climate Plans
PBT	Payback time
PREn	Energy Consumption Rationalisation Plans
REWS	Regulator for Energy and Water Services of Malta

RVO	Netherlands Enterprise Agency
SEAI	Sustainable Energy Authority of Ireland
SGCIE	Energy Intensive Management System
SIEA	Slovak Energy and Innovation Agency
SMEs	Small and Medium-sized Enterprises

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Definition and general information

- Action Plan: a document including a roadmap on Energy Efficiency Measures implementation after the Energy Audit
- Art.8: when Art.8 is mentioned in the text, it refers to Directive (EU) 2012/27
- Art.11: when Art.11 is mentioned in the text, it refers to the Directive (EU) 2023/1791 (EED Recast)
- Average cost effectiveness of energy savings: the cost effectiveness indicator of energy savings is calculated as an average value. It is the mean of the ratio of investment to the energy saving calculated for each implemented EEMs or the mean of the ratio of the potential investment to the corresponding energy saving calculated for each recommended EEM.
- Managing authority: National or Regional Authority in charge of managing and/or implementing a piece of legislation
- Obligated enterprises: companies subjected to Art.8 obligation to conduct an Energy Audit.
- Partner Country: Country of each Consortium member which is also a National Energy Agency (all partners except partner Revolve)
- Savings on obligated enterprises' energy consumption: for implemented EEMs, this indicator is calculated as the ratio of the achieved savings to the energy consumption of Art.8/11 obligated companies. Analogously, for recommended EEMs, the indicator is given by the ratio of the potential savings to total energy consumption.
- Total savings in final energy (or primary energy): sum of the (final or primary) energy savings in electricity, thermal energy, fuels and other savings expressed in [MJ, toe, kWh…]

Disclaimer

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1. Executive summary

This report, published as part of the Life LEAPto11 project, presents findings related to the implementation of Energy Efficiency Measures (EEMs) under Art. 8 of the Energy Efficiency Directive (EED 27/2012), based on data collected from the Partner Countries. It provides a comprehensive overview of the availability of data on EEMs and of related analyses, facilitating factors, good practices under Art. 8, as well as other relevant programmes and initiatives supporting the implementation of EEMs. The aim of this report is to offer a clear summary of the current state of the implementation of EEMs across the ten Partner Countries.

An Energy Audit (EA) should include, in addition to the detailed analysis of energy consumption across different levels of business activity, a section outlining both the EEMs implemented since the previous audit and those recommended for future implementation. EEMs refer to strategies, technologies, or actions implemented to reduce the amount of energy required to deliver products and services. These measures aim to optimize energy use, minimize waste, and improve overall energy performance in buildings, industrial processes, transportation, and other sectors.

This report is based on information on EEMs gathered through a questionnaire assessing how Partner Countries collect related data, focusing on the existence of structured databases and the publication of related information. Significant differences in data collection practices emerged among the Partner Countries: three out of ten have a structured database in place, while others are at varying stages of development. As a result, quantitative indicators are available only for a limited number of countries, and differences in data collection methods hinder cross-country comparisons.

The questionnaire also provided insights into how EEMs are addressed in EA guidelines, whether there are obligations to implement the recommended measures, the role of Energy Management Systems (EnMS) in data collection, and the use of Action Plans. While EA guidelines exist in all countries, they differ in their treatment of EEMs. Similarly, EnMS is used across all Partner Countries to comply with Art.8 obligations but varies in the extent of information provided on EEMs. Few countries impose a mandatory obligation to implement the recommended EEMs, and such obligations are often targeted to energy-intensive industries. Action Plans are legally mandatory in three countries, while voluntary practices are rare or non-existent in the others. These variations pose challenges for the transposition of Art.11.

The report also reviews the relevance of several facilitating factors based on expert opinions from energy agencies in the Partner Countries. The key facilitating factors include incentives, obligations, support for energy efficiency culture, institutional support (e.g., training and workshops), promotion of standardisation, one-stop shops, quantification of multiple benefits, and assessment of further opportunities. Incentives were identified as the most significant factor, with seven Partner Countries rating them as highly relevant, indicating that financial or policy incentives are considered critical drivers for EEM promotion. Many countries also rated support for energy efficiency culture and institutional support as highly or moderately relevant, highlighting the importance of public awareness and capacity building. For other factors, such as obligations, promotion of standardisation, and one-stop shops, the responses were more mixed.

Good practices in the implementation of EEMs are then highlighted, focusing on how countries have translated these facilitating factors into concrete policy measures and tools for businesses. Eighteen good practices, aimed at

encouraging EEM implementation under Art. 8, have been identified by the Partner Countries. These are categorised by type, including prescriptive, economic, supportive policies, and R&D initiatives. Detailed descriptions of each good practice are provided in Annex 7.1. Finally, the report explores the implementation of EEMs beyond Art.8, examining their integration into broader national and regional programmes. The diverse approaches adopted by the Partner Countries are described, with country-specific information available in Annex 7.2.

The key findings of the overview on the implementation of EEMs are as follows:

1. **Data Gaps**: Most countries lack systematic tracking of EEM implementation, limiting policy evaluation and compliance with Art.11 of the revised Directive.

2. **Incentives**: Stable, selective, tailored and data-driven incentives are essential for maximising energy savings and ensuring cost-effectiveness.

3. **Standardisation**: Harmonised reporting and standardised monitoring are needed for better cross-country comparisons and policy optimisation.

4. **Cultural and Institutional Support**: Promoting an energy efficiency culture and adopting international standards are key to achieve long-term energy efficiency targets.

2. Introduction

“LEAPto11" is a collaborative project between ten European Partner Countries aimed at supporting EU Member States (MS) in the implementation phase of the revised Energy Efficiency Directive (EED), specifically Art.11 of EED (EU/2023/1791). The main goal is to contribute to a comprehensive improvement of the quality framework for Energy Audits (EAs) and Energy Management Systems (EnMS) through the evaluation, update, upgrade, and optimisation of current national programmes.

The participating Partner Countries include the Portuguese Energy Agency (ADENE), Center for Renewable Energy Sources of Greece (CRES), the German Energy Agency (DENA), the Energy Institute Hrvoje Poža of Croatia (EIHP), the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), the Energy and Water Agency of Malta (EWA), the Lithuanian Energy Agency (LEA), the Netherlands Enterprise Agency (RVO), the Sustainable Energy Authority of Ireland (SEAI), the Slovak Energy and Innovation Agency (SIEA), and the Belgian communication agency REVOLVE, all coordinated under the leadership of ENEA. The project is funded by the EU LIFE programme and has a duration of 36 months (2024-2027).

EAs and EnMS provide a key opportunity for industrial companies to identify potential energy savings and implement targeted actions to reduce consumption. These measures are essential tools for meeting the EU’s energy and greenhouse gas emissions reduction targets.

Art.11 of the new Energy Efficiency Directive (EU/2023/1791) introduces new provisions for businesses, requiring them to adopt concrete measures to improve energy efficiency, with particular focus on companies consuming more than 10 TJ of energy per year. For companies with an annual energy consumption exceeding 85 TJ, the implementation of an EnMS becomes mandatory. For obligated companies, the article also sets the obligation to submit information on the implementation of EEMs and the requirement to create Action Plans. This shows the key relevance to have reliable information from businesses regarding the EEMs they have implemented and plan to implement.

This report analyses the state of implementation of Energy Efficiency Measures (EEMs) in the Partner Countries with a specific focus on how data and information are collected and managed by policy makers and Partner Countries in the context of the transposition of the new Directive. It examines how related data and information are collected not only within the framework of the current Art. 8 but also beyond it, assessing the effectiveness of these approaches in supporting the transition to the new requirements of Art.11. The deliverable aims to provide valuable insights for policy makers and Partner Countries in enhancing their strategies for implementing EEMs as outlined in the revised Directive.

The report is structured as follows: Section 3 outlines the **Methodology**, explaining how data and information on implementation of EEMs were collected from Partner Countries. Section 4 focuses on the **Implementation of EEMs under Art. 8/11**, examining the availability and structure of data from EAs, obligations to implement recommended measures, and the role of EnMS and Action Plans. It also discusses factors facilitating EEMs’ adoption, including incentives, standardisation, and awareness programmes, and showcases examples of good practices across countries. Section 5 explores the **Implementation of EEMs beyond Art. 8/11**, analysing their integration into broader national and regional programmes, illustrating the diversity of approaches adopted by Partner Countries. The report concludes in Section 6 with a summary of key findings and recommendations.

Additional details, including country-specific information and good practices, are provided in the Annex, offering a comprehensive overview of current information on implementation of EEMs across the ten Partner Countries.

This report, Deliverable 2.2 of Task 2.2 within Work Package 2 led by the German Energy Agency (dena), was developed under the leadership of ENEA. However, as a collaborative effort within this European project involving multiple countries and languages, the expertise and linguistic contributions of all partners were essential to the successful completion of this deliverable.

3. Methodology

This report is based on a qualitative and quantitative comparative analysis of the status quo in the countries of the ten participating Partner Countries. In order to benefit from the knowledge of all project partners, the methodology was developed in such a way to include the know-how and support of all Partner Countries. ENEA developed a questionnaire with 12 questions divided into three main topics: current information on the implementation of EEMs under Art. 8/11, good practices useful for encouraging the implementation of EEMs under Art. 8/11, overall information on EEMs in the Partner Countries. The questionnaire is provided in Annex 7.3.

The draft questionnaire was first shared with dena, the feedback was incorporated and then shared with the rest of the partners to allow for further feedback or clarifying questions. After the final review, the questionnaire was then filled in by the Partner Countries within a period of two months. All partners developed country-specific questionnaires based on the knowledge within their Agency, desk research and in exchange with other national institutions such as ministries, other national or regional Partner Countries or research centres. Once the completed questionnaires were submitted to ENEA, further insights were integrated by contacting individual partners and carrying out desktop research.

The questionnaire was designed to gather detailed information on the implementation and monitoring of EEMs in each partner country. In Section 2 of the questionnaire, the key areas of inquiry included:

1. **Availability and Structure of Information on EEMs** (Questions 2.1-2.6): This section focused on understanding the type and organisation of data available on EEMs in each country. The goal was to assess the comprehensiveness and accessibility of the information.

2. **Action Plans Related to EEMs** (Questions 2.7-2.8): Questions in this section sought to gather insights into the Action Plans for implementing EEMs.

3. **The Role of EnMS in the implementation of EEMs** (Question 2.9): This question aimed to understand how EnMS are employed to comply with Art. 8 and whether they play a significant role in monitoring and supporting the implementation of EEMs.

4. **Support Mechanisms for EEM Implementation** (Question 2.10): This area explored the support provided by governments, national energy agencies, and other bodies to facilitate the implementation of EEMs, including financial, technical, and regulatory assistance.

5. **Best Practices** (Question 2.11): The questionnaire included a section to identify and share best practices related to EEM implementation, which could serve as a model for other countries or sectors.

Additionally, the questionnaire included **two summary tables**, which were designed to outline the procedures used by each agency in the data collection process and the sources of information consulted. These tables were crucial for understanding how each partner approached the questionnaire and ensured consistency in the information provided.

Section 3 of the questionnaire focused on gathering information regarding the implementation of EEMs beyond the framework of EED Art. 8. The aim was to provide a comprehensive overview of the implementation of EEMs in each partner country, covering policies, programmes, and practices that fall outside the scope of Art. 8 but provide useful quantitative information on EEMs. This section has been built based on the following strategy:

1. **Research Process**: The research for Section 3 involved a thorough investigation, both internally within the Partner Countries and externally through consultations with institutions, experts, and available databases. The goal was to map the broader landscape of the implementation of EEMs, considering both active and past national policies and programmes.

2. **Information Collection**: The methodology included consulting a range of sources, such as:

    - Active and completed national energy efficiency policies and programmes.
    - Reports and data from past National Energy Plans and Efficiency plans.
    - Interviews with senior experts, former programme managers, and officers from ministries or regional authorities involved in energy efficiency.

3. **Goals**: The primary goal of this section was to create a clear and detailed picture of the current state of the implementation of EEMs in each country, including past and ongoing efforts, rather than provide best practices. This information will serve as a knowledge base for future policy development, particularly in light of the new EED 2023/1791 (Art.11) and upcoming project tasks.

4. **Data Sources**: The section encouraged the use of both publicly available resources, ensuring a broad spectrum of data is collected. The use of material in national language were also encouraged to ensure the inclusion of locally relevant information.

This structured approach to data collection allowed for a thorough analysis of the implementation of EEMs across the participating countries and provided a solid foundation for the subsequent tasks of the project.

4. Implementation of EEMs – Art.8/11

This Section discusses the implementation of EEMs under Art. 8/11 of the EED. It focuses on the various approaches taken by the Partner Countries in relation to different aspects of EEMs' adoption. The content is based on responses provided by LEAPto11 Partner Countries to the questionnaire, as detailed in the methodology section.

Section 4.1 examines how countries gather and make available data from EAs and how this affects the identification of EEMs. The Section provides an overview of the data collection practices highlighting the different systems in place for monitoring, reporting, and publishing data related to EEMs.

Section 4.2 illustrates the varying approaches across countries regarding how EA guidelines address the analysis of implemented and identified EEMs showing that data availability varies across countries, influencing the effectiveness of the implementation of EEMs.

In Section 4.3, the obligation for countries to implement the recommended EEMs is explored, with a comparison of the different legal frameworks and enforcement mechanisms in place. Some countries have stricter rules on implementation, while others rely more on voluntary commitment.

Section 4.4 focuses on the structure of the information on EEMs from Energy Management Systems highlighting that, although they are used in all countries to fulfil Art. 8 obligations, their role in supporting EEMs varies.

Section 4.5 explores if voluntary practices to develop Action Plans for the implementation of EEMs exist at country level, focusing on three aspects: drafting the Action Plan, publishing the Plan, and publishing implementation rates.

Section 4.6 examines the evolution of EEM implementation in Partner Countries across different obligation periods. The section shows how different countries have adjusted their policies in response to initial challenges and the evolving energy efficiency landscape.

Section 4.7 explores the facilitating factors for the implementation of EEMs through the lens of experts from Partner Countries. These experts provide insights into the factors that can ease the adoption of EEMs, such as economic incentives, regulatory obligations, and institutional support.

The measures to support the implementation of EEMs differs from country to country. Some countries are offering subsidies and tax incentives, while others prioritize regulatory measures or offer more extensive institutional support, including training, workshops, and awareness campaigns.

Section 4.8 presents good practices on the implementation of EEMs under Art. 8 in Partner Countries, grouping them in different categories, such as economic or supportive policies.

In conclusion, Section 4.9 summarizes the main findings, highlighting the main challenges and opportunities in dealing with the implementation of EEMs under Art. 8.

4.1. EEMs data collection/availability

This Section provides an overview of the data collection practices on EEMs under Art. 8 across Partner Countries. It highlights the different systems in place for monitoring, reporting, and publishing data related to EEMs. Moreover, it shows the varying degrees of availability and accessibility of this information.

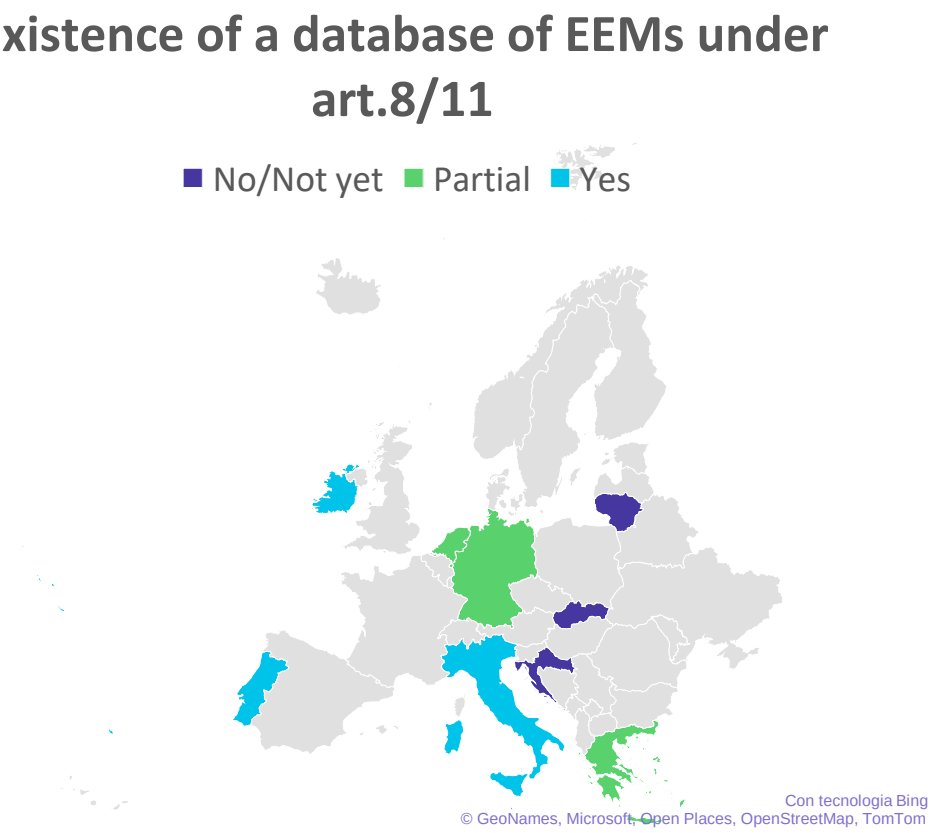

Figure 1. Overview of existing EEMs database under Art. 8/11 in Partner Countries

Figure 1 shows that only in **Italy**, **Portugal** and **Ireland** there is a structured and searchable database of EEMs under Art. 8. Other countries, namely **Greece**, **Germany** and the **Netherlands**, organize these data in a database only partially while in remaining countries an EEMs database is not yet implemented.

Table 2 presents information on the collection and publication of EEMs data under **Art. 8** across analysed countries:

- **Italy** makes data available through reports, documents, and scientific papers, ensuring accessibility for public and research purposes. Similarly, **Portugal** publishes data in several reports, allowing for a good level of transparency.
- **Ireland** collects data through the EAs compliance notification system, which has the features of a database, but does not publish data.

- **Croatia, Greece**, and **Germany** publish only partial or summary data.
- **Lithuania**, the **Netherlands**, **Malta** and **Slovakia** neither have a structured database nor publish data.

Overall, the level of data availability varies, with several countries opting not to publish or only partially publish their data on EEMs, while others provide aggregated information.

Country	Authority collecting EEMs data under Art.8	EEMs Collection Method	Data publication
Croatia	Ministry of Economy	EAs stored in a repository	Data published in reports
Germany	BAFA	EAs internal database for recommended EEMs	Data not published
Greece	Ministry of Environment & Energy	EAs internal database for recommended EEMs	Data partially published
Ireland	SEAI	EA compliance notification system	Data not published
Italy	ENEA	EAs web portal	Data published in reports, documents and scientific papers
Lithuania	LEA	EAs stored in a repository	Data not published
Netherlands	RVO	EAs stored in a repository	Data not published
Malta	EWA	EAs stored in a repository	Data not published
Portugal	ADENE	SGCIE[1] web portal	Data published in SGIE portal, reports and documents
Slovakia	Slovak National and Accreditation Service	EAs stored in a repository	Data not published

Table 1. Availability of data on EEMs in the Partner Countries of the LEAPto11 project

[1] Portuguese Energy Intensive Management System programme, see Annex 7.1 for more details.

The information gathered shows that Art. 8 managing authorities in Ireland, Italy and Portugal collect data about implemented and recommended EEMs of EAs and EnMS:

- **Ireland**
  Not all implemented EEMs are reported through the EA compliance notification system, as the system allows for the entry of only the first five. Indeed, the system tracks the top five energy-saving recommendations identified in EA and EnMS, although the reports may include more than five recommendations. Simplified EEM categories are included in the reporting system, but many of the implemented projects fall outside the identified categories description (other). The recommendations range from behavioural changes to system optimisations and upgrade, but they do not always include reliable energy savings data. The audit compliance report also allows companies to identify any energy projects (max. five) that have been completed since the last EAs. These projects may or may not have been identified in the last EAs. Similarly, there may be more than five energy projects completed since the last audit. This data is not published. The sectoral level is broken into many subsectors, making the data analysis difficult. Implementation of EEM's has not been monitored at a sectoral level.
- **Italy**
  ENEA serves as the managing authority, overseeing the collection of data. Companies submit their information via the ENEA web portal (audit102.enea.it) to officially upload EAs. Specifically, EMMs information is uploaded by companies to the portal, which can also be queried to extract a spreadsheet (MS excel) file on specific obligation years or sectors. EEMs are categorised into homogenous intervention areas already on the portal[2]. Information on investments, savings and simple payback time (PBT) is also collected on the portal and checked by ENEA experts before computing further indicators and publishing them. Information is published in an annual report for the Ministry, in the Energy Efficiency Annual Report, in sectoral guidelines and studies, all published by ENEA. Sectoral notebooks/guidelines for EAs, including results both for energy performance indicators and EEMs, have been published by ENEA for several sectors, namely glass, cement, pharmaceuticals, waste incineration, foundries, hotels, airports and offices. More information on these sectoral notebooks is provided in Section 4.8 on good practices.
- **Portugal**
  ADENE, that is the Art.8 managing authority, collects data about the implementation and recommended EEMs resulting from EAs through the application of the SGCIE which is part of the national legislation. The SGCIE legislation implementation urges that the companies within the system register on a private and dedicated platform, where EAs results and Rationalisation Plan reports (PREn) are recorded, namely by filling in specific fields. The technical information about EnMs is not collected. IPAC (the Portuguese Accreditation Institute) collects data only concerning the number of companies certified according to ISO 50001, ISO 14001, etc. Similarly to Italy, sectoral notebooks are elaborated and they are described in Section 4.8.

In Croatia, Germany, Greece and the Netherlands information is partially collected:

- **Croatia**
  The Ministry of Economy collects reports on EAs from companies subject to Art.8, but so far, data on implemented and recommended EEMs are not regularly extracted or collected. The analysis of data from EAs is ongoing, and some data will be available in the upcoming period. In the meantime, an assessment

[2] The database is manually reviewed by an expert to identify outliers, with the assistance of statistical software, and the areas are subsequently standardised for further analysis.

was developed on which EEMs recommended in the previous EAs have been implemented. This analysis is included in Section 4.8 as good practice. The Ministry of Economy and, according to current plans, the Croatian Real Estate Agency (APN) will be in charge of the collection, for large enterprises and public sector/public enterprises respectively. The register of energy-intensive companies will be established in the upcoming period as part of the implementation activities derived from the transposition of Art.11.
Other databases could be useful for EEMs monitoring, such as the National System for Monitoring, Measuring and Verifying Energy Savings (SMIV), managed by the same authority. SMIV monitors the implementation of measures and the realisation of energy savings at the national level relative to alternative measures and the Energy Efficiency Obligation Scheme (EEOS); more information on this good practice is available in Section 5. Moreover, in the Information system of energy certificates (IEC), which is a database for energy certification of buildings under the jurisdiction of the Ministry of Physical Planning, Construction and State Assets, 76,951 EEMs were proposed from 2010 to 2024, in hotels and restaurants, trade buildings - wholesale and retail, office buildings and other non-residential buildings. According to the IEC system, in the last four years the implemented EEMs have been 3,220 (2024), 5,963 (2023), 5,167 (2022) and 4,345 (2021).

- **Germany**
  The Federal Office for Economic Affairs and Export Control (BAFA) is responsible for the management of the Art.8 implementation. Companies obligated to carry out an audit under Art.8 must submit an online self-declaration. BAFA collects data on EEMs implemented by enterprises within these declarations. However, the companies do not have to indicate whether the given EEMs were recommended in audits or not. BAFA does not evaluate the data. Therefore, it is not planned to be published. Furthermore, BAFA collects data on the EEMs recommended in the obligatory audits through the self-declarations, storing them in an internal database (MS excel spreadsheet), which can be queried and requested for scientific analysis as anonymised extract. Also these data are currently not and are not planned to be published in the future.
  Data on EEMs identified in an EnMS is not collected because the Art. 8 monitoring procedure includes only a self-declaration of companies which use an EnMS to fulfil their audit obligation but no further requirements for data collection.
  There is no systematic collection of data on recommended EEMs based on voluntary audits. BAFA only collects data on voluntary audits when the companies apply for and carry out the audit with funding from the federal funding programme “Energy consulting for non-residential buildings, installations and systems” (EBN)[3]. Companies can choose among different categories of measures and are allowed to submit a maximum of five measures. Thus, a maximum of five measures per funding application/ grant is collected and the total number of recommended EEMs is not available. The data is collected in an internal database by BAFA which is not freely available but can be used for evaluations.
- **Greece**
  The managing authority collects data only about the EEMs recommended in EAs. The authority does not collect data about the implemented EEMs. The relevant data are uploaded on the EA database by the obligated company. The data on recommended EEMs is published occasionally, but not regularly or at standardised intervals. Currently, available data only includes the total final energy saving, the total energy efficiency percentage improvement and the total final primary energy savings (PES) for recommended EEMs in 2018.

[3] For a description of the programme, please see Section 5.

- **Netherlands**
  Implemented EEMs are collected and stored as part of a pdf document (one per company) and are not digitally available or published.

The remaining countries do not have a structured system to collect data. In the following the available information by country is described:

- **Malta**
  Data on implemented EEMs is not available as these are often implemented by the companies themselves on their own steam, financing the actions through company funds, or through other incentive mechanisms. It is important to note that measures financed through these mechanisms cannot be directly linked to EA recommendations. Recommended EEMs are encouraged to be included as part of the EA however, Energy Auditors/ companies are not obliged to provide such information. Furthermore, this information is not easily extractable.
- In **Lithuania** and **Slovakia** there is currently no collection of data on implemented and recommended EEMs of EA and EnMS. However, Slovakia plans to introduce a regular and systematic monitoring of EEMs as a part of implementation of Art. 11 EED.

Table 2 provides an overview of the number of EA and EEMs implemented and recommended from 2019 to 2023 under Art. 8 across the countries having available information. Even among them, data availability and reporting practices vary significantly, impacting the ability to draw comparisons or uniform conclusions. The following observations arise:

- **Data Gaps**: Not all countries report both implemented and recommended EEMs, and some provide data only for certain years.

- **Timeframes**: The range of years covered varies, reflecting differences in reporting frameworks and national priorities.

- **Number of EEMs per audit**: Comparing the number of Art. 8 EAs with the number of EEMs, the ratio of EEMs (implemented or recommended) per EA can be computed. The indicator is higher for recommended EEMs, with a number of EEMs per audit in the range of 1.5 to 3, while it is equal to 0.5 or 1.3 for Italy and Ireland.

- **Implementation rate**: Comparing implemented and recommended EEMs a first assessment on the implementation rate could be obtained. The differences in average values suggest varying approaches to EAs and follow-up across countries. However, it should be taken into account that the EEMs recommended in an audit and the implemented EEMs in the next audit could not necessarily converge.

The data highlights the importance of harmonised reporting to enable better cross-country comparisons and policy evaluation. **The variation in periods and completeness underscores the need for greater standardisation in monitoring EEMs across countries.**

Country	Calendar year[4]	No. Art. 8 EAs	No. Implemented EEMs	No. Recommended EEMs	Source
Germany	2023	5,572	No data available	1,231	Internal OREA database used by BAFA
	2022	1,237		3,958	
	2021	1,929		6,403	
	2020	4,187		13,970	
Ireland	2023	136	185	513	SEAI database
	2022	92	111	283	
	2021	228	281	551	
	2020	72	116	205	
Italy	2023	10,559	8,850	25,446	ENEA database and reports for the Ministry[5]
	2022	553	356	1,659	
	2021	629	317	1,837	
	2020	759	348	1,190	
	2019	11,152	7,352	30,487	
Portugal	2023	N/A	6,454	6,454[6]	SGCIE
	2022	89	5,861	5,861	
	2021	69	6,070	6,070	
	2020	118	6,703	6,703	
	2019	169	6,437	6,437	

Table 2. EEMs from EAs and EnMS in the Partner Countries of the LEAPto11 project

[4] The calendar year refers to the year of the energy audit obligation, so 2019 indicates that the data are relative to the energy audits collected for the 2019 deadline. The reference year is the year preceding the calendar year indicated in the table, so the data for calendar year 2019 refers to 2018.
[5] The annual report for 2023 was sent by ENEA to the Ministry of Environment and Energy Security but there is no public link yet.
[6] The average implementation rate of EEMs per company in Portugal is approximately 100%. The number of EEMs is independent of the reference year of the audit and the number of audits. The EEMs can be associated with an audit prior to the reference year.

In Table 3 several indicators are computed as follows:

- Average final energy savings per EEM (toe)
- Final energy savings/ energy consumption[7] (%)
- Average final energy savings per EEM (toe)
- Final energy savings/ energy consumption (%)

The variability in average final energy savings per EEM primarily depends on two factors: the mix of companies required to undergo mandatory EAs each year, and the types of interventions reported in the EAs, whether implemented or proposed.

Country	EAs reference period	Implemented EEM		Recommended EEM	
		Average final energy savings per EEM (toe)	Final energy savings /energy consumption (%)	Average final energy savings per EEM (toe)	Final energy savings/ energy consumption (%)
Germany	2023	N/A	N/A	26.7	0.6%
Ireland	2023	67.8	1.1%	34.3	1.5%
Italy	2022	9.3	0.2%	13.7	1.4%
	2021	8.8	0.4%	8.5	2.0%
	2020	106.3	0.9%	21.8	0.6%
	2019	64.4	0.6%	54.9	2.3%
Netherlands	2023	N/A	N/A	21.7	N/A
Portugal	2023	1.7	N/A	1.7	N/A
	2022	1.9	3.5%	1.9	3.5%
	2021	2.4	N/A	2.4	N/A
	2020	1.7	3.2%	1.7	3.2%
	2019	2.2	2.9%	2.2	2.9%

[7] Data on total final energy consumption of obligated companies are reported in Deliverable 2.1

Table 3. Average final energy savings from implemented and recommended EEMs

The table shows that the availability of data is fragmented across different countries. Out of a total of ten, only for five countries it was possible to calculate average savings per EEMs and savings on energy consumption. The commentary and comparison of these data are limited by the existence of different methodologies applied by the countries in data collection.

The variability in savings percentages relative to total consumption implies that the adoption of energy efficiency technologies may depend on factors such as the availability of incentives, the technological maturity of industrial sectors, and the complexity of energy processes. Overall, the analysis reveals significant variability in the results, with some countries showing higher savings per EEM. The fluctuations in annual data underscore the need for enhanced efforts in data collection at the national level, as well as the establishment and agreement on standardised methodologies at the European level, which are essential for enabling meaningful comparisons between countries.

In Tables 4-6 additional indicators are reported for Portugal and Italy, the two countries having a more structured data collection system allowing for further evaluations.

Year	Total savings in final energy [ktoe]	Total savings in primary energy [ktoe]	Savings: electricity [ktoe]	Savings: fuels [ktoe]	Average cost effectiveness of energy savings [Euro/toe]	Average PBT [years]	Achieved carbon emissions savings [tCO_2e]
2023	10.99	16.54	9.24	7.29	42,573	4.4	35,133
2022	10.86	19.58	14.55	5.04	29,118	4.3	46,794
2021	14.29	27.25	21.60	5.65	21,974	4.2	60,766
2020	11.32	23.49	20.29	3.20	28,151	3.9	53,314
2019	14.28	27.42	21.89	5.53	20,228	3.7	62,169

Table 4. Detailed information on implemented EEMs in Portugal[8]

As shown in Table 4, the key data points available for **Portugal** from the SGCIE database over the five-year period include various metrics related to energy savings, cost-effectiveness, payback periods, and environmental impact spanning the years 2019 to 2023. Data on energy savings in terms of tonnes of oil equivalent (toe) is available for both final and primary energy for every year from 2019 through 2023. Additionally, the database provides separate figures for electricity and fuels savings, also measured in tonnes of oil equivalent (toe), for the years 2019, 2020,

[8] As already explained, the average implementation rate of EEMs per company in Portugal is approximately 100%.

2021, 2022, and 2023. The database also includes information on the average cost-effectiveness of the energy savings, expressed in Euro per toe, which is available for all five years. This figure reflects the cost of saving one toe associated to the mix of EEMs in a specific year. Furthermore, the average simple payback period for the implemented EEMs, calculated in years, is provided for the years 2019 to 2023, giving an insight into the time it takes for businesses to recoup their investments in the mix of EEMs in a specific year. Another important aspect included in the database is the carbon emissions savings, measured in tonne of CO_2 equivalent (tCO_2e), for each year from 2019 to 2023. However, no data is available for water savings or other non-energy benefits for any of the years in the database. The majority of the EEMs listed in Table 3 and the savings reported in Table 4 originate from obligated enterprises, with voluntary contributions being only marginal. However, it is not possible to distinguish them.

Total savings in final and primary energy have varied, with the highest primary energy savings recorded in 2021 (27.25 ktoe), and the lowest in 2023 (16.54 ktoe). Electricity savings consistently outpace fuel savings, particularly in 2021 and 2022, reflecting a strong focus on electrical energy efficiency. The average cost-effectiveness of energy savings has fluctuated, with a significant increase in 2023 (42,573 Euro/toe) compared to previous years, indicating potentially higher costs for recent interventions. The average payback period has remained stable, averaging around 4 years, demonstrating consistent performance in terms of investment recovery. Lastly, carbon emissions savings peaked in 2021 (60,766 tCO_2e) but saw a decline in 2023, which aligns with the lower energy savings achieved that year.

Year	Total savings in final energy [ktoe]	Total savings in primary energy [ktoe]	Average cost effectiveness of energy savings [Euro/toe]
2023	N/A	511.0	6,091[9]
2022	3.3	15.8	8,107
2021	2.8	19.3	11,475
2020	37.0	2.4	12,672
2019	473.8	190.9	10,879

Table 5. Detailed information on implemented EEMs in Italy

Table 5 outlines the information available in Italy for implemented EEMs. Savings are monitored in the period 2019-2023, but a methodological change was introduced in 2023. Until then, savings were calculated in final energy for all intervention areas except two (so 15 areas in total), namely production from renewable energy and cogeneration/trigeneration; for these two areas, savings were expressed in primary energy. This implied that savings could not be summed up for all areas. From 2023 onwards, savings will be computed in primary energy for all intervention areas, and the same is true for recommended measures. For this reason, savings of year 2023 are not comparable with the figures of previous years. The cost effectiveness of final energy savings (Euro per toe of

[9] This value is related to primary energy savings, as explained in the text, and not comparable with previous years.

final energy) was computed from 2019 to 2022[10], expressed as the ratio between investment and energy saving and referred to the 15 intervention areas: these average data are not included in annual reports prepared for the Ministry, but ad hoc calculations were made for this questionnaire. The information provided in the table is the cost effectiveness of the overall mix of EEMs in a specific year, that is calculated as average of each intervention cost effectiveness. Data for each intervention area are included in the sectoral guidelines in Euro/toe of final or primary energy depending on the area, and they are publicly available[11]. In 2023, the cost effectiveness is an average on all intervention areas and expressed in Euro per toe of primary energy, so it is not comparable to previous values.

Total savings in final energy were notably high in 2019 (473.8 ktoe), which was the first year of the second obligation period and was subsequently associated to a very much higher number of EAs. The average cost-effectiveness of energy savings varied across the years, with the highest values observed in 2020 (12,672 Euro/toe) and 2021 (11,475 Euro/toe), indicating relatively higher costs per unit of energy saved in these years. This suggests that while energy savings in Italy have been significant, the cost-effectiveness of these interventions has fluctuated.

Year	Total savings in final energy [ktoe]	Total savings in primary energy [ktoe]	Savings: electricity [%]	Savings: thermal energy [%]	Savings: fuels [%]	Savings: other [%]	Average cost effectiveness of energy savings [Euro/toe]	Average PBT years [Euro/toe]
2023	N/A	1,309.0	60%	N/A	N/A	N/A	5,384[12]	4.8
2022	22.8	37.6	49%	41%	3%	7%	8,812	4.6
2021	15.7	40.5	44%	29%	7%	20%	7,736	4.4
2020	2.0	39.1	59%	23%	5%	13%	6,986	4.5
2019	1,674.6	855.9	23%	13%	4%	60%	6.616	4.7

Table 6. Detailed information on recommended EEMs in Italy

Table 6 provides an overview of the indicators computed on recommended EEMs in Italy, showing a more detailed information set than for implemented ones. Indeed, recommended EEMs are described in the EAs more deeply, also because of the existing EA guidelines, as will be described in Section 4.2. Data on energy savings are available on the whole period 2019-2023, except for final energy savings due to the methodological changes outlined above. In addition to the total value of energy savings, for years 2019-2022 the breakdown is provided referring to four components: electricity, thermal energy, fuels and other. An analysis of 2019 data by sector revealed that some savings in the “other” category - typically representing a combination of electrical and thermal savings not disaggregated in the EA - can be fully reassigned as either electrical or thermal. Consequently, the

[10] The cost effectiveness of the two areas for which energy saving are computed in primary energy is not shown here.
[11] See Section 4.8 and Annex 7.1 for a description of subsector guidelines.
[12] This value is related to primary energy savings, as explained in the text, and not comparable with previous years.

data included in the “other” category presented in the Ministry's report and shown here should be revised to reflect a lower value. The savings associated with Combined Heat and Power (CHP) systems still have a significant weight in the “other” category, since they consist of a mix of different components: the self-production of electricity, the consumption of natural gas to feed the CHP, and the avoided fuel consumption for heat production through traditional boilers. From 2020 onwards, the category “other savings” is almost entirely linked to cogeneration. Starting from 2023, a breakdown will only be provided for the roles of electricity and natural gas. This information is not included in the table but is equivalent to 60% and 20%, for electricity and natural gas respectively. Cost-effectiveness is calculated as previously described for implemented EEMs, with the 2023 analysis focusing solely on primary energy savings; for this reason, the value in the table for year 2023 is not comparable with previous years. The simple PBT refers to data reported in the EAs for the period 2019–2022, while for 2023, it is estimated by ENEA based on investments and savings included in the EAs and Eurostat electricity and gas prices. For all years, it refers to the return of investment without considering the impact of incentives. Average data are not included in annual reports prepared for the Ministry, but ad hoc calculations were made for this questionnaire. Summary information by class of PBT[13] is not included here but it is available in the reports for the Ministry and in sectoral guidelines, with particular focus on the role of EEMs having a PBT less than or equal to 3 years. PBT by intervention area is published in sectoral guidelines and other sectoral studies.

In 2023, while primary energy savings were significant (1,309 ktoe), other indicators such as final energy savings, savings by energy type, and cost-effectiveness are not available. In previous years, electricity savings were the largest component of total savings, peaking at 59% in 2020, but decreasing in later years. Thermal energy savings represented a lower share of the total, variable in the years. The cost-effectiveness of energy savings has varied over the years, with a peak of 8,812 Euro/toe in 2022, indicating a higher cost for energy savings in that year compared to previous others. The average payback time remained relatively stable, ranging from 4.4 to 4.7 years, suggesting that the return on investment for energy efficiency interventions has been fairly consistent.

For both implemented and recommended EEMs, the ratio between final energy savings and total final energy consumption of the audited companies is computed for specific sectors and is available in the subsector guidelines for EAs available online[14]. Looking at multiple benefits of energy efficiency, in recently published sectoral guidelines (hotel and office sectors) scope 1 and 2 CO_2 emissions are computed. No information on water savings has been published yet, but starting in 2023, such data can be included in the web portal for collecting EA information. Additionally, an investigation into multiple benefits is currently underway for the plastic and tertiary sectors, considering water savings alongside other advantages, such as improved process productivity, reducing environmental impact and green marketing opportunities.

Italy and Portugal, as shown in the previous tables, have been collecting and analysing data on EEMs in a structured manner for several years. It is valuable to have data on savings disaggregated by type, as this allows for an assessment of the impact of existing incentive policies focused on different technologies and areas of intervention. The average payback time for the interventions identified in the EAs, calculated in the absence of incentives, is under 5 years for both countries, indicating significant energy efficiency opportunities with attractive investment returns for businesses in the short term. In general, the reform of existing policies or the creation of new

[13] Six PBT classes are identified: the first three have a duration of one year each, followed by a class ranging from 3 to 5 years, then from 5 to 10 years, and the last one is greater than 10 years.
[14] More information can be found in Section 5.

ones should always be driven by real data, covering a sufficiently long time period to account for any fluctuations related to economic cycles.

4.2. Structure of available data from EA

This paragraph illustrates the varying approaches across countries regarding how EA guidelines address the analysis of implemented and identified EEMs. Some countries, such as Italy, Malta, Ireland, and Lithuania, have specific guidelines that encourage or require Energy Auditors to report on both the measures implemented since the previous audit and those recommended in the current audit. In contrast, countries like Croatia and Germany do not mandate the reporting of EEMs implemented after the initial audit, although they may encourage auditors to assess and describe these measures. Additionally, other countries like Greece and Portugal include guidelines that address the technical and economic feasibility of proposed EEMs but do not require reporting on whether past recommendations have been implemented. Although robust guidelines for tracking both implemented and proposed measures exist in some countries, there is a noticeable heterogeneity in how this aspect of EAs is handled, with many countries focusing mainly on new recommendations rather than assessing the success or failure of past measures. **This lack of uniformity limits the ability to fully track and compare among countries the progress of energy efficiency improvements across EAs.**

There are no guidelines in **Croatia**, and the *Ordinance on EAs for large companies* does not oblige or encourage companies or energy certifiers to report on EEMs implemented after the first EAs[15]. According to this ordinance, EAs should include proposals of economically justified measures to increase energy efficiency with life cycle calculations of measures. Metrics that are applied to inform the decision maker about the feasibility of each EEM in the EAs report are the following: Investment [Euro]; Energy saving [kWh/y]; Cost savings [Euro/y]; Reduction of CO_2 emissions [tCO_2/y]; Simple Return on Investment [y]. Also, according to the Ordinance, the internal rate of return should be determined, but this metric is not always reported. In the description of the proposed EEMs, calculations with and without incentives should be included: these are mainly considered when calculating the investment and the simple return on investment.

In **Germany**, there is a guideline from BAFA for preparing EAs reports. The guideline does not explicitly encourage reporting the EEMs implemented after the previous audit. This is usually done by auditors/energy managers in consultation with the responsible persons of the company and adapted to each location. However, the guideline gives guidance on the description of measures identified in the audit. Preparing trackable and transparent EAs reports is a key element of the BAFA guideline to DIN EN 16247-1. The guideline gives a detailed table of contents for audit reports (chapter 2).

In **Greece** there are guidelines for the preparation of EAs, and they include a specific section on the recommended (but not on the implemented) EEMs. The economic and technical feasibility of each energy efficiency measure is reported including the overall cost of the intervention, savings in energy costs, and the simple payback period.

In **Ireland**, “Project specific details completed since last audit” and “Energy project details identified in the current audit” are highlighted as two of the reporting compliance requirements of the online notification system. No information on energy incentives is directly provided through the notification system. However, EAs reports may

[15] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_09_97_1761.html

address this topic, or it may be discussed between the auditor and the company.
In Italy, as per ENEA's guidelines for EAs, reports should include several key elements. These include a description of the most significant implemented EEMs, specifying whether they were part of State or Regional incentive programmes. Additionally, each EAs must identify potential EEMs and evaluate their technical and economic feasibility.

In **Italy** EAs guidelines published by ENEA require that a description of the implemented EEMs should be included, specifying whether they were carried out as part of state or regional incentive programs. However, the guidelines do not provide specific information on metrics for assessing the effectiveness of EEMs, such as energy or economic savings or payback time. Each audit should also include the identification of potential EEMs, evaluating their technical and economic feasibility. For each measure, a detailed technical description, a cost-benefit analysis based on Net Present Value (NPV), a plan of measures and verifications, and potential access to state or local incentives should be included.

In **Lithuania** the methodology for performing EAs is contained within Regulations Nr. 110203NISAK0001-141[16], Nr. 2023-05891[17] and Nr. 2017-03102[18]**.** The *Description of the Supervisory Procedure for Conducting Energy Consumption Audits and Reports for Companies that are not Small and Medium Enterprises* (item 15.8 of the document) states that information on the results of the EEMs recommended in previously conducted audits should be provided in the EAs report. According to the *Methodology for Auditing Energy, Energy Resources and Water Consumption in Technology Processes and Installations* (item 1.14 in Annex 1), the EAs report must provide "a brief description of the measures implemented to save energy and create cleaner technology."

In **Malta**, reporting the EEMs implemented is encouraged as part of the summarised template for obligated companies which Energy Auditors are asked to complete for the following obligation period. However, no information is collected on whether the implemented measures have been recommended in the previous EAs.

Since 2022, the guidelines in the **Netherlands** encourage the reporting of implemented EEMs in a table similar to the table for potential EEMs. Energy savings are measured in terms of energy usage, and the payback time for each measure is also considered. Companies are asked to use their own methods for calculating the payback time. Additionally, the guidelines encourage the identification of different recommended EEMs for decision-makers, with the feasibility of each measure assessed based on energy savings and payback time. The use of Net Present Value (NPV) is recommended.

In **Portugal** ADENE has developed guidelines for preparing the EAs Report, as well as Execution and Progress Reports, to ensure that all mandatory information (as per Ordinance No. 17449/2008 of June 27) and all necessary information for the correct preparation and validation of the process are included. The use of these documents is not mandatory. It is up to the recognised technician to decide whether to use the guidelines on a voluntary basis.

[16] Minister of Energy of the Republic of Lithuania, *order on the approval of the methodology for conducting audits of energy, energy resources and water consumption in technological processes and facilities*, May 10, 2010 No. 1-141

[17] Minister of Energy of the Republic of Lithuania, order on the *adoption of a methodology for conducting a detailed audit of energy, energy resource consumption in buildings,* March 30, 2023 No. 1-90, Vilnius.

[18] Minister of Energy of the Republic of Lithuania, order on the approval of the *description of the supervision procedure for conducting energy consumption audits and reporting for companies that are not small and medium-sized business entities,* 22 February 2017 No 1-46 Vilnius.

In **Slovakia**, the attachments No. 1, 2 and 3 of Decree No. 179/2015 of the Ministry of Economy of the Slovak Republic (MoE) include a description of the contents of an EAs. This description is quite detailed and can be considered as a guideline.

Country	EAs Guidelines Link	Reporting the EEMs implemented [Yes/No]	Identifying a list of different recommended EEMs [Yes/No]
Germany	https://www.bafa.de/SharedDocs/Downloads/DE/Energie/ea_leitfaden.html	Yes	Yes
Greece	https://ypen.gov.gr/energeia/energeiaki-exoikonomisi/energeiakoi-elegchoi/ https://ypen.gov.gr/wp-content/uploads/2020/11/Periexomena-ekthesis-apotelesmatwnsample.pdf	No	Yes
Ireland	SEAI-Guide-to-Energy-Audit-Compliance-Scheme.pdf	Yes	Yes
Italy	https://www.efficienzaenergetica.enea.it/component/jdownloads/?task=download.send&id=%20170&catid=41&Itemid=101	Yes	Yes
Lithuania	https://www.e-tar.lt/portal/lt/legalAct/TAR.A3AC13936022/asr	Yes	Yes
Netherlands	https://www.rvo.nl/onderwerpen/energiebesparingsplicht/eed-auditplicht https://english.rvo.nl/topics/energy-saving-obligation/eed-audit-obligation	Yes	Yes
Malta	https://energywateragency.gov.mt/non-sme-audit/	Yes	Yes
Portugal	https://sgcie.pt/linhas-orientadoras-para-a-elaboracao-de-relatorios-de-auditoria-energetica-e-de-execucao-e-progresso-rep-no-sgcie/ https://sgcie.pt/informacao/ferramentas/	Yes	Yes
Slovakia	https://www.slov-lex.sk/static/pdf/2015/179/ZZ_2015_179_20150801.pdf	No	Yes

Table 7. EAs guidelines links and EEMs required information

After having summarised overall information on the guidelines in Table 7, a comparative overview of the EEMs reporting metrics used by Partner Countries as outlined in EA guidelines is provided in Table 8. The countries differ in the metrics they use to report on implemented and recommended EEMs, reflecting varying national practices and priorities.

For instance, some countries use comprehensive metrics such as savings in energy consumption, CO_2 emissions, and economic efficiency analysis, while others focus mainly on energy savings and cost evaluations, emphasising the importance of payback periods but do not always considering incentives. A leaner reporting format is adopted in the remaining countries. The variation in approaches highlights the diversity in how different countries structure and evaluate their energy efficiency efforts.

Country	Implemented EEMs (Metrics)	Recommended EEMs (Metrics)	Incentives
Germany	• Reference of building/company/location • Name of the measure Investment costs in Euro/year • Savings in final energy (e.g., kWh/year or MWh/year) • Savings in energy costs (Euro/year) • Savings in final energy consumption (kWh/year or MWh/year) • Savings in CO_2 emissions (tonnes/year) • Economic efficiency analysis results • Net present value Internal rate of return	• Savings per year (static) • Internal rate of return • Net present value	• The summary template does not oblige Energy Auditors to consider incentives in their analysis on energy efficiency investments. However, Energy Auditors are highly encouraged to consider this and communicate this information with the company management. • The identification and reporting of different EEMs leads to an Action Plan with a timeline which enables the executing enterprise to choose the appropriate financing model.
Greece	N/A	• Economic cost of the intervention • Energy cost savings • Simple payback period	• Not considered in the economic assessment of EEMs
Ireland	• Energy savings (kWh/year)	• Energy savings (kWh/year)	• No information required
Italy	• Presentation of information is free form, without strict indicators.	• Economic cost of the intervention • Energy cost savings • Simple payback period • Net present value • Internal rate of return	• A useful practice, suggested in the guidelines, could be the development of business plans that calculate PBT with and without incentives. Usually, simple PBT is calculated without incentives in the EAs.

Country	Implemented EEMs (Metrics)	Recommended EEMs (Metrics)	Incentives
Lithuania	• Presentation of information is free form, without strict indicators.	• Measures classified by payback period • Energy savings per year (MWh/year) • Payback period • CO_2 reduction	• EAs reports evaluate investments without incentives
Netherlands	• Description of the measure • Investment (Euro) • Energy savings (kWh, GJ, Nm^3) • Payback period • Use of NPV recommended	• Energy savings (kWh/year) • Payback time (calculated using the company's method)	• Yes, but in the Netherlands EEMs with payback period of 5 years or less are not subsidised because these measures are mandatory.
Malta	• Description of implemented energy saving measures • Cost savings • Energy and water savings achieved	• Description of recommended measures • Capital costs of the measure • Cost savings • Energy and water savings projections	• The summary template does not oblige Energy Auditors to consider incentives in their analysis on energy efficiency investments. However, Energy Auditors are highly encouraged to consider this and communicate this information with the company management.
Portugal	• Investment • Energy savings • Economic savings • Payback time	• Investment • Energy savings • Economic savings • Payback time	• There is no information available regarding this evaluation.
Slovakia	N/A	• Static economic evaluation method with simple payback period • Dynamic evaluation methods (Net Present Value, Internal Rate of Return, discounted payback period) • Clear presentation of economic evaluation results, with table templates provided	• In the table templates incentives are not included.

Table 8. Implemented and Recommended EEMs reporting metrics

In **Malta**, Information on implemented EEMs is collected by the Energy and Water Agency either as part of the EAs obligation (for obligated companies) or part of the Promotion of Energy Audit Scheme (for Small and Medium Enterprises, SMEs). Non-SMEs provide this information every four years while there is no requirement for SMEs to collect this information on a regular basis. Information on implemented EEMs for SMEs is only collected if the SME has carried out an EAs and are undertaking an EAs again while benefitting from the 'Promotion of Energy Audit Scheme'.

In **Germany**, Section V of the guidelines elaborates how to calculate and describe energy saving potentials of different fields of technologies. Furthermore, chapter V.3 explains how to define criteria for ranking EEMs, to set up a plan of suitable EEMs as well as a plan to implement them. The measures to which the metrics should be applied are as follows: lighting, ventilation control, compressed air, replacement of motors, window replacement, PC replacement (s. table 29 chapter 3.2). All measures shall be integrated into a concrete plan of measures.

In **Greece**, the EAs guidelines suggest reporting recommended EEMs by delving into economic and technical feasibility in terms of the economic cost of the intervention, energy savings and simple payback period without considering possible incentives.

In **Italy**, according to the guidelines, an EAs should include different elements among with a description of the most important implemented EEMs. It should be specified whether they were carried out as part of a programme of incentives provided by the State or the Region. The technical-economic feasibility of identified EEMs is key for subsequent implementation. Thus, a detailed technical description should be provided, accompanied, as far as possible, by: documentation from the possible supplier(s) of the equipment; cost-benefit analysis based on the calculation of the Net Present Value (NPV); plan of measures and type of instrumentations to be adopted, in case of implementation, to estimate the energy savings; for each measure the type of measuring instrumentation should be indicated; possible access to state or local incentives. From a technical point of view, feasibility must consider the availability of the technology, the installation space, the skilled workforce required, reliability, etc.; the impact of the EEMs on safety, quality, production or process; the need for maintenance and the availability of spare parts. As far as the economic feasibility of EEMs is concerned, the analysis can be carried out following different methodologies (Payback Time, Net Present Value, Internal Rate of Return, etc.). According to the guidelines, for small investments of short duration a simple method such as PBT is normally sufficient. By contrast, more significant and longer-term investments, more structured methodologies are needed taking more factors into account.

In **Lithuania** in the *Methodology for conducting audits of energy, energy resources and water consumption in technological processes and facilities* (Annex 6), details on how to compile lists of recommended EEMs are provided. It is recommended that three groups of EEMs (A, B, and C) are prepared, and for each individual measure on the lists, certain parameters should be specified: required investment (thousands of Euro); annual energy savings (MWh/year); annual energy savings (%); payback period (years), CO_2 reduction (t/year). Incentives do not have to be considered in the assessment of the required investment.

In the **Netherlands** implemented EEMs should be summarised by including a description of each measure, detailing the specific action or technology used to improve energy efficiency. Additionally, the summary should report the investment made in Euro and the energy savings achieved, measured in units such as kWh, GJ, or Nm^3. As for payback time, companies should use their own internal method of calculation, with Net Present Value (NPV) analysis as a recommended approach. However, EEMs with a payback period of five years or less are not eligible for subsidies, as these shorter-term measures are mandatory by Dutch legislation (Energy Saving obligation).

The **Portuguese** EAs guidelines require reporting on EEMs implemented after the previous EAs, as these measures are mandatory under the SGCIE system. For these past measures, the metrics used include investment, energy and economic savings, and payback time. During the audit, a list of recommended EEMs should also be provided for company decision-makers. To assess the economic and technical feasibility of these recommended EEMs, the metrics applied are investment, energy and economic savings, and payback time. There is no available

information regarding whether incentives for energy efficiency investments are considered in the economic evaluation of EEMs.

In **Slovakia** different economic indicators are proposed for recommended measures, but incentives are not mentioned in the guidelines. According to the table templates, the economic savings should be detailed referring to changes in energy provision costs but also, if applicable, in personnel costs, e.g. wages, insurance premiums, other operating costs, e.g. repairs and maintenance, services, overheads, property insurance, other separately stated costs, e.g. emissions and waste

4.3. Obligation to implement the recommended EEMs

This paragraph outlines how different Partner Countries handle the implementation of EEMs. Portugal has a clear obligation to implement EEMs, with a structured monitoring system managed by ADENE, achieving nearly 100% implementation. The Netherlands mandates EEMs with a five-year payback period, though data on implementation rates is limited. Ireland and Germany do not have an obligation to implement recommended measures, whereas Italy has an obligation limited to energy-intensive companies and recently modified the associated legislation. Greece, Lithuania, Malta, and Slovakia do not have implementation obligations, and no data is collected. Overall, there is significant variation in how countries enforce and track the implementation of EEMs.

Portugal is the only LEAPto11 country with an obligation to implement EEMs under Art.8. An Energy Consumption Rationalisation Plan (PREn) is developed based on the results of mandatory EAs reports. The PREn serves as a three-year implementation plan, outlining specific obligations tailored to the company's energy consumption levels. For companies consuming 1,000 toe/year or more, all EEMs with a payback period of up to five years must be implemented. For companies below this threshold, all EEMs with a payback period of three years or less are required to be implemented[19]. The collection of information on the implementation of EEMs in **Portugal** is managed by ADENE. ADENE oversees the operational management of the SGCIE system, which includes tasks such as maintaining a registry of energy-intensive facilities, receiving and submitting energy consumption rationalisation plans to the Directorate-General for Energy and Geology (DGEG) for approval, and monitoring accredited technicians and operators. The monitoring period has been ongoing since 2008. The average implementation rate of EEMs per company is approximately 100%, as reported by ADENE. Implementation rates are tracked by type of EEM as well as by sector, using a monitoring platform and periodic reports that consider economic activity classification. The public data can be found in https://sgcie.pt/estatisticas/.

In the **Netherlands**, the implementation obligation is not directly tied to the EED *Art.8* on EAs but aligns with national energy-saving rules. According to Dutch Energy savings regulations implementation of EEMs with payback period of five years is mandatory. The monitoring period is set to four years, meaning that every four years, companies are expected to report on their progress in implementing EEMs. There is no available data on the average implementation rate of Art.8 related EEMs per company[20]. However, additional information on implementation rates can be obtained from other sources, such as sectoral reports or databases. The implementation rates are monitored by type of EEM. This monitoring follows a Dutch regulation that includes a predefined list of 120 standard EEMs, which provides a structured approach to tracking progress for each type of

[19] Ministry of Economy and Innovation, Decree-Law No. 71/2008 of April 15.
[20] Additional resources are available on the Klimaatmonitor databank website, providing access to detailed data on the Dutch energy-saving obligations

energy-saving measure. Monitoring also occurs at the sectoral level, allowing for an assessment of energy-saving achievements within specific industries.

In **Ireland**, the EAs must identify and analyse the most significant opportunities for improving energy efficiency, however, there is no obligation to implement the recommendations. While the analysis of recommendations is included in the EAs report, it is not reported through the audit notification system. SEAI only received the identified recommendation, and the potential energy savings in kWh (in some cases, but not all).

In **Italy**, Legislative Decree 73/2020, transposing the recast EED 2018, introduced the obligation for energy-intensive companies to carry out at least one intervention in the period between two EAs. In September 2023, the framework for EAs in energy-intensive companies was changed by Decree Law 131[21], for which the implementing Ministerial Decree was recently issued (end of July 2024)[22]. According to the previous legislation, the obligation to implement at least one intervention for energy-intensive companies should have been verified for the first time by referring to the EAs collected by ENEA in the 2024 deadline. As the legislation has been changed, so will the method of verifying the obligation.

In **Germany,** the Art.8 transposition by the German Energy Efficiency Law does not include an obligation to implement recommended EEMs. An early version of the draft of the German Energy Efficiency Law an obligation included an obligation for companies to implement EEMs that have been identified as being economically feasible in a prior audit. However, this obligation was not adopted and therefore not introduced in Germany[23]. The information about the implementation of EEMs through mandatory audits is not collected or monitored by the managing authority because only data on recommended EEMs is processed.

In **Greece, Lithuania, Malta** and **Slovakia** there is no obligation to implement the recommended EEMs, and so corresponding information is not collected.

4.4. Information on EEMs from Energy Management Systems

In all countries Art.8 obligations can be fulfilled through the implementation of a certified Energy Management System (EnMS), as already stated in Deliverable 2.1[24]. Table 9 provides an overview of the approaches taken by the different LEAPto11 Partner Countries to fulfil Art.8 requirements through EnMS and the associated practices in reporting and recommending EEMs.

All listed countries comply with Art.8 obligations by implementing EnMS, but there is significant variability in the additional practices adopted. Only in a few countries, specifically **Ireland, Malta,** and **Portugal**, both implemented

[21] https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2023-11-28&atto.codiceRedazionale=23A06611&elenco30giorni=true
[22] https://www.mase.gov.it/sites/default/files/archivio/bandi/CEE/dm_128076_11-07-2024.pdf
[23] Draft of the German Energy Efficiency Law (Referentenentwurf der Bundesregierung, Entwurf eines Gesetzes zur Steigerung der Energieeffizienz und zur Änderung des Energiedienstleistungsgesetzes): https://www.bmwk.de/Redaktion/DE/Downloads/E/entwurf-eines-gesetzes-zur-steigerung-der-energieeffizienz-u-aenderung-des-energiedienstleistungsgesetzes.pdf?__blob=publicationFile&v=6
German Law for Increasing Energy Efficiency and Ammending the Law for Energy Services (Gesetz zur Steigerung der Energieeffizienz und zur Änderung des Energiedienstleistungsgesetzes vom 13. November 2023, Bundesgesetzblatt Jahrgang 2023 Teil I Nr. 309, 17. November 2023): https://www.recht.bund.de/bgbl/1/2023/309/regelungstext.pdf?__blob=publicationFile&v=2
EDL-G: https://www.gesetze-im-internet.de/edl-g/__8c.html
[24] https://leapto11.eu/resources/

and recommended EEMs stemming from EnMS are reported to national institutions. Other countries, like **Greece** and **Slovakia**, include a list of recommended EEMs but do not require reporting of those implemented. Meanwhile, in **Croatia, Germany, Italy, Lithuania,** and **the Netherlands** the reporting on both implemented and recommended EEMs is limited or absent when complying to Art.8 with an EnMS. This variability suggests a divergence in national approaches to EEMs reporting under EnMS, indicating potential areas for harmonisation and knowledge-sharing between EU member states.

Country	Reporting the EEMs implemented	Identifying a list of different recommended EEMs
Croatia	No	No
Germany	No	No
Greece	No	Yes
Ireland	Yes	Yes
Italy	No	No
Lithuania	No	No
Netherlands	No	No
Malta	Yes	Yes
Portugal	Yes	Yes
Slovakia	No	Yes

Table 9. EnMS in Art. 8: EEMs information in Partner Countries

Additional information, where available and relevant, is provided below:

- **Croatia**
  Companies only submit information to the managing authority that they have fulfilled the obligation, i.e. that they have implemented the EnMS (mostly ISO 50001) and certificate; other information or data is not delivered, processed or published.
- **Germany**
  Data on EEMs identified in an EnMS is not collected because the Art. 8 monitoring procedure includes only a self-declaration that the audit obligation was fulfilled with an EnMS. Thus, in this case, no data on EEMs is available.
- **Ireland**
  ISO 50001 is highly encouraged as a route to compliance. The notification portal is the same for both EAs and EnMS. Companies that use EnMS as a route to compliance have the option to include five

recommendations and five completed projects since last reporting. The information on EEMs is very similar to what is collected through the EAs. Indeed, up to five implemented EEM's can be reported in the notification system, and energy savings can be included but corresponding data are not always reliable. Similarly, up to five recommendations can be included through the notification system, and more can be included in the actual audit/ EnMS report. In this case, potential energy savings in kWh is the metric used. No information on energy incentives is provided through the notification system. EAs and EnMS reports may include this, or it may be discussed between auditor and company.

- **Italy**
  ENEA provided a template ("matrice di sistema" or "Spreadsheet for ISO 50001 enterprises") to be voluntarily filled in by companies complying to Art.8 with an EnMS. In this template, a section is devoted to implemented EEMs. They are listed, but in most cases no detailed information is provided. Two sections of the template refer to implemented and recommended, but very rarely investments and energy savings are provided.
- **Netherlands**
  EnMS are not required to include a description of the EEMs that were implemented in previous years. As a result, there is no information provided regarding metrics such as investment, energy savings, economic savings, or payback time for past measures. Additionally, the EnMS does not offer a list of different recommended EEMs. The system primarily focuses on certification, without requiring detailed reporting on previous or recommended EEMs.
- **Malta**
  Companies fulfilling Art.8 obligation with an EnMS are required to provide information on the cost savings of the implemented measure, energy or water savings achieved and expected lifetime of the measure. They should also provide a list of recommended EEMs: when identifying recommended measures, Energy Auditors must provide a description of the measure, indicate the capital costs of the measure, indicate cost savings the measure is projected to achieve, as well as energy and water savings projections. Whilst it is not obligatory to consider incentives for energy efficiency investments, it is highly encouraged to do so.
- **Portugal**
  Any company under Art.8 obligations that implement certified EnMS can be exempted from EAs except if they are already under the SGCIE mandatory audit schemes.
- In **Greece** and **Slovakia,** it is possible to fulfil Art.8 obligations with a certified EnMS (ISO 50001 or 14001).

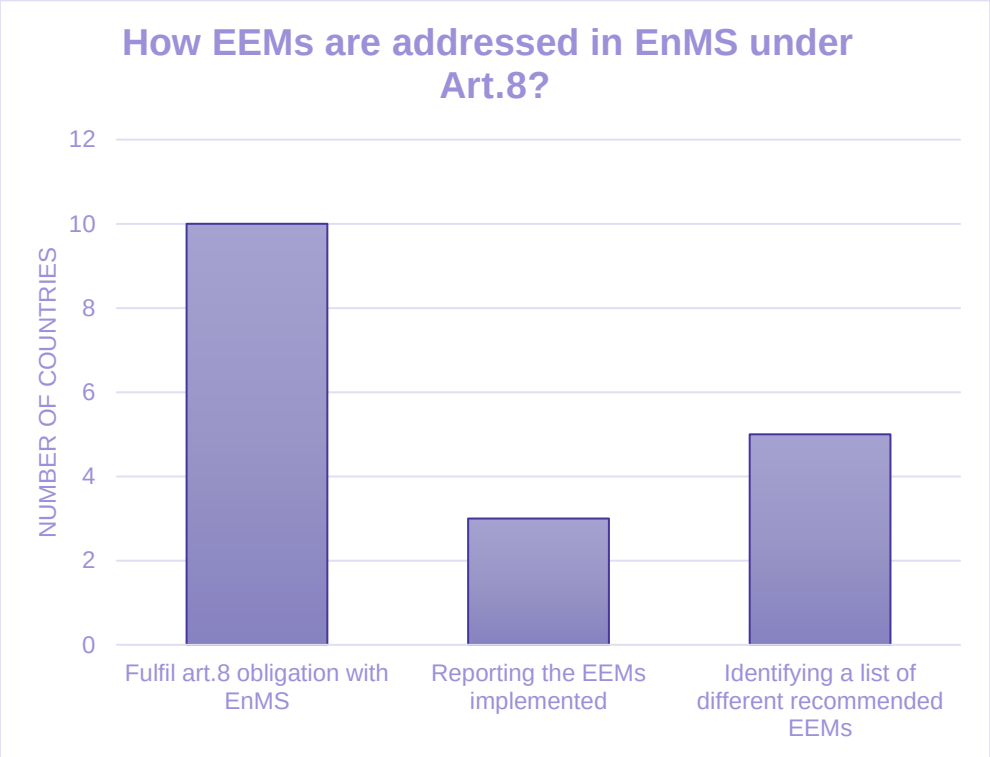

Figure 2. Coverage of EEMs in EnMs under Art.8 in Partner Countries

To conclude, the overall situation is illustrated in Figure 2, which highlights that while it is possible to comply with the obligation through EnMS in all Partner Countries, the reporting on EEMs varies significantly. Only a few countries include the identification of EEMs or provide information on the measures implemented.

4.5. Role of Action Plans

Art. 8 does not require the preparation of an implementation plan for measures, whereas Art. 11 introduces new provisions related to Action Plans. According to the EU Recommendation on Art.11[25], the Action Plan must be submitted to the enterprise's management and include all recommendations deemed "technically or economically feasible." It must also be published in the enterprise's annual report, accompanied by the "recommendation implementation rate," which must be made publicly available. For enterprises subject to obligations under Art.11(2), the Action Plan and the updated recommendation implementation rate must be published annually for the duration of the obligation. Action Plans are expected to have a key role in increasing the implementation rate of EEMs and for tracking progress.

[25] Commission Recommendation (EU) 2024/2002 of 24 July 2024, setting out guidelines for the interpretation of Art.11 of Directive (EU) 2023/1791 of the European Parliament and of the Council as regards energy management systems and energy audits, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202402002

In this Section, the current situation on the development of Action Plans in Partner Countries is analysed. Table 10 provides an overview of voluntary practices in different countries, focusing on three aspects: drafting the Action Plan, publishing the Plan, and publishing implementation rates.

The table highlights significant diversity in reporting practices through Action Plans and progress in implementing EEMs:

1. **Drafting the Action Plan**: The Netherlands, Germany and Portugal have this practice in place, not as a voluntary choice but due to national legal requirements. Greece and Lithuania have voluntary practices related to specific projects and sectors, while other countries do not adopt this practice on a voluntary basis.

2. **Publishing the Action Plan**: Greece and Lithuania have voluntary practices for publishing their Action Plans, while other countries do not.

3. **Publishing the Implementation Rate**: None of the countries voluntarily publish the implementation rates of EEMs adopted.

The **Netherlands**, **Germany** and **Portugal** show more formalised approaches due to regulatory requirements.

However, the absence of published implementation rates, even in countries with voluntary practices for plans' publication, may limit the ability to monitor and assess the overall effectiveness of EEMs. Thanks to the drafting and publication of Action Plans, greater transparency can be achieved regarding the information base on the EEMs implemented annually by companies and the corresponding energy savings. Furthermore, by comparing recommended measures with those implemented, it will be possible to identify barriers and better target existing incentives. In this context, it will be very important for Member States to coordinate efforts to standardize the formats of Action Plans.

Country	Voluntary practices of drawing Action Plan	Voluntary practices of publishing Action Plan	Voluntary practices of publishing implementation rate
Croatia	No	No	No
Germany	Not voluntary but as consequence of national law	Yes	No
Greece	Yes	Yes, in the context of the Energy Saving in Enterprises-Technical Assistance, Action:1.2.3 project	No
Ireland	No	No	No
Italy	No	No	No
Lithuania	Yes	Yes	No
Netherlands	Not voluntary but as consequence of national law	No	No
Malta	No	No	No
Portugal	Not voluntary but as consequence of national law	Yes	No
Slovakia	No	No	No

Table 10. Action Plans framework in Partner Countries

Additional information, where available and relevant, is provided below:

- **Germany**
  Transposed the Art.11 requirement to draw up and publish Action Plans into national law. German national law does not stipulate any minimum requirements regarding the form and content of these plans and a guideline for companies by BAFA is pending. Some companies have voluntarily published Action Plans online. These are in a similar format as the part of the audit report in which measures are recommended. Regarding the publication of Action Plans, there are no requirements on the format and location the publication. It is not mandatory to publish the rate of implemented measures at enterprise or site level.

- **Greece**
  The creation of Action Plans is supported in the framework of a specific project: *Energy Saving in Enterprises-Technical Assistance, Action:1.2.3 Save by Doing Business*. The project supports the Ministry of Environment and Energy and includes the maturation of Energy Saving actions sub-projects in businesses, as well as the creation of an electronic platform for the management of state subsidies.
  The maturation of Energy Saving actions refers to different EEMs, namely: installation of photovoltaic systems which may be combined with storage systems with electrochemical batteries, energy upgrading actions for enterprises in the tertiary sector and the tourism sector and support of energy self-production issues in industry. Through the services provided, the effective management of state aid for the above energy initiatives are sought.
- **Italy**
  There are no voluntary practices on Action Plans. In sectors where sustainability reports are required, information on EEM implementation plans could be included in such documents. However, the information would not necessarily refer to the EEMs recommended in EAs. Indeed, when companies are obliged to perform an EAs and a sustainability report, the two documents might not be linked. However, some company-level practices might exist but be very site-specific.
- **Lithuania**
  Currently, as stated in Section 4.3, there are no national legal provisions from Art.8 of the EED that require the implementation of recommended EEMs. However, a proposed amendment to the Law of the Republic of Lithuania on Increasing Energy Efficiency has been published for public comment. This law includes Article 13, which transposes Art.11 of the EED.
  Key points from the draft law:

  - Article 13 requires companies to prepare a mandatory Action Plan based on the recommendations in their energy consumption audit reports.
  - The Action Plan must outline specific measures to implement each recommendation, except where technical or economic barriers (such as an excessive payback period) prevent implementation. These reasons must be clearly stated in the Plan.
  - The Action Plan must be approved by the company's management.
  - Companies are required to publish the implementation progress of the Action Plan in their annual reports, unless the information is a commercial secret. If certain details are confidential, the report must provide summarised information on the implementation status[26].

- **Netherlands**
  There are no voluntary practices in which companies create an Action Plan for implementing recommended EEMs. However, according to Dutch energy savings regulations, companies are required to have an Action Plan for implementing obligated EEMs that have not yet been carried out.

[26] As of July 19, 2024, no related by-law legal acts have been published.

- **Portugal**
  In Portugal, the SGCIE framework mandates the preparation of Energy Consumption Rationalisation Plans (PREn) for energy-intensive consumer installations (EIC). PREn agreements with Directorate-General for Energy and Geology (DGEG) set minimum energy efficiency targets, linking compliance to eligibility for incentives. The PREn, based on EAs reports, must prioritize measures with a payback period of ≤5 years for installations consuming ≥1,000 toe/year or ≤3 years for smaller installations. Targets include reducing energy intensity and specific energy consumption by at least 6% over eight years for larger installations (≥1,000 toe/year) and 4% for others, while maintaining historical carbon intensity levels
- In other countries, such as **Ireland**, **Lithuania** and **Portugal** individual companies may, on their own initiative, publish Action Plans and related achievements (such as implemented efficiency measures) in the field of increasing energy efficiency on websites and other information channels. When companies decide to do so, Action Plans are not monitored or verified.
- In **Croatia**, **Malta** and **Slovakia** there are no voluntary practices related to Action Plans.

4.6. Evolution of the implementation of EEMs and data collection under Art. 8/11

After discussing the status of Art.8 implementation across LEAPto11 partners, this section provides a brief overview of how different countries have adapted their systems to manage the obligation during its various obligation phases. This will serve as an introduction to Section 4.7, which focuses on the facilitating factors and, most importantly, will help identify the key actions still required and the main challenges in the EED transposition.

Table 11 shows the evolution of the transposition of Art.8 EED across various Partner Countries, highlighting some common trends:

1. **Strengthening obligations for energy-intensive companies**: In some countries (Italy, Croatia, Netherlands), the obligations to implement EEMs with a payback period of less than 3-5 years was introduced, along with mandatory periodic EAs. In Malta, obligations were strengthened to report on implemented and recommended EEMs as part of the summary template, for all obligated companies.

2. **Improvement in data collection and management**: Several countries have enhanced their data collection systems, shifting from PDF files to digital databases and online platforms (Germany, Italy, Netherlands, Croatia), to better monitor energy consumption and the implementation of EEMs.

3. **Introduction of minimum thresholds for the obligation to carry out EAs**: In some countries, a minimum threshold, varying from case to case, was introduced, which excludes large companies with relatively low energy consumption from the obligation. This has an impact on the data collection for EEMs.

Partner Countries are adopting similar measures to strengthen company obligations and improve energy efficiency monitoring, with a common focus on digitalisation, centralised data management, and tracking the implementation of EEMs.

Country	From Phase I to Phase II (2015-2018)	From Phase II to Phase III (2019-2022)	Phase III (2023-ongoing)
Croatia	• No centralised database for consumption data, EEMs, and indicators • No targets or obligations for EEM implementation or energy savings	• Identification of obligated enterprises and creation of Register of large enterprises companies	• Establishment of a digital platform for monitoring energy efficiency • Continuous monitoring and reporting on energy efficiency in the business sector of energy-intensive companies
Germany	• Specification of register for Energy Auditors	• Specification of some audit-implementation requirements, details on obligated companies, and implementation periods • Mandatory registration for Energy Auditors • Introduction of OREA database and change to exportable (Excel) and searchable database • Online EA declaration and external data collection • Enhanced data collection on energy consumption and recommended EEMs stemming from audits	None
Greece	No relevant updates from Phase I		
Ireland	• Creation of a compliance notification database (2020) for reporting EA data and EEMs as per S.I. 599 of 2019	None	None
Italy	• Improvement of data collection system (from pdf files to searchable database) with regard to EEMs • Availability of sectoral information and analyses on EEMs	• Obligation for energy-intensive companies to implement at least one EEM listed in EA within the four-year period • First elaboration of CO_2 savings in addition to existing set of indicators	• Obligation for energy-intensive companies to implement all the EEMs with PBT < 3 years • Start of data collection on water and CO_2 savings associated with EEMs

Country	From Phase I to Phase II (2015-2018)	From Phase II to Phase III (2019-2022)	Phase III (2023-ongoing)
	associated with Energy Performance Indicators (EPIs) and benchmarking		
Lithuania	• Introduction of a procedure for calculating and monitoring energy savings from EEMs	• Inclusion of measures in strategic planning documents by the Ministry of Economy and Innovation to encourage SMEs to conduct EAs and implement EEMs	• Changes to qualification requirements for energy auditors.
Malta	• Developed a Guidance Note for companies required to perform EAs • Obliged companies to complete a checklist with company details and energy consumption data	• Updated Guidance Note and introduced a summary template (voluntary) summarising energy consumption and recommended improvements	• Updated and provided a detailed Guidance Note • Obligation for companies to fill in the updated summary template (MS Excel format)
Netherlands	• Change of responsible authority from local authorities to national authority (RVO as executive body) • RVO provides a template for audit reports matching Annex VI criteria	• RVO reviews audit reports and approves those matching the criteria • Penalty process for non-compliant enterprises	• Added questions to digital forms about audit costs, implemented EEMs since 2019, and investments in EEMs • Enhanced continuous penalty process Start of NL-audit obligation for locations with gas usage >170,000 m^3 or 10 GWh, focusing on electric motors, isolation of process equipment, and implementation of all EEMs with PBT up to 5 years
Portugal	No relevant updates from Phase I		
Slovakia	No relevant updates from Phase I		

Table 11. Evolution of the framework for EA and EEMs in Partner Countries

4.7. Facilitating factors for the implementation of EEMs

In this section the facilitating factors for the implementation of EEMs are examined to provide a context for the good practices analysed in Section 4.8. The choice of facilitating factors was based on experience gained by energy agencies at both national and international levels, as well as on analyses of technical and scientific literature. **It is important to note that these opinions reflect the views of the individual experts and do not represent the official stance of the respective Partner Countries.** In Figure 3 the Y-axis represents the number of Partner Countries attributing each level of relevance (high, average, low) to specific factors.

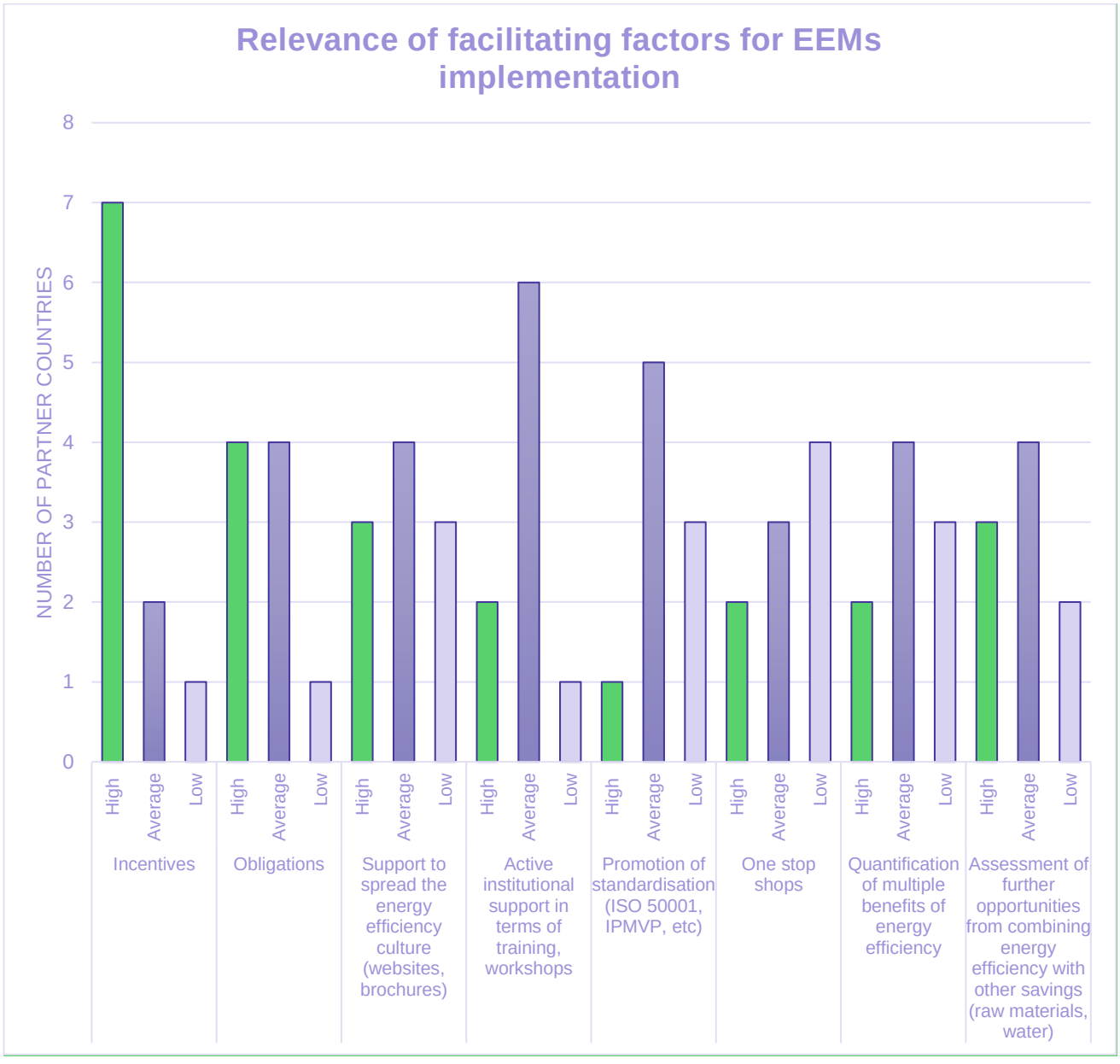

Figure 3. Facilitating factors for the implementation of EEMs according to Partner Countries experience

Key Observations can be summarised as follows**:**

1. **Incentives**: This factor received the highest emphasis, with seven Partner Countries rating it as highly relevant. This suggests that financial or policy incentives are viewed as a critical driver in promoting EEMs.

2. **Obligations**: The responses for obligations show a balanced spread across high, average, and low relevance. While obligations are recognised as somewhat important, they may not be as universally prioritised as other factors.

3. **Support for Energy Efficiency Culture**: Many Partner Countries rated this factor as highly or moderately relevant, indicating the importance of public awareness and education (e.g., through websites and brochures) in encouraging EEMs.

4. **Institutional Support (Training and Workshops)**: This factor also shows strong support, with a majority viewing it as either highly or moderately relevant. Institutional backing through training and workshops is seen as essential for building capacity and understanding around energy efficiency.

5. **Promotion of Standardisation (ISO 50001, IPMVP, etc)**: Factors such as the adoption of ISO 50001 and International Performance Measurement and Verification Protocol (IPMVP) standards are rated moderately important by most Partner Countries, reflecting the potential value placed on standardised procedures to streamline the implementation of EEMs.

6. **One-stop Shops**: There is a mix of opinions on the relevance of one-stop shops, though several Partner Countries see them as moderately important. This variation suggests that while centralised services are beneficial, their role might depend on specific regional or project contexts.

7. **Quantification of Multiple Benefits**: Ratings here indicate a moderate to high appreciation, highlighting the need for a comprehensive assessment of the various benefits derived from energy efficiency, beyond just energy savings.

8. **Assessment of Further Opportunities (e.g., combining energy savings with resource efficiency)**: Responses show moderate to high relevance, suggesting that Partner Countries see value in evaluating additional resource efficiencies, such as savings on raw materials or water, in conjunction with energy efficiency.

Overall, the histogram reflects a strong consensus on the importance of incentives as critical facilitators. In addition, medium to high importance is attributed to the introduction of obligations and the promotion of a culture of energy efficiency. Other factors like one-stop shops and multiple-benefit quantification, while still relevant, appear to be more context-dependent in their perceived importance. Several of the key observations highlighted above align with the findings of a survey conducted within the LEAP4SME project to assess EAs and the barriers and needs of efficiency policies in SMEs. In particular, priorities were identified not only in terms of incentives and obligations but

also in training and information campaigns[27]. This highlights that, within the current Art. 8 framework, there are many common actions that are effective not only for obligated enterprises but also for SMEs.

4.7.1. Incentives

Experts from national energy agencies emphasised the significant role that incentives play in enabling the implementation of EEMs, though their perspectives reveal some nuances.

In **Croatia**, the primary concern is clarity; enterprises who apply for incentives often need well-defined rules and procedures to navigate the process effectively. Indeed, without clear guidelines, potential beneficiaries might be discouraged or confused, reducing the overall impact of these incentives.

In **Ireland**, grant incentives are seen as a major driving force, essential for supporting both energy efficiency upgrades and the initial adoption of EEMs. This highlights how direct financial support can catalyse improvements that might otherwise be out of reach for companies. Similarly, for **Portugal**, targeting incentives specifically toward technologies with longer payback periods could boost the adoption of typically costlier solutions. Incentives can be strategically applied to ensure even high-investment technologies become accessible, thus widening the scope of energy efficiency improvements. **Italy** echoes the importance of incentives in this sense, especially for smaller businesses, where financial barriers are often the primary obstacle. In **Malta** grant incentives are considered as crucial to accelerate the implementation of EEMs, particularly for SMEs where financial barriers are one of the major challenges. **Germany** provides an example of a diverse and structured approach to incentives. There, cuts in energy costs are available for SMEs implementing certified EnMS, and the federal funding programme “EEW” supports a range of energy-saving investments. Incentives like these, including tax cuts for larger companies, have proven crucial in promoting energy efficiency over time, particularly benefiting SMEs and supporting their investments in digital infrastructure. In **Greece**, while financial support is recognised as beneficial, it's noted that EEMs often pay off on their own by reducing energy consumption and costs, which motivates companies even without incentives. Financial aid is acknowledged to accelerate its adoption, and the **Netherlands** adds that incentives can encourage companies to aim higher in their energy-saving goals, suggesting that financial support not only enables action but also inspires ambition in corporate sustainability efforts. **Lithuania** notes that incentives, that do not include elements of financial support, have low impact. While business leaders understand the financial benefits of efficiency, the upfront investment can be a barrier and tangible financial support to make energy efficiency projects feasible.

Overall, these insights underscore that while incentives are generally effective in promoting energy efficiency, their impact is maximised when they are tailored to specific needs, clearly communicated, and structured to address the financial challenges unique to different business sizes and types.

4.7.2. Obligations

The effectiveness of obligations for promoting EEMs varies across countries, with Partner Countries’ experts offering different perspectives based on national approaches and enforcement levels.

[27] More details can be found in LEAP4SME D3.2 Report and survey on SMEs characterization to address an effective policy development.

In **Croatia**, the obligation scheme requires further development to become more effective, while **Greece** highlights that although EAs are conducted, companies are not obligated to implement the recommended measures. Greece suggests making the adoption of cost-effective measures mandatory, aligning with practices in many IEA member countries[28]. **Portugal** and the **Netherlands** support mandatory schemes, viewing them as effective in driving energy efficiency improvements. Concerns about compliance are raised in **Ireland**, where some companies may avoid their obligations. In Lithuania, the introduction of obligations would encourage the implementation of EEMs, although there may be a risk that companies implement such obligations only formally. Similarly, **Italy** observes that having obligations does not guarantee impactful energy savings, pointing to a gap between compliance and actual outcomes. **Germany** has successfully implemented comprehensive measures including mandatory audits, CO_2 tracking, and EnMS for large consumers. In contrast, **Slovakia** has opted for a more flexible approach, choosing not to enforce mandatory obligations but instead pursuing alternative pathways through the EED. In **Malta** there are no obligation schemes for the implementation of EEMs. However, companies obliged to carry out an EAs are encouraged to implement the recommended EEMs. SMEs/ non-obliged companies often require financial assistance highlighting the key role that incentives play in the adoption of EEMs.

The comments from experts of the national agencies show a mixed but generally supportive view of obligations. While many countries see obligations as effective tools, there are concerns about compliance, enforcement, and the potential for companies to fulfil obligations only superficially. Several Partner Countries suggest that obligations need careful design and monitoring to ensure they translate into meaningful energy savings.

4.7.3. Promoting energy efficiency awareness and education

Experts emphasize the importance of raising awareness and educating about energy efficiency to promote the adoption of energy-saving measures. In **Portugal**, energy literacy is key to encouraging both individuals and businesses to take action. In **Italy**, lack of information and internal obstacles prevent companies from implementing EEMs, suggesting that better awareness could help overcome these barriers. **Ireland** highlights the importance of informational tools, like brochures and websites, to increase participation in energy efficiency programmes. **Germany** suggests that awareness initiatives alone have limited impact and should be combined with financial incentives or regulations. Moreover, smaller and focused group discussions are seen as effective for addressing specific business needs. In the **Netherlands,** fostering a culture of energy efficiency is deemed to be essential for long-term, sustainable changes. **Croatia** acknowledges the value of awareness-raising but calls for more targeted efforts for greater impact, while **Lithuania** points out that although businesses recognize the benefits of energy efficiency, financial constraints often prevent action, showing that awareness needs to be backed by financial support. **Malta** highlights that is important to raise awareness on energy efficiency and its benefits since it may further encourage companies to implement EEMs. Finally, **Ireland** notes that while training sessions and workshops are useful, their reach is limited, and additional tools may be necessary for wider impact.

In summary, Partner Countries generally view support for spreading energy efficiency awareness as a helpful facilitating factor, particularly when combined with financial incentives or obligations. While awareness and educational efforts are key to shaping attitudes and increasing understanding, some Partner Countries note that these alone may not be enough to drive action. For the greatest impact, awareness initiatives should be well-targeted, scaled appropriately, and paired with financial and regulatory supports.

[28] IEA Greece 2023 Energy policy review.

4.7.4. Active institutional support in terms of training, workshops

Experts highlight the key role of workshops and training programmes as effective tools to support companies in adopting EEMs.

Portugal notes that training, in addition to raising energy literacy, has shown tangible results in helping companies implement these measures. Italy shares a similar perspective, adding that combining literacy efforts with hands-on training significantly enhances the impact on EEM adoption.
In **Croatia**, while there are some existing training programmes, the range of businesses engaged in these initiatives remains limited. Expanding outreach could therefore make these efforts more inclusive and effective.
Lithuania highlights the value of showcasing specific success stories from other companies, which helps to illustrate the practical benefits of energy efficiency in relatable terms. This approach can be particularly motivating for companies, although it tends to resonate most with those that already have the financial capacity to invest in such measures.
Germany points out that workshops and training programmes are especially beneficial for SMEs, as they help bridge basic knowledge gaps about EEMs. While sector-specific training is helpful for addressing specific needs, Germany also emphasizes the importance of providing general training on fundamental energy efficiency principles, ensuring that companies of all types can benefit from a strong foundational understanding.
In **Malta**, promoting awareness and education on energy and water efficiency through sustainability courses is crucial. These courses provide companies with innovative ideas and practical sustainability solutions while fostering behavioural change within the corporate sector. This, in turn, often helps businesses reduce their environmental footprint

Partner Countries experts agree that well-designed workshops and training, tailored to different sectors and backed by practical examples, can greatly facilitate the adoption of EEMs. By addressing knowledge gaps and showcasing proven benefits, these programmes provide essential support for businesses aiming to become more energy efficient.

4.7.5. Promotion of standardisation

Partner Countries highlight the role of standardisation (ISO 50001, IPMVP, etc) in promoting EEMs in businesses. **Germany** emphasizes that standardisation improves energy efficiency while enhancing brand image and credibility, helping companies build trust. According to **Croatia**, standardisation good practices need to be promoted and further disseminated. **Portugal** views standards as a valuable tool for managing and improving energy efficiency by providing clear guidelines for businesses. **Italy** sees standardisation as useful for large companies but suggests that EAs should be tailored to specific industry needs for better results. **Lithuania** cautions that encouraging standard adoption alone may not be sufficient, as businesses often face high costs for implementation and maintenance and make decisions based on cost-benefit analysis. **Malta** believes that while standardisation improves energy efficiency and enhances brand credibility, the high costs of implementing ISO or similar standards may discourage companies, leading most to base decisions on cost-benefit analysis.

In conclusion, while standardisation is seen as an opportunity for improving energy efficiency, its effectiveness depends on company size, sector needs, and cost. Partner Countries highlight different aspects regarding the promotion of standardisation as a facilitating factor for the implementation of EEMs.

4.7.6. One-stop shops

One-stop shops for energy efficiency are dedicated platforms designed to provide businesses and individuals with comprehensive information and support to implement EEMs. These services typically include advice, financial guidance, and access to energy-saving programmes and incentives. One-stop shops are often designed to simplify the process of identifying and implementing EEMs by offering tailored solutions, technical expertise, and assistance with regulatory compliance. By consolidating these services into a single access point, one-stop shops help improve the uptake of EEMs, making them more accessible and easier to manage. Partner Countries offer different views on the role of one-stop-shops in facilitating the implementation of EEMs.

Italy highlights that one-stop-shops could help overcome information barriers and decision-making challenges by providing direct support from trusted experts. **Germany** sees them as useful for navigating the complex landscape of incentives and obligations, simplifying the process for businesses. **Lithuania** expresses doubt about their effectiveness, questioning how well they would work in practice. Indeed, one-stop shops could greatly benefit companies and policy institutions, but their implementation involves challenges such as complexity and high initial investment. The **Netherland**s considers them unsuitable for large target groups, noting scalability issues.

In summary, while Italy and Germany see clear benefits in simplifying decision-making and regulatory understanding, other countries have concerns about their practical application and scalability.

4.7.7. Quantification of multiple benefits of energy efficiency

Partner Countries emphasize the importance of quantifying the multiple benefits of EEMs to encourage broader adoption. **Portugal** notes that identifying these benefits can help to lower overall audit costs and enhance the implementation of EEMs. **Italy** highlights that quantifying multiple benefits can shorten payback times, making EEMs more appealing for businesses. **Greece** points out that such quantification offers a clearer understanding of the economic value of EEMs, potentially reducing production or service costs. **Lithuania** believes a comprehensive evaluation of multiple benefits better communicates the strategic value of EEMs to decision-makers. The **Netherlands** adds that demonstrating these benefits is essential to fostering a positive mindset toward energy efficiency. **Croatia** raises the issue of needing unified methodologies for assessing these benefits, while **Germany** suggests that credible, best-practice examples can effectively illustrate how EEMs improve profitability, company image, and carbon footprint, thereby encouraging more businesses to implement them. Malta states that quantifying multiple benefits provides clearer information on their economic value, making them more appealing for companies to implement.

In summary, Partner Countries see quantification of multiple benefits as key to enhancing the appeal of EEMs, improving cost-effectiveness, and fostering a stronger commitment to energy efficiency, though standard methodologies remain a challenge.

4.7.8. Assessment of further opportunities from combining EE with other savings

Partner Countries recognise the value of integrating multiple savings (energy, raw materials, water) when assessing EEMs. **Portugal** highlights that evaluating resource efficiency can reduce audit costs and enhance the

implementation of both energy and non-EEMs. **Italy** agrees, noting that assessing combined opportunities can make investments in EEMs more attractive. **Croatia** calls for more analyses and case studies to better understand the potential. **Lithuania** emphasizes that a comprehensive assessment of various benefits helps convey the importance and potential of EEMs to business managers. **The Netherlands** believes such assessments are crucial for fostering the right mindset towards energy efficiency. **Germany** acknowledges the importance of integrating savings from the circular economy (e.g., cradle-to-cradle models) but notes that the integration of other savings, such as raw materials and water, is not yet as advanced, suggesting that its impact on the implementation of EEMs is still limited. **Malta** states that assessing water and resources alongside energy makes audits more comprehensive, but further local analysis is needed to integrate these elements

Overall, while the integration of other savings into EEM assessments is recognised as beneficial, the extent of its implementation and impact varies across countries, with some calling for further studies and more advanced integration practices.

4.8. Good practices to encourage the implementation of EEMs

After analysing the facilitating factors, we will examine good practices in the implementation of EEMs, specifically focusing on how countries have translated these facilitating factors into concrete policy measures and tools available to businesses. In this section a series of **good practices** aimed at encouraging the implementation of EEMs under **Art.8 of the EED** are presented. The good practices are categorised by type, such as **prescriptive, economic and supportive policies and R&D, and are summarised in** Figure 4. More details on each good practice, presented in Table 12, will be provided in sub sections 4.8.1-4.8.5 and in Annex 7.1.

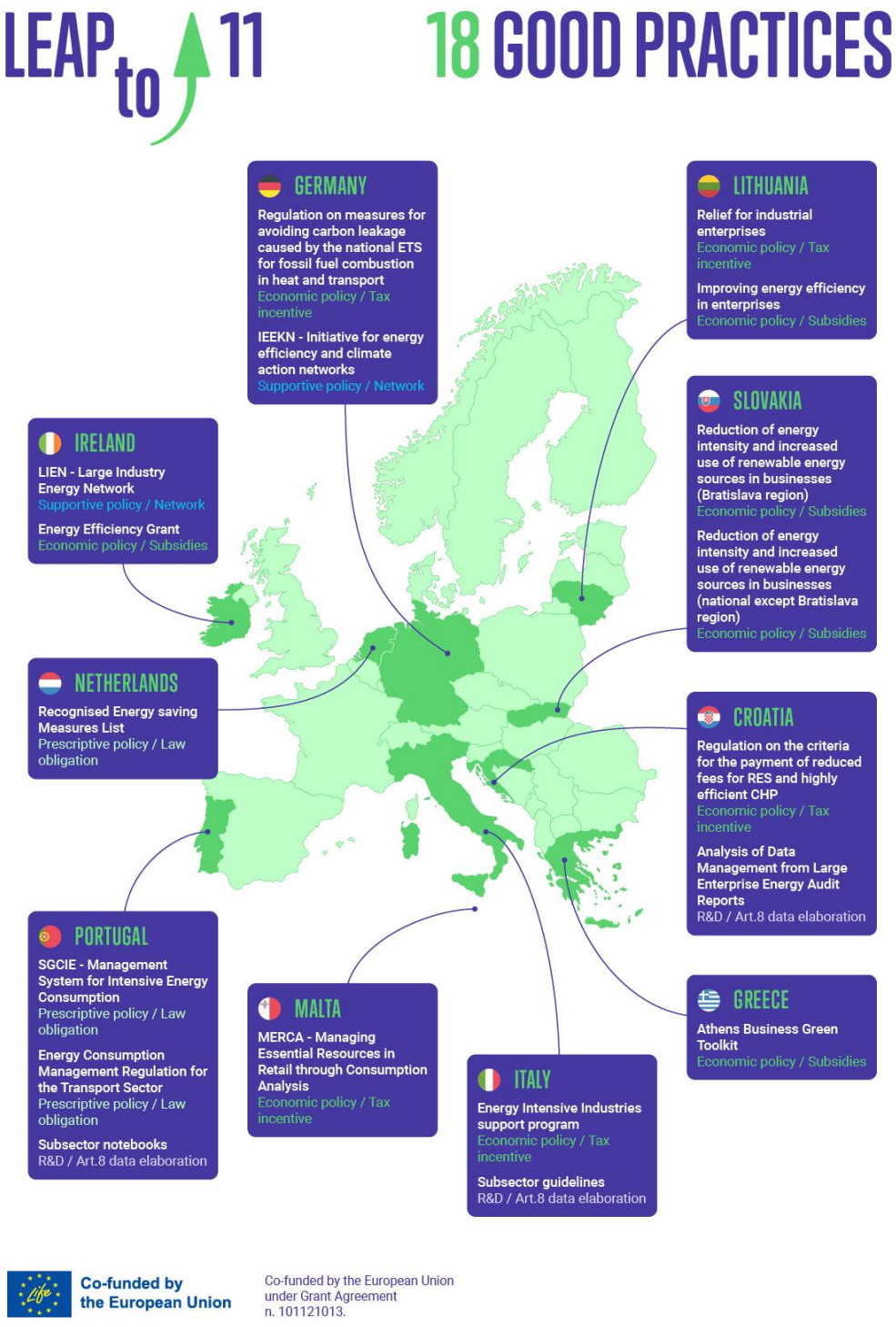

Figure 4. Map of Art.8 good practices in Partner Countries

For example, **Croatia** has implemented a regulation for reduced fees for renewable energy and highly efficient cogeneration, providing an economic incentive for energy-intensive industries. In **Germany**, two initiatives focus on carbon leakage prevention and energy efficiency networks, with Energy Management Systems being mandatory for financial relief under the carbon leakage prevention. Within the network activities, the focus lies on the implementation of EEMs, which can also include the fulfilment of obligations under Art. 8. **Ireland** and **Italy** both use EAs as prerequisites for financial support or incentives, like the **Large Industry Energy Network** in Ireland and the **Energy Intensive Industries** programme in Italy.

Countries such as **Lithuania**, **Malta**, and **Portugal** also link audits and encourage the implementation of EEMs to subsidies or tax incentives, while **Portugal** has specific laws mandating audits and energy-saving measures for both industrial and transport sectors. **Slovakia** employs EU structural funds to promote energy efficiency, linking funding to the implementation of audit recommendations.

The **subsector notebooks** are another notable practice found in **Italy** and **Portugal**, where these documents serve as tools for compiling and analysing sector-specific data from EAs. These notebooks allow for the identification of energy-saving opportunities and help standardize the EAs process across industries. They provide an in-depth overview of energy usage and offer tailored recommendations to improve efficiency in specific sectors.

These good practices support the implementation of **EEMs** by providing a combination of financial incentives, regulatory requirements, supportive policies and other tools, all of which align with the objectives of **Art.8** of the EED, ensuring that audits lead to tangible energy savings and reduced emissions.

Country	Good Practice	Category/Type	Link with Art.8	Link
Croatia	**Regulation on the criteria for the payment of reduced fees for RES and highly efficient CHP**	Economic policy / Tax incentive	EA obligation if the company voluntary applies for the tax relief	2023 regulation (Croatian)
	Analysis of Data Management from Large Enterprise EAs Reports	R&D / Art.8 data elaboration	EA data elaboration	N/A
Germany	**Regulation on measures for avoiding carbon leakage caused by the national ETS for fossil fuel combustion in heat and transport**	Economic policy / Tax incentive	Obligation to introduce an EnMS if the company applies for the compensation	Information on the mechanism (German)
	IEEKN Initiative for energy efficiency and climate action networks	Supportive policy / Network	Implementation of EEMs, including EA or EnMS	Information on the network
Greece	**Athens Business Green Toolkit**	Economic policy / Subsidy	Financial incentive on the EAs	Information on the mechanism (Greek)
Ireland	**LIEN Large Industry Energy Network**	Supportive policy / Network	Network related to large enterprises to obtain ISO 50001 certification	Energy agency incentive webpage

Country	Good Practice	Category/Type	Link with Art.8	Link
	Energy Efficiency Grant	Economic policy / Subsidy	EA is a pre-condition for small enterprises applying to the grant	Information on the grant
Italy	**Energy Intensive Industries support programme**	Economic policy / Tax incentive	EA obligation if the company voluntary applies for the tax relief	Information on the mechanism (Italian)
	Subsector guidelines	R&D / Art.8 data elaboration	EA data elaboration	Agency webpage on sectoral guidelines (Italian)
Lithuania	**Relief for industrial enterprises**	Economic policy / Tax incentive	EA and EEMs obligation	Measure administer webpage
	Improving energy efficiency in enterprises	Economic policy / Subsidy	EA obligation to apply for the grant	Measure administer webpage
Netherlands	**Energy saving obligation – Recognised Energy saving Measures List**	Prescriptive policy / Law obligation	List of EEMs (EML) to be included in EA	Link to EML (Dutch)
Malta	**MERCA – Managing Essential Resources in Retail through Consumption Analysis**	Economic policy / Tax incentive	Support to EA for non-obligated companies	Information on project launch

Country	Good Practice	Category/Type	Link with Art.8	Link
Portugal	**SGCIE – Management System for Intensive Energy Consumption**	Prescriptive policy / Law obligation	EA and EEMs obligation	Programme webpage
	Energy Consumption Management Regulation for the Transport Sector	Prescriptive policy / Law obligation	EA and EEMs obligation	Programme webpage
	Subsector notebooks	R&D / Art.8 data elaboration	EA data elaboration	Agency webpage on sectoral notebooks (Portuguese)
Slovakia	**Reduction of energy intensity and increased use of renewable energy sources in businesses (Bratislava region)**	Economic policy / Subsidy	Implementation of EEMs identified in the EA	Incentive documentation
	Reduction of energy intensity and increased use of renewable energy sources in businesses (national except Bratislava region)	Economic policy / Subsidy	Implementation of EEMs identified in the EA	Incentive documentation

Table 12. Identified good practices to encourage the implementation of EEMs in Partner Countries

In the following sections the measures are grouped and commented by typology, using the classification explained below

- **Economic policy / Tax incentive:** Economic policy with tax incentives encourages energy efficiency by offering tax breaks to businesses who invest in EEMs.
- **Economic policy / Subsidies:** Economic policy with subsidies provides financial support to encourage the adoption of EEMs.
- **Prescriptive policy:** Prescriptive policy involves setting specific regulations or standards that require businesses to adopt certain energy-efficient practices or technologies.
- **Supportive policy/ Networks:** Supportive policy with networks focuses on creating collaborative frameworks that connect stakeholders, such as businesses, governments, and experts, to share knowledge and resources and at the same time achieve energy efficiency targets.
- **R&D/ Data elaboration:** It involves investing in research and development for analysing the data collected from EAs, to evaluate the effectiveness of implemented measures, identify sectoral and overall trends, and inform the design of future policies or improvements in energy efficiency strategies.

The graph in Figure 5 illustrates the distribution of the 18 collected best practices by type, along with the number of countries involved.

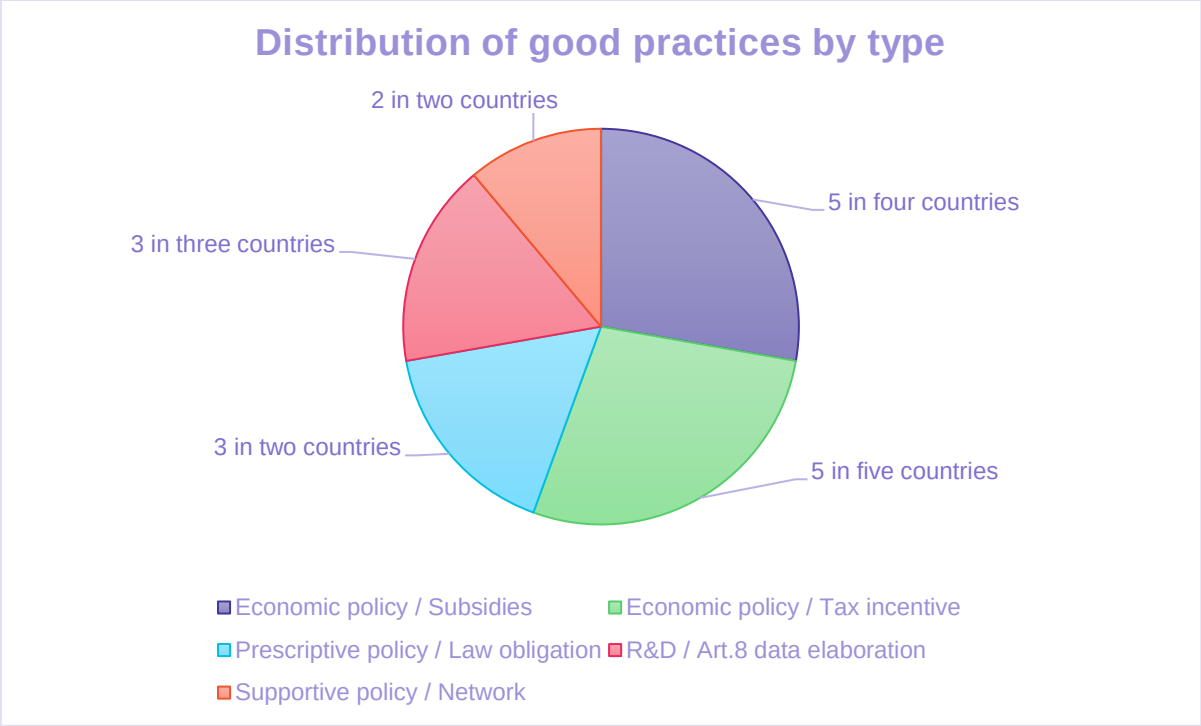

Figure 5. Distribution of good practice types for the implementation of EEM measures in Partner Countries

4.8.1. Economic policy / Tax incentive

In **Croatia**, a reduction of fees for RES and high-efficiency cogeneration is in place, with the aim of reducing the risk for energy intensive companies to delocalise their production activities. One of the conditions to access the mechanism was having an EAs according to the methodology of large enterprises or to the ISO 50001 standard. As part of this process, the Energy Market Operator (HROTE) maintains and publishes a database of enterprises accessing the incentive for 2020-2023 period. The companies should provide evidence either on implementation of **EEMs identified in the EAs with a payback period of up to three years,** reduction of the carbon footprint of electricity consumption and investment of a minimum of 50% of the support amount in emission reduction projects. The implemented measures have been registered in SMIV, but these data are still not published.

In **Malta**, through the MERCA pilot project a number of EAs were carried out within the identified establishments to characterise the energy and water usage in the food retail sector, whilst assisting these outlets with the available opportunities to implement audit recommendations. EWA also gathered information on the consumption patterns and savings achieved. In this way, enterprises will be able to assess their performance and potentially, similar enterprises can identify the opportunity cost of changing their approach. The project is also aiming to support the participating companies to implement some of the measures that are identified through the audits being carried out.

The services in the public interest (SPI) relief for industrial enterprises in **Lithuania** is a financial measure aimed at supporting industrial companies in improving their energy efficiency and promoting environmental sustainability. It is part of a broader package of state-supported initiatives, including funding for companies to implement environmental solutions and technologies. The "SPI relief for industrial enterprises" is a support mechanism to finance the implementation of energy efficiency improvement measures in all major industrial plants in Lithuania that consume more than 1 GWh of electricity per year. Companies receive compensation for the implementation of energy efficiency improvement measures – companies can recover 85% of the public service price paid for electricity consumed in the previous calendar year in excess of 1 GWh, provided that the recovered funds are earmarked for investments in energy-saving measures. EEMs are planned to be put in place annually, leading to annual energy savings of around 77 GWh and 4.23 TWh of energy savings by 2030. In order to improve the energy efficiency of businesses, **Lithuania** has planned a financial instrument that encourages companies to implement EEMs identified in the EAs. It is planned to provide a subsidy for the energy savings achieved and to save 100 GWh annually and close to 5.5 TWh by 2030. Eligible applicants include legal entities registered and operating in Lithuania that consume energy for their own end use. To qualify, these entities must not participate in the European Union's emissions trading system, and they should not fall under Classification C (Manufacturing) in economic activity types. Funding is available for the purchase and installation of new, unused equipment for lighting, heating systems, or technological processes. This equipment should be implemented as part of energy efficiency improvements recommended in an energy consumption audit report, with the goal of making energy use more efficient.

In **Germany**, the national emission trading system includes a carbon leakage regulation to protect companies from CO_2 price disadvantages. This regulation offers compensations for eligible companies, covering 65-95% of additional CO_2 certificate costs based on emissions intensity per Euro of gross value added. In exchange for compensation, companies must implement a certified energy management system (ISO 50001) or an environmental management system (EU No. 1221/2009). Smaller companies (with energy demand below 10 GWh over the past three years) may adopt a less stringent, non-certified system (ISO 50005:2021) or join the Initiative for Energy Efficiency and Climate Networks (IEEKN). In addition, companies must reinvest at least 80% of their received compensation) in EEMs from 2025 onwards (at least 50% prior to 2025), which must go beyond existing regulatory requirements. EEMs should be economically viable, meaning they should either have a positive capital

value over their lifetime or a reasonable payback period. Alternatively, companies may prove they have invested in decarbonising production processes if their emissions are below the EU Emission Trading Scheme product benchmark, which represents the top 10% most efficient EU production plants.

In **Slovakia**, two measures aimed at **reducing energy intensity and increasing the use of renewable energy sources** support businesses in the Bratislava region and across the rest of the country. These initiatives focus on the reconstruction and modernisation of industrial and related service buildings to reduce energy consumption. Support is provided for improving energy efficiency through various sub-measures, based on EAs, including enhancing the thermal and technical properties of building structures, upgrading heating/air conditioning and hot water systems, and modernising lighting systems in industrial and service buildings. This support helps businesses reduce their overall energy demand, contributing to energy savings and improved sustainability.

In **Italy**, energy-intensive companies, both large and SMEs, that voluntarily apply for partial tax relief on electricity (registered with CSEA, the government agency) are required to conduct EAs. These companies, known as "Energivori", consume more than 1 GWh per year and belong to specific industrial sectors (in Annexes 3 and 5 of EU Guidelines 2014/C 200/01). Under Legislative Decree 73/2020, they must implement at least one energy efficiency measure from the audit every four years. SMEs in this category submit audits to ENEA under D.Lgs. 102/14. Since 2021, the programme has been extended to natural gas consumption, with similar requirements for companies using at least 1 GWh or 95,000 Nsm^3 annually.

4.8.2. Economic policy / Subsidy

In **Ireland**, the Local Enterprise Office (LEO) administers the Energy Efficiency Grant, **which reimburses** 75% of eligible costs from a minimum grant of 750 Euro to a maximum of 10,000 Euro. The investment in technologies and equipment are supported in companies having carried out **a Green for Business Report, GreenStart Report** or a **SEAI EAs.** So, an EAs is one of the pre-conditions to access the mechanism, since the incentive is aimed to support the recommendations of one of the above reports. This scheme supports not only energy efficiency, but also other aspects of sustainability project expenditure associated with the operation of an enterprise, for example water and circular economy. The aim of the scheme is to reduce the impact of enterprises on the environment thereby increasing the agility and resilience of these businesses.

In **Lithuania** the NECP measure EE9 (Improving energy efficiency in enterprises) is a financial instrument that supports companies in implementing EEMs identified in EAs. The goal is to achieve 100 GWh of annual energy savings, with a minimum of 20 MWh/year saved per project. It provides subsidies for energy savings, focusing on new lighting, heating, or process equipment, as well as other EEMs. Eligible applicants are energy-consuming legal entities operating in Lithuania that are not part of the EU emissions trading system and do not belong to the manufacturing sector (classified under C). Costs related to renewable energy systems or building modernisation are excluded. To apply, companies must have an EAs approved by the Lithuanian Energy Agency. Financial support is granted through specific calls for applications, with aggregated energy savings data made publicly available.

4.8.3. Supportive policy / Network

In **Ireland**, LIEN is a energy efficiency network made up of 205 of Irelands largest energy users that are committed to improving their energy performance. Companies are eligible to join the network if they are either spending at least 1 million Euro on energy annually or are certified to or pursuing ISO 50001 certification. After signing up to

LIEN, companies should fulfil certain commitments, namely development of an energy management system, set and review energy targets, and report annually on energy performance. In the framework of the network, guides are published, documenting best practice and techniques for reducing energy use. LIEN members account for 18% of the national total primary energy requirement in 2022.

Launched in **Germany** in 2014, the **Initiative for Energy Efficiency Networks (IEEN)** helps companies collaborate and share best practices to improve energy efficiency. Having an EA is an access condition to participate. The initiative provides a platform where businesses can exchange experiences, implement EEMs, and achieve collective sustainability goals. In 2021, it expanded to include climate action and sustainability, becoming the **Initiative for Energy Efficiency and Climate Action Networks (IEEKN)**. Companies participate in networks that focus on identifying and implementing energy-saving measures, while also setting targets for reducing energy consumption and emissions. Since its inception, 431 networks have involved over 3,000 companies, saving 7,432 GWh of energy and 2.69 million tCO_2 annually. Early results from the second phase (2021 onwards) show high potential, despite limited data.

4.8.4. Prescriptive policy

In Portugal the **SGCIE (Management System for Intensive Energy Consumption)** programme aims to enhance energy efficiency by modifying production processes, introducing new technologies, and fostering behavioural changes. It applies to facilities consuming over 500 toe/year, requiring mandatory EAs every eight years. Installations under the EU – ETS and those with lower consumption may participate voluntarily. Energy-intensive consumers (EIC) must implement Energy Consumption Rationalisation Plans (PREn) with targets to reduce energy intensity and specific consumption by at least 6% over eight years for facilities ≥1000 toe/year, or 4% for smaller installations. PREn prioritizes measures with payback periods of ≤5 years (or ≤3 years for smaller installations). From 2008 to 2023, SGCIE registered 1,349 installations, mostly industrial, accounting for 20% of Portugal's primary energy consumption (2019 data). SGCIE aligns with Art.8 of the EU EED, sharing goals of mandatory EAs, efficiency improvements, and regular monitoring to reduce energy use and emissions.

In addition to the SGCIE the **Energy Consumption Management Regulation for the Transport Sector (RGCEST)** is aimed at improving energy efficiency in transport. The regulation mandates energy-intensive companies (≥500 toe/year) to conduct EAs and implement a three-year Energy Consumption Rationalisation Plan (PRCE) to reduce energy intensity. RGCEST applies to transport companies or those with energy-intensive fleets (CIE). The audits identify opportunities to reduce costs and CO_2 emissions, forming the basis for PRCEs that outline energy-saving measures. The Directorate-General for Energy and Geology (DGEG) oversees PRCE implementation through annual progress reports (REP).

Both the SGCIE and the RGCEST align with Art.8 by mandating regular EAs, encouraging energy-saving plans, and fostering reduced energy consumption in energy-intensive process and transport operations. SGCIE and RGCEST aim to promote sustainable practices and lower emissions through structured monitoring and actionable measures.

4.8.5. R&D / Data elaboration

In **Italy**, the "*Quaderni dell'efficienza energetica*" series was created by ENEA as part of the "Electricity System Research 2019–2021" programme, continuing into the 2022–2024 period. These publications guide companies and professionals in preparing EAs compliant with Annex II of Legislative Decree 102/2014. They cover sector-specific

production processes, energy performance indicators, monitoring systems, and implemented and recommended EEMs, including economic and energy evaluations. Sectoral EAs guidelines have been published for glass, cement, pharmaceuticals, waste incineration, foundries, hotels, and offices, with more sectors (ceramics, plastics, textiles) to be released by year-end.

In **Portugal**, **Subsector notebooks,** developed by ADENE**,** use the SGCIE database to analyse energy consumption and efficiency indicators for companies with approved Energy Consumption Rationalisation Plans (PRCE). They assess the energy and environmental performance of installations before implementing the efficiency measures in these plans. The notebooks also systematize the energy-saving potential of each subsector and highlight the most common efficiency measures with the greatest impact on energy reduction. Additionally, they include the average payback periods for each measure and analyse them both individually and by type. Currently, 21 notebooks are available, categorised by NACE (rev.2) codes.

In **Croatia**, a first analysis of EA reports from 63 large companies (126 reports) was conducted under the auspices of LEAPto11 project. It identified 766 EEMs with a total savings potential of 255 GWh in buildings, 20 GWh in processes, and 1.5 GWh in transport. Most EAs included relevant indicators, such as savings or CO_2 emissions; some lacked quantitative details or consistent data structures. Recommendations from the analysis include standardised reporting forms, detailed EEM records, and ongoing monitoring of implemented EEMs. These improvements aim to enhance data consistency, compliance, and strategic energy management.

4.9. Conclusions on implementation of EEMs under Art.8

In general, the analysis of the policies and practices adopted by various countries regarding EEMs under Art. 8 reveals significant variability in the approach and transposition of regulations. While some countries, have developed structured systems and clear obligations for companies, others adopt less stringent measures that do not require companies to implement all the recommendations from EAs.

A common aspect among countries is the improvement of data collection and management systems if compared to the first obligation period, transitioning from traditional methods based on pdf documents to advanced digital platforms. This not only helps monitor the implementation of EEMs but also facilitates more efficient data collection and analysis, making reporting processes more transparent.

Furthermore, the variability in reporting practices, such as the publication of EEM implementation rates, highlights that while some countries have adopted more formalised approaches, overall transparency could be improved. In general, the availability of information on the implementation rate would play a crucial role in monitoring the effectiveness of policies and identifying any barriers to the implementation of recommended measures.

It should be emphasised that many countries have not yet systematically tracked the implementation rate of EEMs, but doing so would be crucial for monitoring progress towards energy savings long term objectives. Additionally, as highlighted in Section 4.5, Action Plans, while not yet widely adopted, are expected to play a key role in enhancing the implementation of EEMs rates and tracking progress, and a harmonised approach to their requirements and reporting could provide a solid foundation for future EU-wide analyses and comparisons.

Several countries use EAs as a prerequisite for accessing funding or tax relief, encouraging companies to act on the recommendations that arise. Other countries, use European structural funds to finance the implementation of audit recommendations.

Finally, national experiences in EAs' data elaboration demonstrate how standardising audit practices can help identify EEMs specific to each sector, improving the effectiveness of existing policies and programmes and facilitating sector-specific investments in energy efficiency and decarbonisation.

In summary, while Partner Countries show heterogeneous approaches to managing EEMs, common practices such as integrating economic incentives, digitising monitoring processes, and promoting Action Plans for the implementation of EEMs could contribute to the overall effectiveness of energy policies. Standardisation and harmonisation of reporting practices, including the publication of implementation rates, could further strengthen policy effectiveness and facilitate cross-country comparisons in assessing progress in energy efficiency.

5. Implementation of EEMs – other relevant programmes beyond Art.8/11

It is important to evaluate programmes beyond Art.8 that have had an impact on the implementation of EEMs, specifically looking at how the data related to the measures were collected. This section explores the implementation of EEMs beyond the scope of EED Art.8/11, focusing on its integration into broader national and regional programmes, selected by Partner Countries are particularly effective. It highlights the diversity of approaches adopted by the Partner Countries, illustrating how EEMs are incorporated into wider energy efficiency and sustainability frameworks. The analysis provides insights into the synergies between EEMs and other national and regional initiatives aimed at advancing climate and energy goals. Specifically, this section examines 37 measures, identified by the project partners, related to the implementation of EEMs in businesses, for which relevant indicators are available assessing the results of the programs in terms of the implementation of EEMs. This section could provide valuable insights, also considering that Member States are increasingly adopting a more integrated approach to energy efficiency taking into account the new requirements of Art.11.

Table 12 maps various programmes, projects, and initiatives in the Partner Countries that go beyond the specific requirements of Art.8/11 of the EED. These programmes aim to support energy efficiency improvements across sectors and are part of broader efforts to promote sustainable energy practices.

The programmes include a range of approaches, such as economic policies, supportive policies, and prescriptive policies. As in Section 4.8, measures are grouped and commented by typology, using the following classifications:

- **Economic policy / Cap and trade scheme** - A cap and trade scheme is a market-based policy where a limit (cap) is set on total emissions or energy use for businesses. Companies can trade allowances to reduce costs and remain within the cap.
- **Economic policy / Loan** - Economic policy with loans provides businesses with financial support through low-interest or zero-interest loans to fund investments, reducing upfront costs and making these initiatives more accessible.
- **Economic policy / Tax incentive** - Economic policy with tax incentives encourages energy efficiency by offering tax breaks to businesses who invest in EEMs.
- **Economic policy / Subsidy** - Economic policy with subsidies provides financial support to encourage the adoption of EEMs.
- **Prescriptive policy / Obligation** - Prescriptive policy with obligation involves setting specific regulations or standards that require businesses to adopt certain energy-efficient practices or technologies.
- **Supportive policy / Awareness raising campaign** - Supportive policy with awareness-raising campaigns aims to inform and educate businesses about the benefits and opportunities of energy efficiency, using workshops, media campaigns, or industry events.
- **Supportive policy / Energy saving agreements** - In voluntary agreements between governments and businesses companies commit to specific energy-saving targets. In return, they may receive benefits such as financial incentives or technical support to help achieve these goals.

- **Supportive policy / Information system** - Supportive policy with information systems involves the development of centralised platforms or tools to track, monitor, and share energy consumption data, helping businesses benchmark their performance and identify opportunities for improvement.
- **Supportive policy / Network** - Supportive policy with networks focuses on creating collaborative frameworks that connect stakeholders, such as businesses, governments, and experts, to share knowledge and resources and at the same time achieve energy efficiency targets.
- **R&D/ Data elaboration** - It involves investing in research and development for analysing the data collected from EAs, to evaluate the effectiveness of implemented measures, identify sectoral and overall trends, and inform the design of future policies or improvements in energy efficiency strategies.
- **R&D/ Tool development** - This covers investing in the creation of specialised tools, models, or software to help businesses analyse energy use, optimize operations, and design more effective EEMs tailored to their needs.

For example, Germany's "Federal Funding for Energy and Resource Efficiency in the Economy" and Portugal's "Energy Consumption Efficiency Promotion Plan (PPEC)" offer financial support for implementing EEMs, with published reports on energy savings, investments, and CO_2 reductions. Other programmes, like Lithuania's "NECP Measure EE4," focus on energy education and advice.

In some Partner Countries, such as the Netherlands and Slovakia, there are obligations for businesses to meet certain energy savings targets, often linked to financial support. The availability of data on the implementation of EEMs varies by country, with some providing detailed reports on energy savings, investments, and measure implementation, while others offer restricted access. Overall, all of these programmes aim to encourage energy efficiency across industries and promote the use of renewable energy, thus contributing to broader environmental and energy goals beyond the scope of Art.8/11 EED.

For a more detailed exploration, Annex 7.2 includes country-specific factsheets that provide in-depth information on all the examined measures, available indicators, and key messages arising from the analysis.

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Croatia	**SMIV - National Monitoring, Measuring and Verifying Energy Savings System**	Active	Supportive policy / Information system	Yes The database has restricted access, but information such as investments, final and primary energy savings, CO_2 savings are available.	Information system on governmental/ministry website (Croatian, login)
	ISGE - Energy Management System in the public sector	Active	Supportive policy / Information system	Yes The database has restricted access, but information such as investment, estimated energy and CO_2 savings, payback period are available.	Information system description on governmental/ministry website (Croatian)
Germany	**Special Compensation Scheme within the Energy Finance Act**	Active	Economic policy / Tax incentive	No	BAFA webpage on incentive (German)
	Federal Funding for Energy and Resource Efficiency in the Economy	Active	Economic policy / Subsidy	Yes Evaluation reports are published, including information on applications, fundings and GHG emission reductions	Bfee webpage on incentive evaluation (German)

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
	Federal Funding for Buildings - Non-Residential Buildings	Active	Economic policy / Subsidy	Yes Evaluation reports are published, including information on applications, fundings and final and primary energy savings, distinguishing by new construction and renovation	BWK webpage on incentive (German)
	SME-Innovative: Energy Efficiency, Climate Protection and Climate Adaptation	Active	Economic policy / Subsidy	Yes Examples of financed projects	BmBF webpage on incentive (German)
	KFW Energy Efficiency Programme Production Facilities/Processes	Active	Economic policy / Loan	Yes Evaluation reports are published, including the number of project, investments and final energy savings	BWK webpage on incentive (German)
	Environmental Innovation Programme	Active	Economic policy / Loan	Yes Evaluation reports are published, including the number of project, project description, CO_2 and/or energy savings	Incentive webpage (German)
	Federal Funding for Efficient Heating Networks	Active	Economic policy / Subsidy	No	BWK incentive webpage (German)

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
	Climate Protection Initiative - Measures for Refrigeration and Air Conditioning Systems	Active	Economic policy / Subsidy	Yes Evaluation reports are published, including information on energy savings, investments and cost effectiveness	BWK incentive webpage (German)
	Climate Protection Offensive for Companies	Active	Economic policy / Loan	No	BMK incentive webpage (German)
	ÖKOPROFIT	Active	Supportive policies / Networks	Yes Evaluation reports are published, including the number of networks, number of measures, energy and CO_2 savings, avoided wastes	Incentive webpage (German)
	SME Energy Transition and Climate Protection Initiative of the Chamber of Skilled Crafts (MIE)	Active	R&D / Tool development	No	Initiative webpage (German)
Greece	**Exoikonomo - Epichiro**	Ended	Economic policy / Subsidy	-	Incentive webpage
	Modern manufacturing	Ended	Economic policy / Subsidy	Yes	Incentive webpage (Greek)

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Ireland	**Non-Domestic Microgen scheme (NDMG)**	Active	Economic policy / Subsidy	Yes The database has restricted access, but information such as applications, financing and installed capacity are available	Energy agency webpage
	EXEED Grant Scheme	Active	Economic policy / Subsidy	Yes The database has restricted access, but information on case studies is available	Energy agency webpage
	Support Scheme for Renewable Heat (SSRH)	Active	Economic policy / Subsidy	Yes The database has restricted access, but information is available on applications, distinguishing for heat pumps and biomass, and corresponding CO_2 savings	Energy agency webpage
	Energy Efficiency Obligation Scheme (EEOS)	Active	Economic policy / Cap and trade scheme	Yes The database has restricted access on the performance of OP's against their targets	Energy agency webpage
	Accelerated Capital Allowance (ACA)	Active	Economic policy / Tax incentive	Yes	Energy agency webpage

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Italy	**Regional incentives for SMEs Lombardy**	Ended	Economic policy / Subsidy	Yes For each company: average energy consumption over three years, EPIs before and after EEMs and funding received	Regional website (Italian)
	White Certificates Scheme	Active	Economic policy / Cap and trade scheme	Yes Number of EEMs per technology for standardised approaches, energy savings associated to those EEMs, energy savings per sector	Incentive webpage (Italian)
	Transition 4.0 and Transition 5.0 Plans	Active	Economic policy / Subsidy	Yes Aggregated economic data partially available for Transition 4.0 only	Transition 4.0 webpage Transition 5.0 webpage
	Technology and innovation for savings and widespread energy efficiency (TREND)	Ended	Economic policy / Subsidy	Yes Set of indicators not publicly available, including annual energy consumption by source, energy expenses, production volumes and revenue	Initiative description

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Lithuania	**NECP Measure EE4 – Agreements with energy suppliers on consumer education and advice.**	Active	Supportive policy / Awareness campaign	Yes	Measure description
	NECP measure EE6 – Energy saving agreements with energy companies	Active	Supportive policy / Energy saving agreements	Yes	Measure description
Netherlands	**Energy saving obligation**	Active	Prescriptive Policies/ Obligation	Yes Aggregated data are publicly available	Energy Agency webpage (Dutch)
	Energy Saving Notification obligation	Active	Prescriptive Policies/ Obligation	Yes Aggregated data are publicly available	Energy Agency webpage (Dutch)
	Energy Saving Investigation obligation	Active	Prescriptive Policies/ Obligation	Yes Aggregated data are publicly available	Energy Agency webpage (Dutch)
	Energy Investment Allowance (EIA)	Active	Economic policy / Tax incentives	Yes Aggregated data are publicly available	Energy Agency webpage (Dutch)

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Malta	**Investment Aid for Energy Efficiency Projects**	Ended	Economic policy / Subsidies-Tax incentives	Yes Energy savings and investment costs are available.	Governmental website
	Smart and Sustainable Investment Grant	Active	Economic policy / Subsidy	Energy savings and investment costs are available	Governmental website
Portugal	**Energy Saving Plan**	Ended	Supportive policy / Awareness campaign	Yes Energy saving and measures are available	Initiative webpage (Portuguese)
	Energy Consumption Efficiency Promotion Plan (PPEC)	Ended	Economic policy / Subsidies	Yes Reports with the approved measures and the impacts and benefits of the measures are periodically published.	Initiative webpage (Portuguese)
	Environmental Fund	Active	Economic policy / Subsidies	Yes Information on funded projects, co-financing value granted and execution rate is available	Incentive webpage (Portuguese)

Country	Programme	Status	Category/Type	Availability of data on the implementation of EEMs	Link
Slovakia	**SlovSEFF sustainable energy financing facility**	Ended	Economic policy / Subsidies	Yes Aggregated energy savings	Agency webpage (Slovak)

Table 13. Identified programmes and initiatives on the implementation of EEMs in Partner Countries beyond Art.8

6. Conclusions

This report analyses the state of implementation of EEMs in the Partner Countries, with a particular focus on how data and information are collected and managed by energy authorities in the context of transposing the new Directive. It specifically examines how data related to EEMs are collected not only within the framework of Art.8, but also beyond it, assessing the effectiveness of these approaches in supporting the transition to the new requirements of Art.11. Furthermore, the report highlights how EEMs are integrated into broader national and regional programmes, with Partner Countries adopting diverse approaches. The mapping of 37 measures, identified by project partners, provides valuable insights into the synergies between EEMs and other initiatives aimed at achieving climate and energy goals. For more detailed information, Annex 7.2 includes country-specific factsheets that offer an in-depth overview of each measure, available indicators, and key findings.

The deliverable aims to provide valuable insights for policymakers and energy authorities in enhancing their strategies for implementing EEMs as outlined in the revised Directive. Main results are summarised in the following.

1. **Data gaps:** Most countries lack systematic tracking of EEM implementation, limiting policy evaluation and compliance with Art.11 of the revised Directive.

   A key finding of this analysis is that many countries lack systematic tracking the implementation rate of EEMs recommended through EAs and EnMS over time. In only one third of the partner countries, data on EEMs included in EAs are collected in a structured and searchable database. The availability of data on EEMs varies in terms of time coverage, type of measure (implemented vs proposed), and indicators. When comparing EAs with EnMS, data availability is generally higher in the former.

   Additionally, even in programmes beyond Art.8, the information provided often focuses solely on financial support to businesses, with limited insights on the actual measures implemented. This data gap poses a significant challenge to accurately estimating the actual implementation of EEMs at both national and European levels. Moreover, it hampers the ability to assess the effectiveness and reach of EEMs across different policy initiatives.

   It is crucial to have reliable information from businesses regarding the measures they have implemented and plan to implement, as this will be mandated under Art.11 of the revised Directive. However, as of today, only a few countries include the development of Action Plans to programmes beyond the scope of Art.8. This represents a significant challenge for the transposition of Art.11, as many countries will need to establish robust systems for collecting and monitoring this data. Even if the drafting/development of Action Plans is required, there is a lack of clear guidelines on their required contents and structure.

   More broadly, the availability of reliable data is essential for designing effective energy policies and achieving long-term goals, set out in the National Integrated Energy and Climate Plans (NECPs). Moreover, achieving the Fit for 55 targets within the established timelines is a challenging task for EU Member States. Increased data availability on EEMs would provide invaluable guidance for these efforts.

2. **Incentives**: Stable, selective, tailored and data-driven incentives are essential for maximising energy savings and ensuring cost-effectiveness.

Among the enabling factors analysed, incentives stand out as the most pivotal, with most countries rating them as highly relevant. To be effective, incentives must be stable over time and selective, targeting the most impactful EEMs. This requires the careful selection of eligible interventions to ensure that policy objectives are met at the lowest possible cost. Rationalise incentive spending is crucial to maximise energy savings while minimising the burden on public funds ensuring that such policies remain financially sustainable. For this reason, incentive mechanisms should be tailored, prioritising performance improvements rather than adopting blanket approaches. Data plays a key role in assessing the effectiveness of existing incentives, enabling policy makers to identify which mechanisms have been successful and which have not.

3. **Cultural and institutional support**: Promoting an energy efficiency culture and adopting international standards are key to achieve long-term energy efficiency targets.

Institutional support and the promotion of an energy efficiency culture are also identified as essential components to drive the widespread adoption of EEMs. This reflects the understanding that a deep-rooted energy efficiency culture is a prerequisite for achieving meaningful progress in EEM implementation and energy savings. Building a culture of energy efficiency involves fostering awareness, education, and commitment among businesses and organisations. Recognising companies that lead by example in implementing and promoting EEMs can inspire broader participation across companies. Finally, training programs for energy managers, policymakers, and auditors ensure that the necessary expertise is in place to implement and monitor EEMs effectively.

4. **Standardisation**: Harmonised reporting and standardised monitoring are needed for better cross-country comparisons and policy optimisation.

The adoption of international standards has also proven to be relevant, particularly in relation to the multiple benefits of energy efficiency. When these benefits are considered, they enhance the economic viability of EEMs and encourage their implementation.

The available data emphasises the importance of harmonised reporting to allow for better cross-country comparisons and more effective policy evaluation. The variability in data completeness and reporting periods highlights the need for greater standardisation in the monitoring of EEMs. Looking ahead, it will be essential to explore how existing programmes contribute to the goals of the EED and whether sufficient tools are in place specifically for the implementation of EEMs. Identifying trends, such as the support of specific types of EEMs through fiscal incentives or other programmes, could provide further insights to optimize national and European energy policies.

Overall, these findings underscore the importance of developing data-driven and comprehensive strategies, focused on tailoring existing incentives to improve their effectiveness, and accompanied by the promotion of energy efficiency culture and commitment, at both national and international levels, to standardisation. Doing so could significantly support Member States in meeting their energy and climate goals while advancing broader sustainability objectives. By combining institutional leadership with a well-established energy efficiency culture, policymakers can ensure sustained progress toward achieving both immediate energy savings and broader climate goals.

This report has provided a clear and comprehensive overview of the state of the art regarding the different approaches used by the Partner countries in the data collection and analysis of EEMs regarding the requirements of Art.8 and beyond. The overview could serve as the starting point for a deeper investigation into how existing

policies and programmes on the implementation of EEMs can contribute to achieving the EED goals. Furthermore, it facilitates the comparison of different policy approaches such as prescriptive policies vs. supportive policies in terms of their effectiveness in increasing the implementation of EEMs rates. Finally, it opens the door to exploring scenarios for replicating successful national approaches on a broader scale.

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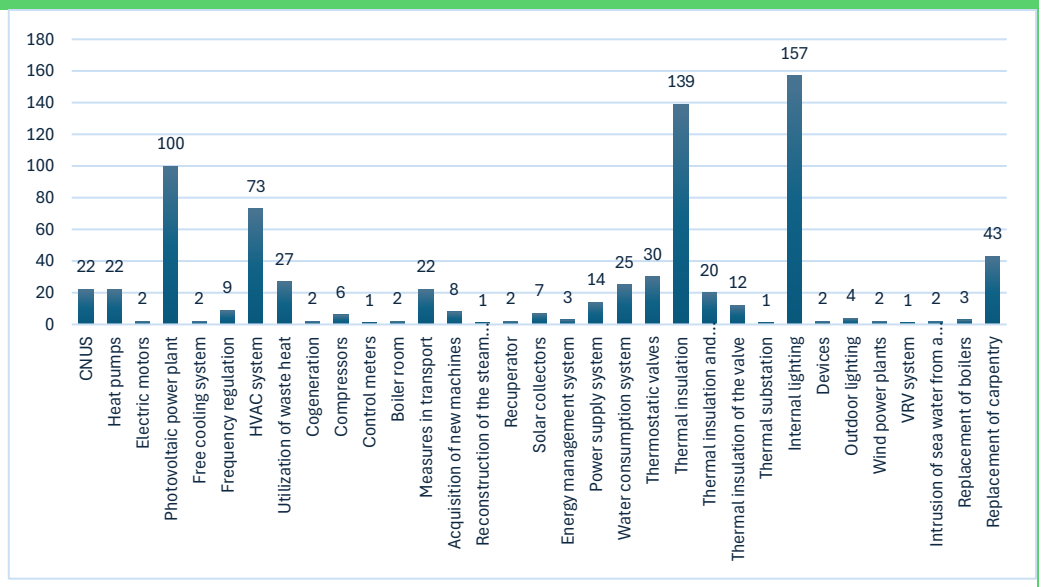
7. Annex

7.1. Good practices useful for encouraging the implementation of EEMs under Art.8/11

7.1.1. Croatia

Name of the programme in Country language	**Uredba o kriterijima za plaćanje umanjene naknade za obnovljive izvore energije i visokoučinkovitu kogeneraciju**
Name of the programme in English	Regulation on the criteria for the payment of reduced fees for renewable energy sources and highly efficient cogeneration
Description	The Croatian Energy Market Operator (HROTE), with the aim of reducing the risk for all entrepreneurs with high electrical intensity and electricity consumption of continuing their activities outside the borders of the European Union due to the costs arising from the payment of fees, adopted the Regulation on the reduction of fees for RES and high-efficiency cogeneration. One of the conditions was that the enterprise had an EAs according to the methodology of large enterprises or according to the ISO 50001 standard. As part of this process, HROTE maintains and publishes a database of enterprises that have achieved the right for 2020, 2021, 2022 and 2023. Data available in the published database concerns name of the enterprise and responsible person, company's activity, company's electricity consumption for the previous three years and costs, annual gross added value and annual electrical intensity The energy market operator carries out the procedure of monitoring the use of funds generated by financial relief for compensation for RES and HEC fee. An entrepreneur who has exercised the right to a fee reduction, within the earliest 60 days to the latest 30 days before its expiration, is obliged to deliver to the operator energy markets the following evidence: • proof (Elaborate on energy savings) that the entrepreneur has carried out minimum EEMs in accordance with the EAs based on who exercised the right to a reduction of the fee for RES with a payback period of up to three years • or that he reduced the carbon footprint of electricity consumption by ensuring that the entrepreneur provides a minimum of 60% of the necessary electricity from RES • or that he invested a minimum of 50% of the support amount in projects to significantly reduce greenhouse gas emissions of entrepreneurs. The document Elaborate on energy savings prepared by a person authorised for EAs of large companies and proof that the implemented measures have been registered in the system for monitoring, measuring, and verifying energy savings (SMIV) and other documentation is considered as proof. In the procedure, the energy market operator is authorised to request from the entrepreneur and/or the operator of the distribution and/or transmission system, the competent financial institutions, and the authorised person for energy certification all the necessary data in order to determine the conformity of the use of the right to reduce the fee for RES and HEC. If the energy market operator determines that the entrepreneur has not implemented all measures in the manner provided for in the Regulation, the entrepreneur is obliged to refund the amount of support granted to his electricity supplier based on the calculation that will be determined in the decision. Supplier of electricity is obliged to pay this amount to the operator of the energy market. Unfortunately, data on the implemented EEMs, savings and CO_2 reduction for companies that report to HROTE on the implemented EEMs are still not published.
Link in national language and/or English	https://www.hrote.hr/evidencija-poduzetnika-prihvacenih-za-umanjenje-naknade-za-oieik https://narodne-novine.nn.hr/clanci/sluzbeni/2023_03_31_534.html
Why it is relevant to the scope of the Section	Incentives for the implementation of EEMs proposed in EAs.

Name of the programme in English	**Analysis of Data Management from Large Enterprise EAs Reports**
Description	As part of Working package 2 of the LEAP 11 project and in cooperation with the Ministry of Economy, the first preliminary analysis of data from EAs of large enterprises reports was made. The analysis included 126 reports, i.e. 63 large companies that prepared the first and second EAs for large companies, ending in April 2024. The purpose of the analysis was to investigate the structure, availability and completeness of data in reports on EAs of large companies. The aim of the analysis is to identify opportunities for improvement and develop recommendations for conducting and managing data from EAs of large companies for compliance with reporting requirements in accordance with Art.11 EED. Activities were carried out: analysis of the Register, identification of companies in the Register according to economic areas of activity, collection and analysis of data on energy and water consumption, collection and analysis of proposed and implemented EEMs and related indicators, identification of non-compliance and incompleteness of data, general recommendations for improving the quality of reports and establishing forms for reporting and data management.  **Number and types of proposed EEMs from the 1st and 2nd EAs reports (2016 2024)** Within the analysis, investment EEMs were included, but measures to change behaviour and introduce energy management systems were not included. 766 EEMs have been registered with a total energy savings potential of about 255 GWh in the *Buildings* sector, 20 GWh in the *Process* sector and 1.5 GWh in the *Transport* sector. Regarding the analysis of data on proposed and implemented EEMs, the following conclusions were reached: the structure of data on EEMs is generally uniform and in most cases complete; relevant indicators such as savings potential, cost efficiency and reduction of CO_2 emissions are presented in almost all reports; in some reports, standard measures of energy efficiency are presented only descriptively, without calculating the effect (savings in kWh and Euro, reduction of CO_2, simple payback period); specific measures, especially in the Processes sector, are often stated only in the form of descriptions, without quantitative assessments; estimates of savings resulting from behavioural change measures are often overestimated, as they are often expressed as a percentage of total energy consumption, which can result in unrealistically high estimates in energy-intensive businesses; in some cases, there is a lack of precise indication of the type of energy to which the effect of a certain EEMs measure applies; the second report rarely compares the implementation status of the EEMs proposed in the first report. Regarding the recommendations for improving the data structure for monitoring the energy efficiency of business sector, the following conclusions were reached: it is recommended to use uniform forms for recording data on energy consumption and implemented EEMs, which ensures consistency and comparability of data; it is necessary to include all relevant data on energy consumption in the forms, including the type of energy source, annual consumption, and consumption by sector (buildings, processes, transport) if applicable; consumption data should preferably be kept at the level of associated companies, locations, ETCs or buildings; consumption data must be maintained at the level of a large company aggregated for all connected companies, locations, ECCs or buildings; EEMs records of measures should contain detailed information on each implemented measure; minimum data requirements for EnU measures: description of the measure, estimated savings (in kWh, Euro and CO_2 reduction), cost of implementation, and simple payback period; it is necessary to monitor the implementation status of EEMs from previous EAs, in order to monitor long-term efficiency; in the forms, it is important to clearly state the status of each EEMs new measure, ongoing, implemented, and regularly update this information; it is desirable to establish monitoring of real savings after the implementation of EnU measures, which would enable comparison with estimates and more accurate analysis. The analysis was devoted also to energy consumption data, but the conclusions are not included here given the focus on EEMs. The preliminary analysis of data from EAs reports of large enterprises in Croatia highlights critical areas for improvement in data consistency, completeness, and comparability. While the EA process provides valuable insights into EEMs and their savings potential across various sectors, inconsistencies in data presentation and a lack of standardised reporting forms hinder comprehensive analysis. Key areas such as detailed metrics on EEMs—particularly for behavioural and sector-specific measures—require a more structured approach. Implementing uniform data collection forms and establishing minimum reporting requirements for EAs would support the Ministry of Economy in assessing compliance and tracking energy efficiency advancements in line with the EED. Additionally, ongoing monitoring and reporting on the implementation and realised savings from previously recommended EEMs could provide critical insights, enabling more strategic decision-making and fostering a culture of continual improvement in energy management among large enterprises.
Link in national language and/or English	N/A
Why it is relevant to the scope of the Section	First analysis on EEMs from EA in Croatia.

7.1.2. Germany

Name of the programme in English	Regulation on Measures for Avoiding Carbon Leakage caused by the National Emission Trading System for Fossil Fuel Combustion in Heat and Transport
Description	In the framework of the national emission trading system for emissions from fossil fuel combustion in heating and transport, introduced in 2019, the carbon leakage regulation shall help to prevent disadvantages for companies facing a CO_2 price. For entitled companies, the regulation offers compensations of 65-95% of the additional costs of CO_2 certificates, based on sub-sectoral emissions intensity per Euro of gross value added, as shown in the table: In return for compensations, companies are obliged (since January 2023) to introduce a certified EnMS in accordance to DIN EN ISO 50001 or an environmental management system according to EG/ No. 1221/ 2009. Companies whose total energy demand of fossil fuels was less than 10 GWh in three years before the accounting year, are allowed to operate a non-certified energy management system based on DIN EN ISO 50005:2021, according to (at least) implementation stage 3. Alternatively, these companies may become a member of the Initiative for Energy Efficiency and Climate Networks (IEEKN). Compensated companies are obliged to implement “economically feasible” efficiency measures identified in the energy management system. Measures are considered as “economically feasible” in case they indicate a positive capital value (according to DIN EN 17463 issued in February 2020) after 60% (2023-2025) or 90% (starting from 2026) of their intended lifetime. For companies with well-established EnMS which evaluate efficiency measures based on their payback period, it is also permissible to determine the economic efficiency of measures based on their payback period (at least during a transition period). Furthermore, companies must reinvest at least 50% (2023-2024) or at least 80% (2025 onwards) of the received compensation in EEMs as mentioned above. These measures need to be additional to existing regulatory obligations. If the total investments for identified efficiency measures are below 80% or 50% of the received compensation, the companies only need to provide proof for these investments. As an alternative for implementing EEMs, companies may also prove that they have invested in measures für decarbonising their production processes, as long as the greenhouse gas emissions of the companies' products are below the respective product benchmark in the EU Emission Trading Scheme. This benchmark represents the average of the most efficient 10% production plants in the EU.
Link in national language and/or English	https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Gesetze/becv_vo_bf.pdf
Why it is relevant to the scope of the Section	Financial relief under this scheme is only granted if companies can provide evidence of an EnMS (or other option, see description above). This encourages companies to establish EnMS and implement EEM, even if there is no obligation under Art.11. As this regulation is within the framework of national emissions trading, it can also be transferred, in this or a similar form, to other countries and their own national emissions trading systems.

Emission Intensity in kg CO_2 per Euro gross value added	Degree of Compensation
≤ 0.3	65%
> 0.3 ≤ 0.6	70%
> 0.6 ≤ 0.9	75%
> 0.9 ≤ 1.2	80%
> 1.2 ≤ 1.5	85%
> 1.5 ≤ 1.8	90%
> 1.8	95%

Name of the programme in Country language	Initiative Energieeffizienz und Klimaschutz-Netzwerke (IEEKN)
Name of the programme in English	Initiative for energy efficiency and climate action networks
Description	The German Federal Government – along with associations and organisations from German industry – launched the Initiative for Energy Efficiency Networks (IEEN) in 2014. Energy efficiency networks have proven to be a suitable instrument that enables companies to exchange experiences with one another and implement measures to increase energy efficiency. The Networks Initiative is a successful tool to implement the National Energy Efficiency Action Plan (Nationaler Aktionsplan Energieeffizienz, NAPE). From 2021 onwards, it continued operations under the name Initiative for Energy Efficiency and Climate Action Networks (IEEKN). The range of topics covered by the networks has been expanded to include climate action, the energy transition and sustainability. However, increasing energy efficiency continues to play an important role. By 2025, the Initiative aims to establish 300 to 350 new networks. These networks are intended to save between 9 and 11 TWh of final energy, and between 5 and 6 million tonnes of greenhouse gas emissions. The Networks Initiative is implemented on behalf of the German Federal Ministry for Economic Affairs and Climate Action, the Federal Ministry for Environment, Nature Conservation, Nuclear Safety and Consumer Protection, and 21 associations and organisations from Industry. Numerous other partners, such as regional coordinators, support the Initiative as well. Since 2014, 431 networks were initiated with more than 3,000 companies and sites involved. The 7th monitoring report of the Networks Initiative (IEEN) clearly shows the continuous success in the implementation of EEMs by the participating companies. Each network in the initiative undergoes a monitoring process at the end of its term. In order to record the overall savings effects of the initiative, the cumulative results of all completed networks are documented in the annual monitoring rounds. The current 7th monitoring report includes the evaluations of 239 networks from the first phase of the Energy Efficiency Networks initiative. The companies in the networks represented in the monitoring report have saved a total of 7,432 gigawatt hours (GWh) of final energy and 2.69 $MtCO_2$ equivalents per year with the reported and quantified measures. The initiative thus demonstrates that the voluntary commitment of companies has a considerable impact. For the current second phase of the Networks Initiative (IEEKN from 2021 onwards), there is not yet a sufficient data basis due to the time delay in monitoring taking place after the end of the networks' term. However, the numbers of new registrations and savings targets submitted by the networks to date indicate that this instrument has a high impact here as well. According to survey results among companies and network leaders as well as moderators, there are also some hurdles despite the many advantages of network participation. As one main drawback of the network activities for company managers the amount of work and time required was mentioned, especially in times of increasing skills shortages and the duplication of workloads for those people who are responsible for energy or environmental issues in companies. In some cases, the costs of network participation are raised as an issue. To counteract this and to create incentives in the form of reduced burdens and even financial benefits for companies, the German government has introduced a special compensation in the Carbon Leakage Regulation (BECV), for example: Under the current regulation, companies can be members of an IEEKN network as an alternative to setting up an EnMS in order to receive the compensation payments. Another example is the Funding Programme for Energy and Resource Efficiency in the Economy (EEW): It includes an additional bonus in Module 5 (Transformation Plans) for companies that are registered in a network of the IEEKN and actively participate in it. This increases the funding rate by 10 percentage points and the maximum possible funding grant can increase by Euro 30,000. This additional bonus is valid until 31.12.2028.
Link in national language and/or English	https://www.effizienznetzwerke.org/ https://www.effizienznetzwerke.org/app/uploads/2023/04/Netzwerkinitiative_Infoflyer_EN.pdf
Why it is relevant to the scope of the Section	Dena implemented several projects in non-EU countries (Mexico, China, and others) to evaluate whether the Initiative is suitable for companies in other economic and political environments. The projects show that it is highly replicable even in countries whose settings differ from EU-countries. Reasons for this are, inter alia: self-financing, self-administration, self-imposed obligations of the company networks. The investment from government side is relatively low compared to the results of savings achieved. The Commission Recommendation on EED Art.11 states, among other things, that member states should ensure that their programmes include support to companies by fostering the development of energy efficiency networks.

7.1.3. Greece

Name of the programme	Athens Business Green Toolkit
Description	In the context of the "Exoikonomo Epichiro" Action of the Recovery and Resilience Fund (RRF) by the Ministry of Environment and Energy, the new programme aims at the energy upgrade of buildings of low energy efficiency and interventions other than those on the building structure, which will contribute significantly to energy saving in line with the country's energy targets. The total budget state expenditure amounts to 176,750,000 Euro. The subsidised budget (state and private participation, excluding VAT) of each investment proposal of a potential aid beneficiary: • may not exceed the amount of five hundred thousand Euro (500,000 Euro) in the case of the tourism sector • may not exceed the amount of two hundred and fifty thousand Euro (250,000 Euro) in the case of the Trade and Services sector. Note that in the case of aid for the provision of consulting or ancillary services in total, said aid may not exceed seven percent (7%) of the subsidised budget of the investment plan, with the maximum total of ancillary expenses covered reaching 30,000 Euro In any case, the subsidised budget (state and private participation, excluding VAT) may not exceed the product of 1.45 Euro multiplied by the total estimated annual primary energy savings (kWh). Where the ratio of subsidised budget to annual primary energy savings is less than 1.45, the eligible amounts shall be reduced proportionately. **Beneficiaries of actions** Enterprises (small, medium and large) in the trade, services and tourism sectors are eligible, except those activities excluded under the ERDF and the Commission's General Block Exemption Regulation (EU) No 651/2014. The Business Activity Codes (KAD) are detailed in Annex 5 of this Call. Expenses eligible under the action include all those related to: • Costs for the implementation of energy upgrade interventions • Costs for preparing, submitting and monitoring the application as well as monitoring the achievement of minimum energy targets under the De Minimis Regulation • Investment costs, required to achieve greater energy efficiency. • Investment costs: **Euro 2.3 million** • **The total budget of the action amounts to 2,300,000 Euro.** The total amount of the co-financed public expenditure of this action can be modified up to the amount of 5,000,000 Euro. In the framework of the action, investment projects with a total investment budget (subsidised budget) of 5,000 to 30,000 Euro are supported. The percentage of public funding amounts to 80% of the investment plan budget. The interventions of this action include: • Interventions in the building envelop (thermal insulation, window frames / glasing, shading systems, etc.). • Upgrading of internal electrical installations and electric power distribution systems. • Upgrading of heat generation and distribution systems for space cooling / heating, as well as the production process (e.g. hot water / steam production equipment and systems, waste heat recovery equipment, etc.). • Upgrading and/or incorporating new materials and equipment to reduce energy losses. • Upgrading lighting equipment. • Installation of energy management systems. • EAs and/or pre and post-EAs to assess energy performance. • Energy management system certification (ISO 50001 standard). • Project consultant. The results from the implementation of the Action are: • energy savings • reduction of carbon dioxide emissions, • upgrading of the urban environment of the historic centre of the Municipality of Athens • *upgrading of the building infrastructure of businesses and improvement of the daily life of citizens additional benefits in other economic and social sectors, such as energy security, the fight against energy poverty, employment and health.*
Link in national language and/or English	https://www.ependysis.eu/en/athens-business-green-toolkit
Why it is relevant to the scope of the Section	The results from the implementation of the Action are: • energy savings • reduction of carbon dioxide emissions, • upgrading of the urban environment of the historic centre of the Municipality of Athens • *upgrading of the building of businesses and improvement of the daily life of citizens additional benefits in other economic and social sectors, such as energy security, the fight against energy poverty, employment and health.*

7.1.4. Ireland

Name of the programme	Large Industry Energy Network (LIEN)
Description	The Large Industry Energy Network is made up of 208 of Ireland's largest energy consumers that are committed to improving their energy performance. The programme aims to support its members in achieving ISO 50001 certification. Beyond ISO 50001 training, the programme gives large companies the opportunity to engage with further free supports, such as expert advice from energy consultants, support with decarbonisation roadmaps, technology focus sessions. Total primary energy consumption of LIEN was over 30GWh in 2022, accounting for 18% of the national PEC. The reported 2022 LIEN CO_2 emissions were 5.018 million tonnes, a reduction of 1% compared with 2021. LIEN energy saving projects reported in 2022 demonstrated savings of 783GWh of final energy. It is estimated that this accounts for savings of 177 $ktCO_2$ emissions. The LIEN objective is to provided alternative supports in the form of information and knowledge sharing, training sessions, special working groups with a focus on a specific area of interest decided by members (i.e., energy efficiency/HVAC/Heat Pumps), 5 free energy consultant days to help with a decarbonisation strategy. LIEN programme is information and support based. No grants/credits/tax breaks are availed of in this programme.
Link in national language and/or English	https://www.seai.ie/business-and-public-sector/large-business/lien/ Member Results & Targets | Large Industry Energy Network (LIEN) | SEAI
Why it is relevant to the scope of the Section	LIEN sessions will support companies to implement EEMs as well as to use credible and reliable energy performance indicators and to create decarbonisation roadmap/ optimisation of current technologies & processes.

Name of the programme	Local Enterprise Office Energy Efficiency Grant (LEO grant)
Description	Climate Toolkit 4 Business: The Department of Enterprise's Climate Toolkit for Business is an Irish government initiative designed to help small and medium-sized businesses (SMEs) on their journey to becoming more sustainable and reducing their carbon footprint. The grant of 50% of eligible costs at a minimum of 1,000 Euro to a maximum grant of 5,000 Euro is intended for small enterprises (employing between 1 and 50) who are not currently clients of Enterprise Ireland or IDA. Programme is largely incentive based (i.e., grants/tax breaks/credits) The Energy Efficiency Grant has a link to Art.8 concerning voluntary entities (SMEs). The small business that wishes to avail of the support must have an SEAI EAs, which can be supported through the SEAI support scheme for EAs (SSEA, https://www.seai.ie/grants/business-grants/energy-audits)
Link in national language and/or English	What is the Energy Efficiency Grant? Local Enterprise Office https://www.neh.gov.ie/business-supports/climate-toolkit-4-business/
Why it is relevant to the scope of the Section	The programme supports the SMEs, which according to Art.8 voluntarily carry on an EA, in implementing EEMs.

7.1.5. Italy

Name of the Programme in Country language	Energivori/Gasivori
Name of the programme in English	Energy Intensive Industries (Electricity and Natural Gas)
Description	All energy-intensive companies (Large or SMEs) subjected to partial tax relief on the purchased electricity (registered in the list of the Environmental Energy Services Fund CSEA, a government agency) are obliged to carry out EAs. These companies are named - in Italian - “Energivori”, they present large energy consumptions (relatively to their internal costs and higher than 1GWh/y), and they must be part of a 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 are obliged to implement at least one of the EEMs identified in the EAs in the 4-year time interval between mandatory EAs. EAs of Energy-Intensive SMEs are submitted to ENEA as per D.Lgs. 102/14.Since 2021 the programme to Energy Intensive Industries with high electricity consumption has been replicated and extended to natural gas under similar conditions (in terms of consumption – 1GWh -95,000 Nsm^3/y)
Link in national language and/or English	https://energivori.csea.it/Energivori/ https://gasivori.csea.it/Gasivori/ https://leap4sme.eu/wp-content/uploads/2022/07/D3.3_website.pdf https://energy-evaluation.org/wp-content/uploads/2022/10/eee2022-paper-toro.pdf
Why it is relevant to the scope of the Section	Companies involved in this programme are obliged to carry out an EA and implement EEMs proposed in EAs.

Name of the Programme Other in Country language	Ricerca di Sistema – Progetto 1.6 WP4 I quaderni dell’Efficienza Energetica
Name of the programme in English	Energy Efficiency Sectoral Guidelines
Description	The series “Quaderni dell’efficienza energetica” was created by ENEA as part of a Programme Agreement between the Ministry of Economic Development (now under the Ministry of Energy Security) and ENEA: “Electricity System Research 2019 – 2021” and has continued into the new three-year period 2022-2024. The publications serve as an operational guide for companies operating in various sectors and for professionals involved in preparing an EAs compliant with Annex II of Legislative Decree 102/2014. The publication includes an overview of the different production processes specific to the sector, guidance on implementing a monitoring system, energy performance indicators related to both the entire production process and individual phases, and a comprehensive overview of potential energy efficiency interventions found in scientific and technical literature. It also includes an economic and energy evaluation of the interventions carried out and proposed in previous years' EAs submitted to ENEA. The sectoral guidelines for EAs have been already published for the following sectors: 1. Glass 2. Cement 3. Pharmaceuticals 4. Waste incineration 5. Foundries 6. Hotels 7. Offices (under publication) Other sectors, namely Ceramics, Plastic manufacturing and Textile, are currently under preparation and will be ready by the end of the year.
Link in national language and/or English	https://www.efficienzaenergetica.enea.it/servizi-per/imprese/diagnosi-energetiche/pubblicazioni-e-atti.html https://www.mdpi.com/2227-9717/10/12/2653 https://www.mdpi.com/2071-1050/13/7/3810 https://www.mdpi.com/1996-1073/14/24/8470
Why it is relevant to the scope of the Section	This activity allows to leverage the data included in EA by providing useful tools to companies and experts and facilitating the implementation of EEMs.

7.1.6. Lithuania

Name of the programme in Country language	**Priemonė EE5 – Viešuosius interesus atitinkančių paslaugų (VIAP) lengvata pramonės įmonėms**
Name of the programme in English	NECP measure: EE5 – Services in the public interest (SPI) relief for industrial enterprises
Description	The programme is a support mechanism to finance the implementation of energy efficiency improvement measures (recommended in the energy efficiency audit reports) in all major industrial enterprises in Lithuania. Companies will be reimbursed for the implementation of EEMs. Annual EEMs leading to energy savings of around 70 GWh are planned. In order to implement the strategic goals of the state's energy, economic and environmental protection policy in the energy sector and to ensure the implementation in the public interests, a tax on services in the public interest (SPI) was introduced. The Government of the Republic of Lithuania decides and appoints who is the administrator of these collected taxes, which are channelled into a fund (in this case it is BALTPOOL UAB). The government has established a procedure by which energy-intensive companies can benefit from a reduction of this tax, if they produce electricity using renewable energy sources (further – RES SPI). Companies will be able to use this benefit from January 1, 2019 until December 31, 2028. Companies that do not have overdue payments of SPI taxes and consume more than 1GWh of energy per year will be able to recover 85 percent of the RES SPI paid for the amount of energy consumed in the previous calendar year. Companies need to allocate the recovered RES SPI financial resources to the implementation of the best energy efficiency improvement measures, which are recommended in the EAs report, carried out in accordance with the procedure established in the Law on Energy Efficiency Improvement of the Republic of Lithuania. To ensure equal conditions for all energy-intensive companies to recover part of the paid SPI price, contracts are concluded with the administrator of SPI funds. The contract may be concluded by: • companies that have performed an EAs and are committed to repeat it at least every 4 years; • companies that have implemented the best existing energy efficiency improvement measures specified in the EAs report or plan to implement such measures in accordance with the procedure established in the contract. Specific data on the implementation of energy efficiency measure at individual company level is confidential information. Since it concerns individual companies, such information (what measures they installed, how much energy they saved, how much money they recovered) is confidential. Aggregate data though can be presented in public reports. Some reports on the use and return of SPI funds are publicly available on the SPI fund administrator's website. Available indicators include: • Total annual end-energy savings achieved per year; • Total cumulative end-energy savings achieved in 2021 .
Link in national language and/or English	Link to the website of the company that administers the services in the public interest funds: https://www.baltpool.eu/viap-lesos/viap-kainos-dalies-susigrazinimas/ Link to NECP: https://energy.ec.europa.eu/system/files/2022-08/lt_final_necp_main_en.pdf Link to general information about the NECP: https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en
Why it is relevant to the scope of the Section	Companies that want to take advantage of the SPI discount need to perform an EAs and undertake to repeat it at least every 4 years. Additionally, they are obligated to use the reimbursed funds to finance the implementation of EEMs.

Name of the programme in Country language	**Priemonė EE9 – Energijos efektyvumo didinimas įmonėse**
Name of the programme in English	NECP measure: EE9 – Improving energy efficiency in enterprises
Description	A financial instrument that enables companies to implement energy efficiency improvement measures identified in the EAs. A subsidy for the energy savings is provided to companies, who won an official call for action. Through this project, the government aims to save 100 GWh annually and close to 5.5 TWh by 2030. **The purpose of the measure:** To implement the measures indicated in the EAs report, which help to use energy more efficiently. After the implementation of the single project, the minimum energy savings cannot be less than 20 MWh/year. **Possible applicants:** legal entities registered in the territory of the Republic of Lithuania and operating in its territory, who are final consumers of energy, i.e. purchases energy for final consumption and: • do not participate in the European Union emissions trading system; • according to the classification of types of economic activity, do not belong to classification C processing production. **Funded activities:** new, unused and installed lighting, heating system or technological process equipment, implementing energy efficiency improvement measures indicated in the energy consumption audit report, which help to use energy more efficiently. **Ineligible expenses:** costs not directly related to ensuring greater efficiency of final energy consumption; acquisition or installation of solar and wind power plants (for electricity generation) and related costs; costs related to the modernisation of buildings. One of the necessary conditions for implementation is to perform an EA. The Public Enterprise Lithuanian Energy Agency assesses he performed audit, checking if it meets the requirements of an EAs report. Aggregated data on energy savings for a specific year are publicly available in various reports. The results of individual calls for support are publicly available. Statistics for the implementation of the two calls are available at the following links: statistics-1, statistics-2.The main indicator is the amount of energy saved. Other available indicators are as follows: amount of allocated financial support; number of applications received, number of financed projects, type and quantity of installed equipment; distribution of support by municipality.
Link in national language and/or English	About implementation of measures: https://apva.lrv.lt/lt/veiklos-sritys-319/projektu-finansavimas-1758/energetika-1852/privaciu-juridiniu-asmenu-energijos-vartojimo-efektyvumo-igyvendinimas-pagal-energijos-audito-ataskaitas-27727/ Link to NECP: https://energy.ec.europa.eu/system/files/2022-08/lt_final_necp_main_en.pdf
Why it is relevant to the scope of the Section	To benefit from financial support, an EAs is required. Energy savings are calculated based on the savings of EEMs specified in EAs, i.e. comparing the energy consumption before and after the installation of the energy efficiency improvement measure.

7.1.7. Malta

Name of the programme	**MERCA (Managing Essential Resources in Retail through Consumption Analysis)**
Description	Within the MERCA pilot project, several EAs were carried out in previously identified companies from the food retail sector, to characterise their energy and water usage, whilst demonstrating with opportunities to implement audit recommendations. The information collected is provided to companies on a one-to-one basis by organising closing meetings. EWA also gathered information on the consumption patterns and savings achieved. In this way, enterprises will be able to assess their performance and potentially, similar enterprises can identify the opportunity cost of changing their approach. The project is also aimed to support the participating companies to implement some of the measures that are identified through the audits being carried out. The Agency is currently compiling a report with the findings of the project, including challenges encountered by companies in the sector and possible solutions. It is planned to share this report with companies in the sector and organise a sectoral event to disseminate the results of the pilot project by the first half of next year (2025).
Link in national language and/or English	https://energywateragency.gov.mt/pilot-project-to-assist-food-retail-outlets-in-efficient-use-of-energy-and-water/
Why it is relevant to the scope of the Section	It is essential to better understand the potential of energy savings that companies in the sector could achieve through an EAs. Through this information and together with engagement with the respective companies, the Agency could then encourage companies to implement the recommended EEMs while also guiding them through available financial aid.

7.1.8. Netherlands

Name of the Programme in Country language	Erkende maatregelenlijst energiebesparing (EML)
Name of the programme in English language	Energy saving obligation – Recognised Energy saving Measures List
Description	The Energy Savings Obligation applies to business locations in the Netherlands that use 50,000 kWh of electricity or 25,000 m3 of natural gas (or an equivalent) or more per year. All energy saving measures with a payback period of five years or less have to be implemented. The Recognised Energy saving Measures List (EML) is a set of lists with approximately 200 measures that differentiates between company branches and field of activities and contain measures that generally have a payback period of five years or less. There are three EML lists: buildings, facilities and processes. Each list contains a set of categories of measures. Examples of these categories are room lighting (buildings list), compressed air (facilities list) and process heating (processes list). Using the EML, enterprises can choose their branch or field of activity and will be presented with the measures that have been identified as having a five-year payback period for their situation. Enterprises are obliged to implement these measures. Specific economical and technical pre-conditions are taken in account. 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. When all measures on the applicable lists have been implemented the business location is considered as having obliged to the Energy Savings Obligation.
Link in national language and/or English)	https://www.rvo.nl/onderwerpen/energiebesparingsplicht/eml https://english.rvo.nl/topics/energy-saving-obligation/energy-saving-notification-obligation#how-to-report
Why it is relevant to the scope of the Section	Obligated companies under Art.8 are provided with a detailed list of EEMs, to which they can refer in the EAs.

7.1.9. Portugal

Name of the programme in Country language	**SGCIE – Sistema de gestão dos consumos intensivos de energia**
Name of the programme in English language	SGCIE – Management System for Intensive Energy Consumption
Description	SGCIE is governed by Decree-Law No. 71/2008 (https://diariodarepublica.pt/dr/detalhe/decreto-lei/71-2008-249821). The goal of this system is to promote the increase of energy efficiency through the modification of production processes, the introduction of new technologies and behaviour changes. The SGCIE applies for all companies and facilities with an annual consumption over 500toe/year (20.9 TJ), imposing binding EAs, with an 8-year periodicity. Facilities under European Emissions Trading System (ETS) are not covered by SGCIE, but they may participate on a voluntarily basis, as can facilities with annual energy consumptions lower than 500toe. Energy-intensive sites (EIC) are required by legislation to conduct recurring EAs and encourage energy efficiency, including the use of renewable energy sources. They are also obliged to develop and implement Energy Consumption Rationalisation Plans (PREn), establishing agreements with Directorate-General for Energy and Geology (DGEG) to decrease their energy consumptions. These agreements include minimum energy efficiency objectives (targets set for energy intensity and specific energy consumption), linking their compliance with receiving incentives by operators (entities operating EIC installations). The PREn is designed based on the reports of mandatory EAs and should consider the implementation, in the first three years, of all measures identified with a return investment period (PRI) of less than or equal to five years, in the case of installations with energy consumption equal to or greater than 1000 toe/year (41.8 TJ), or with a PRI of less than or equal to three years in the case of other installations. The PREn should also set targets for energy intensity and specific energy consumption, which should at least decrease by 6% in eight years in the case of energy-intensive installations of 1000 toe/year or more, or 4% for the remaining installations and the maintenance of the historical values of carbon intensity in both situations[29]. From 2008, there have been (on average) 84 new installations registered in the SGCIE annually, reaching 1,349 in 2023. From these, 84% are in the industrial sector, and 60% of the facilities are listed in the Lisbon, Porto, Aveiro and Braga areas. From 2008 until March 2024, these installations submitted 2,158 EAs and their PREn added up to 5,484,000 toe in primary energy consumption, corresponding to nearly 20% of the country's primary energy consumption according to the 2019 National Energy Balance.
Link in national language and/or English	https://sgcie.pt/ An English webpage is not available, but you can contact the authors of the report to receive PowerPoint presentations in English that provide details on the functioning of the system.
Why it is relevant to the scope of the Section	This is a good practice regarding EAs, defining energy efficiency targets for the industry sector and compulsory implementation of EEMs identified during EAs. In Portugal, SGCIE will contribute to the 2030 National Energy and Climate Plan's targets of primary energy consumption reduction (also preventing CO_2e and greenhouse gas emissions). Moreover, the system is designed to be easily aligned with the new Art.11 requirements.

Name of the programm in Country language	**Regulamento da Gestão do Consumo de Energia para o Sector dos Transportes**
Name of the programme in English language	Energy Consumption Management Regulation for the Transport Sector
Description	Ordinance no. 228/90 of 27 March approved the Energy Consumption Management Regulation for the Transport Sector (RGCEST) and aimed at improving energy efficiency in this sector. The RGCEST makes it mandatory for energy-intensive companies consuming more than 500 toe/year (20,9 TJ) to carry out EAs and an energy consumption rationalisation plan (PRCE) over a three-year period, with the aim of reducing energy intensity. The RGCEST EAs apply to transport companies or companies with their own energy-intensive fleets (CIE). RCEST audits make it possible to identify opportunities for reducing costs and CO_2 emissions. The audits result in energy consumption rationalisation plans (PRCE), which identify potential energy-saving measures. The Directorate-General for Energy and Geology (DGEG) monitors the implementation and progress of the PRCEs by analysing the implementation and progress reports (REP) that the companies concerned submit each year and which must include a review of the PRCE's implementation. Main indicators: Energy savings (toe) Main results (2020-2022): 30 582 toe of primary energy savings The measures with the greatest contribution to the total savings achieved were efficient driving training (33%), fleet renewal (32%), fleet management systems (17%) and tyre pressure control (9%).
Link in national language and/or English	https://diariodarepublica.pt/dr/detalhe/portaria/228-1990-333086
Why it is relevant to the scope of the Section	This regulation sets targets for the Transport sector energy efficiency promotion. It is expected to be included under the Art.11 national transposition.

[29] Carbon intensity, measured by the quotient between the value of greenhouse gas emissions resulting from the use of the various forms of energy in the production process and the respective total energy consumption must be constant. This value cannot increase during this evaluation.

Name of the programme in Country language	**Cadernos Subsetoriais**
Name of the programme in English language	Subsector notebooks
Description	The subsector notebooks are essentially statistical studies, using the Intensive Energy Consumer Management System (SGCIE) database. These studies are intended to characterise, in a given subsector of activity, energy consumption profiles, potential energy and cost savings, identify and typify proposed EEMs, as well as propose a benchmark of the energy efficiency indicators. Each economic activity has two documents available for consultation: a factsheet summarising the main statistical results (production process, disaggregation of the primary energy consumption, energy key performance indicators, and EEMs) and a booklet detailing the information on the technical sheet, namely the main energy indicators and EEMs. Currently, notebooks are available for 21 subsectors, organised by NACE (rev.2) codes. Main indicators: • Energy intensity (toe/Euro) • Carbon intensity (CO_2/toe) • Specific energy consumption (toe/t) (for each one of these three indicators, a benchmarking reference value is provided) • Number of EEMs implemented (No.) • Expected savings (toe, tCO_2, Euro) These notebooks analyse the companies' energy consumption, that have Energy Consumption Rationalisation Plans approved under SGCIE, as well as the energy efficiency indicators contained in these Plans. These reflect the energy and environmental performance of the installations, prior to the implementation of the EEMs that are defined in the Plans. Also, the energy saving potential of the subsector is systematised, as follows:t he processes and use of energy are described; the energy efficiency KPIs for each sector are presented, along with a benchmarking exercise (minimum value, reference value and maximum value). Most frequent efficiency measures (with the greatest impact in terms of energy consumption reduction) included in the Plans are indicated, as well as the average period of return on investment associated with each one of the measures. Efficiency measures are analysed individually and by type.
Link in national language and/or English	https://sgcie.pt/informacao/cadernos-subsetoriais/
Why it is relevant to the scope of the Section	These notebooks are excellent tools for energy efficiency promotion and benchmarking activities within the economic sectors covered.

7.1.10. Slovakia

Name of the programme in Country language	**Európske štrukturálne a investičné fondy / Operačný programme kvalita životného prostredia / Výzva č. OPKZP-PO4-SC421-2019-59 Zníženie energetickej náročnosti a zvýšenie využívania OZE v podnikoch**
Name of the programme in English language	Reduction of energy intensity and increased use of renewable energy sources in businesses (Bratislava region)
Description	Reconstruction and modernisation of buildings in industry and services to reduce their energy consumption demand. Within the framework of the mentioned measure, financial support was aimed at reducing energy consumption during building operation through the implementation of an individual or optimal combination of the following sub-measures resulting from the EAs: a) improving the thermal and technical properties of building structures, in industry and services; b) reconstruction and modernisation of heating/air conditioning systems, hot water preparation systems in a building in the industrial area and related services; c) reconstruction and modernisation of lighting systems in the building in the field of industry and related services. Quantitative results include the following indicators (for years from 2019 to 2023):
Link in national language and/or English	https://www.op-kzp.sk/wp-content/uploads/2019/12/Vyzva_usm_1.pdf
Why it is relevant to the scope of the Section	This programme allows to support the implementation EEMs into practice.

Call No. OPKZP-PO4-SC421-2019-59: Reducing energy demand and increasing use of renewable energy in enterprises

Year	2019	2020	2021	2022	2023	**Total**	**Unit**
Number of finished projects		1	4	15	25	**45**	number
Number of recipients of the finished projects		1	4	15	25	**45**	number
Total contracted amount of money in finished projects		91.726,00	852.115,50	2.360.636,02	5.666.420,71	**8.970.898,23**	€
MEASURABLE INDICATORS - SUMMARY - TOTAL VALUES:							***MWh/year***
The amount of electrical energy produced in the RES facility		66,58	357,44	521,53	2.953,38	**3.898,94**	MWh/year
The amount of thermal energy produced in the RES facility		8,78	192,99	39,44	17,86	**259,07**	t ekviv. CO2
Estimated annual reduction of GHG emissions		12,54	129,42	511,73	737,46	**1.391,15**	number
Number of EEMs implemented in enterprises		2	9	29	76	**116**	MWh/year
Estimated savings of primary energy sources in the enterprise resulting from the e		181	1.329,71	3.857,67	8.516,98	**13.885,36**	MWh/year
Energy consumption in the enterprises after implementation of the EEMs		204	19.791,09	24.880,53	56.770,67	**101.646,29**	MWh/year
Energy consumption in the enterprisee before the implementation of EEMs		277,1	20.322,08	26.898,82	59.250,59	**106.748,59**	MWe
Increased electricity production capacity from RES		0,06	0,38	0,79	3,39	**4,62**	MW
Increased heat production capacity from RES		0,0708	0,56	0,85	3,41	**4,88**	MWt
Increased energy production capacity from RES		0,0108	0,18	0,06	0,02	**0,26**	MWh/year

Name of the programme in Country language	**Európske štrukturálne a investičné fondy / Operačný programme kvalita životného prostredia / Výzva č. OPKZP-PO4-SC421-2018-46 Zníženie energetickej náročnosti a zvýšenie využívania OZE v podnikoch**
Name of the programme in English language	Reduction of energy intensity and increased use of renewable energy sources in businesses (national, except Bratislava region)
Description	Actions from the call relevant for the scope of the question: Reconstruction and modernisation of buildings in industry and services in order to reduce their energy consumption demand. As part of the mentioned measure, financial support will be aimed at reducing of energy consumption during building operation in industry and services by the implementation of individual or optimal combinations of the following sub-measures resulting from EAs: a) improving the thermal and technical properties of building structures in industry and services; b) reconstruction and modernisation of heating/air conditioning systems, hot water preparation systems in a building in the industrial area and related services. Quantitative results include the following indicators (for years from 2019 to 2023):
Link in national language and/or English	https://www.op-kzp.sk/wp-content/uploads/2018/12/V--zva----46-v-znen---Usmernenia---.2.pdf
Why it is relevant to the scope of the Section	This programme allows to support the implementation EEMs into practice.

Call No. OPKZP-PO4-SC421-2018-46: Reducing energy demand and increasing use of renewable energy in enterprises. Implementation of measures/ recommendations from energy audits

Year	2019	2020	2021	2022	2023	**Total**	**Unit**
Number of finished projects	1	2	10	24	24	**61**	number
Number of recipients of the finished projects	1	2	10	22	20	**55**	number
Total contracted amount of money in finished projects	566.604,80	1.503.501,56	10.812.279,46	13.807.554,42	7.293.886,65	**33.983.826,89**	€
MEASURABLE INDICATORS - SUMMARY - TOTAL VALUES:							***MWh/year***
The amount of electrical energy produced in the RES facility			198,00	10,70	220,80	**429,50**	MWh/year
The amount of thermal energy produced in the RES facility	71,63		307,97	6.973,30	305,43	**7.658,34**	MWh/year
Estimated annual reduction of GHG emissions	29,50	272,72	2.559,51	9.742,96	7.446,93	**20.051,61**	t ekviv. CO2
Number of EEMs implemented in enterprises	1	3	33	58	53	**148**	number
Estimated savings of primary energy sources in the enterprise resulting from the e	405,80	2.361,36	26.819,24	39.069,30	52.604,71	**121.260,40**	MWh/year
Energy consumption in the enterprises after implementation of the EEMs	512,85	13.572,01	1.563.049,05	373.202,66	371.069,32	**2.321.405,88**	MWh/year
Energy consumption in the enterprisee before the implementation of EEMs	626,64	14.926,30	1.577.071,41	399.568,43	405.196,70	**2.397.389,47**	MWh/year
Increased electricity production capacity from RES			0,19	0,01	0,20	**0,40**	MWe
Increased heat production capacity from RES	0,15		0,72	2,48	0,40	**3,75**	MW
Increased energy production capacity from RES	0,15		0,53	2,47	0,20	**3,35**	MWt

7.2. Overall information on EEMs in the Partner Countries

7.2.1. Croatia

SMIV – National Monitoring, Measuring and Verifying Energy Savings System

The National System for Monitoring, Measuring and Verifying Energy Savings – SMIV is a system that monitors the implementation of measures and the realisation of energy savings at the national level as part of the system of implementation of alternative measures and the system of energy efficiency obligations (EEO). The database contains 35,033 EEMs in the period from 2014 to 2024, with total savings of 6,016.8 GWh.

The following information is available from the data in the database: holder of savings, title and description of the measure, type of measure, year of implementation, location, energy savings, primary energy savings (not available for all measures), CO_2 savings, cost of the measure, type of fuel, sector, cumulative energy savings, cumulative CO_2 savings.

List of available indicators and data

The following data are available from the database:

- The owner of savings,
- Title and description of the measure,
- Type of measure,
- Year of implementation,
- Location,
- Final energy savings,
- Primary energy savings (not available for all measures),
- CO_2 savings (not available for all measures),
- Investment (not relevant for all measures),
- Type of fuel (not available for all measures),
- EEMs sector (industry, transport, construction, other),
- EEMs group (industry, public lighting, household, transport, public service, commercial service, other),
- Cumulative energy savings (not available for all measures),
- Cumulative CO_2 savings (not available for all measures),
- Energy saving vs. charge (irrelevant indicator due to incomplete data entry)
- CO_2 saving vs. charge (irrelevant indicator due to incomplete data entry)

Implemented measures from the system are as follows:

- 2024: 3,220
- 2023: 5,963
- 2022: 5,167
- 2021: 4,345

Key facts and lessons learnt

The SMIV system demonstrates the importance of collecting diverse and detailed data on EEMs. With over 35,000 measures documented, a robust and inclusive data framework supports better understanding of energy savings and associated impacts, such as CO_2 *reduction and financial investments.*

The system highlights challenges related to incomplete data, such as missing primary energy savings or CO_2 savings information for some measures.

This underscores the need for standardised protocols in data collection and entry to ensure comprehensive and actionable reporting. Including investment data for some measures, even if not universally available, provides opportunities for cost-benefit analyses. This can help prioritize measures that yield the greatest savings for the least cost, fostering efficient allocation of resources. Incomplete indicators such as "energy saving vs. charge" and "CO_2 saving vs. charge" reflect the limitations of inconsistent or insufficient data entry. This suggests a need for ongoing training, standardised tools, and possibly automation in data collection to improve data quality.

ISGE Energy Management System in the public sector

Information system for energy management in public sector – ISGE is an online application for monitoring and analysing energy and water consumption in public sector buildings and is an indispensable tool for systematic energy management.

Systematic energy management implies strategic planning of energy and sustainable management of energy resources in buildings owned or used by cities, counties, the Government of the Republic of Croatia, as well as in buildings of other government budgetary and non-budgetary users as well as those of public authorities.

List of available indicators and data

The following data are available from the database:

- Type of EEMs
- Investment
- Estimated savings
- Payback period
- Estimated CO_2 savings
- Date of application of the measure
- ISGE code
- Object name
- Location and address
- Sector
- Object type

Key facts and lessons learnt

ISGE serves as a centralised platform for tracking energy and water consumption in public sector buildings, highlighting the importance of unified data management for effective energy oversight and decision-making. The inclusion of diverse data points such as energy EEMs, estimated savings, CO_2 reductions, and payback periods ensures a well-rounded analysis of energy management strategies. This comprehensive approach supports informed policy-making and prioritisation of interventions. Information on building locations, addresses, and types allows for location-specific interventions, recognising that energy challenges and solutions may vary based on geography, building usage, and regional conditions. Recording the dates of measure applications provides a timeline for tracking the effectiveness and progression of implemented strategies. This enables longitudinal analysis to assess whether measures achieve their projected benefits over time. Effective use of ISGE likely requires training and capacity building for users at all levels. Ensuring that public sector employees understand how to input and analyse data correctly is vital for the system's success. ISGE’s ability to monitor ongoing consumption data allows for real-time analysis, enabling quick adjustments to strategies and interventions to ensure optimal energy performance.

7.2.2. Germany

Special Compensation Scheme within the Energy Finance Act

Adopted in January 2023 as part of Energy Finance Law (EnFG), the scheme focuses on companies with high electricity intensity, limiting their costs resulting from surcharges imposed on electricity costs (e.g. for combined heat and power as well as grid connection of wind offshore plants). In return, companies are obliged to prove that they operate an energy management system and are energy efficient according to the following criteria:

- they have implemented all economically feasible measures identified in the energy management system or
- no economically feasible measures were identified in the energy management system and
- they have made investments into EEMs identified in the energy management system equivalent to at least 100% of the received compensation.

Two categories of eligible branches or subsectors exist, depending on the level of the risk of relocation to other countries. Category 1 (significant risk) encompasses about 90 branches (subsectors, while Category 2 (risk) includes 25 ones.

If the surcharge payments by companies do not fall below the value of 0.05 Ct per kWh, eligible companies may receive compensation payments for their share of power consumption beyond 1 GWh, as shown in the table

Category of branches or subsectors	Degree of compensation	Limit of compensation
Branches or subsectors of category 1	15% of apportionment payments	0.5% of gross value added
Branches or subsectors of category 2 which have covered a significant share of their electricity demand with renewable energies during the last business year	15% of apportionment payments	0.5% of gross value added
Remaining branches or subsectors of category 2	25% of apportionment payments	1% of gross value added

List of available indicators and data

In 2023, a total of 1,650 companies or legally independent subsidiaries (manufacturing: 1,559; rail transport: 105; E-buses: 15) have received compensations through the Special Compensation Scheme within the Energy Finance Act. These companies have a total of 2,256 electricity consumption points. The overall amount of electricity for which financial compensations have been approved is 103,336 GWh.

Before the Special Compensation Scheme was amended as part of the Energy Finance Act in 2023, it was an independent regulation of high relevance for energy-intensive companies as it aimed at relieving them from payments of the levy of the renewable energy law. The levy is now covered by the federal budget. As a consequence, the number companies applying for compensation has decreased by 25% in 2023 compared to 2022.

Key facts and lessons learnt

- Energy-intensive companies may receive compensation payments for apportionments which increase their electricity costs.
- In return, they need to run an energy management system and prove that they are energy efficient.
- Furthermore, entitled companies need to reinvest at least 100% of the received compensation into EEMs.
- Compensation payments range from 15-25% of the concerned apportionments and must not exceed 0.5-1% of a company's gross added value.
- Since the renewable energy levy is covered by the federal budget and compensations for this levy are no longer needed, the number of companies applying for compensations through the Special Compensation Scheme has dropped by 25%.

Federal Funding for Energy and Resource Efficiency in the Economy

The "Federal Funding for Energy and Resource Efficiency in the Economy" was introduced in 2019 with four modules and since then developed further each year, up to the current number of six modules.
The investment programme aims to reduce GHG emissions and energy demand from industry and commerce, and it follows a technology-open and cross-sector approach, in which funding is available as a direct grant from BAFA or as a repayment grant in combination with a low-interest loan from KfW. The funding is subdivided into the following six modules:

- Module 1[30] cross-sectional technologies, such as highly efficient electric motors, pumps, fans, etc
- Module 2[31] process heat from renewable energies
- Module 3[32] ICE, sensors and energy management software
- Module 4[33] energy and resource-related optimisation of plants and processes, articulated in basic funding, and premium funding and bonus. The first one is based on a list of interventions for energy and resource-related optimisation of plants and processes, while the second is technology neutral
- Module 5[34] transformation plans for the long-term decarbonisation strategy of a company, relative to Scope 1 and 2 emissions
- Module 6[35] electrification of small businesses

Eligible to apply for funding are private companies, municipal companies, state-owned companies, freelancers and contractors (under certain conditions). The amount of funding varies depending on the module, the type of recipient and if a direct or repayment grant is requested. For direct grants, the maximum funding amount per project reaches from 90,000 Euro (Module 5) to 20,000,000 Euro (Modules 2, 3, 4). Repayment grants can finance a maximum of 100,000,000 Euro per project.

List of available indicators and data

BAFA publishes annual statistics for each year in which the module-specific number of applications and payments as well as the total amount paid out are listed. Key findings of the 2022 evaluation report are (for 2019 – 2022):

- Total number of funding commitments: 41,583
- Approved funding: 1,7 billion Euro
- Costs for energy and resources saved in 2022: 1,2 billion Euro
- Gross saving in GHG emissions: 4,8 million tCO_2e
- Gross saving of final energy: almost 13 TWh

The table below lists the GHG emission reductions of the programme since it was established in 2019. It shows the gross and net amounts of the GHG emission reduction of the years 2019 – 2022 in the funding modules 1-4 (modules 5 and 6 were introduced in 2023 and will be evaluated for the first time this year), an added-up amount in 2022 and the change in percentage from 2021 to 2022. This last numbers indicate that from 2021 to 2022 the GHG emission reduction has increased enormously, especially in modules 2 (+1178% gross value) and 4 (+539% gross value).

(*) Values only include energy (excluding resource efficiency).
(**) Annual values for 2019-2021 for Module 2 will be reviewed as part of the 2023 evaluation.
Source: Own calculations.

Gross Values	2019	2020	2021	2022	Cumulative value 2019-2022	Change 2022 to 2021
Module 1	61	63	99	93	316	-7%
Module 2 (**)	8	21	16	200	245	1178%
Module 3	6	13	16	25	61	58%
Module 4	677	519	1.016	974 (904)*	3,186 (3,116)*	-4%
Funding Competition	60	187	103	661 (301)*	1,012 (651)*	539%
Only Modules 1-4	753	616	1.147	1,292 (1,222)*	3,808 (3,737)*	13%
Entire Funding Package	813	803	1.250	1,953 (1,522)*	4,820 (4,388)*	56%
Net Values	**2019**	**2020**	**2021**	**2022**	**Cumulative value 2019-2022**	**Change 2022 to 2021**
Module 1	43	44	72	66	225	-9%
Module 2 (**)	7	22	16	200	245	1176%
Module 3	5	9	12	20	46	68%
Module 4	546	419	835	783 (727)*	2,583 (2,527)*	-6%
Funding Competition	56	165	103	677 (307)*	1,000 (631)*	558%
Only Modules 1-4	601	494	935	1,069 (1,013)*	3,099 (3,043)*	14%
Entire Funding Package	657	659	1.038	1,746 (1,320)*	4,099 (3,674)*	68%

Key facts and lessons learnt

- The funding programme was introduced in 2019.
- It supports a broad range of technologies for improving energy efficiency and expanding the use of renewable energy in companies.
- In 2022, the funding programme has led to energy and resource costs savings totalling 1,2 billion Euro.
- Overall, the funding programme is widely considered as very successful due its very good funding efficiency and a high number of applicants from all sectors and branches, ranging from large to small companies.

[30] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-1.html
https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/KfW/energieeffizienz-u-prozesswaerme-kredit-1.html
[31] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-2.html
https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/KfW/energieeffizienz-u-prozesswaerme-kredit-2.html
[32] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-3.html
https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/KfW/energieeffizienz-u-prozesswaerme-kredit-3.html
[33] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-4.html
https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/KfW/energieeffizienz-u-prozesswaerme-kredit-4.html
[34] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-5.html
[35] https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/BMWi/energieeffizienz-u-prozesswaerme-zuschuss-6.html
https://www.foerderdatenbank.de/FDB/Content/DE/Foerderprogramm/Bund/KfW/energieeffizienz-u-prozesswaerme-kredit-6.html

Federal Funding for Buildings - Non-Residential Buildings

The Federal funding for efficient buildings - Non-residential buildings (BEG NWG) comprises five modules:

1. Individual measures on the building envelope:
2. System technology (except heating):
3. Systems for heat generation (heating technology):
4. Heating optimisation (heating systems that are more than two years old)
5. Specialist energy planning and construction supervision

According to the internal database used by BAFA, the following number of recommended EEMs is available by year

- 2023: 18,024 (based on 5,195 funding applications)
- 2022: 14,584 (based on 4,281 funding applications)
- 2021: 5,328 (based on 1,531 funding applications)

List of available indicators and data

BMWK publishes annual evaluation reports of the programme (already published in 2021 and 2022), including a funding balance sheet and a performance review. Examples are provided below for 2021.
The funding balance sheet provides an overview of the distribution of funding cases and various financial indicators across the different funding options.

Information is provided distinguishing for New construction and Renovation. A differentiation by building is also part of the funding balance sheet:

The performance review includes monitoring of the programme's savings as well as funding efficiency. Therefore, different calculation with the parameter operational lifetime were made.

Also GHG emissions savings are monitored. The funding efficiency is calculated in final and primary energy as well as GHG emissions, describing the amount of subsidy funds that must be raised per toe of energy saving or reduced ton of CO_2e.

Type	Number of Cases [count]	Total Investments [in million €]	Eligible Costs [in million €]	Credit Volume [in million €]	Federal Funds [in million €]
Credit (KfW 263)	974	3,386	2,484	2,484	512
Credit Municipality (KfW 264)	69	386	236	236	49
Grant (KfW 463)	2,724	14,994	14,994	--	2,361
Grant Municipality (KfW 464)	267	1,190	1,190	--	197
Total	4,034	19,956	18,904	2,720	3,119

	Savings per Year	Savings over Operational Lifetime according to NAPE [19.75 years]	Savings over 30 Years
Final Energy	396	7,816	11,873
- New Construction	230	4,542	6,900
- Renovation	166	3,274	4,973
Primary Energy	411	8,112	12,321
- New Construction	242	4,776	7,254
- Renovation	169	3,336	5,067

	End energy		Primary energy	
Category	Operational life according to NAPE= 19,75	Operational life = 30 years	Operational life according to NAPE= 19,75	Operational life = 30 years
New Construction	580 €	382 €	551 €	363 €
Renovation	149 €	98 €	146 €	96 €
Mean	399 €	263 €	384 €	253 €

Category	Operational life according to NAPE = 19,75	Operational life = 30 years
New Construction	1,469 €	967 €
Renovation	608 €	400 €
Mean	1,204 €	792 €

Building Type	Number of Cases [count]	Total Investments [in million €]	Federal Funds [in million €]
Administrative and Office Buildings	1,261	8,330	1,121
Production Facilities, Workshops	629	2,795	504
Warehouses	367	2,321	395
Retail Stores	329	117	193
Other Commercial Buildings	300	1,078	183
Accommodation and Catering	275	1,162	227
Daycare Centers (Kita)	248	603	97
Other Healthcare Buildings	212	406	69
Schools	122	1,016	139
Other Municipal or Social Buildings	92	318	46
Care Facilities	69	137	25
Sports Buildings, Swimming Pools	55	204	39
Clinics, Hospitals, Laboratory Facilities	44	465	64
Data Centers	1	2	0
No Information Provided	28	0	16
Total	4,034	19,956	3,119

Key facts and lessons learnt

- The programme offers funding for EEMs in non-residential buildings.
- Funding is provided for a broad range of measures, including optimisation of the building envelope, heating as well as planning and construction.
- The programme has been further developed several times in recent years and adapted to current developments. Rising application numbers suggest that the programme is very well received, especially as the topic is highly relevant in the context of the energy transition.

SME-Innovative: Energy Efficiency, Climate Protection and Climate Adaptation

The funding programme supports research and development projects that contribute to the technology field of “energy efficiency, climate protection and climate adaptation” since its launch in 2007. To date, 1,986 million Euro have been approved in the overall programme (reaching beyond the topics of energy efficiency, climate protection and adaptation) for more than 2,700 individual and joint projects involving around 4,379 SMEs.

For the technology fields energy efficiency, climate protection and climate adaption the focus is on technologies, processes and services to increase energy efficiency or reduce GHG emissions, climate-relevant cross-sectoral technologies, services and products for climate protection or for adapting to climate change, climate-friendly services and management methods for rural areas, and projects that contribute to the Climate Action Plan 2050 and the German Strategy for Adaptation to Climate Change.

The programme was added to the “SME-innovative” umbrella brand, which has existed since 2007, in 2024. The funding guideline is intended to attract SMEs applying for the first time and motivate SMEs that are already active in research to step up their R&D activities. Within the framework of collaborative projects also universities, non-university research institutions, associations and other organisations can apply.

List of available indicators and data

BMBF portrays selected projects and cooperation examples in their 3 year-term report. Examples for the term 2020-2023 can be found in the report here: https://www.foerderinfo.bund.de/SharedDocs/Publikationen/de/bmbf/5/31710_KMU_innovativ_9_und_10_Auswahlrunde.pdf?__blob=publicationFile&v=7
The landing page offers pilot service, fast procedure, simplified credit check: https://www.bmbf.de/bmbf/de/forschung/innovativer-mittelstand/kmu-innovativ/kmu-innovativ_node.html

As the technology field “energy efficiency, climate protection and climate adaptation” has only been listed separately since this year, no evaluation is yet available.

Key facts and lessons learnt

- The programme funds a broad range of measures for improving energy efficiency and reducing greenhouse gas emissions in SMEs.
- The programme shall encourage SMEs which have started to be active in R&D and to roll out identified EEMs
- The programme is closing the gap between areas of cutting-edge research, SMEs and pioneers of technological progress.
- The programme should aim at simplifying the application and approval of funding for top-level research start-ups and SMEs.
- The fact that the programme is now in its 10th selection round shows that it is highly successful and well received.

KFW Energy Efficiency Programme Production Facilities/ Processes

The programme supports companies in the form of a loan for EEMs around production facilities and processes. For example, companies receive funding for investments in these areas:

- machines, systems and process technology;
- compressed air, vacuum and extraction technology;
- electric drives and pumps;
- process heat;
- process cooling, cold stores and cold rooms;
- heat recovery and waste heat utilisation (for production processes);
- measurement, regulation and control technology;
- information and communication technology;
- construction, replacement or modernisation of port and access infrastructure in inland and seaports.

Both project in Germany and abroad are eligible, with different types of beneficiaries. The conditions are a promotional loan with a 2.94 % effective annual interest rate with up to 25 million Euro loan amount.

List of available indicators and data

The KfW has published evaluation reports of the funding programme for the years 2015 & 2016 and 2017 & 2018.

Approximately 1,400 energy efficiency projects in industry and commerce were funded in 2017 and 2018 with the help of low-interest loans. They resulted in total annual final energy savings of 1,300 gigawatt hours and greenhouse gas reductions of 543,000 tCO_2e.

The table below gives a quantified overview of the key results from the 2017/ 2018 evaluation report.

Table 2: Parameters of the KfW Energy Efficiency Programme – Production Facilities and Processes from 2017 to 2018, in and outside Germany

Parameter	Unit	Total	2017	2018	in Germany	outside Germany
Number of projects	#	1,401	675	726	1,381	20
Investment volume	€ million	3,560	2,104	1,456	3,112	447
Annual final energy savings	GWh/a	1,287	636	651	871	416
Annual primary energy savings	GWh/a	3,589	2,673	915	3,095	493
Annual energy cost savings	€ million/a.	88	50	38	56	32
Annual GHG reduction, including upstream chains	thousand t CO_{2e}/a	543	278	265	392	151
Gross value creation effects in Germany	€ million	1,700	993	707	1,700	-
Employment effects in Germany	thousand employees	22	13	9	22	-

Source: KfW funding database, own calculations © Prognos AG 2019

Key facts and lessons learnt

- The programme offers low-interest loans for EEMs around production facilities and processes to companies.
- The programme finances investments in a broad set of technologies, such as machines and process technology, drives and pumps or heating and cooling technologies.
- In 2017 and 2018, a total of 1,401 projects with an investment volume of 3,560 million Euro have been funded.
- The programme was again relaunched and further developed in 2024, confirming its success.
- Regular revisions of the funding guidelines with adjustments to the funding objects and objectives are relevant in order to reflect current (technological) developments in climate protection.

Environmental Innovation Programme

The Federal Ministry for the Environment, Nature Conservation, Building, Nuclear Safety and Consumer Protection (BMUV) funds industrial-scale pilot projects in key environmental sectors such as climate protection and resource efficiency. The main operator is BMUV, which provides the funding and decides if a project is funded or not. Programme partners are the Federal Environment Agency (UBA) and KfW. UBA is the professional reviewer that examines applications and monitors ongoing projects. KfW is responsible for the financial and administrative processing.

The programme focuses on projects that are well suited for demonstration purposes and hence for replication. Mainly investments related to the following areas are funded:

- Wastewater treatment
- Waste prevention, recycling and disposal
- Circular economy
- Soil protection
- Air pollution control, climate protection
- Reduction of noise and tremors
- Energy saving, energy efficiency, renewable energy
- Resource saving and efficiency
- Material saving and efficiency

Eligible to apply are commercial companies and legal entities, while small and medium-sized enterprises (SMEs) are prioritised. Successful applications receive either an interest subsidy on a loan from or an investment grant. The maximum investment grant is 7.5 million Euro. The extent of funding decides the Federal Environment Ministry based on the suggested project's environmental protection effect, progressiveness, technical and economic risk and the existing federal interest.

List of available indicators and data

The Environmental Innovation Programme website lists all projects for which BMUV has declared an intention to provide funding since the beginning of the year 2000. For every project, the database provides a short description of the funded project and also describes the Branch Environmental area Funding recipient Region Duration Status and CO_2 emissions and/or energy consumption reduction.

Furthermore, a final report made by the funding recipient is published for every project. An example cover sheet for such a report is shown in the figure

Additionally, two evaluation reports of the programme were conducted, one in 2009 (general) and one in 2019 (for period 2008 to 2016). The latter report states that in the period under review 100 projects were successfully completed, 56 still ongoing, 7 not successful and 21 cancelled. For these 184 projects, a total of 242.1 million Euro was granted.

The 100 successfully completed projects have avoided 740,000 tCO_2 emissions and saved 3.423 GWh of primary energy. There is no evaluation report for the entire programme period, however on the programme's website a total number of 809 funded projects is provided, for a total funding of 1,220 million Euro and 2.7 million tCO_2 emissions saved in the last 15 years.

Report Coversheet

Reference-No. Federal Environment Agency:	Project–No.: NKa3 - 003733
Report Title: Demonstration project in Germany and EU for a resource-saving combination of technologies in the packaging decoration process	
Author/Authors (Family Name, First Name): Hammerschmidt, Frank	Start of project: 06 Jan. 2023
	End of project: 30 Sept. 2023
Performing Organisation (Name, Address): Röser GdbR Christian-Müller-Str. 25 96355 Tettau, Germany	Publication Date: 29 Feb. 2024
	No. of Pages: 26
Funded in the Environmental Innovation Programme of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection	
Summary (max. 1.500 characters): In the project, a highly integrated universal screen printing machine for packaging decoration was installed for the first time in Germany and the EU. The system will make it possible to combine previously separate decoration technologies (UV screen printing, hot foil stamping, lasering) within the same system. At the same time, this system enables the substitution of fossil natural gas and drastic electricity savings for the decoration of glass packaging. This is made possible by switching to resource-saving UV-LED drying, whereby the use of UV-LED colors can already be seen as part of the innovation. Another innovation is the possibility of individualization down to batch size 1 using the integrated laser. This results in new services and business models, from the traceability of products to monitoring the (sustainable) supply chain to the visualization of the CO2 balance of individual items. Furthermore, the combination of processes together with new, integrated modules means that significantly less electricity is consumed compared to individual systems and an increase in material efficiency (less waste, rejects) is made possible. The environmental impacts can be summarized as follows: substitution of natural gas, reduction of electricity consumption, reduction of CO2 emissions, elimination of ozone emissions, reduction of material consumption.	

Key facts and lessons learnt

- Funded projects are suited for demonstration purposes and replication.
- The programme prioritizes SMEs.
- 2.7 million tCO_2 emissions have been saved over the last 15 years.
- The programme is a long-established element of the federal funding programme portfolio; its focus on environmental technologies and demonstration projects is well-complementary to other key funding programmes, such as the Federal Funding for Energy and Resource Efficiency in the Economy.
- The open funding offer is regularly extended by new funding priorities in order to provide targeted input in areas relevant to environmental policy and technology.
- The findings from successfully implemented projects are used to further develop state of the art technologies. In this way, the Environmental Innovation Programme makes a significant contribution to shaping German and European environmental policy.

Federal Funding for Efficient Heating Networks

The funding programme promotes the construction of new heating grids with a high proportion of heat from renewable energies and the decarbonisation of existing grids. With the introduction of the BEW in 2022, the previous “Heating Networks 4.0” programme expired (2019-2022).

The BEW consists of four modules and the type of funding depends on the module:

- **Module 1** transformation plans for existing heating networks with the aim of full supply from eligible renewable heat sources by 2045 and feasibility studies for the construction of greenhouse gas-neutral heating networks with increasing shares of renewable energies and waste heat by 2045:
- **Module 2** systemic funding (investments and operating costs), for new construction of heating networks with a high proportion of renewable heat (at least 75% of renewable energies and waste heat) or transformation of existing grids for complete decarbonisation by 2045.
- **Module 3** individual measures, such as solar thermal systems, heat pumps, biomass boilers, etc.
- **Module 4** operating cost funding of solar thermal systems and heat pumps.

Companies according to §14 BGB can apply, as well as municipalities, municipal enterprises, companies and special-purpose associations, registered associations and cooperatives.

The amount of the grant is as follows:

- Module 1: up to 50% of eligible expenses, with a maximum of Euro 2 million for a duration of 12 months; planning services, as well as the evaluation of specific measures, are also eligible.
- Module 2: up to 40% of eligible expenses, with a maximum of Euro 100 million per project over a period of 4 years.
- Module 3: up to 40% of eligible expenses, with a maximum of Euro 100 million per project for a duration of 2 years.
- Module 4: Operating costs can be subsidised for the generation and feeding of heat from solar thermal systems and electrically powered heat pumps, with the amount of funding depending on the type of system and the annual performance factor during the first 10 years after commissioning.

The funding procedure is single stage. The application must be submitted to the Federal Office for Economic Affairs and Export Control (BAFA) before the project begins.

List of available indicators and data

In June 2022, the BMWK published an evaluation plan for the BEW, in which various indicators are listed to enable an assessment of the funding. The schedule integrated into the evaluation plan provides for the preparation of an interim report for August 2025. Up until then, no evaluation of the programme is available. Some selected indicators which assess the impact of the funding programme are:

- Share of renewable energy in funded and non-funded heating networks
- Funded expansion of renewable heat generation capacity
- Share of the investment volume triggered by the funding programme compared to the total investment in the heating network
- Number of stakeholders which have received funding compared to the total of stakeholders in the field of heating networks eligible for receiving funding
- Specific funding in Euro per size class of the networks and route length
- Length of funded existing and new heating networks

Key facts and lessons learnt

- The programme promotes the construction of new heating grids with a high share of renewable energies as well as the decarbonisation of existing grids.
- It funds a broad range of activities, ranging from feasibility studies, construction of new grids and operating costs.
- The programme has been further developed several times in recent years and adapted to current developments. Rising application numbers suggest that the programme is very well received, especially as the topic is highly relevant in the context of the energy transition.

Climate Protection Initiative Measures for Refrigeration and Air Conditioning Systems

The Federal Ministry for Economic Affairs and Climate Protection (BMWK) supports the use of modern climate protection technologies in refrigeration and air conditioning technology with grants.

Companies, non-profit organisations, local authorities, special-purpose associations and municipal enterprises, universities and schools, hospitals and church institutions are eligible to apply.

The following measures receive funding:

- the installation of the refrigeration unit of stationary refrigeration and air conditioning systems and re-cooling systems;
- the installation of stationary heat pumps for waste heat recovery;
- the retrofitting of dry coolers as pre-coolers or free-cooling systems;
- the installation of components and systems for refrigeration;
- the integration of systems for the use of renewable energies and the efficiency retrofitting of small systems.

List of available indicators and data

The Federal Ministry for Economic Affairs and Climate Protection has published an evaluation report of the National Climate Initiative for the years 2020/ 2021. The table below gives an overview on the energy savings realised through the funding programme and related directives performed on refrigeration systems:

The results of the evaluation period are listed below, although the unadjusted figures include effects (e.g. windfall effects) that cannot be directly but indirectly attributed to the measure.

Criteria	Unit	Evaluation Period (2020/2021)	Total Funding Period (2008-2021)
Implementation Type		Implemented through investment grants	Implemented through investment grants
Number of Funded Projects		903	3,783
Duration of Effect	[Years]	15	15
Paid Funding Amount	[Million €]	43.0	242.9
Investment Amount (Unadjusted)	[Million €]	345.4	1,625.6
Investment Amount (Adjusted)	[Million €]	194.5	752.5

Criteria	Unit	Evaluation Period (2020/2021)
Final Energy Savings:		
Net energy savings over the effect duration	[GWh]	1,222.80
Gross energy eavings ever the effect duration	[GWh]	2,803.60
Funding efficiency with regard to enegery savings		
Net funding efficiency with regard to enegery Savings	[GWh/€]	28.4
Net inverse funding efficiency with regard to enegery Savings	[€/MWh]	35.2
Gross funding efficiency with regard to energy savings	[GWh/€]	65.2
Gross inverse funding efficiency with regard to enegery savings	[€/MWh]	15.3

Key facts and lessons learnt

- The programme focuses on refrigeration and air-cooling technologies.
- A broad range of entities, e.g. companies, schools and local authorities, is eligible for funding.
- From 2008 to 2021, more than 3,700 projects with an overall investment volume of about 753 million Euro were funded.

Climate Protection Offensive for Companies

The programme offers low-interest loans to companies planning climate-friendly investments. Funding amounts up to 25 million Euro and up to 100% of eligible costs.

As part of the climate protection campaign for companies, KfW supports domestic or foreign companies in the commercial sector, freelancers and self-employed persons, municipal. Funding is provided for the construction and acquisition of facilities and the modernisation of existing facilities, in particular:

- Module A: Production of climate-friendly technologies and products that make a significant contribution to climate protection in downstream sectors
- Module A+: Investments in the production of batteries, solar panels, wind turbines, heat pumps, electrolysers, equipment for the capture, use and storage of CO_2 (CCUS)
- Module B: Climate-friendly production processes in energy-intensive industries
- Module C: Energy supply, systems for the low-CO_2 provision of electricity and heat, including the necessary infrastructure for distribution and storage
- Module D: Water, wastewater, waste
- Module E: Transportation and storage of CO_2
- Module F: Integrated mobility projects (in conjunction with at least one measure from Module C)
- Module G: Green IT

In connection with an eligible investment measure, expenses for planning and implementation support as well as the preparation of expert opinions and proof of compliance with the minimum technical requirements can also be funded.

List of available indicators and data

This programme has not yet been evaluated and data on potential savings is not available.

Key facts and lessons learnt

- The programme funds a broad portfolio of climate-friendly technologies and processes.
- Funded technologies both include transformation technologies such as CCUS and technologies for process and system optimisation.
- The programme offers loans of up to 25 million Euro and 100% of eligible costs.

OKOPROFIT

The environmental programme ÖKOPROFIT (ÖKOlogisches PROjekt Für Integrierte UmweltTechnik), was developed in 1991 by the Graz Environmental Agency in cooperation with Graz University of Technology. It is a co-operation project between the regional economy, administration and experts (private-public partnership) and offers companies an environmental management approach that focuses on raising awareness, practical relevance and the implementation of measures.

The aim is to reduce operational emissions, conserve natural resources, increase eco-efficiency and raise awareness of the environment and sustainability.

Companies in the production and service sector can participate in a programme which focuses on the establishment of an environmental management system that aims on identifying potentials and initiating improvement processes. The programme focuses on:

- Workshops: members of participating companies work together in groups to gain knowledge from ÖKOPROFIT and to build competences.
- Individual business consulting: carried out by trained ÖKOPROFIT consultants, energy saving potentials of the companies are assessed and accompanied with an implementation programme on how to realise the identified potentials.

Certification: later, the environmental performance of a company is verified by an independent commission and evaluated on certain criteria. The programme concludes with the location-specific ÖKOPROFIT-certification.

List of available indicators and data

Many companies decide to join a local network after the completion of the programme and become part of ÖKOPROFIT themselves by acting as experts for other companies. There are many examples in all the federal states of Germany, Austria and Switzerland, such as:

- Rhineland-Palatinate / Rheinland-Pfalz: Ökoprofit Mainz https://mwvlw.rlp.de/ministerium/oekoprofit
- Baden-Württemberg: https://www.arqum.de/leistungen/umwelt/oekoprofit-ecofit/
- Saxony: https://www.ihk.de/chemnitz/innovation/umweltschutz/umweltmanagement/oekoprofit-1912684

Some details of North Rhine-Westphalia (NRW) as an example:

- Since 2020, the Ministry of Environmental Affairs of the federal state of NRW offers subsidies for the realisation of ÖKOPROFIT-projects in NRW, which enables municipalities to conduct ÖKOPROFIT-projects: https://www.umwelt.nrw.de/system/files/media/document/file/2020-06-12_RdErl_Richtlinie_%25C3%2596KOPROFIT.pdf
- So far, 2,500 companies (613,000 employees) from North Rhine-Westphalia have taken part in ÖKOPROFIT® projects in recent years.
- The 2022/2023 evaluation, the 14 regional institutions of ÖKOPROFIT in NRW have reported successful energy and resource savings. The concrete environmental and energy-related measures taken by these enterprises have led to the following outcomes:
  - Total energy savings: 1,226,627 kWh
  - Avoided CO_2 emissions: 415.6 t
  - Avoided waste quantity: 57.5 t
  - Saved amount of water: 1,004.8 m^3
  - Total number of measures: 108
  - Energy and emissions-related measures: 57
  - Resources and waste-related measures: 32
  - Others: 15
  - Water and wastewater measures: 3
  - Measures related to communication and information: 1

Key facts and lessons learnt

- ÖKOPROFIT offers companies and regional communal or public entities advice on an environmental management.
- Through projects within the programme, companies, cities and counties learn how to develop and implement measures to save energy and natural resources.
- The state government of North Rhine-Westphalia (NRW) provides funding to municipalities so that they may encourage companies within their region to join ÖKOPROFIT projects.
- So far, 2,500 companies from North Rhine-Westphalia (NRW) with more than 613,000 employees have joined the programme.
- All in all, the approach of the programme has been replicated in several German states; the combination of both exchange among companies and individual business consulting seems to be appropriate and effective for participating companies.

SME Energy Transition and Climate Protection Initiative (MIE)

MIE encourages skilled crafts businesses on their path to the energy transition with a free advisory and support programme and suitable advisory tools. MIE stands for the connection of facilitating the exchange among regionally structured initiatives in the skilled crafts sector. For this, seven environmental centres from the skilled crafts organisation joined forces in 2013 and have since been offering professional dialogue, motivation, information and support for business owners as experienced contacts. The nationwide network of experts with over 70 transfer partners provides free information and a web-tool to SME stakeholders in Germany.

On their website, industry-specific knowledge for bakeries, butchers, car repair shops, metals, textiles and hair salons in terms of saving energy is published in form of a wiki, videos (real cases of companies implementing energy-saving measures) and short descriptions on how to become energy efficient as a SME.

The web-based tool “E-Tool” was (besides the seven environmental centres) initiated by Saar-Lor-Lux Umweltzentrum GmbH (website: https://www.saar-lor-lux-umweltzentrum.de) and the private EnMS software developer Wips-com GmbH (homepage: https://wipscom.de/). It is accessible via www.e-tool.de

List of available indicators and data

The free and open-source tool was created to provide SMEs an overview of their energy consumption and efficiency. After entering company-specific data it is possible to:

- evaluate the annual energy consumption
- determine the associated CO_2 emissions
- review certain key values
- analyse individual energy consumers
- analyse machine systems
- analyse the company fleet
- determine the carbon footprint

Separate apps in the tool help to develop:

- a business development plan,
- electricity and energy tax rebates,
- assessment of PV and heating systems.

Data evaluation for a SME in E-Tool. Source: Screenshot of the YouTube-Video “Online-Seminar Das "Energiebuch E-Tool"-Webportal”,
https://www.youtube.com/watch?v=egw8LJ7kOZ0

Furthermore, the tool can be used to get advice through consultation hours and receive support from energy advisors if required. E-Tool, including training courses, is distributed via regional partnerships involving the German Confederation of Skilled Crafts. The total number of users in 2023 has been estimated at ca. 60 SMEs.

Key facts and lessons learnt

- MIE offers free advice, support and tools to skilled crafts businesses on their path to the energy transition.
- The Initiative offers an E-Tool, which enables an individual evaluation of annual energy consumption and the associated CO_2 emissions.
- The Tool shall serve as an entry point for SMEs towards energy management.
- In 2023, the Tool was used by approximately 60 SMEs per year.

7.2.3. Greece

"Exoikonomo_Epichiro"

In the context of the "Exoikonomo - Epichiro" Action of the Recovery and Resilience Fund (RRF) by the Ministry of Environment and Energy, the new programme aims at the energy upgrade of buildings of low energy efficiency and interventions other than those on the building structure, which will contribute significantly to energy saving in line with the country's energy targets.

The total budget state expenditure amounts to 176,750,000 Euro.

The subsidised budget (state and private participation, excluding VAT) of each investment proposal of a potential aid beneficiary:

- may not exceed the amount of five hundred thousand Euro (500,000 Euro) in the case of the tourism sector
- may not exceed the amount of two hundred and fifty thousand Euro (250,000 Euro) in the case of the Trade and Services sector.

Note that in the case of aid for the provision of consulting or ancillary services in total, said aid may not exceed seven percent (7%) of the subsidised budget of the investment plan, with the maximum total of ancillary expenses covered reaching 30,000 Euro

In any case, the subsidised budget (state and private participation, excluding VAT) may not exceed the product of 1.45 Euro multiplied by the total estimated annual primary energy savings (kWh). Where the ratio of subsidised budget to annual primary energy savings is less than 1.45, the eligible amounts shall be reduced proportionately.

Beneficiaries of actions

Enterprises (small, medium and large) in the sectors trade, services and tourism are eligible, except those activities excluded under the ERDF and the Commission's General Block Exemption Regulation (EU) No 651/2014. The Business Activity Codes (KAD) are detailed in Annex 5 of this Call.

Expenses eligible under the action include all those related to:

- Costs for the implementation of energy upgrade interventions
- Costs for preparing, submitting and monitoring the application as well as monitoring the achievement of minimum energy targets under the De Minimis Regulation
- Investment costs, required to achieve greater energy efficiency.

List of available indicators and data

Investment aid for EEMs other than those related to buildings

Business size \ Business type	Energy saving expenditure	Support expenditure (De minimis)
Large enterprises	30%	40%
Medium	40%	
Small and Micro	50%	

Investment aid for EEMs in buildings

Business size / Business type	Energy saving expenditure	Support expenditure (De minimis)
Large enterprises	45%	40%
Medium	55%	
Small and Micro	65%	

Key facts and lessons learnt

The action is expected to contribute to the overall target of reducing annual primary energy consumption by 380GWh, resulting in a corresponding reduction of annual greenhouse gas emissions by 90% CO_2e, corresponding to an average reduction of GHG by 35%.

Modern manufacturing

The programme involves the financing of business plans for small and medium-sized enterprises and aims at transforming the manufacturing base of the Greek economy into new or diversified production lines, products and manufacturing services with extrovert orientation.

One of the three distinct choices of the programme is to improve energy efficiency. In particular, the energy efficiency component for SMEs focuses on providing support to improve the energy efficiency of their production processes and their preparation for the implementation of future Community standards on energy consumption in the production of goods and related services.

Investment projects of very small, small and medium-sized enterprises of the Greek industrial ecosystem are subsidised to strengthen their technological infrastructure and upgrade their manufacturing equipment using smart, cutting-edge technologies with low environmental impact.

Investment projects should aim to improve the resilience of the enterprise through the upgrade of digital production management and control systems, the procurement of advanced and digitally controlled industrial equipment, the digitalisation of interconnection systems throughout the supply chain and the production of systems and technology that support digital transformation.

Indicative interventions that can be implemented concern:

- digitalisation of production lines by utilising Industry 4.0 technologies,
- automation and interconnection of supply chains, design and production of smart products and services,
- application of Smart Manufacturing technologies to improve cost efficiency,
- quality assurance and risk management,
- feasibility studies and market research for the development of new smart products/services.

List of available indicators and data

Total Budget: 73,227,620 Euro
Fund Budget: 73,227,620 Euro

Application Submission Start: 07/12/2022
Application Submission End: 21/04/2023

Geographical Area: All of Greece
Call Publication Website: https://www.ggb.gr/

Key facts and lessons learnt

The aim of the action is to:

- Accelerate industrial transition by digitizing business and production functions, enhancing the competitiveness of enterprises, and fostering a resilient industry. This will be achieved by upgrading micro, small, and medium-sized industrial enterprises with advanced production equipment and industrial digital skills.
- Promote the adoption of innovative technologies by leading beneficiary manufacturers, stimulating the creation of new markets and expanding existing ones.
- Upgrade the production equipment and infrastructure of small and medium-sized enterprises within eligible NACE codes. This will be supported by financial investments in smart manufacturing and artificial intelligence systems, leading to increased productivity, improved competitiveness, and the creation of high-quality jobs.
- Enhance energy efficiency in small and very small enterprises, with a focus on practical, sustainable solutions.
- Create a sustainable industrial sector by fostering long-term growth and innovation.
- Improve energy efficiency within the industrial sector to reduce consumption and environmental impact.

7.2.4. Ireland

Non-Domestic Microgeneration Scheme

The Non-Domestic Microgen Grant provides financial assistance to help businesses and other commercial sector organisations to install solar PV panels to generate electricity on site.

https://www.seai.ie/grants/business-grants/commercial-solar-pv/

The grant amount offered is based on the standard output of the installed solar PV system. A solar PV system with an output of a maximum 1000kWp can be grant funded through the scheme. The maximum grant that can be applied for is 162,600 Euro for a 1MW system. If applicant installs over 1MW, they can still apply for the max grant of 162,600 Euro. This grant is available to a range of non-domestic organisations and businesses, such as:

- Commercial Businesses
- Agricultural Businesses
- Public Sector Bodies
- Schools and Education Facilities
- Community Centres
- Non-profit Organisations and Societies

The applicant creates the application, through the SEAI application portal. When creating an application, the Applicant selects the Company (contractor) on the application portal. Contractors must have attended a certified SEAI approved course. All qualified contractors will be listed on the SEAI website. The Applicant and the chosen Company receive notification of an application. There is a requirement to have a contract (LOO) in place with the Applicant. It is important that the Letter of Offer matches what is installed.

Grants are eligible for 8 months from date the Letter of Offer is received. Company/Installer must apply to the ESB Network about connecting the solar PV System to the electricity network. This must be done before installing the solar PV system. This process can take 4 weeks or more. Once the ESB connection has been approved, the Company/Installer can proceed to install the solar PV system. Full payment for the solar PV system is made to the Company/Installer on completion, by the applicant.

The Company uploads all requirement documentation to the SEAI portal, with the aim of getting this uploaded within three days of the install. SEAI will only begin to process application for payment once all required documentation is received. Typically, there is a four-to-six-week turnaround from documentation received to payment grant. If selected for inspection, this timeline will be extended.

List of available indicators and data

No data available on individual NDMG projects.

Please find details below of NDMG applications received since the scheme began in 2023:

	APPS	TOTAL €	TOTAL kWp
PAID	561	4,519,246	23,510.25
COMMITMENTS	914	17,266,444	92,348.00

Database is restricted and no data on performance of EEM's.

Some data available in annual report on Grants Issued and financial support offered (page: 65 -6.13 Non-Domestic Microgen)

https://www.seai.ie/sites/default/files/publications/SEAI-Annual-Report-2023-Irish-and-English.pdf

Key facts and lessons learnt

- Regulatory Compliance: Ensure that the installation meets all the relevant regulations and standards.
- Financial Incentive: Take advantage of the financial benefits such as feed-in tariffs from selling excess energy back to the grid.

EXEED Excellence in Energy Efficiency Design grant programme

The EXEED grant programme is designed for organisations who are planning an energy investment project. Grant support of up to 3,000,000 Euro per project is available. EXEED supports large businesses to decarbonise their buildings by achieving optimum energy performance.

EXEED addresses the life cycle energy and carbon costs from the design stages. It takes a holistic approach when it comes to energy management and looks at total energy use, identifying and challenging why the energy is needed in the first place. The EXEED approach can be used by large businesses who want to effectively investigate their energy needs and implement energy efficient measures to reduce CO_2 emissions.

EXEED offers 2 stages of grant supports: Stage 1 is up to 50% of costs incurred for pre-investment professional services and Stage 2 is up to 30% eligible costs for implementation of the project. Stage 1 is divided into Application and Planning and Design. Application should start before implementation begins on the project. A letter of offer must be issued by SEAI before the work can commence. In terms of planning and design, the EXEED project will be defined and documented in a plan and shall include system purpose and physical boundary, an energy balance, energy services. Also an **Energy Balance Study should be developed** to ensure the building or system operate within optimal energy usage parameters. This will include: Energy Modelling, EAs, Benchmarking and Recommendations. The objective is to minimalize energy input but maintain desired performance output. A **Detailed Engineering** phase includes detailed planning & design and involves technical improvements and refinements of the project.

Stage 2 grant application commences after the Planning and Design phase is complete, and before Implementation of project. Project construction cannot commence until Letter of Offer is issued by SEAI. This stage consists of implementation and operation. After the implementation is complete, the project is handed over to the client. SEAI site inspection is carried out following the completion of the project as part of the grant payment approval process. Measurement & Verification of the energy savings occurs at the operation stage. The M&V process will compare the energy use of the completed project with the baseline design.

List of available indicators and data

Some case studies available on website: https://www.seai.ie/case-studies/ahascragh-eco-distillery/

https://www.seai.ie/case-studies/dublin-airport-authority/

https://www.seai.ie/case-studies/aurivo-ballaghaderreen/

SEAI EXEED Infographic.pdf

Database is restricted and no data on performance of EEM's.

Data available for some individual projects through case studies, and some data available in annual report on Grants Issued. page: 66 -6.15 EXEED

https://www.seai.ie/sites/default/files/publications/SEAI-Annual-Report-2023-Irish-and-English.pdf

Key facts and lessons learnt

- Data-driven decision making to maximize energy performance.
- Stakeholder engagement throughout the process.
- Long-term vision that aligns projects with EXEED objectives of energy efficiency.
- Set clear & measurable metrics.

Support Scheme for Renewable Heat Programme

Within the Support Scheme for Renewable Heat, two available kinds of support are available

- Investment Aid Grant for heat pumps of up to 40% of capital costs associated with heat pump project. Grant amount for heat pump offered is based on a sliding scale for the (S)COP of heat pump system proposed. As an add-on to this a 30% grant is also offered for any Related Energy Measures, i.e. anything that will improve the operating efficiency of the heat pump system e.g. building fabric upgrades, air tightness, heat recovery, ventilation etc. https://www.seai.ie/grants/business-grants/support-scheme-renewable-heat/Tariff-Scheme-Operating-Rules-and-Guidelines-2022.pdf
- Operational Aid tariff scheme for biomass or biogas installations over a 15-year period. Tariff offered is based on eligible heat usage and paid quarterly through meter readings. These are available to all non-domestic and public sector businesses who are using fossil fuels and wish to switch to a renewable heating source. Eligible heat uses include space heating, hot water and process heat. https://www.seai.ie/publications/SSRH-Grant-Scheme-Operating-Rules-and-Guidelines.pdf

Different technologies are incentivised, and guidelines are provided to take into account the peculiarities, as follows

- Anaerobic Implementation Process Anaerobic-Digestion-Implementation-Guide.pdf (seai.ie) Feasibility study is the most critical stage of the process and includes evaluating feedstock availability & suitability, feedstock characteristics & biodegradability which will determine the potential energy output, facility location & environmental conditions, and costings & revenue.
- Biomass Boiler Implementation Process: www.seai.ie/sites/default/files/publications/Biomass-Boilers-Implementation-Guide.pdf As for the feasibility study the project must assess the technical and economic feasibility of a biomass boiler for the site. The size and complexity of the project will dictate the depth of the feasibility study required. Due consideration to thermal storage is required at the Sizing & Design stage.
- Biomass CHP Implementation Process: Biomass-CHP-Implementation-Guide.pdf (seai.ie) Similar process as Biomass Boiler.
- Heat Pump Implementation Process Heat-Pump-Implementation-Guide.pdf (seai.ie)

Before project commences, applicant must confirm the building meets the eligibility requirements, including adequate insulation, meets required energy performance standards. Building's energy needs and suitability for a Heat Pump system should be assessed. Also in this case a detailed feasibility study to analyse the potential benefits, costs, and energy savings of installing a heat pump.

Once installed the system must be tested and commissioned to ensure it operates efficiently and meets the performance expectations. All actions taken during commissioning should be recorded and documented. A plan for ongoing monitoring and maintenance should be implemented to ensure the heat pump system remains efficient and effective over time.

List of available indicators and data

No individual data available on individually implemented projects. Some case studies available online.

The table below outlines the grant offers for both heat pumps & biomass from 2019, with the carbon savings in tCO_2/Year

Year	Grant Aid Letter of Offers (Heat Pumps)	Carbon saving (tCO2/year)	Operational Aid Letter of Offers (Biomass)	Carbon saving (tCO2/year)
2019	1	31.5	8	3,478
2020	0	0	24	4,594
2021	0	0	19	2,772
2022	2	174.73	14	2,072
2023	3	120.13	20	4,525
2024	7	5,007.08	10	2,301
	13	**5,333**	**95**	**19,742**

Key facts and lessons learnt

- Before installing a heat pump system, the thermal efficiency of the building (or process) must be as high as possible. Existing building will likely need upgrades.
- It is important to undertake a feasibility study to establish the technical, physical, practical, and financial viability of a biomass/biogas system.
- The quantity and type of available feedstock affects the choice of AD facility. It is important to ascertain what manures and potential farm-grown crops (for example, grass, silage) might be available from the farm, and in what quantities.
- A key step in developing a CHP system is to define and quantify the on-site heat and power demand profiles.

Energy Efficiency Obligation Scheme – Energy Credits

EEOS is an Irish energy efficiency scheme operating since 2014 and that until now supported over 3000 businesses. An estimated 2,000 places of businesses (SME/Large enterprises, in industry or tertiary sectors) have received EEOS support in the years 21,22,23 & 24 collectively.

https://www.seai.ie/about/regulatory-functions/energy-efficiency-obligation-scheme/

Under EEOS, large suppliers and distributors must achieve annual energy efficiency targets by supporting energy efficiency projects in businesses, homes & communities. There are three main sub targets under EEOS and the EEOS support measures align with these:

- **Cross Sector:** This includes non-domestic, domestic individual measures and EVs. At this link a full list of the measures EEOS-Cross-sector-deemed-scores-table.pdf (seai.ie) is provided. These support measures are available to businesses, homeowners and communities.
- **Residential**
- **Energy Poverty**

Actions and projects carried out through EEOS are expected to achieve 60% of Irish energy efficiency targets by 2030 (36,424GWh).

Energy suppliers & distributors that sell more than 400GWh of energy per years are Obligated Parties (OP) under EEOS. All OP's are set annual targets based on sale volumes. For every unit of energy saved, OP's earn Energy Credits that contribute to their overall targets. (1kWh = 1 energy credit).

Any organisation who is planning an energy efficiency project/ to implement EEMs can apply for support from an Obligated Party. OP's claim energy credits by supporting energy efficiency projects in homes, businesses & communities. They must get a signed statement from the beneficiary of the project confirming that the OP has supported the project and can count the energy savings achieved. Engineering calculations or M&V reporting must also be included to verify the energy savings from the project.

SEAI tracks the credits submitted by all Obligated Parties on a database, ECMS (Energy Credit Management System). This data is compiled annually into an end of year report which is issued to each OP, quantifying the energy credits they have earned versus their targets, and defining their final compliance position.

It's possible to pull reports from this software (i.e. select OP = all, target year = 2022) and sum the credits. Similarly, we could pull this from 2021 – present to check how OP's are progressing towards the final target.

SEAI also create compliance certificates for DECC indicating the compliance position of each OP at the end of each year (i.e., have they met their target) which contain the totals earned, so it would be easy to sum these also. DECC then issue these to the OPs. As these are cumulative earnings for the whole target period (2021-2030), this tells how Ireland is performing against its final 2030 target (36,424 GWh = 60% target).

OP's can trade energy credits in EEOS. The energy credits can be bought and sold among OP participants, to help meet their regulatory obligations. This trading allows for flexibility in achieving energy efficiency targets.

List of available indicators and data

Energy credits awarded to the OP's

Database is restricted and no data on performance of EEM's.

Some data available in annual report. (page: 64 -6.9 Energy Efficiency Obligation Scheme) & (page: 19)

https://www.seai.ie/sites/default/files/publications/SEAI-Annual-Report-2023-Irish-and-English.pdf

Key facts and lessons learnt

- Obligated Parties are responsible for adopting robust methods of quantifying energy credits.
- Energy credits must be awarded on a conservative basis.
- No Irish studies available on EEOS to date.

7.2.5. Italy

Regional incentives for SMEs to implement measures that allow for the reduction of energy consumption in production processes or to install photovoltaic systems for self-consumption Lombardy

The Lombardy Region promoted incentives for SMEs to implement measures that allow for the reduction of energy consumption in production processes or to install photovoltaic systems for self-consumption.

https://www.bandi.regione.lombardia.it/servizi/servizio/bandi/ambiente-energia/efficientamento-energetico/incentivi-riduzione-consumi-energetici-imprese-l-installazione-impianti-fotovoltaici-eventuali-sistemi-accumulo-destinare-autoconsumo-RLT12020010303

The call for proposals included three different lines of funding:

- **Lines 1 and 2**: Covered 50% of costs for consultancy, certified technical assessments, design, project management, and testing of interventions, capped at 10% of the total costs.
- **Line 1**: Provided 40% of eligible expenses for EEMs, with a minimum investment of 80,000 Euro.
- **Line 2**: Offered 30% of eligible expenses for the installation of photovoltaic systems, potentially including energy storage systems.

Eligible expenses for the supply and installation of photovoltaic systems were defined as follows:

- 2,000 Euro/kW for systems up to 20 kW
- 1,600 Euro/kW for systems up to 100 kW
- 1,000 Euro/kW for systems over 100 kW

The 30% contribution also applied to expenses for:

- The supply and installation of combined inverter and battery systems
- Connection to the electrical grid
- Safety costs
- Any storage systems

For each line, the investment contribution cannot exceed a maximum of 400,000 Euro, excluding consultancy and related costs.

In particular Line 1 included savings obtained by EEMs on the production site of the company, calculated based on the (thermal and electrical) consumption over the last three solar years, derived from an EAs prepared in accordance with the UNI 16247 standard, parts 1 and 3. The reduction of the energy performance index (EPI) had to be at least 7% and did not include the reduction of consumption related to the air conditioning of the production site, except for the possibility of replacing the heating or cooling generation system using waste heat from the production process or from co-generation plants serving the production process.

The participations' application had to be accompanied by an EAs and a consumption reporting sheet in accordance with the one used for the requirements of Art.8.

The ranking was then established by assigning scores based on various merit criteria. A merit score (from 0 to 100) was assigned based on the following evaluation and reward criteria.

Line 1:

a) A score proportional to the energy consumption of each company (expressed as an average of equivalent tonnes of oil over the last three years, referring to thermal and electrical consumption), aimed at favouring companies with higher consumption and, consequently, greater savings in absolute terms.

b) Merit score to be determined based on the reduction of the energy performance index of the intervention, in addition to the minimum reduction requirement of 7%.

Line 2: a) A score proportional to the capacity of the photovoltaic systems, aimed at favouring interventions with greater production capacity; b) A merit score in case of integration with storage systems, to be determined based on the respective storage capacity.

For both Line 1 and 2: priority in the ranking for companies holding one of the following certifications: EMAS, ISO 50001, or ISO 14001.

Participation in the first line was initially very low, while participation in the second line was significantly high, which is why Lombardy Region decided to transfer part of the budget from line 1 to line 2.

List of available indicators and data

The results published by the Lombardy Region for Line 1 include, for each participant, the average consumption over three years, the EPI before and after the intervention, the corresponding score, and the contribution received.

For Line 2, a list of "eligible" applications is available, including the capacity of the photovoltaic systems and any storage units.

https://www.bandi.regione.lombardia.it/servizi/servizio/bandi/ambiente-energia/efficientamento-energetico/incentivi-riduzione-consumi-energetici-imprese-l-installazione-impianti-fotovoltaici-eventuali-sistemi-accumulo-destinare-autoconsumo-RLT12020010303

Key facts and lessons learnt

- The participation of companies in Line 1 was very low, likely due to the 7% reduction threshold.
- Linking efficiency improvements to the completion of the EAs is a good practice.

White Certificates Scheme (Energy Efficiency Obligation Scheme)

White certificates (WhC), also known as Energy Efficiency Certificates, provide evidence of end-use energy savings achieved through projects aimed at increasing energy efficiency in the final uses of energy.

TABELLA 6 – Unità fisiche di riferimento oggetto di interventi approvati dall'avvio del meccanismo al 31/5/2012 e distribuzione geografica dei risparmi energetici (RNc) certificati con schede tecniche (fonte: AEEG)

Scheda tecnica: titolo e periodo di applicazione	Unità fisiche di riferimento		Risparmi netti contestuali (RNc)	Ripartizione percentuale tra aree geografiche			
	Definizione	N		NORD	CENTRO	SUD	Italia
01+smi. lampade fluorescenti compatte (da gen-05 a gen-11)	CFL *	74.599.490	6.161.443	42,3%	33,4%	24,3%	100%
02. scalda-acqua a gas in luogo di elettrici (da gen-05)	scalda-acqua	2.370	807	37,9%	43,5%	18,6%	100%
03. caldaia unifamiliare a 4 stelle a gas (da gen-05)	caldaia	322.234	58.312	71,8%	21,6%	6,6%	100%
04. scalda-acqua a gas più efficienti (da gen-05)	scalda-acqua	4.028	746	57,2%	31,9%	10,9%	100%
05. doppi vetri (da gen-05)	mq di vetro sostituito	183.968	5.327	71,2%	24,4%	4,4%	100%
06. Isolamento edifici per riscaldamento (da gen-05)	mq di superficie isolata	1.204.012	8.162	96,9%	2,8%	0,3%	100%
07. impianti fotovoltaici <20 kW (da gen-05)	Impianti installati	1.792 **	8.176	40,7%	13,4%	45,9%	100%
08+smi. collettori solari (da gen-05)	mq di pannello	737.332	205.569	55,6%	26,5%	17,9%	100%
09. inverter in motori elettrici < 22 kW (da gen-05)	kW installati	7.881	2.930	33,5%	54,3%	12,2%	100%
10. decompressione del gas naturale (da gen-05)	n.a.	n.a.	2.784	92,1%		7,9%	100%
11. motori a più alta efficienza (da gen-05)	kW installati	35.896	1.949	64,1%	18,9%	17,0%	100%
12. elettrodomestici di classe A (da gen-05 a lug-08)	elettrodomestici	1.086.286	91.597	67,2%	20,6%	12,2%	100%

https://www.mase.gov.it/energia/certificati-bianchi https://www.gse.it/servizi-per-te/efficienza-energetica/certificati-bianchi

WhC are tradeable assets certifying that a reduction of final energy consumption has been gained as a result of interventions and projects to increase energy efficiency. As part of this scheme, the development of projects that provide for use of renewable sources in in non-electric processes is also encouraged, in relation to their capacity to increase energy efficiency and to permit primary energy savings.

In the first phase of the scheme, managed by the National Regulator AEEG, a detailed set of information on energy savings was made available through periodic reports (e.g..heat recovery in industry, industrial cogeneration, public lighting, energy improvements in buildings) For specific technologies

a table with the number of units per technology (e.g. compact fluorescent lamps, district heating), their energy saving, and the share of savings by macro-region (North, Centre, South) was published every semester (see II Rapporto TEE (arera.it)).

In the second phase of the scheme (managed by the State Company GSE), only the first reports still included some information on EEMs for deemed savings and simplified monitoring projects, together with aggregated information on energy savings per sector (e.g. IND-FF, IND-E): RAPPORTO+ANNUALE+SUL+MECCANISMO+DEI+CERTIFICATI+BIANCHI.PDF (gse.it) .

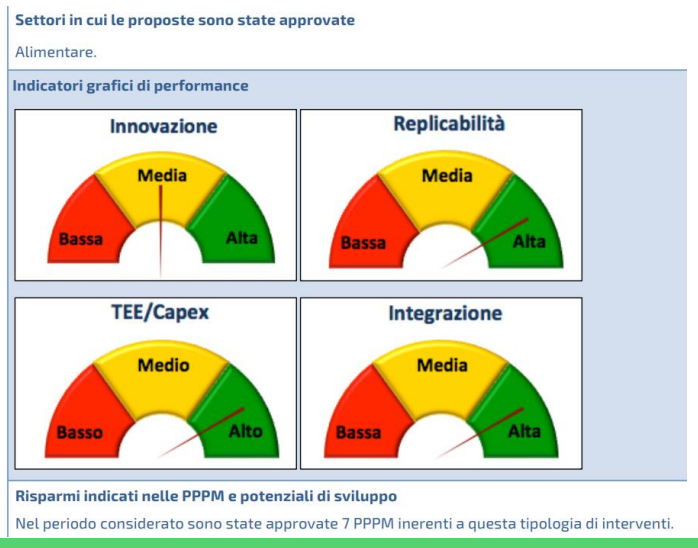
Since 2014, GSE also publishes a set of data on beneficiaries and number of certificates issued: opendata (gse.it) . Nevertheless, there are no information on the type of EEMs.

For Monitoring plans, two studies have been carried out by FIRE on behalf of ENEA. The first of them listed and assessed the proposals received by ENEA as technical body supporting the Managing Authority of the scheme. The number of proposals per type of technologies, savings and sectors were listed and briefly analysed (2013-12-studio-PPPM-FIRE-ENEA.pdf (fire-italia.org)).

Soluzioni tecnologiche monosettoriali	Settore	Risparmi previsti (tep)	N° PPPM
Cogenerazione a biomassa solida	Agro-alimentare	10.000	2
Climatizzazione serre a biomassa		466	2
Forno cottura alimenti		3.731	2
Concentratore/Evaporatore/RMV		8.838	7
Formatura ad aria		1.736	3
Uso diretto di biomassa nel processo	Calce	35.532	5
Macchina continua	Carta	9.649	8
Forno clinker	Cemento	12.897	3
Uso di CSS (CDR)		56.356	12
Molino/Macinazione		25.962	9
Forno ceramiche	Ceramica	4.888	8
Celle a membrana	Chimica	24.604	4

The second study analysed different technologies and provided indicators in the form of a simple dashboard; one of the indicators was the impact of the value of the incentive on the CAPEX of each technology/process improvement technique.

The information on EEMs in the Italian WhC scheme is relevant and listed since 2005, even if not disclosed nor accessible.



List of available indicators and data

First phases of the scheme: number of EEMs per technology for standardised approaches (not available for more complex monitoring projects), energy savings associated to those EEMs, energy savings per sector.

Key facts and lessons learnt

- Interesting analysis in terms of market, comprehensive energy savings, innovative approaches like additionality.
- Need for more information on EEMs in terms of technologies.
- Need for more information on EEMs in terms of SPB, NPV etc., useful for Institutions and Private stakeholders interested in investing in EE technologies.

Transition 4.0 and Transition 5.0 Plans

The measure is an evolution of the 4.0 Plan concept and promotes investment in new digital technologies aimed at rationalising energy consumption. There are two separate routes for investment in new capital goods on Italian territory: the 4.0 digital transition and the most ambitious digital and energy transition 5.0. The benefits offered by both transitions for the same investment are not allowed to be cumulated. Transition 5.0 requires the achievement of specific energy efficiency targets through the adoption of goods 4.0 and provides incentives for different investment categories, including digital assets 4.0, the installation of devices for self-generation of energy from renewable sources and staff training programmes.

Businesses that invest in digital activities, self-production of energy from renewable sources and staff training can benefit from a tax credit. This tax benefit is linked to a reduction in final energy consumption (at least 3 percent) or energy savings in processes (at least 5 percent) due to investments in digital activities. The tax credit increases based on the certified improvement in energy efficiency (from 5% to 45% of investment). Projects must be certified by an independent evaluator, with ex ante and ex post certifications. For SMEs, additional incentives are foreseen regarding the costs of energy-saving certifications. The method of use provides for compensation via F24 by 31 December 2025, with the possibility of settling any remaining allowances in 5 equal annual instalments.

The procedure for accessing the tax credit involves GSE and includes various stages, from booking to final certification. It is necessary to provide regular reporting and technical certifications attesting to the energy savings achieved, as well as verification by the statutory auditor and confirmation of the integration of assets into the company.

In summary, Transition 5.0 provides a structured and targeted incentive to encourage investments that combine digitalisation and energy savings, with more advanced rules of use and monitoring than in the previous Transition Plan 4.0.

For EEMs carried out in accordance with the Transition Plan 4.0 and 5.0, a cumulative saving of 6,6 Mtoe of final energy is expected, assuming that the measures described above in the Industry 4.0 Plan, or similar, remain in place until 2030.

Bratta et al. provided information about the Industry 4.0 Plan (2017-2020) in terms of number and typology of companies involved, investments and employment generated with these policies.

Bratta B., Romano L., Acciari P., Mazzolari F. in 1) The Impact of Digitalisation Policies. Evidence from Italy's Hyper-depreciation of Industry 4. Assessing the impact of digital technology diffusion policies. Evidence from Italy https://www.finanze.gov.it/export/sites/finanze/.galleries/Documenti/Varie/dfwp6-1_ultimo.pdf ; & 2) & Assessing the impact of digital technology diffusion policies. Evidence from Italy (2023) Economics of Innovation and New Technology, 32 (8), pp. 1114-1137, DOI: 10.1080/10438599.2022.2075357

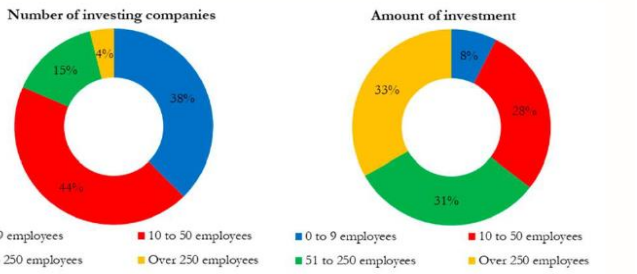


Figure 1. Hyper-depreciation take-up by firm size.

Table 3. Hyper-depreciation take-up by industry.

Industry	Number of beneficiary firms	Advanced digital tech. Investments (.000 euro) Av. per firm	Total	Investment shares
Manufacturing	4,266	731.8	3,121,940.83	82.6%
Trade	1,267	194.8	246,860.10	6.5%
Water, sewerage, waste management	108	716.7	77,407.55	2.0%
Construction	473	123.1	58,207.76	1.5%
Transport and logistics	165	351.1	57,927.79	1.5%
Energy	24	2,376.6	57,037.34	1.5%
Administrative and support service activities	205	182.9	37,495.83	1.0%
Other services	62	338.5	20,986.24	0.6%
Health and social work activities	109	161.9	17,651.70	0.5%
Agriculture	30	580.4	17,412.57	0.5%
Professional, scientific, technical activities	272	55.6	15,111.84	0.4%
Mining	35	417.2	14,600.95	0.4%
Accomodation and food service activities	235	51.8	12,164.37	0.3%
Arts, sports, entertainment	35	262.1	9,172.40	0.2%
Information and communication	159	53.4	8,491.90	0.2%
Other industries	162	43.0	6,958.71	0.2%
	7,607	496.8	3,779,427.89	100%

Figure 5: Cumulative employment growth effect of digital technology investments, log number of employees in 2016=100

Source: authors' calculations based on MEF- DF tax returns data, Bureau van Dijk, ISTAT and ANPAL data.

The results of Transition 4.0 have been published by the "Corte dei Conti" (Court of Auditors Public Finance Coordination Report 2023 https://www.corteconti.it/Download?id=ddfd70d1-1d57-46c6-b12c-6c0001670bb7) provide information on the typology of investments (tangible-intangible capital goods, R&I, training) by economic activity and geographical distribution.

TRANSIZIONE 4.0 PNRR: CREDITI D'IMPOSTA MATURATI

Dichiarazioni dei redditi periodi d'imposta 2020 e 2021	PNRR Numero di beneficiari	PNRR Totale crediti maturati (mln)	TARGET CID T2 2024	TARGET CID T2 2025
1.1.1 Credito d'imposta per i beni strumentali materiali 4.0	64.115	5.438,4	17.700	26.900
1.1.2 Credito d'imposta beni strumentali immateriali 4.0	10.075	78,7	27.300	41.500
1.1.3 Crediti d'imposta per beni immateriali tradizionali	22.830	10,0	13.600	20.700
1.1.4 Credito d'imposta per R&D&I (non coperti da PNRR per l'anno d'imposta 2020)	8.655	559,7	10.300	20.600
1.1.5 Credito d'imposta formazione 4.0 (non coperti da PNRR per l'anno d'imposta 2020)	15.023	617,4	1.000	2.000
TOTALI	120.698	6.704,2	69.900	111.700

Fonte: elaborazione Corte dei conti su dati Ministero per le imprese e il Made in Italy

TRANSIZIONE 4.0 PNRR E PNC: DISTRIBUZIONE PER SETTORE ECONOMICO (N. BENEFICIARI)

Settore economico	2020 e 2021 Numero beneficiari Beni materiali 4.0	2020 e 2021 Numero beneficiari Beni immateriali 4.0	2021 Numero beneficiari Beni imm. tradizionali	2021 Numero beneficiari R&S &I	2021 Numero beneficiari Formazione 4.0
Agricoltura, silvicoltura e pesca	14%	3%	1%	1%	1%
Estrazione di minerali da cave e miniere	0%	0%	0%	0%	0%
Attività manifatturiere	30%	52%	29%	59%	27%
Fornitura di energia elettrica, gas, vapore e aria condizionata	0%	0%	0%	0%	0%
Fornitura di acqua; reti fognarie, attività gestione rifiuti e risanamento	1%	1%	1%	1%	1%
Costruzioni	12%	5%	7%	3%	12%
Commercio all'ingrosso e al dettaglio; riparazione di autoveicoli e motocicli	20%	16%	21%	8%	22%
Trasporto e magazzinaggio	2%	2%	2%	1%	6%
Attività dei servizi di alloggio e di ristorazione	5%	4%	8%	0%	5%
Servizi di informazione e comunicazione	0%	2%	5%	14%	7%
Attività finanziarie e assicurative	0%	0%	1%	0%	1%
Attività immobiliari	0%	1%	3%	0%	0%
Attività professionali, scientifiche e tecniche	2%	5%	13%	9%	5%
Noleggio, agenzie di viaggio, servizi di supporto alle imprese	2%	2%	3%	2%	5%
Amministrazione pubblica e difesa; assicurazione sociale obbligatoria	0%	0%	0%	0%	0%
Istruzione	0%	0%	1%	0%	1%
Sanità e assistenza sociale	3%	3%	3%	1%	3%
Attività artistiche, sportive, di intrattenimento e divertimento	0%	0%	1%	0%	1%
Altre attività di servizi	1%	1%	2%	0%	1%
Attività di famiglie e convivenze	0%	0%	0%	0%	0%
Organizzazioni ed organismi extraterritoriali	0%	0%	0%	0%	0%
Attività non classificabile	5%	1%	0%	0%	0%
Totale	**100%**	**100%**	**100%**	**100%**	**100%**

List of available indicators and data

Aggregated economic data of Transition 4.0 is partially available.
No data of Transition 5.0 is available yet as the mechanism is not fully operative.
No energy data available

Key facts and lessons learnt

- Recognised strong link between energy efficiency and economic competitiveness
- Boosting the link digital and green transition in the evolution to Transition 5.0
- No energy data is available. Objectives of final energy consumption reduction, but no objectives of primary energy reduction (due to renewables implementation).

Technology and innovation for savings and widespread energy efficiency (TREND)

The TREND project in Lombardy was initiated to enhance energy efficiency among small and medium-sized enterprises (SMEs). Funded by the EU's FESR 2007-2013, the project enabled companies to conduct EAs, implement energy management systems, and adopt practices aimed at reducing energy consumption and costs. By analysing energy use, TREND identified opportunities for energy efficiency improvements and established a framework for ongoing monitoring, using key energy and economic indicators, such as energy consumption and production costs. The project aimed to raise awareness, build competencies, and provide tools for energy efficiency specifically within the manufacturing sector.

The project was executed in three phases:

- **Analysis&Scouting**: This phase focused on selecting the most effective measures for improving energy performance in SMEs based on their sector and size. It identified the best measures in terms of energy savings (in toe or Euro saved per year) and the most cost-effective solutions.
- **EA**: This involved matching SMEs (voluntary participating to the project) with experts in energy management. In the end, the experts conducted EAs for 500 companies that requested them.
- **EEMs**: This phase matched the demand for clean technologies and energy efficiency services through a call for suppliers of technology and/or energy services, adhering to national standards (UNI CEI 11352). It included a notice reserved for companies participating in the second phase, aimed at identifying and financing the best projects to improve energy performance, covering 50% of total costs up to a maximum of 50,000 Euro.

Funding was provided through the POR-FESR 2007-2013 Axis 1, focusing on innovation and knowledge economy, featuring two grant funding lines:

- **EAs**: covering 75% of costs, up to a maximum of 5,000 Euro.
- **Energy performance improvement measures**: covering 50% of costs, up to a maximum of 50,000 Euro.

Participation modalities included an over-the-counter call for EAs (post formal eligibility check) and a competitive call for EEMs, reserved for companies that participated in the audit call. Projects were ranked based on innovation, energy savings, environmental benefits, and competitiveness.

The main results of the project have been presented in 2013 by Finlombarda Spa and the Lombardy Region during the Energy Management 2013 conference.

Main results of phase 2 (EAs):

- **105 subscriptions** to the expression of interest from energy experts
- **30 of these experts directly involved** in one or more of the audits
- **408 EAs funded** with a total cost of about 2.5 million Euro (average 6,000 Euro) of which 1.8 million Euro covered by funding (average 4,400 Euro)

The analysis from EAs revealed:

- **Energy characterisation**: A detailed analysis of electrical consumption (the most used energy vector) was conducted, while thermal uses (especially in processes) were less developed.
- **Intervention areas and models**: There was a predominance of targeted interventions focused on:
  - **Electrical equipment** (motors, inverter installations, connected to compressors, pumps, fans, etc.)
  - **Lighting** (replacement with high-efficiency elements, LED installations)
  - **Thermal systems**
  - **Self-generated energy** (renewable energy systems, cogeneration, etc.)

Main results of phase 3 (EEMs):

- **60 companies** responded to the call for expressions of interest for technology and/or energy service providers, with listings added to a dedicated website.
- **175 projects submitted** under the call for measures; 169 were accepted for technical evaluation after formal review.
- **88 projects funded** (with a one-year timeline for completion), involving a total cost of approximately 8.5 million Euro (average 96,600 Euro per project), 3.34 million Euro of which was covered by financing (average 38,000 Euro per project).

Implementing these 169 evaluated projects could enable companies to reduce energy consumption by about 4,600 tonnes of oil equivalent (toe), leading to an average energy savings of approximately 7%, with some cases reaching up to 40%.

The analysis of the projects submitted highlighted:

- **Focus on reducing electrical consumption**, prioritising interventions that include:
  - Replacement of outdated electrical machinery with more efficient models (28% of projects)
  - Introduction of power regulation devices (inverters and transformers, 7%).
- **Significant proposals aimed at reducing thermal consumption**, primarily through the enhancement and recovery of heat in steam production cycles (20% of projects).
- **Implementation of interventions on the compressed air production cycle**, focusing on optimisation and rationalisation (including heat recovery) as well as efficiency improvements through the replacement of outdated compressors (17% of projects).

List of available indicators and data

Companies were required to annually submit, for at least two years after the project's completion, an updated set of indicators (not published), including:

- annual electricity consumption;
- annual consumption of each fuel used;
- annual expenses for electricity procurement;
- annual expenses for the procurement of each fuel used;
- annual production volumes;
- annual revenue;
- annual production costs.

Key facts and lessons learnt

- A large need for knowledge concerning energy efficiency opportunities and tools.
- A very low awareness about energy consumption and related environmental impacts of manufacturing processes.

7.2.6. Lithuania

NECP Measure EE4 – Agreements with energy suppliers on consumer education and advice

Energy suppliers will implement consumer education measures and consultancy services, executed by the energy supplier itself or a third person, bound contractually. This measure is expected to lead to energy savings of 3 TWh (total amount of energy savings in 2021-2030 period) due to changes in consumer behaviour.

The government has decided to continue efforts to increase consumer awareness, therefore the provisions of the Law on Increasing Energy Efficiency concerning agreements with energy suppliers on consumer education and consulting will extend beyond 2030. According to this Law, energy suppliers are obliged to conclude agreements with the Ministry of Energy of the Republic of Lithuania (hereinafter referred to as the 'Ministry of Energy') on consumer education and consulting.

Agreements on consumer education and consulting must include:

the scope and timetable of consumer education and consulting.

the procedure for reporting on the scope of consumer education and consulting (form of report, reporting periods).

information on consumer education and consulting measures.

the duration of the agreement and the procedure, and the possibility of extending it.

Energy suppliers will ensure the implementation of the scope of consumer education and consulting and of measures provided for in agreements concluded between them or through other partners. Newly established energy suppliers must sign agreements with the Ministry of Energy on consumer education and consulting within 6 months of the date of establishment. This measure is expected to lead to energy savings of 2,77 TWh due to changes in consumer behaviour.

Under the agreement, energy suppliers commit to saving at least 1% of their annual energy supply. Energy suppliers have a wide range of education and advice measures in place, which they distribute to their own customer groups (e.g. business or domestic customers). Each education and advice measure has a corresponding weighting, which ranges from 0.002 to 0.07. The supplier shall specify in the contract how many consumers and which E&C tools will be used (this may be all consumers or only a part of consumers).

The most used measures are: 'Publication of information on a website' (coefficient of 0,0025), 'Publication of information in the press or in print publications, on television or radio' (coefficient of 0,002) and 'Counselling at the consumer's premises' (coefficient of 0,02). In the thermal energy sector, a frequently used and highly effective measure is 'Presentation of a comparative analysis to a group of consumers, together with advice on energy savings in the press' (coefficient 0.005) or 'Training on the efficient operation of heat points' (coefficient 0.07).

Penalties are in place for those companies who do not submit their reports:

a warning for failure to submit a report in accordance with the Consumer Education and Consultation Agreement;

for refusal to enter into a consumer education and counselling agreement or for failure to comply with the requirements or conditions laid down in the agreement, a fine of up to 3 % of the gross annual revenue.

List of available indicators and data

Public annual reports on the implementation of the measure and which energy suppliers have concluded agreements with the Ministry of Energy are published on the websites:

https://www.ena.lt/vartotoju-sk-susitarimai/

https://enmin.lrv.lt/lt/veiklos-sritys-3/energijos-vartojimo-efektyvumas/energijos-vartotoju-svietimo-ir-konsultavimo-susitarimai/

The information provided to us by energy suppliers is not publicly available. Many energy suppliers publish energy saving tips on their websites and this information is publicly available, but more detailed information on the implementation of the measure is not publicly available and some information is even confidential.

Key indicators for this measure include:

- Energy savings, which must represent at least one per cent of the energy supplied (total savings and savings per supplier);
- The number of suppliers that have concluded agreements;
- Education and consultation measures applied (under the agreement or additional measures not included in the agreement);
- Types of consumers (business or domestic).

Public annual reports about implementation of measure is published in ena.lt website.

Consumer information, empowering programmes, information and training Art. 12 and 17 EED: Main indicator: total savings by implementing the Energy Saving Agreements annually from year of 2017 till 2030.

Key facts and lessons learnt

- Some energy suppliers do not collect and analyse data related to the feasibility of the education measure.
- The number of energy suppliers remains stable, making it difficult to find new suppliers to contract with the Ministry of Energy.
- Some energy suppliers are reluctant to sign the agreement, even though this obligation is foreseen.
- Most suppliers need to be reminded of the deadlines for submission of declared documents.

NECP measure EE6 – Energy saving agreements with energy companies

Energy companies (operators of the electricity and gas transmission system and distribution networks) will save energy according to the levels of energy specified in the energy savings agreements (either on their own or through others) by applying cost-effective energy efficiency improvement measures at the final energy customers' facilities (installations, equipment, transport).

The Law on Increasing Energy Efficiency sets out a legal framework for energy saving agreements. According to the Law, electricity and gas transmission systems and distribution system operators in which at least 1/2 of the voting rights in the general shareholders meeting are held by the State, either directly or through State-controlled companies (hereinafter referred to as 'State-controlled operators'), have an obligation towards the Ministry of Energy to make public the agreements on energy saving. Other energy companies may also conclude energy saving agreements with the Ministry of Energy.

The energy savings of energy companies will be determined in proportion to the final energy to be delivered to consumers over the last few years.

Energy saving agreements include the following elements:

- the energy savings/GHG reductions to be achieved by the energy company and the timetable for those savings;
- the procedure for reporting on energy savings (form of report, reporting periods);
- information on energy efficiency improvement measures that will ensure mandatory energy savings;
- financial investment indicators for energy efficiency improvement measures and the methodologies for calculating them;
- the duration of the agreement and the procedure, and the possibility of extending it;

This measure is expected to result in annual savings of around 100 GWh.

List of available indicators and data

Summary reports on the implementation of the measure are publicly available (link to the LEA website).

The annual reports submitted by the companies and the documents justifying the implementation of the measures are not publicly available.

Main indicator: total savings by implementing the Energy Saving Agreements annually from year of 2017 till 2023 (https://www.ena.lt/energijos-sutaupymo-susitarimai/)

Other indicators: the number of companies that have concluded energy saving agreements; the difference between the planned amount of energy savings and the realised energy savings; the number of companies that have implemented the planned annual energy savings.

Key facts and lessons learnt

- It is difficult to attract companies to enter into such agreements, because they require concrete savings and annual reporting.
- It is difficult to calculate energy savings because there are no official methods for calculating energy savings for specific measures.
- Energy savings implementation reports are often prepared by non-energy experts, so the energy savings calculations are not always correct. Companies often need to be reminded of their obligation to submit annual energy savings reports.

7.2.7. Malta

Investment Aid for Energy Efficiency Projects
The aid awarded through this measure shall be in the form of a cash grant or a tax credit (which can be utilised against tax payable by the beneficiary) or a combination of both. Approved projects must commence within six (6) months from the date they are approved and should be completed within thirty-six (36) months from approval date. All companies could benefit from this scheme as long as they implemented energy efficiency projects and equipment which is intended to improve energy efficiency. The programme intends to provide finance to implement EEMs and then the company is required to manage the project and ensures implementation of the action.
List of available indicators and data
• Energy savings and investment costs. • Size of the enterprise • Description of the action or equipment to be installed. • Warranted engineer's report or EAs reference describing the forecasted energy savings the project is expected to achieve.
Key facts and lessons learnt
It is key to communicate benefits of financial mechanism to companies in a way that they easily understand and can easily relate to. It also important to promote the available financial schemes with both companies and energy auditors to increase awareness of the available financing schemes. Energy auditors can also serve as agents of change by informing companies on their energy savings potential and available financing schemes to implement the recommended measures.

Smart and Sustainable Investment Grant
The aid awarded through this measure shall be in the form of a cash grant for investments that lead to more sustainable processes leading to the enhancement of competitiveness of the enterprise through the optimisation use of resources. All companies can benefit from this scheme as long as they implement projects that are eligible for financing and are not engaged in activities that are excluded under the *de minimis* Regulation.
List of available indicators and data
• Investment of costs (minimum investment cost of 10,000 Euro). • Energy savings, water savings and carbon footprint reduction (applicable according to project type). • Description of the action or equipment to be installed. • Warranted engineer's report or EAs reference describing the forecasted energy savings the project is expected to achieve.
Key facts and lessons learnt
It is key to communicate benefits of financial mechanism to companies in a way that they easily understand and can easily relate to. It also important to promote the available financial schemes with both companies and energy auditors to increase awareness of the available financing schemes. Energy auditors can also serve as agents of change by informing companies on their energy savings potential and available financing schemes to implement the recommended measures.

7.2.8. Netherlands

Energy saving obligation

In the Netherlands, the *Environmental Activities Decree* (*Besluit activiteiten Leefomgeving*) and the *Environment Buildings Decree* (*Besluit bouwwerken Leefomgeving*) require business locations that consume 50,000 kWh of electricity or 25,000 m^3 of natural gas (or their equivalent) or more per year to implement energy-saving measures that have a payback period of five years or less.

The obligation to report on the implementation of these measures is outlined in the Energy Saving Obligation and the Dutch audit requirement. Businesses subject to the Energy Saving Obligation must submit a report every four years through either the *Energy Saving Notification Obligation* or the *Energy Saving Investigation Obligation*. The most recent deadline for submitting this report was December 1, 2023; companies that have yet to complete this submission are advised to do so promptly.

List of available indicators and data

Data is reported under underlaying regulations: Energy Saving Obligation and NL audit obligation (see profile below).

Key facts and lessons learnt

- Business locations that use 50,000 kWh of electricity or 25,000 m^3 of natural gas (or an equivalent) or more per year have to implement all energy saving measures with a payback period of five years or less.
- Based on business activities with impact on the environment.
- Split between energy saving measures for buildings, facilities and industrial processes.
- Not applicable to residential housing.

Energy Saving Notification obligation

In the Netherlands, if a business location consumes 50,000 kWh of electricity or 25,000 m³ of natural gas (or equivalent) annually, it is subject to the Energy Saving Obligation. This obligation requires the location to implement any energy-saving measure with a payback period of five years or less. Additionally, businesses that meet this requirement must report on the energy-saving measures implemented every four years through the Energy Saving Notification Obligation.

For reporting, organisations must submit their implemented measures through the Netherlands Enterprise Agency's (RVO) eLoket digital portal, using the Recognised Energy Saving Measures Lists (*Erkende maatregelenlijst energiebesparing*, or EML) as a guide. The EML provides categorised measures with payback periods of five years or less, divided into lists for buildings, facilities, and processes. Businesses should refer only to categories relevant to their activities, such as room lighting (buildings), compressed air (facilities), and process heating (processes).

The local competent authority, typically the municipality, is responsible for monitoring and enforcing both the Energy Saving Obligation and the Notification Obligation, though large or complex locations may fall under provincial jurisdiction. These tasks are usually delegated to an environmental agency, which, as of 2023, includes energy-saving obligations in its standard work package.

The environmental agency accesses reports through eLoket and uses them to verify compliance with the Energy Saving Obligations. If a report prompts questions, or if further clarification is needed, the agency may conduct inspections. Businesses failing to report on time risk enforcement actions, which may include financial penalties for non-compliance.

List of available indicators and data

General indicators:

- Sector/type of the business
- Energy usage in kwh, m3 gas, GJ warmth (GJ), fuels, other (GJ)
- Use of renewable energy
- Type and number of buildings
- Energy label of buildings

On 150 energy measures known to have a payback period of 5 years or less (if applicable):

- Description of status before the measure is taken
- Detailed description of the measure
- Economic preconditions (predefined on hours of usage)
- Technical preconditions (predefined on availability)
- Situational preconditions (i.e. only in case of renovation)
- Implementation (fully, partly, not applicable, alternatively implemented, not (yet) implemented, preconditions have not been met yet)

Public access (aggregated data):

Feiten en cijfers energiebesparingsplicht (rvo.nl)

StatLine Aardgas en elektriciteitslevering aan bedrijven; verbruiksklasse, SBI 2008 (cbs.nl)

Key facts and lessons learnt

- Use of the Recognised Energy Saving Measures List is recommended. This prevents having to calculate payback times for all possible measures yourselves.
- If a business location uses the list all the applicable measures on the list have to be reported on.
- Main measure categories: buildings, facilities and industrial processes.
- 27 subcategories (partly pre-selected, party selectable)
- 150 detailed energy savings measures with objectively calculated payback time of 5 years or less.
- Not applicable to residential housing.
- Not applicable to industrial facilities and processes of business locations using 10,000,000 kWh of electricity or 25,000 m3 of natural gas (or an equivalent) or more per year (see Energy Saving Investigation obligation below).

Energy Saving Investigation obligation

In the Netherlands, the *Environmental Activities Decree* (*Besluit activiteiten Leefomgeving*) mandates that business locations consuming 10 GWh of electricity or 170,000 m³ of natural gas (or equivalent) annually must investigate potential energy-saving measures, with a particular focus on manufacturing processes.

If a business location within an organisation consumes at least 50,000 kWh of electricity or 25,000 m³ of natural gas annually, it is subject to the Energy Saving Obligation, requiring the implementation of all energy-saving measures with a payback period of five years or less. Additionally, businesses under this obligation must report every four years on executed energy-saving measures through either the *Energy Saving Notification Obligation* or *Energy Saving Investigation Obligation*.

For locations with a very high energy use (10,000,000 kWh or 170,000 m³ or more), the *Energy Saving Investigation Obligation* applies, focusing on Chapter 3 activities as defined in the Environmental Activities Decree. For these locations, companies must investigate possible energy-saving measures for processes and activities, without the need to submit a report under the Energy Saving Notification Obligation, and the Recognised Energy Saving Measures List (EML) is not required. These organisations are expected to identify and implement energy-saving measures with a payback period of five years or less promptly, detailing this process in a report submitted through the digital eLoket portal.

This report should include a description of installations and processes along with corresponding energy usage, an analysis to identify cost-effective measures for energy reduction and CO_2 emissions, and a specific Action Plan. Companies may use RVO-provided templates to analyze technical insulation, electrical drive systems, and basic measures. The report should also describe the organisation's energy management approach and include energy-saving actions taken between 2021 and 2023, as required for European Commission reporting.

Lastly, the *Energy Saving Notification Obligation* does apply to buildings on these high-consumption locations, and companies can use the EML for buildings to fulfil this reporting requirement.

List of available indicators and data

General indicators:

- Sector/type of the business
- Energy usage in kwh, m3 gas, GJ warmth (GJ), fuels, other (GJ)
- Usage of renewable energy
- EED-audit reference if applicable
- ETS reference if applicable

RVO provides a template that can be used for the investigation report.

The report has to contain at least the following elements:

- A schematic overview and generic description of the location
- A description of the installations and processes
- A description and argumentation of implemented energy saving measures
- Including a description and calculation of the energy reduction, the CO_2 reduction and the payback period

An analysis of the energy usage:

- A description of the monitoring of energy and the processes
- A visualisation of the energy usage within the different elements of the processes (including an energy balance)
- A specification of unused heat flows
- A conclusion regarding the energy usage

An analysis of the production equipment and installations, including a conclusion regarding the energetic optimalisation of the equipment and installations, and:

- A scan of the technical insulation
- An analysis of the electrical drive systems
- A reflection on the base list of energy saving measures
- For IPPC-locations: a description of the implementation of the best available techniques (BAT)

An inventory of cost-effective CO_2 reducing measures including a description and calculation of the energy reduction, the CO_2 reduction and the payback

period The base check Energy management

An implementation plan

Public access (aggregated data):

Feiten en cijfers energiebesparingsplicht (rvo.nl)

StatLine Aardgas en elektriciteitslevering aan bedrijven; verbruiksklasse, SBI 2008 (cbs.nl)

Key facts and lessons learnt

Obligatory audit report including:

- Inventory of implemented energy saving measures
- Inventory of cost-effective CO_2 reducing measures (not yet implemented)
- Implementation plan
- Obligation to implement all energy saving measures with a payback period of five years or less.

Energy Investment Allowance (EIA)

The Energy Investment Allowance (EIA) offers tax benefits to companies in the Netherlands, Aruba, Curacao, Sint Maarten, or the BES Islands that invest in energy-efficient technologies and sustainable energy. This scheme allows businesses to pay less tax, with an average tax reduction of 10%, while also lowering their energy bills. To qualify for the EIA, companies must meet several conditions: they must be entrepreneurs paying income or corporate tax, their investment must be included in the Energy List (referred to as "company resources"), and the company resource must meet the required criteria. Additionally, the resource must not have been used previously, and the company must report the investment on time, typically within three months after placing the order.
The EIA offers tax deductions for both specific investments (clearly defined) and generic investments (tailor-made) that lead to significant energy savings. Companies can deduct 40% of the investment costs from their taxable profits, in addition to the usual depreciation. These investments are listed as "company resources" on the Energy List.

List of available indicators and data

1. Total investment in sustainable technologies: 3.523 billion Euro
2. Increase in total investment compared to 2021: +61%
3. Budget available for the EIA: 149 million Euro
4. Expected budget usage for the EIA: 309 million Euro
5. Total number of EIA applications: 27,059
6. Increase in the number of EIA applications compared to 2021: +7,580
7. Number of entrepreneurs who applied for the EIA: 17,775
8. Total CO_2 reduction per year from energy-saving investments: 1,753 kilotonnes
9. Total energy saving in m^3 of natural gas (equivalent): 990 million m^3
10. Number of households equivalent to the energy savings: 539,000 households
11. Net benefit for EIA entrepreneurs from their energy-saving investments: 11%
12. Most common energy-saving measures:
    - LED lighting system: 2,808 applications, investment of 109.7 million Euro
    - Insulation for existing buildings: 1,329 applications, investment of 34.2 million Euro
    - Heat pump (air-to-air): 1,124 applications, investment of 13.9 million Euro
    - Heat pump (air-to-air, over 12 kW): 1,015 applications, investment of 54.3 million Euro
13. Energy-saving measures in processes and equipment:
    - Technical provisions for energy saving in existing processes: 479 applications, investment of 401.2 million Euro
    - Electric furnaces: 413 applications, investment of 46.7 million Euro
    - Transcritical CO_2 refrigeration and/or freezing equipment: 396 applications, investment of 117.3 million Euro
14. Sectors with the most EIA applications:
    - Agriculture, forestry, and fishing: 7,852 applications, investment of 643.3 million Euro
    - Wholesale and retail trade; repair of motor vehicles: 4,807 applications, investment of 235.4 million Euro
    - Manufacturing industry: 2,503 applications, investment of 700.7 million Euro
    - Financial institutions: 2,079 applications, investment of 382 million Euro
    - Transport and storage: 1,449 applications, investment of 160.9 million Euro
15. Most common renewable energy technologies:
    - Solar panels for electricity generation: 9,019 applications, investment of 353.6 million Euro
    - Batteries for storing sustainably generated electricity: 144 applications, investment of 48.7 million Euro
16. Top 10 energy-saving technologies:
    - Solar panels for electricity generation: 9,019 applications, investment of 353.6 million Euro
    - LED luminaires: 2,808 applications, investment of 109.7 million Euro
    - Heat pump (air-to-air): 1,329 applications, investment of 68.3 million Euro
    - Insulation for existing structures: 605 applications, investment of 34.2 million Euro
    - Energy-efficient fan: 579 applications, investment of 39.3 million Euro
    - Waste heat recovery system: 491 applications, investment of 151.3 million Euro
    - Energy-efficient milk cooling: 479 applications, investment of 4.2 million Euro
    - Technical provisions for energy savings in existing processes: 462 applications, investment of 401.2 million Euro
    - Heat or cold recovery from ventilation air: 413 applications, investment of 34.8 million Euro
    - Electric ovens: 411 applications, investment of 46.7 million Euro
17. Distribution of EIA applications by SBI sector:
    - Agriculture, forestry, and fishing: 7,852 applications (29.02% of total)
    - Wholesale and retail trade; repair of motor vehicles: 4,807 applications (17.76% of total)
    - Manufacturing industry: 2,503 applications (9.25% of total)
    - Financial institutions: 2,079 applications (7.68% of total)
    - Accommodation and food service activities: 1,897 applications (7.01% of total)

These indicators provide an overview of the key data regarding investments and applications for energy-saving measures within the context of the EIA (Energy Investment Allowance) scheme in the Netherlands.

Public access (aggregated data): Jaarcijfers EIA 2022 (rvo.nl)

Key facts and lessons learnt

- You can receive a tax deduction for clearly defined investments (specific) and for tailor-made investments (generic) that result in substantial energy savings. You can deduct 40% of the investment costs from the taxable profit. This is possible on top of the usual depreciation. These investments are described as ‘company resources' on the Energy List.
- The applicable EEMs are more energy efficient (at higher costs) than regular EEMs in the current market.
- EEMs with a pay back period of 5 years or less are not endorsed.

7.2.9. Portugal

Energy Saving Plan
The Energy Saving Plan (PPE), approved in the Council of Ministers Resolution no. 82/2022 of 27 September and extended by Order no. 1572/2024 of 8 February, arose from the need for Member States to respond to the European Commission's challenge to reduce gas consumption by 15% between August 2022 and March 2023, and later extended to March 2024. The PPE encompasses reduction measures in the areas of energy, water efficiency and mobility, and covers the public administration, central and local, and private sectors (including industry, commerce, services, and citizens), with particular emphasis on energy-related measures. The PPE has a cross-cutting and rapid application, focused on demand management, with the following strategic vectors: • Investing in energy and water efficiency in industry, reducing its energy consumption and increasing its competitiveness. • Investing in energy and water efficiency in the residential, commercial and services sectors, as well as in campaigns to promote balanced and sustainable consumption. • Promoting the production of renewable electricity for self-consumption. The PPE comprises a set of measures that complement each other and contribute to reducing energy consumption. The measures to reduce energy consumption focus on the areas of energy and water efficiency. The Plan includes a total of 16 recommended and mandatory measures, the latter relating to the public central administration: • Communication and awareness-raising (one measure). • Training and capacity building (three measures). • Behaviours and recommendations (12 measures). The energy savings envisaged in the PPE influence direct consumption of natural gas and on primary energy consumption associated with electricity production in thermoelectric power stations.
List of available indicators and data
Monthly reports: https://planopoupancaenergia.pt/monitorizacao/ Final report: https://planopoupancaenergia.pt/wp-content/uploads/2024/04/PPE_Flash_report_Mar2024.pdf Main indicators: • Natural gas savings (%) • Achievement of the Regulation’s target (15%) Main results (between August 2022 and March 2024): • 22.6% savings on natural gas; • 150.7% achievement of the Regulation’s target; • 2585 measures taken in public administration; • 277 measures taken in services and commerce sectors; • 456 measures taken in the industry; • 90 training and capacity building actions undertaken, reaching 1408 people. • 29 awareness-raising and communication actions undertaken, reaching 2,8 million people.
Key facts and lessons learnt
• The savings measures recommended in the PPE were broken down by three sectors of activity: central public administration, local public administration and private sector. In addition, a national communication and awareness-raising campaign was defined across all these sectors. • Specific measures were defined for each sector, which were mandatory for Central Public Administration and recommendatory for the other sectors. • The PPE included: specific measures; injection into the grid of electricity produced by photovoltaic systems; calls for funding from the Environmental Fund, under the Recovery and Resilience Plan.

Energy Consumption Efficiency Promotion Plan (PPEC)

The Energy Consumption Efficiency Promotion Plan (PPEC), launched in 2006 by the Energy Services Regulatory Authority (ERSE), is currently enabled by Decree-Law no. 15/2022 of 14 January, which establishes the organisation and operation of the National Electricity System, and by Decree-Law no. 62/2020 of 28 August, which establishes the organisation and operation of the National Gas System.

PPEC aims to promote measures to improve efficiency in the consumption of electricity and gas, on an individualised or integrated basis. PPEC funds EEMs that contribute to the targets set out in the National Energy and Climate Plan 2030 (PNEC 2030).

Applications to the PPEC must comply with the objectives and criteria defined in Regulation no. 343/2021 of 15 April, Ordinance no. 55/2021 of 11 March and Order no. 6546/2021 of 5 July from the Office of the Assistant Secretary of State for Energy. This Regulation establishes the conditions for access and the rules for valuing and selecting EEMs, the procedures for managing, implementing, publicising and reporting the measures, as well as the rules and procedures for registering, publicising and reporting the associated financial resources, which are the responsibility of ERSE, under the terms of the Electricity Sector Price Index Regulation and the Gas Sector Price Index Regulation.

PPEC's latest edition, the 7th, presented as main changes the extension to measures aimed at natural gas customers, promoting energy efficiency in an integrated manner in the electricity and gas sectors, and strategies to ensure greater budgetary implementation of the plan, specifically through the overbooking mechanism.

List of available indicators and data

ERSE publishes reports with the approved measures and the impacts and benefits of the measures. Tangible measures include the installation of equipment with a higher level of efficiency than the market standard, thus achieving measurable reductions in consumption. Intangible measures include disseminating information about good practices in the efficient use of energy, with the aim of promoting changes in behaviour.

Approved measures

Impacts and benefits of measures

Main indicators:

- Energy savings, electricity and gas (GWh)
- Emissions reduction (tCO_2)

Main results (7th edition, October 2022):

- 655 GWh **energy savings**
- 243 000 tCO_2 **emissions reduction**

Values resulting from the implementation of tangible measures.

The beneficial effects of the measures to be implemented will last until 2043.

Key facts and lessons learnt

- Since 2007, seven editions of the PPEC have been implemented, with multi-annual execution.
- The benefits of PPEC, in terms of avoided costs and environmental benefits, far outweigh its costs, in terms of costs borne by the price index.
- Considering the tangible measures of the seven editions together, the benefit-cost ratio is 12.5, i.e. the benefit is 12.5 times greater than the cost, which shows that the commitment to competitive mechanisms of the nature of the PPEC and investment in EEMs provide gains to the energy sector that outweigh the costs borne by it. The accumulated savings, 10 TWh, correspond to the annual consumption of 4.8 million households. The CO_2 emissions avoided, 3.7 million tonnes of CO_2, represent around 29% of the annual emissions of the car fleet in circulation in Portugal

Environmental Fund

In order to ensure that environmental policy is more effective, the programme of the 21st Constitutional Government included the creation of a single Environmental Fund, concentrating the resources of the existing funds so as to obtain an instrument with greater financial capacity and greater adaptability to the challenges posed.

To this end, Decree-Law no. 42-A/2016 of 12 August, which came into force on 1 January 2017, set out to create the Environmental Fund, establishing the rules for its allocation, management, monitoring and execution of the respective revenues and support to be granted.

The purpose of the Environmental Fund is to support environmental and climate action policies for the pursuit of sustainable development objectives, contributing to the fulfilment of national and international objectives and commitments, namely those relating to climate change, renewable energy sources and energy efficiency, water resources, waste, nature conservation and biodiversity, the welfare of pets, forestry and forest management, landscape planning and management.

The Environmental Fund is managed by the General Secretariat of the Ministry of the Environment and Energy and finances organisations, activities or projects that fall within the following areas of activity:

a) Mitigation of climate change, through actions that contribute to the reduction of greenhouse gases (GHG) and thus to the fulfilment of targets, namely in the field of GHG emissions, renewable energies and energy efficiency.

b) Adaptation to climate change, with particular emphasis on actions to increase resilience and reduce the territory's vulnerabilities to climate change.

c) Carbon sequestration and utilisation;

d) Carbon markets;

e) Efficient use of water and protection of water resources;

f) Sustainability of water services;

g) Environmental protection, radiological protection and management of environmental risks and damage;

h) Waste management;

i) Transition to a circular economy;

j) Protection and conservation of nature and biodiversity;

k) Fostering the welfare of pets;

l) Fostering a sustainable bioeconomy;

m) Forestry and sustainable forest management;

n) Valuing land-use planning and the landscape;

o) Transport and sustainable mobility;

p) Energy efficiency, energy from renewable sources, self-consumption and renewable energy communities, tackling energy poverty and just transition;

q) Tackling energy poverty

r) Promoting the systemic balance and sustainability of the energy sector and national energy policy;

s) Monitoring environmental quality;

t) Capacity-building and awareness-raising on the environment and climate action;

u) Research, development and innovation projects, from the basic research process to transfer to the market and eventual market introduction;

v) Cooperation in the area of the environment and climate action, namely to fulfil international commitments.

List of available indicators and data

The activity report of 2022 "Relatório de atividades, gestão e contas 2022" (Activity Report 2022) can be accessed at:

https://www.fundoambiental.pt/ficheiros/2024/relatorio-de-atividades-e-gestao-2022-pdf.aspx

The aim of the 2022 Call for Proposals was to fund measures to promote rehabilitation, decarbonisation, energy efficiency, water efficiency and the circular economy, helping to improve the energy and environmental performance of buildings.

Main indicators:

- No. of projects that received financial support with measures that promote an average 30% reduction in primary energy consumption in the intervened buildings
- Co-financing value granted (Euro)
- Execution rate (%)

Main results (2022):

- 70,468 **projects received financial support**
- 122.8 million Euro **granted**
- 91% of **execution rate**

Key facts and lessons learnt

- The annual plan for the allocation of funds and the use of revenue is defined by order of the member of the government responsible for the environment and climate action.
- The annual plan includes a programme of calls for applications for some or all types of support.
- The measures supported by the Environmental Fund contribute to the targets set in the PNEC and Lon-Term Strategy for Building Renovation (ELPRE).

7.2.10. Slovakia

SlovSEFF sustainable energy financing facility

SlovSEFF programme was financed by the sale of Emissions Trading System emission certificates from Slovakia to Spain. The programme has already ended after finishing its third phase, SlovSEFF III in 2021. In the first and second phase of the programme, approximately 150 mln euro was used to finance approximately 700 projects with total energy annual savings estimated at 583 GWh/year. The majority of the funding (about 600 projects out of the 700 and more than 60% of the financial resources) was dedicated to residential projects. Next to the financing, applicants obtained an incentive of between 5 to 20% of the disbursed loan. In order to participate in the project, applicants had to provide a form that provides information on the measures they wanted to implement. Upon approval of the application, industrial companies had to carry out an EAs to confirm that the most appropriate energy saving measures have been chosen. The implemented savings had to be verified later on by a third party.

SlovSEFF was established in 2007 as a financing mechanism for investments in residential and industrial energy efficiency. More specifically, it provides private companies, energy service companies and housing associations/cooperatives with a financing facility for investments in energy efficiency and renewable energy to reduce greenhouse gas emissions. The programme addressed all company sizes.

List of available indicators and data

Collected in the Monitoring system of energy efficiency of SIEA, tailored datasheet accessible upon request, not publicly available.

Actually, achieved energy savings according to monitoring system of SIEA:

Relevant measures in Slovak NEEAP 2017-2020 SlovSEFF						
2017	2018	2019	2020	2021	**Total**	Unit
5,269,444	3,819,452	1,049,510	4,123,977	7,085,526	**21,347,909**	kWh
18.97	13.75	3.78	14.85	25.51	**76.85**	TJ

Key facts and lessons learnt

- The funding programme was introduced in 2019.
- It supports a broad range of technologies for improving energy efficiency and expanding the use of renewable energy in companies.
- In 2022, the funding programme has led to energy and resource costs savings totalling 1,2 billion Euro.

7.3. Questionnaire and data collection on EEMs in Partner Countries

In this Annex, the structure of the questionnaire completed by each of the Partner Countries is presented. To answer the various questions, the Partner Countries drew upon multiple sources. Regarding the information sources, Partner Countries relied on a combination of both internal and external sources to respond to the various questions. Among the most frequently cited sources were publicly accessible databases, such as those managed by SEAI and ENEA, which were widely used for several questions. Non-publicly accessible data managed by Energy Agencies played a crucial role for EWA, LEA, ADENE, and RVO, being frequently mentioned as primary sources. Non-public external databases were also used, although less frequently (dena and EIHP). Direct interactions, such as bilateral calls, mainly involved dena and EIHP, underscoring the importance of direct communication in gathering information. European institutional sources, on the other hand, were used to a limited extent, with only a few occurrences (e.g., SEAI for a single question).

Overall, it could be highlighted how the Partner Countries combined various strategies and resources to obtain the necessary information, balancing the use of public, internal, and non-public sources depending on availability and the type of question.

Regarding the organisations involved in gathering information, the National Energy Agencies themselves emerged as key contributors throughout the questionnaire. Indeed, their own data played a particularly prominent role in answering several questions and were used by more than half of Partner Countries. For the remaining countries, Ministries of Energy, Climate, and Environment departments, were frequently consulted for most questions. Other ministries played a more limited role in providing information, although they were consulted in specific cases. This summary underscores the importance of National Energy Agencies as central actors in supporting the collection and analysis of data on the implementation of EEMs.

7.3.1. Questionnaire structure

Section 1 – Overview of the Contents and Guidelines

Section 2 – Energy Efficiency Measures (EEMs) under Art. 8/11

Question 2.1:
Does the Art.8 Managing Authority collect data about implemented and recommended EEMs of Energy Audits and EnMS? If yes, how is the data being collected and stored? Is such data published?

Question 2.2:
If yes to 2.1, please indicate in the table below the available information, starting from the most recent available year.

Question 2.3:
If yes to 2.1, please complete the table below for 2023 or the latest available year. If data are available, provide their value, unit of measure, and source. In the *Comments* column, you can provide further information, such as whether the data are available by EEM type (e.g., lighting, heat recovery, air compressors) or at sectoral level.

Question 2.4:
Are there guidelines for preparing Energy Audit reports in your country? Do they include a specific section on implemented and recommended EEMs? If yes to the second question, please provide the information required in the table below.

Question 2.5:
Does the Art.8 transposition include an obligation to implement the recommended EEMs? If yes, please explain and provide details.

Question 2.6:
How is the information about the implementation of EEMs collected? Please provide the information required in the table below.

Question 2.7:
Is it possible to fulfil Art.8 obligations with a certified Energy Management System (EnMS)? If yes, please describe which information is provided by the enterprise on the EEMs.

Question 2.8:
Are there voluntary practices in which companies draw up an Action Plan or any plan to implement recommended EEMs? If yes, please provide more information on the structure of the plan.

Question 2.9:
Is there any practice in your country to publish the Action Plan and/or a rate of implemented measures at enterprise or site level? If yes, please provide more details.

Question 2.10:
According to your Agency's experience, what can facilitate EEMs implementation?

Question 2.11:
Please include any good practice in your country useful for encouraging the implementation of EEMs, with potential for exploitation/replication in other EU Member States.

Question 2.12:
Summary tables
Please indicate which organisation you contacted to answer each question and the way you collected information.
Complete the table as follows:

- B - Bilateral call
- E - Email exchange
- P - Published information
- Other (e.g., event, roundtable, internal meeting, interview with senior experts)

Please indicate which information source you used to answer each question. More details on references and links can be found in correspondence with each question.

Section 3 – Overall Information on EEMs in the Partner Country

Question 3.1:
Implementation of EEMs in relevant programmes, projects, research, NECPs, studies, governmental actions, other EED articles such as Article 7, or other.