DEESME

National schemes for energy efficiency in SMEs

Deliverable 3.7

Best practices related to multiple benefits approach applied to energy audit and management

Authors:

Gary Fragidis, Laura Martínez and Detlef Olschewski – Cleopa GmbH

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Legal Notice

About

Improving energy efficiency is increasingly understood as the most cost-effective way to reduce energy-related greenhouse gas emissions, improve economic competitiveness and increase energy security. In the European Union, several pieces of legislation aimed at guiding states and companies, regardless of their size, on ways to improve their energy efficiency: one of them is the Energy Efficiency Directive, establishing a common framework of measures and requirements with the goal to remove market barriers and promote a more efficient use of energy in supply and demand. Article 8 of the Directive offers ways to achieve this, requiring Member States to promote and facilitate the implementation of energy audits and energy management systems. The audits are compulsory for large companies and recommended for small and medium enterprises (SMEs). National authorities should encourage both to implement the resulting recommendations.

Member States have all chosen different approaches to transpose the requirements into national laws and to support companies (trainings, websites, helplines and funding support schemes). SMEs have less workforce, technical and financial capacity to perform energy audits, and therefore rarely do so: making them aware of the multiple benefits that can derive from improving their energy efficiency and accompany them in the energy transition, with knowledge and funding from both the public and private sectors, is key. That is what DEESME, a Horizon 2020-funded project (September 2020 – September 2023), aims at.

DEESME enables companies, especially SMEs to manage the energy transition by taking profit of multiple benefits from energy management and audit approaches and provides national authorities with guidelines and recommendations to empower their schemes under article 8, using the multiple benefits' approach.

The project identifies and shares good practices from national schemes, EU projects, and other initiatives with national authorities and support them in developing more effective schemes dealing with energy audits and energy management systems. It assists SMEs to develop and test the technical DEESME solutions by organizing information and training initiatives, realising energy audits, and implementing energy management systems starting from international standard and adding the multiple benefits energy efficiency approach.

The project is built on a consortium of academics, research organizations, consultancies and government offices from Belgium, Bulgaria, Germany, Italy, the Netherlands and Poland, namely: IEECP (NL, coordinator), FIRE (IT), SOGESCA (IT), Fraunhofer ISI (DE), CLEOPA (DE), SEDA (BG), ECQ (BG), KAPE (PL), EEIP (BE).

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Executive Summary

Best practices, sometimes referred also as “good practices”, are business practices that have been proven to be successful in the past in the same or other organisations and for this they can provide useful learnings and directions for future decisions and actions. This deliverable describes the best practices developed during the implementation of the DEESME approach for energy efficiency with selected companies. In particular, it describes and analyses 10 best practices in the implementation of the DEESME approach in the four testing countries: Italy, Bulgaria, Poland and Germany.

There are three types of best practices in the implementation of the DEESME approach:

a. Best practices in the implementation of the multiple benefits approach.

b. Best practices in the implementation of the energy audit.

c. Best practices in the implementation of the energy management system.

The best practices cover a wide area of business domains that include both industrial and service sectors. All the companies are SMEs, while the majority of the companies are small and family-owned. All the best practices refer to an integrated approach that includes at least two areas/ aspects of the implementation of the DEESME approach (Energy Audit, Multiple Benefits approach and Energy Management Systems). The most popular type of implementation was the combination of the Energy Audit with the Multiple Benefits approach, while the Energy Management System was selected in some implementations only.

Most companies were uncertain at the beginning that the integrated DEESME approach was appropriate for them. Hence, the adoption of sophisticated methods for energy management by SMEs requires serious efforts to raise awareness and training the business managers. In addition, SMEs need financial support, because they in most cases lack the necessary financial resources in order to invest in state-of-the-art energy management systems and procedures.

The key learnings from the best practices refer to the following:

a) The importance of having complete and accurate data.

b) Top management commitment.

c) Communicate success.

d) Quantification of energy-related problems and issues.

e) Training personnel and managerial staff.

f) Wide participation in the project management team.

g) Energy efficiency is a long-term procedure.

Keywords: DEESME approach, best practices, multiple benefits, non-energy benefits, energy audit, energy management system, energy efficiency.

1. Introduction

The DEESME project aims to promote the EU Energy Efficiency Directive[1] (EED) by supporting companies and particularly SMEs in the implementation of energy saving measures in order to take advantage of low-carbon technologies, improve materials/resources efficiency and develop renewable energy schemes. To this end the project takes the following approaches: a) it seeks to remove barriers for SMEs in implementing energy saving measures and low carbon technologies, related also to lack of awareness, and b) it seeks to promote a "multiple benefits" mindset that looks for additional business benefits that promote business development and improvement. Therefore, the DEESME project suggests approaching energy efficiency investments from a strategic perspective and emphasizes on the multiple business and the non-energy benefits that can derive additionally from energy efficiency investments.

This deliverable describes the best practices developed during the implementation of the DEESME approach for energy efficiency with selected companies. In particular, it describes and analyses 10 best practices in the implementation of the DEESME approach in the four testing countries: Italy, Bulgaria, Poland and Germany.

The deliverable describes at the beginning the concept of best practices as a management tool and the uses of best practices in business management. Next it describes the methodology for the identification of best practices in the DEESME project. The analysis of the best practices in the implementation of the DEESME approach follows, with a focus on the key learnings that can be used as guidelines for future implementations.

All the best practices of the DEESME project are described in the Appendix.

[1] This project was underway before the Energy Efficiency Directive was revised in 2023. All references are for Directive 2012/27/EU. The new recast is Energy Efficiency Directive *(EU) 2023/1791*.

2. Best Practices as a Management Tool

2.1. The Concept of Best Practices

Best practices, sometimes referred also as “good practices”, are business practices that have been proven to be successful in the same or in other organisations and for this they can provide useful learnings and directions for future decisions and actions. They refer to a set of processes, methods, techniques, or strategies that are recognized as the most effective and efficient means of achieving a desired outcome or goal.

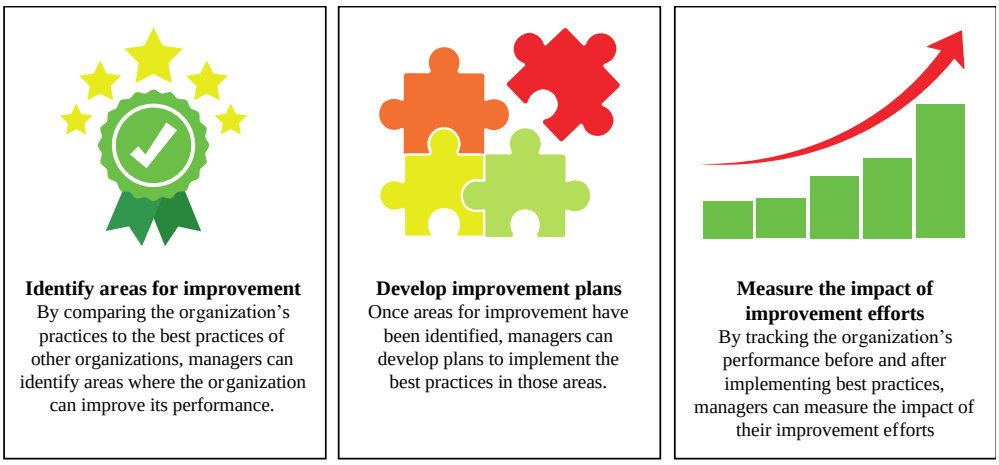
Best practices can be used as a management tool to improve the performance of an organization by leveraging past knowledge or taking advantage of the knowledge and the experiences of others. They are a method of organisational learning that can support the improvement and the advancement of organisations (Bierly and Daly2007).

Best practices can serve as benchmarks for excellence and are considered proven approaches that can be adopted by organizations to enhance their performance, streamline processes, and achieve superior results. Benchmarking is a managerial method for organisational improvement that is based on comparing a company's products, services, and processes against those of other companies that are considered to be leaders in one or more aspects of their operations (Castro and Frazzon, 2017). There is a relation between best practices and benchmarking: benchmarking refers to comparing a company's performance against others, usually the leaders or major competitors, while best practices refer to procedures that may come from any other organization and have been proven to be effective (Bhutta and Huq, 1999).

2.2. The Use of Best Practices in Business Management

Best practices play an instrumental role as a management tool in driving organizational success. By embracing best practices, organizations can optimize processes, promote innovation, and elevate their overall performance.

Best practices can be used in a variety of ways to improve the performance of an organization. For example, they can be used to (Harelstad, Swartwood and Malin, 2004):



Best practices can be used for a variety of purposes in business management. Some of the most common uses include (Harelstad, Swartwood and Malin, 2004):

Improving efficiency
Best practices can help organizations to improve their efficiency by streamlining processes and eliminating waste.

Increasing profitability
Best practices can help organizations to increase their profitability by improving their products and services, reducing costs, and increasing sales.

Attracting and retaining customers
Best practices can help organizations to attract and retain customers by providing them with high-quality products and services.

Building a strong reputation
Best practices can help organizations to build a strong reputation by demonstrating their commitment to excellence.

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3. Best Practices in the DEESME Project

3.1. Methodology

The best practices refer to exceptionally good implementations or handling of situations that have produced superior outcomes and results. Therefore, it is useful to discover and analyse the best practices we developed during the implementation of the DEESME approach for energy efficiency with selected companies in order to learn from past experience, replicate the same methods and procedures in similar situations and re-produce equally exceptionally good outcomes and results in future implementation. Best practices can be seen as what we have learned from the implementation of the MB approach and we want to codify it for future implementations and that deserve to be widely promoted to other SMEs and intermediaries.

As DEESME approach for energy efficiency integrates three inter-related methods (i.e. the multiple benefits approach, the energy audit and the energy management system), we identify three major areas of best practices in DEESME project:

a. Best practices in the implementation of the multiple benefits approach.

b. Best practices in the implementation of the energy audit.

c. Best practices in the implementation of the energy management system.

The multiple benefits approach adopted in DEESME as a keystone concept refers to the idea that energy management and energy efficiency do not only bring energy savings, but can also contribute to a wider spectrum of benefits ("multiple benefits") for companies that promote business development and improvement. Hence, multiple benefits in DEESME approach motivate SMEs to see energy management from a new perspective that connects energy efficiency to business development and improvement. Best practices regarding the implementation of the multiple benefits approach refer to exceptionally good implementation of the multiple benefits approach that enables companies to develop strategic advantages (e.g. introduction of new products, services or processes), improve their processes (e.g. improve quality or improve safety), increase the efficiency of their resources (e.g. increase recycling), achieve market goals (e.g. increase the satisfaction of customers or acquire new customers) and improve the relationships of their partners (for further details see the multiple benefits framework of the DEESME project).

The energy auditing activities in DEESME refer to the procedure of systematically collecting and analysing energy-related data in order to manage energy use and identify energy waste. Best practices regarding the implementation of energy audits in DEESME can be related to the procedure of energy auditing (e.g. data collection, data analysis, planning interventions and improvements, etc.), as well as the development and implementation of innovative recommendations for improvement and the consultation procedure with the company.

The activities for the development of an Energy Management System in DEESME refers to the preparation of companies to implement such a system under the prism of the multiple benefits approach (for further details see the Deliverable 3.2, The Energy Management System Supporting the Multiple Benefit Approach). The best practices regarding the implementation of an energy management system can be relate to the different phases of the project, such as the communication and the commitment of the top management or the participation and engagement of the employees, the selection of energy objectives and targets, the development of energy policy, the innovative

implementation of energy improvement measures, the communication and/ or collaboration with stakeholders, etc.

3.2. Overview of Best Practices in DEESME

The DEESME project partners identified and specified 10 best practices in the implementation activities in the four testing countries: Italy, Bulgaria, Poland and Germany. Table 1 summarizes the basic details of these ten best practices. Notice that the companies in Bulgaria and Poland agreed to publish information about the implementation of the DEESME approach, but strictly under terms of anonymity.

Table 2: Best practices in DEESME project

No	Company Name	Country	Business domain	Type/ Area		
				MB	En. Audit	EnMS
1	F.lli Rossetto	Italy	Chemical	Yes	Yes	Yes
2	Conceria La Veneta	Italy	Apparel & footwear	Yes	Yes	No
3	A Ltd.	Bulgaria	Apparel & footwear	Yes	Yes	No
4	B Ltd.	Bulgaria	Printing	Yes	Yes	No
5	D Ltd.	Bulgaria	Medical services	Yes	Yes	Yes
6	Goldland Media	Germany	Media/ Content development	Yes	No	No
7	Kedua	Germany	Software/ information services	Yes	Yes	Yes
8	Airport Squash & Fitness	Germany	Sport services	(Yes)	(Yes)	Yes
9	Anonymous-1	Poland	Charcoal industry	Yes	Yes	No
10	Anonymous-2	Poland	Food industry	No	Yes	Yes

F.lli Rossetto produces and prints flexible, integral and rigid polyurethanes with the use of a variety of polyurethane formulations; the company sells to 60 countries with a market that extends to 5 continents. The company participated in the DEESME project in order to "make its approach to energy more structural". The company implemented the Energy Audit, the Multiple Benefits approach and the Energy Management System aiming to control the energy expenses and recognise benefits for its future development. The dynamic environment of the company requires constant control of energy costs and non-energy costs, as well as the exploitation of the possibilities offered by possible tenders internationally and leveraging the opportunities for technological innovation. The

implementation of the DEESME approach focused on three interventions: the introduction of heat pump for the offices, the development of a co-generation plant and the revamping of the existing photovoltaic system. The company performed simulations of various efficiency interventions to find the best options for its current operations and future development options.

Conceria La Veneta is a family-run company that carries out leather tanning activities for the high fashion industry. Today company's production is focused on the high-end footwear sector for men and women, as well as the production of leather jackets and leather apparel and accessories. Since 2019 the company has grown significantly as it paid much attention to the modernization of the production methods and introduced concepts and practices of Industry 4.0. The outcome was to reduce production time and consumption of resources, improve monitoring of the data flow and upgrade quality. Reaching sustainability goals is a major concern of the management to keep working with the most important fashion houses. The company implemented the Energy Audit and the Multiple Benefits approach to take control of the energy expenses and dealsimultaneously with the shortage of production capacity and low productivity in meeting client demands.

A Ltd specializes producing apparel for men (shirts) and women (blouses and dresses). It was founded in 2002 with the mission of continuous improvement and development. A Ltd. aims to establish itself as a subcontractor for leading European chains to produce and sale cloths. The company implemented the Energy Audit and the Multiple Benefits approach aiming to control the energy expenses and deal with the shortage of production capacity and low productivity in meeting client demands simultaneously.

B Ltd performs various finishing activities in printing for all kinds of advertising materials: notebooks, notepads, books, boxes, calendars, posters, and others. The company's challenges are linked to the outdated current equipment, characterized by low energy efficiency, limited productivity and need for numerous manual operations. Significant challenges are the implementation of new energy-saving technologies to improve resource efficiency and the reduction of energy consumption in the production process. Therefore, the multiple benefits approach and the energy audit were considered by the management as useful tools in this effort.

D Ltd. is an ophthalmic laboratory specialized in the production of eyeglass lenses and sun lenses, frames for glasses made of metal or plastic, that it sells to individuals and corporate clients. It also offers specialized ophthalmic services for diagnosing the need for corrective vision aids. In addition, the company has commercial activity as it is the exclusive importer for the Bulgarian market of over 24 world-renowned brands of frames, sunglasses, and related products. The company operates several administrative and production facilities across the country. It faces challenges related to high energy costs, low productivity and high raw materials costs. The company implemented the Multiple Benefits approach, the Energy Audit and the Energy Management System.

Goldland Media GmbH Berlin is a dynamic media and content creation company from Berlin that employs 40 scientists and professionals. It is specializing in diverse forms of digital media, including video production, animation, and interactive experiences. The company implemented the Multiple Benefits approach only aiming at strategic benefits that derive from a comprehensive approach on energy related issues.

Kedua GmbH is a leading provider of privacy and data protection services and training services in these topics in Germany. The management has the ambition to adopt SDG particularly to minimize the company's environmental impact. The DEESME project that combines GHG/ energy savings and a multiple benefits approach was regarded as a solution to this strategic challenge. The implementation of the DEESME approach started with the introduction to the Multiple Benefits mentality to adopt a wide perspective on the issue of environmental performance and how it can be related to multiple business benefits. Next, the company continued with an energy audit to recognize the energy key performance indicators (EKPI) for the company. This helped to collect the relevant numbers and also to understand them. The Kedua experts then also started with DEESME support a simple EnMS and already had a successful kick-off. Now the next steps for the EnMS are taken to have a better sustainable company.

Airport Squash & Fitness Berlin is a premier sports and fitness facility in the Berlin-Tegel airport. Boasting state-of-the-art squash courts and a well-equipped fitness centers, the company offers its members a diverse range of health and wellness services to its members. The company is very successful in its practices and several Airport Squash teams are playing in national and European leagues. However, the company operates in an old building with dated engineering infrastructure and, thus, it faces challenges that required innovative solutions to reduce energy consumption and create a greener, more efficient space. The company has expressed a great interest in the implementation of an Energy Management System that will provide control over energy consumption and will save energy and money. Through participation in the DEESME implementations, the company learned for the requirements and the necessary procedures before, during and after the development of an Energy Management System. In addition, the company got familiar with the Multiple Benefits approach and the Energy Audit requirements and has shown interest in their implementation in the future.

Anonymous-1 is the largest charcoal producer in Europe. It was founded in 1991 and supplies high-end, customized semi-coke products to the leaders of the European Ferro-Silicon industries. The company emphasizes innovation and quality improvement to remain competitive. The DEESME approach helped raising awareness of energy consumption, energy cost but also the Multiple Benefit advantages that can be generated from EMS. The company has expressed a great interest in their future combined implementation.

Anonymous-2 operates in the meat and vegetable processing sector (vegetable and meat products). The food is supplied in ready-to-eat form, packed in glass jars or tins. The raw materials of animal, vegetable and animal/vegetable origin are delivered to the production raw materials and materials plant, then unloaded and stored in designated places. The multiple benefits approach and the energy audit were proven as useful tools in this effort.

In sum, **the best practices cover a wide area of business domains that include both industrial and service sectors**. In particular, six best practices refer to industrial sectors and four best practices refer to services. This is a clear indication that the energy saving measures and the multiple benefits that can derive from energy management practices are major issues for all companies and they are not restricted only to the industrial sectors.

All the best practices refer to **an integrated approach that includes at least two areas/ aspects of the implementation of the DEESME approach**, while the majority of the best practices refer to the integrated implementation of the Multiple Benefits approach, the Energy Audit and the Energy Management System. **The most popular type of implementation was the combination of the**

Energy Audit with the Multiple Benefits approach, while the Energy Management System was selected in some implementations only. This can be related to the small size of the companies, as the development and implementation of an Energy Management System is a demanding procedure that small companies find difficult to handle (see comment below). Notice that in most cases **the companies received training in all three aspects of the integrated DEESME approach** (Multiple Benefits, Energy Audit and Energy Management System), but because of the lack of resources or for other idiosyncratic reasons, they focused on the implementation of some aspects of the integrated DEESME approach.

Finally, **all the companies are SMEs, while the majority of the companies are small and family-owned.** This is a clear sign that the integrated DEESME approach that includes sophisticated methods (the Multiple Benefits approach, the Energy Audit analysis and the Energy Management System according to the ISO 50001 standard) for improved energy management and the development of sustainable business models is appropriate for all sizes of companies and can offer administrative and strategic benefits to all types of companies.

It should be noticed that most companies were uncertain at the beginning that the integrated DEESME approach was appropriate for them (their concern mostly referred to the Multiple Benefits approach and the Energy Management System). However, after the training on the Multiple Benefits approach, **the managerial teams in many companies expressed their amazement that the energy saving measures can be related to and affect so many aspects of the operation and the strategy of the company.** In some cases, they found the integrated DEESME approach very interesting, but they remained doubtful that they have the required resources (mostly financial resources and staff capacity) to adopt it and implement it successfully. This is clear evidence that **the promotion of sophisticated methods for energy management, such as the integrated DEESME approach, requires serious efforts to raise awareness and training for the the business managers**. In addition, **SMEs need financial support**, because in most cases they lack the necessary financial resources to invest in state-of-the-art energy management systems and procedures.

3.3. Best Practices Learning and Results

The best practices revealed several important issues for further implementations of the DEESME approach for energy efficiency and multiple benefits. Next, we outline the most important of these.

a) The importance of having complete and accurate data

Complete and accurate data are essential for taking informed managerial decisions. Without it, the managers will not be able to get a clear picture of the facility's energy consumption, identify all areas of potential energy savings, and develop accurate recommendations for improvement. If the data is incomplete or inaccurate, the auditor's findings and recommendations may be called into question.

The development of complete and accurate data sets is usually the outcome of the Energy Audit. For this, the integrated approach proposed in the DEESME project recognizes the Energy Audit as the first step for the development of any kind of energy intervention, because the Energy Audit provides a complete data set for taking decisions for energy issues.

In the best practices developed in the DEESME project we recognize the importance of having complete and accurate energy and relevant non-energy data for to the following topics:

- identifying cost centers (F.lli Rossetto & Conceria La Veneta)
- taking decisions for the modernization of machinery (B Ltd)
- reducing water and energy consumption (D Ltd)
- comparing with other companies and taking (strategic) decision (Kedua GmbH, Goldland Media GmbH & Anonymous-2)
- having real-time energy consumption control (Airport Squash & Fitness Berlin).

In general, having complete and accurate data offers the following benefits:

- To accurately identify areas of energy waste. Energy audits are used to identify areas where energy is being wasted so that corrective measures can be taken. Without complete and accurate data, the auditor may miss important areas of waste, or may underestimate the amount of energy that is being wasted. This was explicit in the cases of F.lli Rossetto & Conceria, La Veneta and D Ltd.
- To develop accurate recommendations for improvement. Once the auditor has identified areas of energy waste, they will develop recommendations for improvement. These recommendations may include changes to equipment, operations, or maintenance practices (such as in the cases of Kedua GmbH & Anonymous-2). Without complete and accurate data, the auditor may be unable to develop the most effective recommendations.
- To track progress over time or to analyse energy performance under different configurations. Energy audits are often performed on a regular basis to track the facility's energy performance over time. This information can be used to assess the effectiveness of energy conservation measures and to identify new opportunities for improvement. In the case of F.lli Rossetto several simulations of various efficiency interventions were performed in order to find the best options for its current operations and future development options.
- To start the activities well in advance, in order to allow the company to collect and analyse accounting data in depth.

b) Top management commitment

Top management commitment is essential for developing of any energy efficiency measure, but especially for adopting the Multiple Benefits approach and implementing an Energy Management System according to the ISO 50001 standard. This is because top management sets the tone and direction for the organization, and their commitment to sustainability and energy efficiency sends a strong signal to employees that these issues are important. Several best practices in DEESME implementations revealed that the commitment from top management is crucial and ensures that the initiative is taken seriously. The direct involvement of the senior manager creates a sense of importance and urgency throughout the organization and encourages employees to engage more actively.

Top management commitment offers the following benefits:

- It provides the necessary resources and support. Implementing Strategic Development Goals (SDG) strategies and energy management systems requires resources and support from top management. This includes funding, personnel, and access to information and data. Without top management commitment, securing the necessary resources and support is difficult. In the

case of Kedua GmbH, the top management was committed to contribute to the SDG and minimize the company's environmental impact.

- It creates a culture of sustainability and energy efficiency. Top management commitment helps to develop a culture of sustainability and energy efficiency throughout the organization. This means that employees are more likely to be aware of and engaged in sustainability initiatives. In the case of Goldland Media GmbH Berlin, the company implemented the Multiple Benefits approach only aiming at strategic benefits that derive from a comprehensive approach on energy related issues. Anonymous-1 managed to develop a vision of sustainability to its employees.
- It drives innovation and continuous improvement. Top management commitment drives innovation and constant improvement in SDG strategies and energy management systems. This is because top management is constantly look for new and better ways to reduce the organization's environmental impact and improve its energy efficiency. This is evident in the cases of Conceria La Veneta, as well as companies A Ltd and D Ltd.

In addition to these specific arguments, top management commitment is also important for ensuring that the organization is responsible for its sustainability and energy performance. When top management is committed to sustainability and energy efficiency, they are more likely to hold themselves and their employees accountable for meeting the organization's goals.
Here are some specific examples of how top management can demonstrate their commitment to SDG strategies and energy management systems:

- Set clear goals and objectives. Top management should set clear goals and objectives for the organization's SDG strategies and energy management systems. These goals and objectives should be ambitious but achievable.
- Allocate the necessary resources. Top management should allocate the resources needed to support the implementation of SDG strategies and energy management systems. This includes funding, personnel, and access to information and data.
- Communicate the organization's commitment to sustainability and energy efficiency. Top management should communicate the organization's commitment to sustainability and energy efficiency to employees, customers, and the public. This can be done through various channels, such as the company website, employee newsletters, and social media.
- Lead by example. Top management should lead by example by demonstrating their own commitment to sustainability and energy efficiency. This includes reducing their energy consumption, using sustainable transportation, and recycling and composting.

c) Communicate success

Several best practices revealed the importance of communicating the success of energy improvement projects internally and to external stakeholders.
Communicating success to internal stakeholders supports:

- boosting employee morale and engagement. Communicating the success of energy improvement projects shows employees that their efforts are making a difference. This can boost morale and engagement, and improved productivity and performance (A Ltd, B Ltd and Kedua GmbH).

- raising awareness of energy efficiency and sustainability. Communicating the success of energy improvement projects can help to raise awareness of energy efficiency and sustainability among employees. This can lead to employees taking steps to reduce their own energy consumption and environmental impact at work and at home (Kedua GmbH, Goldland Media GmbH, A Ltd).
- identifying and replicating successful practices. Organizations can identify and replicate successful practices across different departments and locations by communicating the success of energy improvement projects. This can help to accelerating energy savings and emission reductions (D Ltd, Conceria La Veneta).

Communicating success to external stakeholders:

- To enhance the company's reputation. Communicating the success of energy improvement projects shows external stakeholders that the company is committed to sustainability and environmental responsibility. This can improve the company's reputation and attract new customers, investors, and partners (F.lli Rossetto, A Ltd, Kedua GmbH, Goldland Media GmbH).
- To comply with regulations. Many governments and regulatory bodies now require companies to report on their energy consumption and greenhouse gas emissions. Communicating the success of energy improvement projects can help companies comply with these regulations (F.lli Rossetto, BLtd, Anonymous-1).

In sum, it is important to design procedures that provide feedback from various parties, including stakeholders, team members, external experts and consultants. This can include insights into the methodology, data collection, analysis techniques, and the effectiveness of the identified benefits

d) Quantification of energy-related problems and issues

The quantification of energy-related problems and issues provides a number of benefits when a company wants to make decisions about improving energy efficiency. In the integrated DEESME approach the quantification of energy-related issues usually occurs with the implementation of the Energy Audit, either at the beginning of the procedure or after the discussion and training on the Multiple Benefits approach.

In the DEESME implementations the top management seems to be more familiar with quantified methods and sometimes does not understand the benefits expressed in a qualitative way and/or does not consider them as such.

The particular benefits of the quantification of energy-related issues are the following:

- It helps to identify the most significant areas of energy consumption and energy waste. By quantifying energy-related issues, companies can identify the areas where they are consuming the most energy and where they are wasting the most energy. This information can then be used to prioritize energy efficiency measures. This benefit was revealed in the case of F.lli Rossetto, with the company performing simulations of various efficiency interventions to find the best options for its current operations and future development options.
- It helps to develop realistic and achievable goals. Without quantifying energy-related issues, it is difficult to set realistic goals. For instance, Kedua GmbH needs quantified information to set a plan for SDG and minimize the company’s environmental impact.
- It helps to track progress over time. By quantifying energy-related issues on a regular basis, companies can track their progress over time and identify areas where they need to improve.

This information can then be used to refine energy efficiency measures and make sure that they are on track to achieve their goals. For instance, the efforts of Airport Squash & Fitness Berlin to reduce energy consumption and create a greener, more efficient space requires tracking progress over time. In addition, F.lli Rossetto needs constant control of energy costs, non-energy costs, the possibilities offered by possible tenders and technological innovation.

- It helps to make informed decisions about energy investments. Quantifying energy-related issues can help companies to make informed decisions about energy investments. For example, companies can use this information to compare the costs and benefits of different energy efficiency measures. It was necessary for A Ltd to decide the replacement of old sewing and cutting machines to save materials and energy. Likewise, Conceria la Veneta invested on equipment and state-of-the-art production procedures to reduce time and energy consumption, monitor the flow of data and achieve unique quality.
- In addition to these benefits, quantifying energy-related issues can also help companies to comply with regulations, attract investors, and enhance their reputation.

e) Training personnel and managerial staff

Several best practices in the implementation of the DEESME approach highlighted the importance of training the personnel and managerial staff in energy efficiency topics, as well as in the multiple benefits philosophy. Training has been noticed to be extremely significant for the adoption of the multiple benefits approach in almost all best practices, as well as for the development of an energy management system.

There are several reasons why it is necessary to train personnel when a company wants to adopt the multiple benefits approach and (or) to develop an energy management system:

- Training ensures that employees and managers understand the particular philosophy of the multiple benefits approach and the requirements of the energy management system. ISO 50001 is a complex standard and employees must understand the key concepts and requirements to implement it effectively.
- To develop the knowledge and skills employees need to perform their roles in the EnMS. The EnMS requires employees to perform a variety of tasks, such as data collection, energy audits, and project management. Training can help employees develop the skills and knowledge needed to perform these tasks effectively. F.lli Rossetto, Kedua GmbH and Airport Squash & Fitness Berlin are the main best practices that revealed this benefit.
- To develop the particular knowledge and mindset for implementing of the Multiple Benefits approach. In this respect, Kedua GmbH and Goldland Media GmbH found the information and training of employees extremely important.
- To build energy efficiency and sustainability culture and to improve the organization's energy performance. Training can help creating culture of energy efficiency and sustainability throughout the organization. This means that employees are more likely to be aware of and engaged in energy conservation initiatives. Training can help the organization to improve its energy performance by enabling employees to identify and implement energy efficiency measures.

f) Wide participation in the project management team

It is important to include managers from the finance and marketing departments when a company wants to develop energy efficiency measures and especially the multiple benefits approach and an energy management system. This way, companies can ensure that the energy efficiency measures or the EnMS are financially feasible, that the benefits of the energy initiatives are communicated to customers and other stakeholders, and that the energy efficiency measures are continuously improved. The division into cost centers is useful for most companies (e.g. F.lli Rossetto, Conceria La Veneta, A Ltd and B Ltd), for purposes other than energy management. Therefore it is important to also involve administration and finance personnel. The participation of managers from the finance department can offer the following benefits:

- They can assess the financial feasibility of energy efficiency projects. Energy efficiency projects can often require upfront investments, so it is important to assess their financial feasibility before implementing them.
- They can support revealing/ quantifying and tracking the financial benefits of energy efficiency projects. Once energy efficiency projects have been implemented, it is important to track their financial benefits; the same is true for the tracking of the financial benefits of the multiple benefits approach. This information can be used to demonstrate the value of the energy management system and to secure funding for future energy efficiency projects.
- They can report on the financial performance of the EnMS. ISO 50001 requires companies to report on the financial performance of their EnMS. Financial managers can help to develop and maintain these reports.

The participation of managers from the marketing department can offer the following benefits that are mostly related to the multiple benefits that can be achieved in energy efficiency projects:

- The marketing department can communicate the benefits of the energy efficiency measures and the multiple benefits to customers and other stakeholders. This can help to improve the company's reputation and to attract new customers (they are both particular “multiple benefits” that an organization can achieve according to the DEESME approach).
- The marketing department can develop and implement marketing campaigns to promote energy efficient products and services. This can help to increase the company's revenue and to reduce its environmental impact.
- The marketing department can collect and analyse customer feedback on energy efficiency. The marketing management department can collect and analyse customer feedback on energy efficiency. This information can be used to improve the EnMS and to develop new energy efficient products and services.

g) Energy efficiency is a long-term procedure

Energy improvement is a long-term procedure and must be a long-term objective for the following reasons:

- Energy systems are complex and interconnected, and it takes time to understand them and to identify improvement opportunities.
- Energy efficiency measures can often require significant upfront investments, such as purchasing new equipment or modifying existing equipment and facilities. In addition, they can take time to implement, depending on the complexity of the measure and the size of the

organization, and to produce results, depending on the type of measure and the organization's energy consumption patterns.

- Changing employee behavior. This can be challenging and time-consuming, but it is essential for achieving long-term energy savings.
- Energy needs and technologies are constantly changing. It is important for organizations to stay up-to-date on the latest energy efficiency technologies and practices to maintain their energy performance over time.

4. Conclusions

This report describes the best practices developed during the implementation of the DEESME approach for energy efficiency with selected companies. The objectives were to learn from past experience, replicate the same methods and procedures in similar situations and re-produce equally exceptionally good outcomes and results in future implementation. Best practices can be seen as what we have learned from the implementation of the MB approach and we want to codify it for future implementation. We identified and specified 10 best practices in the implementation activities in the four testing countries: Italy, Bulgaria, Poland and Germany.

There are three types of best practices in the implementation of the DEESME approach:

a. Best practices in the implementation of the multiple benefits approach.

b. Best practices in the implementation of the energy audit.

c. Best practices in the implementation of the energy management system.

The best practices cover a wide area of business domains that include both industrial and service sectors. Hence, energy saving measures and the multiple benefits that can derive from energy management practices are major issues for all companies and they are not relevant only for industrial companies. All the companies are SMEs, while the majority of the companies are small and family-owned. Hence, the integrated DEESME approach is appropriate for all sizes of companies and can offer administrative and strategic benefits to all types of companies.

Most companies were uncertain at the beginning that the integrated DEESME approach was appropriate for them, especially with regard to the Multiple Benefits approach and the Energy Management System. The adoption of sophisticated methods for energy management by SMEs requires serious efforts to raise awareness and train the business managers. In addition, SMEs need financial support, because they in most cases lack the necessary financial resources in order to invest in state-of-the-art energy management systems and procedures.

The key learnings from the best practices refer to the following:

a) The importance of having complete and accurate data.

b) Top management commitment.

c) Communicating success.

d) Quantification of energy-related problems and issues.

e) Training personnel and managerial staff.

f) Wide participation in the project management team.

g) Energy efficiency is a long-term procedure that requires commitment and consistency to bring about effects.

5. APPENDIX: Best Practices

A1. F.lli Rossetto (Itally)

F.lli Rossetto produces and prints flexible, integral and rigid polyurethanes, with 7 different polyurethane formulations in order to satisfy the needs of each customer. F.lli Rossetto sells in 60 countries with a market that touches 5 continents and dedicates skills and resources to the creation of the innovation it prefers: the one that has not yet been invented.

Rossetto is a dynamic company that has started its journey towards sustainability for years. After 65 years of experience, F.lli Rossetto is today engaged in the printing of polyurethane products with over 200 employees and a production of approximately 500,000 pieces sold every year. The company was looking to make its approach to energy more structural, which is the reason it agreed to participate in the DEESME project.

Type of Best Practice: a) implementation of the multiple benefits approach, b) implementation of the energy audit, and c) implementation of the energy management system.

F.lli Rossetto implemented all the three types of interventions in DEESME project with great success, that rationalizes the characterization of best practice. The activity began with an in-depth energy audit which was integrated with the request for data on "non-energy" aspects which also allowed the company to dissect "unknown" cost centers. An in-depth monitoring campaign was carried out, with portable instruments, on practically all the significant users of the site. Since gas prices were constantly rising during the diagnosis, the analysis focused on the possibility of shifting consumption from gas to other carriers. In this sense it has become necessary to detail all the costs, energy and otherwise, related to the site's gas utilities. This led to the simulation of various efficiency interventions, among which the transition to a heat pump (initially for offices only) was also of interest due to the initial reduced investment.

Thanks to the monitoring conducted and the multi-benefit analysis relating to the most important consumption centers (heat generation and electric machines), the implementation of a cogeneration plant was simulated which, while increasing the gas consumption initially opposed, generated a series of savings both energetic and not particularly useful in the medium-long term.

The energy audit ended with the starting of the ISO 50001 EnMS. The company needs constant control of energy costs, non-energy costs, the possibilities offered by possible tenders and technological innovation. For this reason it has begun the implementation of a non-certified energy management system, which is slowly creating a culture of efficiency within the company.

Best Practice Description

The execution of the energy diagnosis, the first carried out by the company, confronted the company with some initial "challenges" such as:

- Carry out a census of electricity and heat users.
- Ask yourself the question of how the total energy was divided between the various users.

- Verify whether the energy cost was correctly assigned to the various existing cost centers

Much time was dedicated to the collection of field data about the users, on the working parameters of the machines, on their operating and operating methods. The site is particularly complex and many systems spread over large surfaces.

The company already had a minimum user census, which however with the occasion of the audit was re-verified by internal staff together with Sogesca staff. This activity was particularly appreciated as it was also useful for drawing up a maintenance plan for the machinery and in general for having an updated view of the machinery fleet.In fact, the auditing with regard to the operation and maintanance planning was based on the DEESME multiple benefit approach.

For the first time the company understood the importance of having real and solid energy data, in order to be able to make detailed assessments on current consumption and the actual savings expected following an efficiency intervention.

An aspect noted was also the lack of attention to certain existing assets such as the present photovoltaic system: the production was absolutely not in line with the installed power, so much so that a specific analysis was requested which highlighted structural problems of the system which, in addition to the lack of production, entails a significant reduction in revenue deriving from the failure to receive the contributions foreseen for these plants.

Different types of interventions were identified:

- Monitoring system.
- Installation of a 400 kW photovoltaic system.
- Revamping of existing photovoltaic system.
- Installation of the generator set.
- Conversion of steam generators to LPG.
- Conversion of steam generators to diesel.
- Installation of cogeneration system.
- Heat pump installation.

The company continued with the implementation of the multiple benefits approach. In the beginning this new process of multiple benefits analysis seemed to be rather complicated. With the support of the auditor the company understood the context much better. A major challenge is usually to find a routine for implementing the MB in daily business and habits, but it can bring significant improvements.

We essentially focused on three interventions: heat pump for the offices, cogeneration plant and revamping of the existing photovoltaic system. The non-energy advantages represent a significant portion of the total advantage deriving from the photovoltaic revamping, so much so that it is an urgent intervention to carry out. On the other hand, the analysis of the impacts of cogeneration required more time and involvement from the company, in particular to simulate the possible scenarios resulting from changing energy prices. The CHP plant is now under construction.

The implementation of the Energy Management System according to the ISO 50001 standard was partly difficult, especially due to the short time available and due to the fact that the company was in the process of being newly certified according to the ISO 9001 standard. The 50001 system has been sketched from a documentary point of view, and will presumably be developed more over the next year, once the 9001 has become fully operational. This cultural shift towards energy consciousness will foster a sense of responsibility among the staff, motivating them to actively participate in the company's energy-saving efforts.

Key Elements and Learnings

The key points for a successful implementation and the key learnings for each type of implementation can be summarized as such:

a) Energy Audit key learnings.

- Availability of energy data is necessary.
- It is important to start the activities well in advance, in order to allow the company to collect and analyse accounting data in depth.
- The division into cost centers is often also useful for the company, for purposes other than energy management, therefore it is important to also involve administration and finance personnel in this phase (specific to the energy audit).
- It is important to quantify, even approximately, the non-energy benefits for which there are no quantitative data. Top management often does not understand the benefits expressed in a qualitative way and/or does not consider them as such.

b) Multiple benefits approach key learnings.

- The analysis of non-energy benefits makes it possible to reduce the impact of changes in energy costs; in a historical period where management is looking for an "immediate" technological solution to deal with price increases, the addition of multiple benefits makes decisions more weighted and less risky for the future.

Guiding Principles for Future Implementations.

- Time. It is important to evaluate the impacts in the medium term both in terms of energy and non-energy costs. haste is never a good advisor
- Staff Integration. Often companies describe themselves as teams but on energy issues there are only lonely wolves. Sharing information and adapting ideas from all staff members increase the wellbeing and energy savings.
- Share success. Benefits and impact should be shared as information with staff, but also external parties and stakeholders
- Required dataset. Thanks to future implementations of multi-benefit analysis it will be possible to gradually create an archive of non-energy benefits and their characteristic (or at least indicative) values, if companies are not able to quantify them precisely (a very frequent case). In this way it will be possible to immediately carry out a quantitative multiple benefits

analysis, perhaps to be explored in greater depth at a later time as part of an energy management system implemented according to the MB logic.

A2. Conceria La Veneta S.p.A. (Italy)

This is the case of a family-run company that carries out leather tanning activities for the high fashion industry and started implementing a multiple benefit approach. The company was born with the acronym S.A.L.P. (Società Arzignanese Lavorazione Pelli) in a small warehouse in the peripheral area of Arzignano. After years of development and expansion even outside national borders, today the production of Conceria La Veneta is focused on the high-end footwear sector for men and women, to which have been added articles intended for leather goods, jackets and clothing. accessories. Since 2019 it has entered the world of leather clothing and the attention to production has been evident with the support of Industry 4.0 which allows us to reduce times and consumption, monitor the flow of data, and guarantee unique quality. Reaching sustainability goals is one of the main focus of the management, in order to keep working with the most important fashion houses.

Type of Best Practice: a) implementation of the multiple benefits approach, and b) implementation of the energy audit

Conceria la Veneta was the first company where the multi-benefit approach of the DEESME project has been tested. Having not yet developed all the necessary tools, the work at the company was preparatory to defining the contents and requirements of the multiple benefits approach.

The activity began with an in-depth energy audit which was integrated with the request for data on "non-energy" aspects which also allowed the company to dissect "unknown" cost centers. These cost-centers were then used to evaluate all benefits related to energy efficiency projects proposed in the energy-audit (now turned into an multiple benefits audit).

Final result was a list of proposals which, in part already addressed in the past, found fertile ground for a future implementation, also in view of the sustainability obligations that the company is called upon to achieve by some of its customers and that the DEESME audit contributed to identifying.

Best Practice Description

The execution of the energy diagnosis, the first carried out by the company, confronted the company with some initial "challenges" such as:

- Carry out a census of electrical and heating users
- Ask yourself the question of how the total energy was divided between the various users
- Verify whether the energy cost was correctly assigned to the various existing cost centers

The diagnosis made it possible to identify the most relevant consumption centers, among which the thermal power plant stood out, now old, oversized and unsuitable for the company's current working conditions. For the first time the company understood the importance of having real and solid energy data, in order to be able to make detailed assessments on current consumption and the actual savings expected following an efficiency intervention. Since there was no consumption monitoring system,

we proceeded with the purchase and installation of a meter for the gas consumed by the plant, in order to understand the typical daily profiles.

At the same time, all the costs that revolve around the thermal power plant were identified: maintenance, spare parts, etc. This quantification required a dose of approximation, since the internal accounting was not structured to identify these costs specifically; the advantage was that of assigning previously "generic" costs to a specific asset, an aspect which if extended to all users of the site would allow for an absolutely valuable cost distribution.

The proposed renovation of the thermal power plant also has its own dignity from a strictly energy point of view, but so far it has not been sufficient to push the owners to carry it out. However, what was previously a hypothesis, i.e. the actual cost related to the thermal power plant and above all the potential savings resulting from its revamping, has become clear thanks to the multi-benefit analysis conducted.

The non-energy advantages represent a significant portion of the total advantage deriving from the intervention, touching on different aspects such as: maintenance, employee safety, possibility of achieving the sustainability objectives set by customers. At the moment the intervention is not yet being implemented due to the recent increases in natural gas, which have effectively frozen any intervention that is not strictly necessary, especially if related to thermal uses.

Key Elements and Learnings

- The availability of energy data is necessary
- It is important to start the activities well in advance, in order to allow the company to collect and analyse accounting data in depth
- The division into cost centers is often also useful for the company, for purposes other than energy management, therefore it is important to also involve administration and finance personnel in this phase (specific to the energy audit)
- It is important to quantify, even approximately, the non-energy benefits for which there are no quantitative data. Top management often does not understand the benefits expressed in a qualitative way and/or does not consider them as such
- Non “core-business related” investments have to be regularly reminded to companies, as they often forget the energy audit left in the drawer.

Guiding Principles for Future Implementations

- Data & User Awareness. It is important to display not just data but relations, e.g. comparisons of other companies, compare train vs plane, present also visible impact
- Staff Integration. Often companies describe themselves as teams but on energy issues there are only lonely wolves. Sharing information and adapting ideas from all staff members increase the wellbeing and energy savings.

- Share success. Benefits and impact should be shared as information with staff, but also external parties and stakeholders.
- Support to success. SMEs will need long-term support to be successful on their way. Not all are ready for an EnMS and results of energy audits should be supported to truly become saved energy.

A3. A Ltd – Apparel and footwear company (Bulgaria)

"A" Ltd was founded in 2002 and specializes in the production of sewing products - men's shirts, as well as women's blouses and dresses. It was founded with the mission to produce contemporary clothing that is comfortable and affordable for consumers of all ages. Through continuous improvement, A Ltd. aims to establish itself as a subcontractor for leading European chains for the production and sale of clothing. Through the DEESME Multiple Benefits approach and potential energy savings the company aims to tackle concerns on the surging electricity rates that lead to high energy expenses, dealing in the same time with the shortage of production capacity and low productivity in meeting client demands.

Type of Best Practice: a) Implementation of the Multiple Benefits approach, and b) implementation of the energy audit.

Best Practice Description

A Ltd participated in the DEESME piloting in Bulgaria. A company cost analysis highlighted some areas where optimisation could be achieved such as the replacing of obsolete machines for the cutting and sewing processes, which would result in less energy and personnel cost per unit of output.

One of the key measures recommended in the conducted energy audit was replacement of a system of 3 old cutting machines with a new cutting line from a new high-tech plating system with a robot for cutting. This measure not only allowed for reduction of energy costs and less scrapped production, but also brought about a new sustainability practice in the company – upcycling of the generated scraps from high-quality cotton fabrics. Thanks to the precision of cutting of the new system the company will be able to produce secondary products using waste material (upcycling) from the main production as a raw material: Fashion accessories - "pocket squares" will be produced from the appropriately sized scraps; and "patchwork" products.

Cumulative impact of the applied energy saving measures and MB approach will be increased overall production of A Ltd. which allows the company to attract and address the demand of new customers with more exacting standards for quality.

Designing and creating upcycled products from fabric scraps represents a new creative challenge for workers and stimulates both their creative thinking and imagination to create new designs and applications. The significant reduction of waste from scrapping shows that their work goes beyond just production and adds value to the environment.

The multiple benefits of the two measures recommended from the energy audit are related to:

- Improved product and service efficiency through reduced energy consumption and energy savings per unit of output and reduction of the leftovers from fabrics
- Introduction of new products - more complex clothing designs and patchwork
- Increased productivity and improved quality
- Improved maintenance costs by 5%
- Reduced carbon footprint
- Improved safety of workers due to automated safety systems which stop the machines
- Improved raw materials consumption through the more precise cutting of the new equipment
- Reduced waste and increased recycling
- Acquisition of new customers and increased customer satisfaction
- Improved supply chain relationships

At the outset, the concept of Multiple Benefits Analysis seemed complex. Through the auditor's guidance, the company gained clarity and better comprehension of the principles of the model and the potential gains.

Based on the DEESME energy check combined with the multiple benefits approach which was conducted in A Ltd., two measures which can boost energy efficiency and bring various benefits for the company were identified:

- Measure 1: Replacement of old sewing machines with a new technological line of 9 new sewing machines;

- Measure 2: Replacement of an old system of 3 old cutting machines with a new cutting line from a new high-tech plating system with a robot for cutting;

Based on the various benefits that these measures could bring for A. ltd., the following potential improvements of the business model sustainability could be highlighted:

The implementation of Measure 2, which includes the introduction of a new cutting system and software, will enable the company to design and cut more intricate patterns. Furthermore, the precision of the new cutting robot will create opportunities for upcycling of the fabrics leftovers from the cutting process, they will be turned into patchwork and/or pocket squares which will represent a sustainable addition to the company's value proposition. Additionally, with the incorporation of new sewing machines through Measure 1, the company will be capable of producing more complex clothing designs. The cumulative effect from Measure 1 and 2 will be that the company will be able to produce faster, with less costs (reduced energy and material costs); with optimised resources.

Key Elements and Learnings

- The commitment from top management is crucial for the success of the energy audit and ensures that the audit process is taken seriously. The direct involvement of the senior manager in the energy audit process creates a sense of importance and urgency throughout the organization and encourages employees to engage more actively in energy-saving initiatives.

- SMEs need support in setting well-defined, realistic and specific energy objectives such as "reduce overall energy consumption by 20% within one year", instead of "improve energy efficiency".

Guiding Principles for Future Implementations:

- Flexibility in objectives: It is crucial to maintain flexibility when defining and pursuing energy audit objectives to ensuring that the efforts are responsive to changes. The business environment is dynamic and circumstances often change suddenly. Shifts in market conditions, technological advancements, or regulatory changes, change the context with which the objectives should be aligned.
- Use every opportunity to educate employees and stakeholders about the broader benefits of energy efficiency. The potential savings and positive outcomes of an energy audit are often underestimated.
- Feedback loops: Design systems which to help you collect feedback from various parties, including stakeholders, team members, external experts and consultants. This can include insights on the methodology, data collection, analysis techniques, and the effectiveness of the identified benefits.

A4. B Ltd – Printing Company (Bulgaria)

"B. Ltd" was established in 2007 in Bulgaria and specializes in various types of finishing activities in printing. The diverse equipment and modern technologies allow the production of all kinds of advertising materials: notebooks, notepads, books, boxes, calendars, posters, and others. Every year, the company strives to offer new types of services or products. The company carries out its activity in a rented production and storage facility in Sofia, Bulgaria, which was the subject of the DEESME energy check.

The challenges that the company faces are linked to the depreciated current equipment characterized by low energy efficiency, limited productivity and need for numerous manual operations.

Type of Best Practice: a) Implementation of the Multiple Benefits approach, and b) implementation of the energy audit.

In its activities, the company strives for sustainable growth, directing its attention towards the implementation of new energy-saving technologies to improve resource efficiency in the production process, as well as reducing energy consumption in production. Therefore, the multiple benefits approach and the simplified DEESME audit were considered by the management as useful tools in this endeavour.

Based on the energy audit combined with the multiple benefits approach which was conducted in B Ltd., 5 measures which can boost energy efficiency and bring various benefits for the company, were identified:

- Measure 1: Replacement of 3 old machines with 1 new folding, set and sewing machine.

- Measure 2: Replacement of 1 old creasing machine, with 1 new creasing machine.
- Measure 3: Purchase of a laminating machine
- Measure 4: Purchase of a system for the utilization of residual thermal energy
- Measure 5: Purchase of an automated energy consumption monitoring system

Best Practice Description

The multiple benefits of the measures assigned from the energy audit manifest in different areas. B Ltd will be able to enhance their ability to meet the demand of their clients through increased production capacity and productivity, as well as the optimization of production processes and resource utilization.

The implementation of the planned energy saving measures (Measure 1-3) will lead to the introduction of new products and services at the company (e.g. sewing and folding of various types of products such as cards, notebooks, leaflets, etc.). These products will be produced in a more ecologically friendly manner thanks to the low percentage of waste from rejected products and the optimised raw materials use.

The technological processes in the enterprise are related to the consumption of electrical energy. The targeted energy savings for the company as a result of the planned 5 energy efficiency measures are 26.5%.

Additionally, the company has a machine with heaters with a power of about 4 kW that releases a large amount of heat. As harmful substances are released together with the heat, the heat is removed from the machine by a local exhaust system. The exhaust air is discharged without heat recovery, which is estimated at about 3.5 kW of constant heat output. Measure 4, planned in the energy audit, provides for the use of the residual heat energy from this extraction system to heat an adjacent room by utilizing an industrial recuperator which to operate during the heating season.

The introduction of a software enabled energy monitoring system (measure 5) is planned to ensure 10% savings on the energy consumption in the long-run. The software will monitor the quantitative and qualitative parameters of the power grid and prepare load schedules. All this will make it possible to structure adequate energy policies that will lead to a practical reduction in annual energy consumption.

Key Elements and Learnings

- Ensure a balanced assessment by considering the impact on people (social impact), planet (environmental impact), and profit. Don’t focus only on the financial advantages of energy efficiency improvements; explore also how the planned energy-saving measures can positively affect employees, customers, and the local community. Energy-efficient improvements can also lead to a healthier and more comfortable work environment, better indoor air quality and reduced pollution.
- Prioritize measures that can be scaled across the organization, such as energy-intensive equipment that is used in multiple processes. Upgrading such equipment with energy-efficient substitutes can result in significant savings by impacting multiple processes.

- Data-driven decision-making: decisions should be based on comprehensive data gathering and analysis to ensure accuracy and intended outcomes. When deciding between alternative solutions evaluate the long-term impact and scalability of the initiative.
- The dedication of the leadership is essential for the accomplishment of the initiative and to guarantee that all resources, including budget, time, and personnel, are provided.

Guiding Principles for Future Implementations:

- Understand Operations - to ensure efficient energy audit, it is essential to understand your processes and operations. By prioritizing energy-intensive areas and identifying potential inefficiencies, you can establish the groundwork for significant improvements. Begin by creating detailed process maps for every major operation within your organization. The process comprises of recording all stages, inputs, outputs and equipment used in each step. This map should provide a visual representation of the entire workflow process and guide you to identify areas that consume the most energy.
- Synergy Identification: Explore energy efficiency strategies that provide benefits beyond mere energy consumption. These actions are expected to have a beneficial effect on other areas within the organization, such as cost-cutting, productivity, and environmental impact. While exploring synergies, develop solutions that suit your organization's requirements. It is possible that a single measure has different effects on different SME's, so make sure the solutions match your needs and requirements and demonstrate positive synergies when sharing results with management or with stakeholders and employees.
- Clear Communication: The relevance of the energy audit and its possible advantages should be clearly communicated by top management to all staff members. This will increase the likelihood that they will actively participate in the endeavour and ensure that everyone understands its significance. With leadership backing, the energy audit gains priority among other initiatives or competing projects.

A5. D Ltd - ophthalmic products and services (Bulgaria)

D. Ltd. was established in 1997 in Bulgaria with the main activity of laboratory production of prescription eyeglass lenses, prescription and sun lenses, frames for glasses made of metal or plastic, sun, and prescription glasses, etc. The company offers its products under own registered brand to both individuals and corporate clients.

D. Ltd also offers specialized ophthalmic services for diagnosing the need for corrective vision aids. In addition to being an established manufacturer, D Ltd. is also an exclusive importer for the Bulgarian market of over 24 world-renowned brands of frames, sunglasses, and related products.

D. Ltd has its own administrative and production base and several administrative offices across the country.

Type of Best Practice: a) Implementation of the Multiple Benefits approach b) implementation of the energy audit, and c) implementation of the energy management system.

The needs and problems that the D. Ltd seeks to address through the multiple benefits approach and energy audit are related to high energy costs due to the rising prices of electricity, low productivity and high raw materials costs due to the use of obsolete "conventional" modular line for ophthalmic lenses. Furthermore, the current conventional lens production line results in production scrapping, which generates more waste and slows the production process. Based on the energy audit combined with the multiple benefits approach which was conducted in D Ltd, one measure which can boost energy efficiency and bring various benefits for the company was identified: Replacement of the old "conventional" modular line for spectacle lenses with the new Free Form (FF) modular line.

Best Practice Description

One of the multiple benefits of the intended measure is the improved equipment maintenance. The new FF line is equipped with modern technology that reduces wear and tear on the machinery and also uses computerized technology to shape the lenses. The conventional line, on the other hand requires more maintenance due to the mechanical processes involved in the production of lenses.

Moreover, the D Ltd will benefit from improved product quality. The FF production line will use advanced technology to produce lenses with the highest precision of ophthalmic values, resulting in more accurate and customized lenses for individual customers. Also, the line will reduce the amount of manual labor required in the production process, minimizing the risk of errors and inconsistencies.

Another benefit will be the reduced wastewater from the production. Preconditions for recycling will be also created - the new FF line will work with closed water cycle and will filter the lenses shavings created from the grinding and polishing processes. These filtered shavings will be offered to a company producing cleaning products to use as abrasive material in their production.

The FF production line, the recommended measure in the energy audit, includes various modules that are interconnected through software program which controls all machines and processes. Due to modern production methods, the materials in stock from which prescription lenses are made, the various consumables, water and electricity consumption will be significantly reduced, while productivity will be increased at least 2 times. Thus, the product efficiency will be improved through energy savings per unit of output and decreased use of water in the production thanks to implementation of closed water cycle in the grinding and polishing processes.

The company has initiated the first steps for adopting an energy management system (EnMS), involving increasing awareness and gaining support among the employees. The top management's dedication to the EnMS sends a powerful message to the organization. A shared understanding is facilitated by clearly communicating the advantages, both in terms of financial savings and environmental impact. An internal energy policy with specific goals for energy reduction, allocating the required funds, and promoting active involvement is the first milestone laid in the process of changing the organizational culture. Collaborators from different departments are involved in the process of developing instructions and procedures thus guaranteeing a variety of viewpoints and fostering a sense of responsibility among the group.

Key Elements and Learnings

- Holistic Approach: Take into account the broader effects of energy-saving initiatives, such as the positive effects on the environment, society, and the economy. Modern businesses cannot afford to overlook the profound influence of their operations on the environment. As sustainability concerns rise globally, consumers, investors, and regulatory bodies increasingly demand responsible practices.
- Data Collection: A thorough energy audit should take into account a variety of aspects in addition to tracking energy usage to give a comprehensive picture of an organization's effectiveness and sustainability. These could include monitoring water use patterns to spot possible waste or efficiency possibilities, assessing indoor air quality and workplace comfort to ensure employee well-being and productivity, and looking at occupational safety measures to maintain a secure work environment. A well-rounded audit also considers waste management plans, renewable energy sources integration, and equipment maintenance procedures.

Guiding Principles for Future Implementations:

- Organizational Cultural Influence: The level of devotion shown by the leadership affects the workplace culture. The promotion of a culture of sustainability and responsible resource management among employees occurs when management places a high priority on energy efficiency.
- Public Relations and Marketing: If appropriate, leverage your energy efficiency efforts for positive PR and marketing. Sharing success stories that highlight the triple bottom line benefits of people, planet, and profit will demonstrate your dedication to a balanced strategy.
- Consistent Work: Leadership commitment helps sustain energy-saving efforts beyond the audit process. It shows that achieving energy efficiency is a continuous organizational objective rather than a one-time event. Initiate multi-benefit projects that are in line with the organization's long-term sustainability objectives and ambitions.

A6. Goldland Media GmbH (Germany)

Goldland Media GmbH Berlin is a 40 smart heads, dynamic media and content creation company from Berlin. Specializing in diverse forms of digital media, including video production, animation, and interactive experiences, the company crafts captivating narratives that engage and resonate with audiences. With a team of visionary creatives, Goldland Media is reaching out for better solutions. In the DEESME context, Goldland Media is a positive adopter of the Multiple Benefits approach.

Type of Best Practice: Implementation of the Multiple Benefits approach

As energy saving measures have been taking broadly and successfully implemented in the office landscape at Goldland Media, the focus is now to fully exploit Multiple Benefits approach in order

to become a true sustainable company, but also show the corporate responsibility to the employees and clients.

Best Practice Description

Goldland Media GmbH Berlin has embraced a holistic strategy by integrating the DEESME Multiple Benefits approach that will improve multiple aspects as the company activities. This will transform, in incremental steps, the company to a more sustainable service provider in the Market.

The Goldland Media management has recognized the importance of digitalization for the company but also for the societal impact of the company. This has, in the first step, rewarded into a higher energy efficiency of the internal processes. Though new processes as Augmented Reality (AR) and Artificial Intelligence applications are power consuming the company will balance the power consumption and the benefits of the services.

An advances aspect inside Goldland Media is on improving lighting conditions within their mixed-use old building. Understanding the impact of lighting on employee well-being and productivity, they invest in modern, energy-efficient lighting solutions. These enhancements create a more pleasant and vibrant workspace, fostering a conducive environment for creativity and collaboration among their team members.

Furthermore, Goldland Media's holistic approach bolsters their green market competitiveness. Their focus on operational efficiency, staff well-being, and cost-effectiveness aligns with the preferences of contemporary consumers who seek partners that demonstrate a commitment to sustainability. This positions the company as a forward-thinking and responsible choice within a competitive market landscape.

In their pursuit of becoming a sustainable company in the long term, Goldland Media's multifaceted approach reflects their dedication to responsible business practices. This approach not only contributes positively to their own success but also sets a precedent for other businesses aspiring to achieve lasting sustainability.

Key Elements and Learnings

- Multiple Benefits is a new tool: the DEESME MB offers a new understanding of the company in the society and for clients. New ideas will be found.
- Employee Wellbeing Impact: Employees and their ideas are a core value of Goldland. So a best possible working environment will have multiple rewards.
- Cost-Saving Potential: Re-Uncovering potentials for cost savings through energy-efficient measures and responsible resource management.

Guiding Principles for future Improvements:

- Redo DEESME MB: Even with tight schedules, the DEESME MB will be redone.
- Sustainability is more than words: Doing is better than just proposing – so all Goldland team members should be involved and improve the company.

- Being Sustainable is Cost Saving: This is the good news derived: Goldland become more competitive by applying MS Sustainability measures.

A7. Kedua GmbH - data protection experts being also sustainability experts.

Kedua GmbH is a leading provider of privacy / data protection services and trainings in Germany. The company has just celebrated the 25th anniversary and several thousand Privacy officers have received the certification from Kedua over the years. The management and employees now want to contribute to the SDG and minimize their environmental impact. The DEESME project offer to combine GHG / energy savings and the Multiple Benefits (MB) approach was the solution to this challenge.

Type of Best Practice: a) Implementation of the Multiple Benefits approach b) implementation of the energy audit, and c) implementation of the energy management system.

Kedua is a successful SME participant of the DEESME in Germany. The company started with the MB approach – to offer the clients the partnership in minimizing the environmental impact in their services. This helps also to envision the employees for a sustainable company concept.

After the successful presentation of the MB this led to the simplified DEESME audit to recognize the energy key performance indicators (EKPI) for the company. This helped to collect the relevant numbers and also to understand them.

The Kedua experts then also started with DEESME support a simple EnMS and had already a successful kickoff. Now the next steps for the EnMS are taken to have a better sustainable company.

Best Practice Description

The multiple benefits of the measure assigned from the energy audit are related to energy consumption since they allow to consume less electricity (high performance LED) and less natural gas (the new control system to reduce heat consumption).

Monitoring system will lead to benefits related to productivity, since this system will change and optimize some process phases in order to work in a more efficient way.

LED lamps will also improve lighting conditions, and this will increase safety and working conditions of personnel involved in those areas.

Finally, savings generated by the energy efficiency measures will allow the company to limit the increase in the prices of products (due to the increase in energy prices), ensuring competitiveness on the market.

It was not possible having a quantification of these non-energy benefits, due to lack of sources/quantitative indicators related to these topics. However, this is relevant from a qualitative side and can affect company's business model.

In the beginning this new process of Multiple benefits analysis seemed to be rather complicated. With the support of the auditor the company understood the context much better. A major challenge is

usually to find a routine for implementing the MB in daily business and habits, but it can bring significant improvements for SMEs.

The DEESME audit was a successful start after the MP presentation. The main challenges are travel related energy consumptions and the heating in the rented offices. The office building dates back to the 1990s and has no state-of-the-art insulation and HVAC system. This leads, with more glassed facades, to a higher temperature in the summer and to more heating in the winter. As the company has the offices there for more than a decade, it was also important to see the current benchmark consumption values and strategies how to optimize the heat consumption in the winter. The first results will be seen in the next annual invoice. After the first steps in the audit the involvement of the employees led to the EnMS.

The new ISO 50005 is specifically for SMEs to establish a phased approach to implement an energy management system (EnMS). This phased approach is intended to support and simplify the implementation of an EnMS for all types of organizations. This gives guidance on the use of twelve core elements with four levels of maturity for each element to establish, implement, maintain and improve an EnMS that results in energy performance improvement.

Employees were educated on the importance of energy conservation and given practical tips to incorporate sustainable habits into their daily routines. This cultural shift towards energy consciousness fostered a sense of responsibility among the staff, motivating them to actively participate in the company's energy-saving efforts.

Key Elements and Learnings

- The longer the saving, the higher the savings! (or only little immediate savings are possible). The changes take some time to become visible or to generate impact – as changing behaviour takes some time. Heating changes will be visible only up to 18 months later!
- Create the energy year inner cinema: for newbies the main way to address energy spending is cooling in the summer or heating in the winter – so not cooling in winter and heating in summer. Therefore, saving does not mean freezing in winter and power sweating in the summer!
- Collecting the right data: help the SMEs to look for the needed data

Guiding Principles for Future Implementations:

- Data & User Awareness It is important to display not just data but relations, e.g. comparisons of other companies, compare train vs plane, present also visible impact
- Staff Integration Often companies describe themselves as teams but on energy issues there are only lonely wolves. Sharing information and adapting ideas from all staff members increase the wellbeing and energy savings.
- Share success: Benefits and impact should be shared as information with staff, but also external parties and stakeholders.
- Support to success: SMEs will need long-term support to be successful on their way. Not all are ready for an EnMS and results of energy audits should be supported to truly become saved energy.

A8. Airport Squash & Fitness Berlin (Germany)

Airport Squash & Fitness Berlin is a premier sports and fitness facility located in Berlin-Tegel. Boasting state-of-the-art squash courts and a well-equipped fitness center, the company offers a diverse range of health and wellness services to its members. The Squash teams are playing in national and European leagues. The company has done already energy saving activities for more than a decade.

Type of Best Practice: Implementation of the energy management system.

Within the project there was an adaption of all three types of DEESME improvements with a stronger focus on the energy management system. The best practice focusses on saving energy on the long term, as within the box building from the 1970s, where Airport Squash & Fitness Berlin is a tennant, more measures become positive on the way to a net Zero place.

Best Practice Description

In response to the increasing focus on sustainability and energy conservation, Airport Squash & Fitness Berlin embarked on a mission to implement best practices in energy efficiency within the box building from the 1970s that they rent. This rented building, with its dated infrastructure, poses challenges that required innovative solutions to reduce energy consumption and create a greener, more efficient space.

Challenges Addressed:

- Heating Inefficiencies: Even though the company has a CHP installed, the heating system lacks monitoring and control capabilities, resulting in energy inefficiencies. A challenge is that no building cover related activities are possible.
- Inefficient Processes: Certain operational phases within the facility were identified as energy-intensive, calling for optimization to streamline energy usage.
- Proposed Measures: Advanced Heating Monitoring and Control: To address the heating inefficiencies, the company plans to install a better monitoring and control system. This new system allows to register the generation and consumption of heating systems, enabling precise temperature regulation in different areas of the building. This real-time data helps to avoid heat inefficiencies, optimizing energy use and enhancing overall comfort for users.
- Process Optimization: Airport Squash & Fitness Berlin will (again) conduct a thorough analysis of their operational processes to identify areas where energy usage could be reduced without compromising service quality.

Additionally, the company prioritized employee training on energy awareness and responsible energy consumption. Staff members will be trained on the impact of energy savings and get practical tips on how to incorporate sustainable practices into their daily routines. This created a culture of environmental responsibility within the facility, where everyone plays an active role in promoting energy efficiency.

The simplified DEESME energy audit was a successful start after the MP presentation.

Challenges Addressed:

- Heating Inefficiencies: The heating system lacked monitoring and control capabilities, resulting in energy wastage due to improper temperature regulation.
- Inefficient Processes: Certain operational phases within the facility were identified as energy-intensive, calling for optimization to streamline energy usage.

Key Elements and Learnings

- The longer the saving, the higher the savings! (or only little immediate savings are possible). The changes take some time to become visible or to generate impact – as changing behaviour takes some time. Heating changes will be visible only up to 18 months later!
- Create the energy year inner cinema: for newbies the main way to address energy spending is cooling in the summer or heating in the winter – so not cooling in winter and heating in summer. Therefore, savings will not result in freezing in winter and power sweating in the summer!
- Collecting the right data: help the SMEs to look for the needed data

Guiding Principles for Future Implementations:

- Data & User Awareness It is important to display not just data but relations, e.g. comparisons of other companies, compare train vs plane, present also visible impact
- Staff Integration Often companies describe themselves as teams but on energy issues there are only lonely wolves. Sharing information and adapting ideas from all staff members increase the wellbeing and energy savings.
- Share success: Benefits and impact should be shared as information with staff, but also external parties and stakeholders.
- Support to success: SMEs will need long-term support to be successful on their way. Not all are ready for an EnMS and results of energy audits should be supported to truly become saved energy.

A9. Anonymous-1: Charcoal Company (Poland)

Anonymous-1 is the largest char producer in Europe supplying high-end, customized semi-coke products to the leaders of the Ferro-Silicon industries in Europe. Founded in 1991 in Poland, the Company has two production sites in Police and Kostrzyn with a total production capacity of 225,000 tons of char and 2 million Gj of steam. Polchar is focused on continuous quality improvement of both, existing and new products, as well as implementing innovative production processes.

The DEESME integration helped to raise the awareness of energy, energy cost but also Multiple Benefit advantages, which can be generated from EMS.

Type of Best Practice: a) Implementation of the Multiple Benefits approach, and b) Implementation of the energy management system.

The company is a successful SME participant of the DEESME in Poland. The company started with the MB approach – to offer the better product footprint. This helps also to envision the employees for a sustainable company concept.

After the successful presentation of the MB this led to the DEESME support for EMS and to reevaluate the energy key performance indicators (EKPI) for the company. This KPI can be used for a better impact.

Best Practice Description

The Multiple Benefits (MB) at the company are related to the improvement of energy consumption since they allow to consume less heat energy. In the beginning this new process of Multiple benefits analysis seemed to be rather complicated. With the support of the KAPE partners the company understood the context much better. A major challenge is usually to find a routine for implementing the MB in daily business and habits, but it can bring significant improvements for SMEs.

The new ISO 50005 is specifically for SMEs to establish a phased approach to implement an energy management system (EnMS). This phased approach is intended to support and simplify the implementation of an EnMS for all types of organizations. This gives guidance on the use of twelve core elements with four levels of maturity for each element to establish, implement, maintain and improve an EnMS that results in energy performance improvement.

Employees were educated on the importance of energy conservation and given practical tips to incorporate sustainable habits into their daily routines. This cultural shift towards energy consciousness fostered a sense of responsibility among the staff, motivating them to actively participate in the company's energy-saving efforts.

Key Elements and Learnings

- The longer the saving, the higher the savings! (or only little immediate savings are possible). The changes take some time to become visible or to generate impact – as changing behaviour takes some time. Heating changes will be visible only up to 18 months later!
- Create the energy year inner cinema: for newbies the main way to address energy spending is cooling in the summer or heating in the winter – so not cooling in winter and heating in summer. Therefore, saving does not mean freezing in winter and power sweating in the summer!
- Collecting the right data: help the SMEs to look for the needed data

Guiding Principles for Future Implementations:

- Data & User Awareness It is important to display not just data but relations, e.g. comparisons of other companies, compare train vs plane, present also visible impact
- Staff Integration Often companies describe themselves as teams but on energy issues there are only lonely wolves. Sharing information and adapting ideas from all staff members increase the wellbeing and energy savings.

- Share success: Benefits and impact should be shared as information with staff, but also external parties and stakeholders.
- Support to success: SMEs will need long-term support to be successful on their way. Not all are ready for an EnMS and results of energy audits should be supported to truly become saved energy.

A10. Anonymous-2: Producer of ready-to-eat meals (Poland)

The company operates in the meat and vegetable processing sector (vegetable and meat products). The assortment is supplied in ready-to-eat form, packed in glass jars or tins. The Company, with its registered office in Rusiec, operates in the field of meat and vegetable processing. The raw materials of animal, vegetable and animal/vegetable origin are delivered to the production raw materials and materials plant, then unloaded and stored in designated places.

The company receives cleaned and selected meat raw materials for production, which are then washed and subjected to the necessary processing (mechanical and thermal) in the production halls. The same applies to the vegetables, which enter the production hall where they are selected, washed and then thermally treated. The finished products are packaged in glass jars, covered with sauce, sealed with metal lids and pasteurised in autoclaves. All packaging used for the finished product is disinfected (with steam or ultraviolet rays), then washed and dried in steam-operated membrane dryers.

Type of Best Practice: a) Implementation of the Multiple Benefits approach, and b) Implementation of the energy audit.

Best Practice Description

The main results from Energy Analysis are the following:

- Improving water vapour management - reducing vapour and condensate losses
- Reduce heat losses - Replace cold store sandwich panels
- Lighting - upgrade internal lighting
- Lighting - upgrade outdoor lighting
- Power generation - Use of photovoltaic panels

Regarding the multiple benefits approach, the company started with the analysis of the existing business model.

- Key partners: suppliers of vegetables, pork, preserves, spices, energy media.
- Products: Retail and wholesale of ready meals.
- Market: Sale of sub-products in the company's own shop, sale of products to shops and markets.

The company estimated the significance and the impact of the various elements of the DEESME multiple benefits approach on value creation and energy efficiency respectively. For example, Workforce Productivity has great significance and high impact on both value creation and energy efficiency, while Overall Equipment Effectiveness was found to have low significance and low impact on value creation and energy efficiency.

Next the company implemented the DEESME approach for the Business Model Sustainability Advancement. With respect to the key elements of the business model, the company decided that:

- Value Proposition: Use of “natural” spices, purchase of meat from certified suppliers.
- Customer Segments: Young people, adults and seniors, clients with different income levels: low, medium, clients with time constraints for meal preparation.
- Channels: Wholesalers and retailers of products, selling in the company shop, selling through wholesalers. Both channels work well. We try to tailor our products to be easy and ready to eat.
- Key activities: Improving the energy efficiency of equipment, improving the productivity of employed workers, reducing defective products.
- Key resources: Retail and wholesale of ready-to-eat food products.
- Key partners: Selection of partners with sustainability and organic certification