innoveas
The power of energy audits

D4.2 Validation report on trainings

AUTHORS : BOTTIGLIONI, CARIANI, CORBELLA, SILENI
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Technical References

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Project Coordinator	Luisa Sileni Istituto per l'Istruzione Professionale dei Lavoratori Edili della Provincia di Bologna (IIPLE) Email: luisasileni@edili.com
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Document history

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Project summary

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

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

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

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

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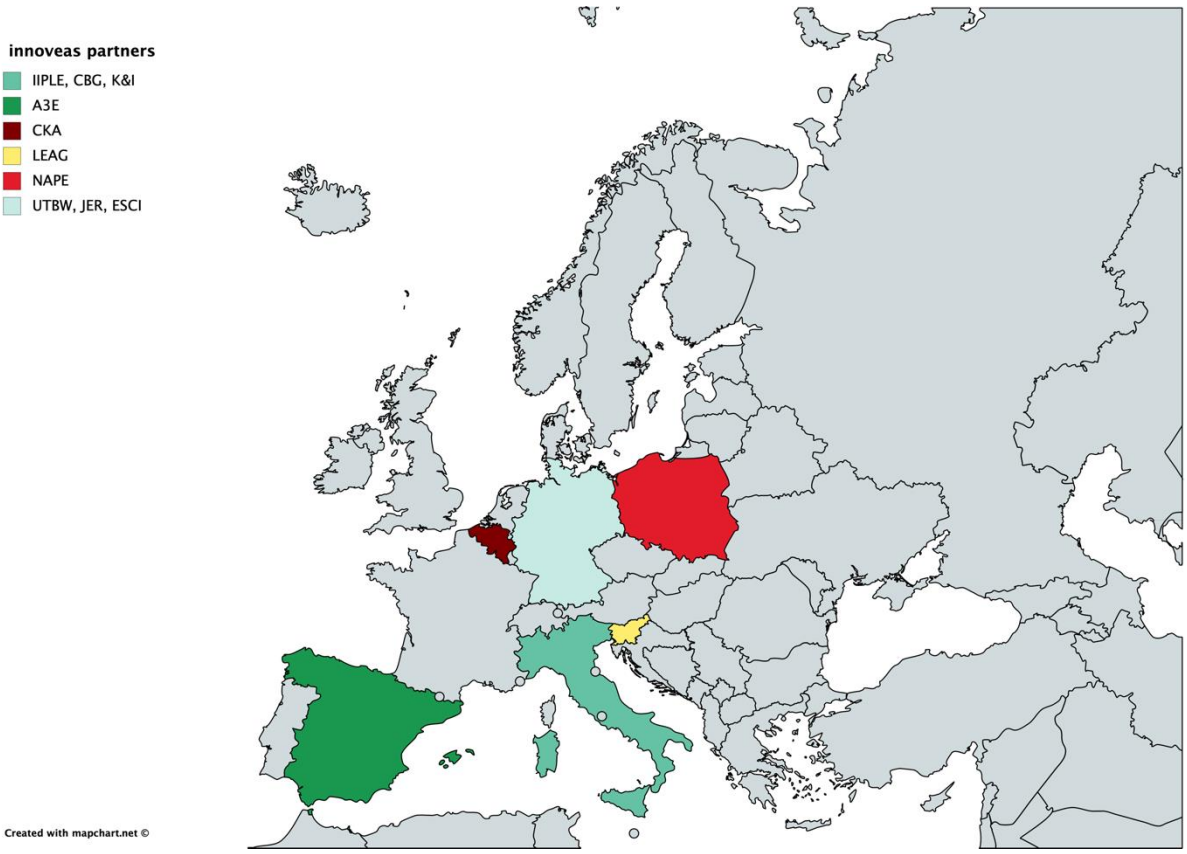
Partners



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1. Executive summary

This deliverable represents the next step to the Deliverable 3.3 Performance Report, as well as being the second document produced under WP4 "Implementation of capacity development".

The main objective of this deliverable is to report the main findings from the implementation of the of the Capacity Building Programme, described in the D3.2 “Capacity Building Plan”, with the aim to validate the training products developed.

The main goal of this deliverable is to validate the capacity building programme which aims to overcome the behavioural and organizational constraints that hinder the adoption of energy saving measures and the implementation of energy audits in SMEs.
The Capacity Building Programme developed within the Innoveas project was implemented by the project partners in the following countries: Italy, Germany, Poland, Spain and Slovenia. The report summarizes the training activities carried out in these countries, the results achieved and the lessons learned.

The document is structured in 2 main chapters:
- chapter 2 "A COMMON CAPACITY BUILDING PROGRAM" which includes a detailed description of the implementation, in the partner countries, of the 3 main products of the Capacity building programme such as: web-based modules, In-situ training and In-company training. Furthermore, it provides information on the modalities for recruitment of beneficiaries and the selection of trainers for each type of training.
- chapter 3 “CONCLUSIONS AND LESSONS LEARNT DURING TRAINING” which describes the results achieved in the different countries involved in the training activities, the lessons learned and the critical issues that emerged.
The chapter closes with some overall considerations concerning the validation of the training offer tested in the different countries of the partnership and the possible replicability of the capacity building program developed in the construction, chemical and food processing sectors also in other production sectors.

The report includes among the annexes the curricula of the trainers and teachers who have developed the in-situ training and the in-company training. Finally, the guideline of training activities are enclosed too.

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2. A common capacity building programme

The characteristics and structure of the capacity building programme have already been displayed in deliverable 3.2 “Capacity building plan”, submitted in M16.

As already described, the capacity building activities have been designed to address 3 main groups of targets:

1- SMEs → the final beneficiaries of the Innoveas Project are SMEs and, within it, several roles could be involved in the training activities: CEO, administrative managers, heads of production, energy managers, operative workers.
2- Stakeholders → as, for instance, energy auditors, policy makers and financial institutes, as directly-involved actors who will receive hints and tools to approach the different profiles in SMEs, implementing the audit.
3- Intermediaries → industrial associations and other intermediaries who will be the successors of the project’s training activities and materials, after the completion of the EU-funded actions. They will be the responsible for the implementation of an awareness raising and training programme directly targeting SMEs, after the end of the Innoveas Project.

The success of the project largely depends on the capacity building programme, which is the core activity of the EU finance action. Therefore, the Consortium has designed the training programme with the specific purpose of reaching the targets and overcoming the barriers and obstacles identified in previous research activities.
With this in mind, the capacity building programme has been divided into 3 different tools, which will be better described in the following paragraphs, by detailing the differences and similarities of the effective implementation in the Innoveas countries.

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2.1. Capacity building for SMEs

The capacity building programme for SMEs has been divided into 4 training activities and tools:

- Web-based modules, a set of short videos uploaded on the YouTube channel of Innoveas and on the official website, with the aim of raising the awareness and interest of SMEs, through hints on the advantages of energy audit. In the following sub-paragraph, it will be detailed the numbers of views and evaluations collected for each video, realized by the partners and monitored by ESCI.
- In-situ training, organised for companies' staff members. The partners set 16 hours of training but there have been some modifications in the implementation, which will be discussed in the following paragraphs.
- In-company training, organised on demand and involving relevant profiles of the SMEs. The activity has been carried out by consultants from intermediary organisations or energy auditors; the training included the same contents of the in-situ training but tailored on the specificity of the single company.
- Training videos, have been produced during the in company training and published on the INNOVEAS channels, to summarize the training activity and its aim for users who couldn't join the classes.

2.1.1. Web based modules

The web-based modules are training pills in video, which have the aim of introducing the main topics of the training, catching the interest of SMEs to whom the training is addressed, attracting the expected number of participants for the following phases of the capacity building process.
In this sense the videos were used to start approaching SMEs to be involved in the Capacity building programme. Six partners are involved in this activity: IIPLE, CBG, UTBW, A3E, NAPE and LEAG. While the Italian partners have produced 4 videos (for a total of 8 for the country), the other partners developed 5 videos each.
The structure and contents of the video modules have been described in detail in deliverable 3.2, Capacity Building Programme. Below, each partner will describe its videos and peculiarities.
The web-based modules have been published on the Innoveas website, in the section titled "Training platform" and divided per country, and collected in the deliverable 4.1, Training webinars.

Italy

IIPLE

For the development of the videos, IIPLE has selected a team of film makers to work in cooperation with the experts, companies interviewed, energy auditors and representatives of public administrations. The videos realised are all focused on the construction sector and are structured as follows:

- Training for SMEs on energy transition, the first video to illustrate the aim of Innoveas project, the structure of capacity building, the categories of participants involved.
- Introduction to the energy audit for SMEs, to present the key concepts of energy efficiency, the impact that these measures can produce locally and globally, the main national regulations and certifications governing energy interventions, the fundamental role of the energy auditor.

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- Building companies towards the green economy: wooden buildings, describes the good practices in energy efficiency adopted in the Emilia-Romagna area. The interviewed company deals with prefabricated wooden buildings and, during the interview, illustrates the virtuous characteristics of these buildings and the energy saving possibilities they offer.
- Building companies towards the green economy: Best practices in Emilia-Romagna, presents a best practice of the Emilia-Romagna region. The Appennino Building Cooperative (CEA) is a virtuous example for SMEs, as a reality attentive to the issues of the green economy and the circular economy, of the disposal of construction waste and the adoption of energy efficient measures.

CBG

The training video developed by Confindustria Bergamo presented the INNOVEAS project and the activities carried out towards energy efficiency for SMEs.
More in details, 4 training videos were developed:

- Incentives in Italy for Small and Medium Enterprises: the video addressed the issue of the little diffusion of energy audits among SMEs. This is due to the lack of economic resources mostly. However, Italy has several incentives and supporting measures to increase the number of companies that carried out energy audits or energy efficiency interventions in companies. This video provides an overview of the incentives present in Italy and in the various Regions for Small Medium Enterprises and summarizes the concessions currently available. The video achieved more than 240 views.
- Consumption and energy efficiency in Lombardy: the aim of the video is to highlight the peculiarities in Lombardy on energy efficiency in SMEs and energy audits. To give a comprehensive view, different stakeholders have been interviewed: an energy auditor, a policy maker and representatives from an SME intermediary and a technological cluster. The video achieved more than 100 views
- Energy efficiency: Best Practice in the food and construction sector. The video shows two good practices on energy efficiency. Two companies in the province of Bergamo, operating in the construction and food sector, show their path towards energy efficiency. The video achieved more than 170 views
- Energy efficiency: Best Practice in the chemical industry. The video shows two good practices on energy efficiency. Two companies in the province of Bergamo, operating in the chemical sector, show their path of energy efficiency. The video achieved more than 160 views.

The video material is available on the Innoveas online website in the Italian section of the training platforms tab as well as in YouTube, in INNOVEAS channel.

Germany

UTBW

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The videos were divided into videos that draw attention to the topic of energy efficiency and audits in general and videos that present examples of energy efficiency in practice.
Videos 1 and 2 belong to the "more general" part and were made in presentation style with animations. In video 1, the urgency of addressing energy efficiency through energy audits in SMEs was presented, especially against the background of climate change and its drastic effects. Energy efficiency was presented as a solution strategy. Video 2, on the other hand, was intended to motivate SMEs to tackle the issue more concretely and provided viewers with practical tips for networks and initiatives in the field of energy efficiency.
Videos 3-5 are "best-practice" portraits of companies from the target sectors of construction, chemicals and food that demonstrate exemplary behaviour in the area of energy efficiency. With a camera team on site, employees were accompanied through their companies and were allowed to present to the viewers the ways and means they use to fight for a more climate-friendly world. The companies portrayed were Ensinger Mineral-Heilquellen GmbH (food), Merkle GmbH & Co KG (construction material) and Zeller+Gmelin GmbH (chemicals).

Poland

NAPE

NAPE had worked on the videos with stakeholders and energy efficiency experts. NAPE wrote scripts and guidelines for guests on topics that should be presented on the videos. 6 videos were produced in order to capture the attention of potential training participant and to introduce smart and reasonable ways to improve energy efficiency in SMEs with focus on food and chemical sectors:

- 1. Title: What is Energy efficiency and how to proceed with an audit in SME
  The video explains how to understand the concept of energy efficiency and how to measure and increase it. Besides that, the video explains what the energy audit is and presents necessary steps to conduct an energy audit in SMEs. The video has a form of animation with script and lecturer.
- 2. Title: Energy management system – ISO 50001 and ESCO formula
  The video explains how to introduce EnMS in SMEs and how to implement it according to ISO 50001 standard. Additionally, the video consists of a description on how the ESCO formula works and how it can be used in SMEs. It shows positive outcomes of introducing EnMS in SMEs as a part of day-to-day work of a company, including monetary benefits. Second part of the video explains the ESCO model of financing energy efficiency measures. Video contains animation and guest talk from ISO 50001 Certifier and ESCO company President
- 3. Title: Programme „Energia Plus”
  Introduction of the national support programme dedicated to SMEs, Energia Plus” run by National Fund for Environmental Protection and Water Management. Video contains animations and guest talk – Deputy Director from National Fund for Environmental Protection and Water Management.
- 4. Title: White Certificate scheme

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The video contains the explanation of what are the White Certificates and how the entrepreneur can obtain them. Video contains animations and guest talk – Head of energy efficiency department form NAPE.

- 5. Title: Heat pumps in food processing
  The video contains a technical explanation on how the heat pump works
  Further on, it shows examples of how it can be used in food processing sector. The video shows monetary benefits and also assurance that food process safety won't be endangered by installing any measures supporting energy efficiency
- 6. Title: Cogeneration, photovoltaics and other solutions in chemicals manufacturing SMEs
  The video shows how to reduce the energy costs of a production plant by the use of waste heat, optimization of equipment operation, replacement of existing energy sources with others. All presented solutions were based on a real study cases from an SME from chemical sector.

Slovenia

LEAG

LEAG has produced and published 5 videos addressed to SMEs to transmit them key information about energy efficiency, energy audits and few examples of good practice. Videos can be divided in two sections.

1.) Energy audits and key information with:
- Video 1: Introduction & Norms
- Video 2: Incentives
- Video 3: Regional Peculiarities

2.) Examples of good practice with:
- Video 4: Case study 1 Construction Sector
- Video 5: Case study 2 Food Sector

Video 1 Introduction
First introduction video starts with the presentation of the importance of addressing SMES. Then it proceeds to presents viewer with the energy audit. Narrator presents what is energy audit, why it is important, what are its benefits, who can make energy audit etc. In the continuation there is a detailed description of individual steps and procedures necessary for the implementation of energy audit. Each step is described further in detail. In the last stage of the video, where viewer is presented with what can expect and what are the cost of energy audit. The video is 6.55 minutes long.

Video 2 Incentives
Second video is a sort of interview with main incentive organization in Slovenia – Eco Fund. Eco Fund is Slovenian environmental public fund which is specialized financial institution that deals with subsidizing measures in the field of environmental protection. Video addresses:

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- what kind of subsidies are available for small and medium sized enterprises
- how does a small or medium-sized enterprise apply and obtain a subsidy
- what is the amount of the subsidy for the energy audit
- why should a company conduct an energy audit
- which companies can apply for subsidy to conduct an energy audit
- why it is important to act

The video is 6.55 minutes long.

Video 3 regional peculiarities

In the third video we addressed local particularities. We had a talk with Uroš Habjan who is the head of the low-carbon society sector on Ministry of Infrastructure. He informs viewers why it is important for SMEs to conduct energy audit, what are goals of Slovenia regarding SMES, role of Ministry of infrastructure and their efforts to help SMEs in their transition. The second part of the video is addressing Slovenian goals, and possibilities for SMEs to consider obtaining/implementing standards in their organization (ISO 50001). The video is 9.19 minutes long.

Video 4 Case study 1 from Construction sector

The fourth video presents an example of good practice in the construction sector. In the video there is Aleš Ažman who is a CEO of Gorenjske elektrarne d.o.o. which is highly engaged in solutions of electricity from sources available in the local environment (water, solar and wood biomass energy). Viewer is presented on how this particular SME recognized the importance of energy efficiency, use of renewable energy sources and also their experience in obtaining ISO 50001. Interviewee also presents how to become energy efficient, which steeps to take, their products, efforts and advise to other SMEs from this sector. The video is 9.14 minutes long.

Video 5 Case study 2 from Food sector

The fifth and last short video presents two examples of good practice in the food sector. First example is company Jata Emona, which is engaged in poultry hatching. Head of the hatchery, and his colleague share their story on how they found out that compared with other hatcheries they have very high energy costs, and that this compromised their ability to compete in the market. They sought for the help of external experts, who advised them on how to act. They present measures the company made in order to be more efficient and competitive, and urge other companies to act as well. The other part is a presentation of implementation of energy audit in restaurant and bakery, and their efforts to improve their energy and resources efficiently. The video is 7.09 minutes long.

Spain

A3E

In Spain, A3E has produced 5 short videos, between 5.5 and 9 minutes long.

The first one "Introduction to energy auditing for SMEs" is the first of a series of videos aimed at Spanish SMEs in order to promote energy audits and energy efficiency measures in their facilities. In this video, Ignacio Martín-Escanciano, General Manager of NESS, associated to A3E, introduces the energy audit as a crucial tool to improve the energy efficiency of the

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operations of SMEs. He explains the energy consumption of industry in Spain and the legal framework that supports energy efficiency policies, explains the procedure of energy audits and the benefits they bring to SMEs in Spain.

In the second video entitled "Incentives for energy efficiency measures for SMEs in Spain", A3E has tried to summarise the aids, both at national and regional level, available to industrial SMEs when carrying out energy audits, as well as other types of measures that contribute to the energy transition and the fight against climate change. The Regional Energy Agency of Castilla y León (EREN) and the Basque Energy Agency (EVE) have collaborated in this video.

The last three videos are success stories in SMEs from the three sectors involved in the project: food, construction and chemical.

The first of the case study videos starts with the Muela- Mueloliva oil mill in a small town in the province of Cordoba, which undertook an energy audit with the energy efficiency company Azul y Verde a few years ago and has since implemented many of the measures recommended by the auditor. Both the company and the auditor tell us about the difficulties and benefits encountered and the lessons learnt in this process.

The second success story is a little different. The Ormazabal transformer station factory is a company within the VELATIA group. So, it is not an SME in the strict sense of the word. They carried out the energy audit to comply with RD 56/2016 and, thanks to the Stratenergy consultancy and the consumption monitoring system introduced, they implemented more energy efficiency measures, obtaining significant savings. Both the construction company and the energy manager report the difficulties and benefits they encountered in the implementation of these measures.

In the last of the videos Industrias Químicas SATECMA shows how, with the implementation of an Environmental Management System more than 20 years ago, they have been implementing many measures not only environmental but also energy. With these energy efficiency measures they have achieved significant benefits. In addition, both the head of Quality and Environment and the General Manager himself, told how they overcame the barriers encountered along the way and some fundamental keys to successfully implement these measures.

The Web modules in the Spanish training platform have achieved 3,839 views in total. A lot of media campaigning was done, involving mainly the collaborating companies.
All participants in the training programme were also invited to watch the videos.

2.1.2. In-situ for groups of companies

The in-situ training activity was conceived as face-to-face lessons for SMEs staff. The trainers involved were energy efficiency experts, energy auditors or profiles related to the concept of green / energy transition.
The participation of the learners in the training was traced through several questionnaires and forms in order to understand the characteristics of the participants, the expectations and the evaluation of the activity.

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In specific, the most relevant forms were:

- Annex 0, questionnaire for involvement of companies is a form to measure the SMEs interest towards the topics addressed by training; the form is anonymous.
- Annex 1, the participants register to keep track of the effective presence of each participant to the lessons.
- Annex 3, registration form with data and personal information of the participants. These modules will not be shared within the partners but are archived by each training provider.

The forms and questionnaires for the validation have been included and described in detail in D3.3 “Performance Report”.
Each partner involved in the training, starting from the guidelines developed by IIPLE (Annex 7), has then adapted its training offer to the specific characteristics of the local context. The description of the 6 programmes is presented in this paragraph.

Italy

IIPLE

According to the project’s requirements, the in-situ programme has been designed by IIPLE with a duration of 16 hours divided into 4 lessons. The 5 editions of the in-situ course have been implemented from April 2021 to March 2022.
Because of the health emergency related to COVID-19, the training has been implemented in online synchronous modality, through the GotoMeeting platform.
The health emergency has also generated a general slowdown in the training activity and a decrease in the availability of participating companies, which is why IIPLE has implemented 5 editions instead of 6 that were originally described in the project.
At the beginning of the pandemic emergency, most of the construction companies have been forced to stop or significantly reduce the on-site working activities. When the situation improved at the beginning of 2021, the working situation in Italy was almost back to normal and companies were less interested in training their employees and workers. Moreover, in May 2020 the Italian Government approved and presented a new financing action called Superbonus 110%, aimed at the renovation of residential buildings to improve safety and energy efficiency. For this reason, from that moment onward, most of the Italian construction companies have been involved in renovation, with little time to dedicate to training.

After a first evaluation of the public interests, the contents of the trainings have been identified around the concept of Energy Transition. The programme is in fact titled “The energy transition and the challenges for SMEs in the construction sector”. The specific topics are described in detail in deliverable D5.5 Training Toolkit, where the partners have also collected the list of references used by trainers.
The deliverable will be public and could be used by other learners and workers to update their knowledge and skill set.

Considering the several barriers of the sector which discouraged SMEs from participating to trainings, the target group has been broadened: entrepreneurs and technicians of building and plant companies, producers of building materials, energy auditors and energy managers.

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Professionals and practitioners of the construction sector have been involved too in the training courses.
The total number of participants registered to training has been 90 people, of which 70 have attended 70% of the lessons. All of them belong to the construction sector and to its supply chain.
In the following table we have listed the participants by number and by edition.

Edition number	Hours	Participants	Sector
1	16	17	Construction
2	16	11	Construction
3	16	16	Construction
4	16	11	Construction
5	16	15	Construction

Table 1: In-situ participants IIPLE

The training course is presented and published on the IIPLE website with the details of contents, hours, addressed targets and so on. Furthermore, a focused communication strategy has been carried out on social media in order to attract the target groups.

A further tool which has been used for the advertisement is the network newsletter: the newsletter, which reaches more than 4000 subscribers, has been sent multiple times to inform SMEs about our in-situ training activities.
Based on the analysis carried out by IIPLE on feedback from SMEs, the newsletter has been the most effective tool in reaching users and encourage them to participate to the Innoveas training.
The participants submit the application through the IIPLE platform and must then attend at least 70% of the lessons in order to complete the training.

Implementation of the in-situ training activities was carried out by 3 trainers who were carefully selected by IIPLE from a list of Experts with profiles and expertise that are consistent with the goals of the Innoveas project.

During the selection process great attention was paid to the trainers' ability to convey the specific contents of the courses, the new and original approach and narrative as well as the strong and significant connection with the concept of energy transition for SMEs.

As a result, 3 profiles have been selected:

- The first trainer is a Civil Engineer, associated partner in an architecture and engineering studio but also active in training and teaching activities, both in VET centres and universities. The main topics of interest are: mechanical plant design for the use of renewable sources; environmental compatibility studies of building interventions; environmental quality control activities; consultancy and support for eco-sustainability of interventions.
- The second trainer has a relevant specialisation in sociology (Anthropology of religion and cultural change). The main topics that he has discussed in the Innoveas training programmes are: the concept of social generativity, assessment of impact and contributory sustainability, Generative design in the construction field.
- The third trainer has a degree in Economics and Management, with a specialisation in Economics of resources and sustainable development. Currently, he is working as project

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officer for sustainable investments in an energy agency. His focus is on green marketing projects, corporate social responsibility, compensation or philanthropic activities, fundraising.

CBG

The is-situ activities carried out by CBG foresaw two main training modules: 1) Transformation talks and 2) Energy management course. Both of them have been carried out online.

Module I - Title: *Transformation Talks: take control of your company's electrical management. With digital transformation, the future is in your hands*

For the selection of trainers, both academic and industrial experts were considered. In particular, were involved experts in:

- Management Engineering, having multi annual experience in management operations and advanced processes and technologies for multinational companies.
- Energy manager, having master in energy efficiency and energy management.
- Product marketing expert, with multi annual experience in marketing and production processes in energy companies.
- Expert in digital governance, EMBA graduated manager, with 20+ years' professional experience, both in the energy sector and in the management consulting business.

For this module, the targets were entrepreneurs and technicians from SMEs in constructions, chemicals, foods and manufacturing companies.
The course aims at explaining to the audience the new sustainability trends, the barriers to be overcome, the importance of an energy audit, the possible measure of energy efficiency to be implemented in SMEs, the incentives and the regulatory frameworks available.

Training modules and contents:
Transformation talks were developed as a cycle of 5 lessons:
1 – Introduction module - Saving and optimizing: achieving sustainability through energy efficiency.
Current scenario of the Italian small and medium-sized enterprise in the field of electricity distribution and sustainability
How to optimize consumption and achieve sustainability thanks to energy efficiency
2 – Sustainability and SMEs: energy efficiency in the Italian market.
Technologies used, purchasing methods, investments and barriers to overcome: description of the scenario that characterizes energy efficiency on the Italian market.
3 – Energy audit: the importance of having everything under control
Discovering the advantages of energy audit, the reference technical standards and obligations for businesses by reviewing interesting case studies.
4 – Electricity distribution: technological solutions for a new energy identity.
Explanation about how technology can solve dispersion problems and lead the company to achieve a new energy identity. Discovering how some technological solutions can be decisive in terms of plant control and management, reducing costs and making it possible to optimize the company's energy.
5 – Maximizing opportunities: regulatory frameworks, projects and incentives for innovation.
Explanation about the most interesting regulatory changes and the Italian and European plans linked to the energy transition of companies. Energy Efficiency Certificates, Transition 4.0, REC and AC.FER, Virtual Units, Next Generation EU and Italian PNRR: together with experts we will analyse in detail which are the tools available to companies and the incentives provided for energy efficiency.

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Module II – Title - *ENERGY MANAGEMENT COURSE*

For the selection of trainers, experts from the Lombardy Energy Cleantech Cluster were involved. In particular, the following profiles were in charge of training:

- Engineer, experts in energy savings and buildings physics and energy fields;
- LE2C Lombardy Energy Cleantech Cluster experts with a master degree in in European Economics, a Masters in International Relations and an MBA in International Business and Sustainability with focus on entrepreneurship.

For the second module, the target were entrepreneurs and technicians from SMEs in constructions, chemicals, foods and manufacturing companies.
The course was aimed at corporate personnel who want to deepen the issues of energy efficiency of buildings and production facilities and auxiliary. It will deepen the issues related to energy efficiency in the company, the Energy Audit tool and energy monitoring systems. The team of experts will also provide an overview of the methods, tools and incentives to make these changes in the company.

Training modules and contents:
Energy Management course was developed as a cycle of 4 lessons.
1 – Energy efficiency: a lever for the competitiveness of the company
During the first introductory module we will see together with the North Lombardy Energy Consortium framework on energy issues energy issues, energy monitoring energy monitoring, energy audits, with the presentation of some examples and case study.
2 – Energy efficiency: a lever for the company's competitiveness
How can you make a building more efficient? The objective of the course is to provide the basis for understanding the phenomena related to energy dispersion energy losses in buildings, in terms of building envelope and consumption of air conditioning systems. Reviewing interesting case studies.
3 – Energy: economic opportunities - cost and investment management
Let's take a closer look at the tax benefits, incentives and funding opportunities for actions in the field of Energy Management. We will analyse in detail with the North Lombardy Energy Consortium what are the tools available to companies and what incentives provide for energy efficiency.
4 – Green marketing and improvement of corporate image
Together with LE2C's expert we will discover how to implement an effective green marketing strategy and why it is important to communicate a sustainable corporate image. We'll also look at some tools such as the Personal Branding Canvas for the rapid and concrete development of a sustainable branding strategy.

Module III – Title - *ENERGY MANAGEMENT COURSE*

For the selection of trainers, experts from the Lombardy Energy Cleantech Cluster, the Lombardy Energy Consortium and the University of Milano Bicocca were involved. In particular, the following profiles were in charge of training:

- Lombardy Energy Consortium director, experts in energy savings certifications.
- LE2C Lombardy Energy Cleantech Cluster experts with a master degree in in European Economics, a Masters in International Relations and an MBA in International Business and Sustainability with focus on entrepreneurship.
- LE2C Lombardy Energy Cleantech Cluster experts in entrepreneurship, circular economy and open innovation.
- University Milano Bicocca expert in advanced technologies for innovation, Public Law and Policy della School of Law di Berkeley member.
- University Milano Bicocca experts in banking and finance.

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In lined with the previous modules, for the third module, the target were entrepreneurs and technicians from SMEs in constructions, chemicals, foods and manufacturing companies.
The course was aimed at corporate personnel addressing energy efficiency measure as a tool for business competitiveness, green marketing and green deal as well as it presented an overview of the methods, tools and incentives to make these changes in the company.

Training modules and contents:
Energy Management course was developed as a cycle of 4 lessons.
1 – Energy efficiency: a lever for the competitiveness of the company
During the first introductory module we will see together with the North Lombardy Energy Consortium framework on energy issues energy issues, energy monitoring energy monitoring, energy audits, with the presentation of some examples and case study.
2 - Green marketing and company brand improvement
During this module, the main topics addressed how to implement an effective green marketing strategy and why it is important to communicate a sustainable corporate image. It provided also an analysis of some tools like the Personal Branding Canvas for it rapid and concrete development of the strategy of sustainable branding.
3 – Energy: economic opportunities - cost and investment management
Let's take a closer look at the tax benefits, incentives and funding opportunities for actions in the field of Energy Management. We will analyse in detail with the North Lombardy Energy Consortium what are the tools available to companies and what incentives provide for energy efficiency.
4 – Green deal, action plan and European taxonomy of sustainable investments
The module aimed to provide an overview of the main economic and legal aspects of the European Green Deal. The objectives and the main actions of the Action Plan focusing on the European taxonomy of sustainable investments. Experts analysed the main objectives, the characteristics and the applicability of the taxonomy thinking about what the consequences may be on SMEs.

Number edition	Hours	Participants	Sector
1	15	31	Eletric, mechatronic, textile
2	12	27	Building, mechatronic, textile, services
3	12	34	Building, energy, mechatronic, textile

Table 2: In-situ participants CBG

Germany

UTBW

As described in D3.3 UTBW switched, because of the Covid emergency, completely to online formats for the in-situ training. After feedbacks from the first stakeholder workshop, the design of the training programme was based on short modules (1,5 h – 2,25 h) instead of long editions based on a two-days training design.

Due to the module-based concept for the trainings, we had to recruit a large number of trainers. We saw this as an opportunity to focus more on the individual topics and to achieve a level of detail in the content that would make the participants directly capable of acting in

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the specific topic area. Each selected speaker is a proven and usually long-standing expert in his or her subject area. The experts either have experience in advising SMEs or, in the case of technical content, offer solution-oriented perspectives on the relevant technology. In this respect, it is guaranteed that participants receive useful first-hand information and at the same time access to technology-based solution expertise is created. The ultimate goal has always been to strengthen SMEs' own solution expertise and to provide information that independently supports their own decisions and also supports their ability to discuss with providers of EE-solutions or, in the best case, to develop a company-specific solution itself. This usually improves the SME's negotiating position vis-à-vis potential providers of technical efficiency solutions. Many services in the field of energy efficiency are consultancy-intensive and the participants should be empowered to better evaluate and assess consultancy offers.

As we presented a large number of individual topics in great detail due to the modular structure, it was hardly possible to collectively present this via one or a few speakers. Therefore, the UTBW network was systematically searched for suitable speakers for each of the individual topics and suitable speakers were engaged for the individual lectures. In the end, we succeeded in doing this for all the desired topics, but it did of course increase the effort required to find speakers. For the management topics (ISO 50005, DIN EN 16247, EMAS) we were able to get representatives or auditors who could describe and explain the systems in detail from their many years of experience. For the topic of funding programmes, we were able to win over either the respective funding agency or a consulting firm specialising in funding. For networks and other supporting multipliers, we were also able to win the respective executing agencies as speakers. The range of tools and technical solutions in the field of energy and climate monitoring as well as energy management is very diverse in Germany. Here, a selection of suitable experts with access to the respective tool was compiled in order to be able to offer expertise that is as practical as possible. In this way, detailed technical questions could be dealt with directly in the web seminars and detailed questions from the participants could be answered by the trainers. For the large block of technical solutions, corresponding experts were booked in each case. These could be appropriately trained moderators from the KEFF[1] network, university professors or suppliers of corresponding energy-efficient technology. In the case of the latter, special care was taken to ensure that the technical expertise was in the foreground and not the company giving the presentation. In our view, this has worked out well. A list of the individual experts can be found in the appendix.
The seminars were advertised through different channels. At UTBW events, reference was made to the individual seminars when it fitted thematically. All former participants were regularly informed about the current seminars so that they were up to date. In the follow-up mails to each event, the documents were made available for download and at the same time the following appointments were pointed out. At longer intervals, large mailings were sent to a new group of addressees in order to generate new participants. The dates of the events were regularly made available to suitable multipliers so that they could refer to them in their networks. The dates were made available on the UTBW homepage for registration. The social networks, LinkedIn in particular, were used to draw attention to each individual module.

[1] Regionale Kompetenzstellen Netzwerk Energieeffizienz, a network of energy advisors in Baden-Württemberg that offers energy checks as an entry point for SMEs

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Depending on the topic, the modules were mainly designed for knowledge transfer in order to provide participants with a broad basis for implementing energy efficiency and climate protection in the company. The teaching phases were loosened up by surveys on topic-related issues and exercises on the use of the knowledge imparted. In each module, the participants were asked to actively make questions about the topics taught. Since all events were offered in an online format, questions were possible both in the written chat of the Edudip training platform and by activating the video and audio function by the participants. As a rule, lively discussions and specific questions on the respective topics of the seminars arose mainly in the chat.
The 27 modules focused on training content in the categories of management, tools for implementation, technical solutions and help for implementation. The aim was to build the offers didactically on each other. The recordings of the modules made it possible for the participants to catch up on missed modules, which was used intensively.

Number edition	Hours	Participants	SMEs	Sector
n.a.	10	64	31[2]	Construction, chemical and food processing

Table 3: In-situ participants UTBW

Poland

NAPE

In the beginning, according to the project's requirements, the in-situ programme has been designed by NAPE with a duration of 16 hours divided into 4 lessons. In this form the course has been promoted and organized between April 2021 and November 2021 in on-line form (due to COVID-19 health emergency). Two trainings in such form were organized successfully in May and June 2021.
NAPE hired a professional recruitment agency that contacted over 600 SME's in Poland; BNP Paribas bank and their portal "Agronomist", which is a main source of information for agro-food sector, were involved in the promotion of the on-line course too. Several forms of participating where proposed, to increase the chance to get participants.

Nevertheless, the low rate of registration forced NAPE to cancel four planned courses and re-design the training curriculum in order to better address the SME need. NAPE had several meetings with SME's and BNP Paribas and other stakeholders where the identified issue was the length of the course. Due to the low economic period at the beginning of the pandemic, the focus of SME's in Poland was on retrieving the lost revenues, therefore two-day training was inconvenient for them.
After careful consideration NAPE has decided to implement in-situ training with a hybrid modality, to ease the participation of companies.

[2] As already explained in this report and in deliverable 3.3, the case of UTBW is peculiar and different from the approaches chosen by other partners. The number of participants has been calculated considering users who attended at least 10 hours of training.

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This solution was apparently considered attractive to SME's and the final 3 in person trainings were implemented in March/April in various locations of Poland in order to spread our action through the country. Additionally, the new training program attracted wider number of SME's who couldn't participate in physical trainings due to long distance to the location and the last training was done on-line.

The programme title was "Improvement of energy efficiency and lowering energy costs in your SME" and was focusing on four main pillars:
1. Energy efficiency measures – examples of modernization and methods of calculating their energy, ecological and economic effect.
2. Non-investment methods of reducing energy costs.
3. Energy Management Systems according to the ISO 50001 standard.
4. Financing the improvement of energy efficiency - support programs, white certificates and ESCO.

All training materials were collected in D5.5. Training toolkit. In both training structures all the topics were covered; nevertheless, some were shortened or delivered to the participants as individual study.

NAPE was targeting the food and chemical production sector, even if a major interest was expressed from the food sector. Few registration (around 10) came from energy companies and energy auditors but taking into consideration the training scope they have been rejected. Instead, they have been subsequently contacted and involved in the train the trainers' activity, better described in D4.3. Total number of participants who registered is 101 where 51 participated in the training, representing totally 44 SME's (39 from food sector, 5 from chemical sector, 8 other sectors).
After careful consideration NAPE has changed the training program to in-person, 8h of training, plus 4 hours of individual consultation with available trainers for the participating SME and 2h on-line consultation for interested SME's after the training.

Below the numbers of participants, split by edition:

Number edition	Hours	Participants	SME's	Sector
1	16	8	8	Food
2	16	7	7	Food
3	16	10	8	Food, Other, Chem
4	16	13	8	Food, Other, Chem
5	16	6	6	Food, Chem
6	16	7	7	Food, Other, Chem

Table 4: In-situ participants NAPE

The training course has been presented and published on the NAPE website and social media, with the details of contents, hours, targets addressed including a promotional video.
More than 400 SME's were contacted by phone by the agency hired for recruitment of participants. The information was also published on the website of the Ministry of Climate and was sent to the members of the Lewiatan Confederation . Trainers who represented different organisations dealing with energy efficiency were asked to reach out to their networks f.e. ISOQAR – ISO 50001 Certification body sent the invitation to SME's and The

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Polish National Energy Conservation Agency (KAPE), who was responsible for the above-mentioned initiative in the Ministry of Climate, reached out to their connections established during the previous projects.
What came as a most effective solution was the BNP Paribas network of clients who represented SME's already interested in investment in energy efficiency measures but without knowledge of benefits beyond monetary.

Registration was done by dedicated NAPE website which is currently used as an overview of the training, access to training materials and invitation to contact NAPE if interested in the scope of training and energy efficiency in SME's.

For performing in-situ training, NAPE has selected 7 trainers, to prepare the training program and implement the in-situ training activities. They have been chosen based on their knowledge on energy efficiency and experience with enterprises sector.
Here a list of the selected profiles:

- Energy auditor;
- Civil engineer, with a specialisation in energy efficiency of buildings;
- Environmental engineer;
- Business and financial project manager.

The detailed curricula and expertise of trainers can be found in annex 3.

Moreover, different representatives from NAPE, Polish Foundation for Energy Efficiency, the Polish National Energy Conservation Agency (KAPE), FEWE and BNP Paribas were available during the trainings in order to provide sufficient help and individual consultancy as well.

Slovenia

LEAG

When designing the trainings, we paid special attention on who to include in the training material in order to have the best possible results. Firstly, we designed our training structure. This was done according to description of action in Grant agreement, local particularities, and needs of SMEs that were addressed in the first months of the project. When we had the structure (number of sessions, general topics), we started addressing potential speakers. Internally, we covered the topics we were familiar with, and looked for external speakers on topics we couldn't cover ourselves.

We have joined forces with speakers coming from Jožef Stefan institute which is the leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. The staff of about 1050 employees, specializes in natural sciences, life sciences and engineering. Our speakers are habituated to make training in Energy efficiency centre. All of the speakers have vast amount of experience in their field and also in trainings of large companies and SMEs as well. The other section of trainings was covered by LEAG with its own personnel. In the continuation there is a list of profiles that have been involved in the training activities:

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- Civil engineer with a specialisation in electro energetics; consultant for the infrastructure, sustainability, construction, and energy fields. Has experience in building energy calculations, preparation of energy audits, energy management, local energy concepts (SECAPs), measurements simulation and other technical documentation.
- Consultant for the Economy and promotion and qualified energy manger. Has developed experiences in commercial sector on cost cutting projects, analytical work, calculations and negotiations.
- Energy and environmental manager. Has gained many practical experiences in the implementation of domestic and international projects, especially in the field of energy efficiency, and in performing more than 100 energy audits in industry and buildings.
- Mechanical engineers, expert in energy management systems in industry and buildings and the development of sustainable transport, Environment, Spatial planning end Energy; expert in energy management.
- Electrical engineer, actively participates in local, national and international projects in the field of energy efficiency, energy communities, green technologies, merging sectors and assists in the preparation of strategies for sustainable development of large companies and regional strategic environmental energy studies.

During the project we have been compiling list of SMEs in Slovenia. We have made list of more than 1.000 companies that are working in food, chemistry and construction sector in Slovenia. We have contacted the SMEs on our list ourselves. To reach even more SMEs we partnered with Chamber of commerce, Chamber of crafts and entrepreneurship. We have prepared special promotional materials dedicated to in situ-trainings, and reached more than 5.000 SMEs. We used the open-source platform Jotform, in order to monitor registration of SMEs. After receiving registration, we sent out invitations to MS Teams webinars, to the participants for each date. Feedbacks from the participants was gathered manually, by mail and email.

In situ training course was structured as 4-day trainings for approximately 4 hours, depending how long was the discussion. Due to Covid 19 measures that were in force in Slovenia, in-situ trainings, were implemented via MS Teams application. Each lecture of the training was picked and tailored to the needs of SMEs in order to present them with as much useful and understandable materials as possible. Below is the list of lectures developed in the scope of INNOVEAS.

Day 1
The INNOVEAS project and energy audits in SMEs (introduction)
Methodology of performing energy audits (energy audits)
Collection and analysis of data on energy supply and its use (energy monitoring and analysis)
Energy efficiency and energy management in buildings (energy efficiency in buildings)

Day 2
Thermal inspections in SMEs (IR thermal inspections)
Economic analysis of energy efficiency projects (evaluation of measures)

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Energy efficient buildings and heating and ventilation in winter (energy efficiency, technologies, etc.)
Energy efficient buildings and cooling and ventilation in summer (energy efficiency, technologies, etc.)

Day 3
Tools or opportunities to improve energy efficiency in companies (specific measures for SMEs)
Energy efficient buildings and electric lighting (lighting – measures, importance)
Green office and practical exercises (energy efficiency in office)
Financing energy efficiency projects (how to finance energy efficient measures)

Day 4
Energy management, data collection and verification of savings (non-investment measures)
Calculation of key indicators for assessing the state of energy efficiency (status of energy efficiency)
Energy communities and infrastructure integration (how to connect and collaborate)
Integration of RES systems in buildings - heat pumps (key information – heat pumps)

Training material was prepared in Power point and it is accessible on the Slovenian training platform (https://innoveas.eu/training-platform/slovenian/).

Number edition	Hours	Participants	SMEs	Sector
1	16	17	14	Construction, food and chemistry
2	16	31	21	Construction, food and chemistry

Table 5: In-situ participants LEAG

Spain

A3E

For the in-situ training, A3E has selected and involved 27 trainers.
The experts have been identified and selected as specialists in the following fields and contents.
Most of the speakers were auditors and consultants of companies associated to A3E, with wide knowledge and experience in energy auditing, energy management, and energy saving and efficiency measures. Many of them also had knowledge of renewable energies, control and remote measurement of energy consumption, carbon footprint calculation and sustainable buildings.
On the other hand, we invited external experts on topics such as social responsibility, circular economy or SDGs.

In order to disseminate information about the programme to SMEs in the three sectors (food, construction and chemicals), a large number of industrial associations were contacted, which

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in turn disseminated the information to their companies and, in many cases, it was sent directly to the companies themselves.
It was also disseminated in various specialised LinkedIn groups and other social networks.
Our energy efficiency service providers also made it known among their clients as well as the network of collaborators created for the INNOVEAS project.
To register, companies had to fill in the registration form (Annex 3) where they were also asked about their interest in carrying out energy audits (Annex 0).
In order to be accepted for the training, companies had to be SMEs within the sectors we were working in. In the case of the construction sector, it was also open to manufacturers of the materials.

The courses were entitled "Towards zero-emission industrial SMEs", but 6 editions were held with 3 different courses aimed at the 3 sectors of activity: food, construction, and chemicals.
The trainings were addressed to managers, energy managers, quality and environmental managers and maintenance personnel of SMEs in the food and beverage production or other companies in the food chain, involved in the manufacture of chemical products and substances, or involved in the construction sector.
The course aimed to provide the necessary elements to understand the current ecological transformations and to show them the range of solutions towards an energy transition and decarbonization of their activity.
The courses had certain common contents and others more specific but always targeted and with examples to the particularities of each sector. These were the contents covered:

Module 1. INTRODUCTION
- Introduction to the course and presentation of the participants
- Need to act now: Climate emergency, externalities of energy use, European regulatory framework
- Overcoming obstacles: analyse and share the barriers of the attending SMEs to the introduction of energy efficiency measures. Share the results of the INNOVEAS project. Set their own climate targets. Define energy transition and continuous improvement.
- Energy audit as a starting point: Definition, steps, benefits, and limits of the energy audits. Energy audit´s copes and climate audit. Useful tools. SPEEDIER project.

Module 2. ENERGY EFFICIENCY BENEFICTS
- Assess the benefits: economic savings (bill optimization, power purchase), energy savings (monitoring and remote control of energy consumption, thermal insulation, energy efficiency measures in food companies), costs vs. benefits
- Climate audit: carbon footprint calculation

Module 3. GREEN ECONOMY AND ENABLING ENVIRONMENT
- Green economy and green marketing: non-economic benefits and business opportunities, green Marketing, Corporate Social Responsibility, Sustainable Development Goals.
- Certificates: environmental certificates, ISO 50001, other certificates for food, chemical and construction companies.
- Enabling context: Regulatory framework, Energy Agencies, and public support; Private financing mechanisms; Energy efficiency insurance and the Go Safe with ESI project.

Module 4. IMPLEMENTATION

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- Other measures and possible actions: Renewable energies, Solutions for transport/distribution and storage in food, chemical and construction companies, Circular economy for food, chemical and construction companies, Carbon sequestration and emission offsetting mechanisms.
- Case Study: Measures implemented and results in companies in the food, chemical and construction sector
- Climate Audit/Carbon Footprint Exercise
- Tailor made solutions: Positive and negative aspects of each SME, Roadmap to energy transition

The sessions were held online due to the pandemic situation in which we have found ourselves in recent years, as it was not possible to hold large meetings in closed spaces. This made it difficult to deal more closely with each participant, but it also made it possible to reach companies from all over the country.
On the other hand, in order to try to overcome the barriers of the online treatment, the number of attendees was limited, and questions, surveys and examples were interspersed to encourage the participation of the attendees.

The number of participants was limited to between 15 and 20 participants per edition to facilitate their participation and involvement in the sessions.

Number edition	Hours	Participants	Sector
1	16	16	Food
2	16	6	Chemical
3	16	19	Construction
4	16	13	Construction
5	16	20	Food
6	16	10	Chemical

Table 6:In-situ participants A3E

2.1.3. In-company

Italy

IIPLE

The in-company training has been designed to be tailor-made at the SME headquarters, involving the owner and key figures of the company, in order to implement a sort of energy pre-audit.
The activity was carried out by an energy auditor who, starting from an analysis of costs and company bills, was able to implement the following activities:
- definition of appropriate measures aimed at limiting consumption and improving the performance of the building stock;
- collection of typological data of systems, vehicles and buildings with acquisition of consumption trends, use of systems, etc;
- definition of the calculation model
- analysis of critical issues and evaluation of possible interventions

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- elaboration of a programmatic intervention plan;
- development of a plan for improving energy performance, aiming, when possible, at improving sustainability.

The activity was in fact divided into different consultancy moments: a first preliminary meeting to explain the training steps, the pre-audit activity carried out at the headquarters of the PMI, the desk processing of the data collected, the presentation of results and energy report, the identification of possible strategies to reduce energy consumption and to act accordingly.
These activities have been developed with the aim of adding new competences and tools to the knowledge of the company, training its employees with a practical and based on real cases approach. As in a frontal, traditional lesson, the participants received theorical concepts, practical tools and the description of how to use them; in this way, they both received theorical knowledge and practical demonstration to be autonomously implemented at the end of the training.
During all these phases the expert is in contact with the company and IIPLE, in order to share information and knowledge, continuing the training course. At the end of each business process, together with the energy report, the certifier has released a register of activities to quantify his hourly commitment.

The beneficiaries of the in-company training have been selected, at first, within the list of participants of the in-situ courses and, in a second moment, within IIPLE's register of companies. Only SMEs with, at least, a big storehouse or site machineries have been contacted. It has not been easy to find available companies, considering the historical phase: most of them have reported a remarkable lack of time to dedicate to training or improving the internal management of energy.
In order to proceed with the audit, the energy manager has collected electricity and gas bills, periodic report on energy consumptions, information on the machineries and vehicles used by employees. Moreover, the expert has examined also the approach of the SME towards the concepts of energy efficiency and transition, explaining the possible positive outcomes from a non-economical point of view.
The approach has been positively evaluated by participants, because the knowledge transferred can be also exploited to train and increase the awareness of the final client, bringing more workload for the company.

Here the structure of the report delivered to each company who attended the training:

INTRODUCTION
SECTION I: General information on the company and on the method for calculating the energy consumption
SECTION II: Energy diagnosis, calculation of energy consumption for each type of resource, KPIs, monitoring system
SECTION III: Programme and strategy for energy improvement, opportunities for SMEs, training and awareness, ISO 50001.

The database and local network used by IIPLE to disseminate and advertise the in-company activity, are the same of the in-situ training described above: both direct contact and restricted newsletter have been used as methods to reach the companies.

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As already mentioned, the first who have been offered with this opportunity are the SMEs participants of the in-situ training; ideally, the training was divided in consequent steps, to create a coherent path for companies. Because of their characteristics, only few of them where suitable for this activity (dimension, type of intervention and machinery used for work...) and many of them refused to participate because of time-lack.
Therefore, several newsletters have been prepared and sent to IIPLE database, and direct calls have been done to a selected list of SMEs in line with the required "profile".

The energy auditor involved in the activity has been selected within the list of IIPLE's independent contractors, after the analysis of its curriculum, in line with the profile requested for the implementation of the in-company activity. He will also be involved in other activities related to the Innoveas project, such as transdisciplinary workshop, final conference and so on. He has a degree in Environmental sciences, with a specialisation in Environment and territory sciences. He has then completed his training, attended the professional course for Energy Managers at ENEA and has obtain several certifications and qualifications issued by certification bodies and the Emilia Romagna Region.

Nr edition/company	Nr participants from company	Sector
1	2	Construction
2	4	Construction
3	2	Construction
4	1	Construction
5	1	Construction

Table 7: In-company participants IIPLE

CBG

The in-company training activity began with the mailing of the ENERGIA 360 questionnaire to the company. The company was requested to fill the energy questionnaire, which then was sent to the energy auditors.
The auditors analyzed the questionnaire to assess the energy knowledge of the company management and produced a report with the performance of the company and suggestions for future actions to improve energy efficiency.
After the report production, a meeting was organized in the company headquarters, during which Confindustria explained the INNOVEAS project to the company management along with the annexes' questions. Moreover, the auditors explained the report to the company management and gave suggestions to the company in developing possible measures to improve the company performances.

Nr edition/company	Nr participants from company	Sector
1	3	Machinery
2	2	Cosmetics

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3	3	Wood products
4	3	Cosmetics
5	2	Electric components
6	4	Textile

Table 8: In-company participants CBG

Germany

UTBW

As it was agreed to work with the KEFF network facilitators, all experts involved were from the KEFF network. KEFF is a network of energy advisors in Baden-Württemberg that offers energy checks as an entry point for SMEs. As part of the INNOVEAS project, we were able to offer SMEs the additional service of deepening the topics of energy audit, energy management and implementation of efficiency potentials (found within the individual energy-check) in the in-house workshops. The workshops were attended by the KEFF moderator who also conducted the energy-check in the specific SME.
UTBW took over the parts on energy management, especially climate management and ISO 50005. All KEFF facilitators have completed energy-related studies and have knowledge in the field of energy efficiency.

After half of the completed seminars, we pointed out the possibility of in-house workshops in each seminar. In addition, we called interested participants of the workshops directly and offered them to participate in the in-house workshop. Most of the feedback we received was rather sobering (what surprised us), but some participants did take part thanks to this approach. The energy moderators of the KEFF network, with whom we cooperated for the workshops, approached interested companies about combining the energy check with the workshop. A few participants also came in this way.

Nr edition/company	Nr participants from company	Sector
1	2	Construction
2 (2 companies)	2	Trade
3	1	Foundry, (construction materials)
4	1	Food (beverages)
5	1	Machinery

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6[3]	1	Interior (buildings)

Table 9: In-company participants UTBW

An energy check (KEFF check) was carried out in each company, the results of which were also made available to UTBW. A list of potential efficiency measures was derived from each of the checks, from which the savings potential was also derived. In the subsequent workshop, the topics of climate change and motivation to act, energy management according to ISO 50005 up to levels 1 and 2, climate management and CO_2 balancing were worked out as required by the specific SME. In order to strengthen the motivation to act, a benefit analysis with the most important measures was carried out in each workshop in order to prepare a roadmap. This was based on the management approach Plan-Do-Check-Act. This made it possible to take a very company-specific approach and to address the specific situation in the companies.

At least 10 potential measures were identified in each of the companies with the energy checks (in one case it was less than 10). Although all companies were quite differently positioned, some focal points emerged. Frequently identified topics were

- Implementation of ISO 50005 and/or Implementation of DIN EN 16247,
- heating and building modernisation,
- lighting (LED),
- compressed air management (and/or investing in a new compressor)
- plant management, for example with automatization.

Other, more specific findings where

- the combination of PV with charging point for EVs or battery storage,
- heat recovery,
- making a funded refurbishment roadmap,
- installing new heating pumps in existing systems,
- exchange of complete heating system by a heat pump,
- implement energy controlling (digital),
- optimisation of ventilation systems,
- peak load management,
- uninstall hot water tank for drinking water and replace with instantaneous water heater,
- Implementation of local heating network with neighbouring companies,
- machine cooling optimisation,
- create a cadastre of electric drives and replace old motors,
- conversion of steam generation from oil to other energy sources.

Regarding the topic climate protection and climate management most of the participants were interested in the CO_2-calculation tool Eco cockpit and want to use it in future. In this

[3] At the time of final editing, only the first part of the workshop (energy check) had been completed – the check was initiated by the in-situ workshop.

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context, the use of the SBT-tool (Science Based Targets) was also required in some cases, with which the reduction paths (1,5°C or 2°C target until 2050) for the participating SMEs were calculated.

Some participants already had PV, while others were made aware of the existing potential and discussed the advantages and disadvantages or possible risks in the workshop.
In each of the companies, at least individual measures were discussed for which a high probability of implementation can be assumed. Most participants were cautious about measures with a very high investment. However, it was also emphasised that the Ukraine war had increased the pressure to act, but also the uncertainty for the SMEs what to do in the near future.

In the Workshop itself we worked on Level 1 (partly Level 2) of ISO 50005, regarding the topics EnMS-Team, responsibilities for energy related topics in different positions of the SME, energy policy, overview of the main energy consumers, energy data collection and action plan (utility analysis). From the pool of possibilities, those that the company wanted to deepen were selected in each case. In most cases, the action plan was an important issue in order to come into action (Plan – Do – Check - Act).

Poland

NAPE

In-company training has been designed to be performed on demand at the SME premise, involving its representatives. The activity has been carried out by energy auditors.

The activity has been divided into 6 steps according to logic defined in energy auditing methodology in order to strengthen the importance of the energy audit:
1. Meeting to introduce the method for performing the audit, information on the existing energy management system, as well as opinions and ideas on possible energy efficiency improvement measures, CO_2 emission targets and the expected audit results. The result of this meeting was a signed Agreement on the scope of in-company actions.
2. Data collection: the energy auditor explains how-to collect data with the SME training responsible, according to the agreement
3. Fieldwork: joint cooperation with SME's staff members, in the premises of an SME, in order to assess the existing energy use etc.
4. Data analysis: analysis of the existing state of energy consumption and possible improvements. The trainer should present simplified methods for data analysis and together with the responsible for training, identify possible energy efficiency improvement measures based on his own experience, comparison of the indicators of the assessed facility and benchmarks, assessing the condition and age of the facility.
5. Report: Trainer presents typical draft of the report from energy audit to the SME.
6. Closing meeting: participant to training, backed up by the trainer, presents the report to the SME training group. The Trainer provides dedicated training on main outcomes and ways to improve energy efficiency and strategies to reduce CO_2 emission, and possible scenarios for achieving climate neutrality in this particular SME

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The beneficiaries of the in-company training have been selected mostly from participants of the in-situ trainings based on the previous activity and also declaration on willingness to participate in the next steps of the project. Moreover, the SME's were chosen on the basis of the energy consumption and potential savings that such training can offer.

Energy auditors involved in this activity were previously involved during the in-situ training activity.

Nr edition/company	Nr participants from company	Sector
1	5	Food
2	4	Food
3	5	Food
4	3	Food
5	3	Food
6	2	Food

Table 10: In-company participants NAPE

Slovenia

LEAG

For the in-company training, we tried to collaborate with external experts, but there were issues with organizing 3 different actors. This was a major issue. It was also an issue with external expert fees, and COVID restrictions, that were in place. That is why we opted to conduct trainings with our experts. In company trainings were therefore conducted by LEAG personnel. We have 3 energy auditors in our company. Between us we have prepared more than 40 energy audits for both private and public sector. We have 2 mechanical engineers and one civil engineer. All of us are EURME certified. Two of us have Slovenian licence for energy performance certificate for buildings.

We have approached many SMEs during our promotion activities. We have addressed them through same sources as in situ trainings, contacting them ourselves, through Chamber of commerce, Chamber of crafts and entrepreneurship, INNOVEAS Slovenian training page, out company webpage and LinkedIn. We also got in touch with the Chamber of Agriculture and Forestry of Slovenia, who noticed the potential and contacted their members. That is how we organized first 4 trainings. Those trainings were done in small SMEs regarding food sector. The fifth training was organized through contact via in situ-training. Regarding last two trainings we were approached by beneficiaries ourselves. They got in touch with us through our and INNOVEAS training page.
Trainings were done in the premises of individual SME. We presented INNOVEAS project, and summarized presentations. In most cases these trainings were performed in small sessions (through laptop). These sessions were productive because, beneficiaries are less shy, and much more involved, because they are more relaxed and focused. Therefore, there are more

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questions and discussions. Especially regarding concrete issues and measures. After power point presentations that varied in length (depending on the company and their needs and interest) we continued to go through the company – guided tour, with inspection of production and building. After each training we than analysed the data, and made the study of potential measures. We than notified each company where we discussed the proposed measures. This was done via phone, in person, or by virtual meeting.

Nr edition/company	Nr participants from company	Sector
1	3	Food
2	1	Food
3	2	Food
4	1	Food
5	2	Food
6	1	Construction
7	5	Food

Table 11: In-company participants LEAG

Spain

A3E

For in company training, A3E has selected 6 experts to implement the pre-energy audit; they have relevant experience in energy innovation in industry and energy auditing. They belong to the field of industrial engineering, energy management for industry and buildings.

The objective was to train 6 SMEs for the In-Company training, so it was decided to choose the most interested company and the one that had participated the most in each of the editions of the In-situ training.
To check their interest, annex 0 and attendance to all the sessions of the in-situ training were evaluated, in addition to requesting the delivery of annexes 5 and 6.
The people from the companies involved in the in-company trainings, at least one, had attended to all the In-situ trainings. Their positions ranged from: Maintenance Dept., Quality and Research Director, Company Director, Head of the Integrated Management System, Production Manager, Construction Manager, Quality and Environment Technician, Director of Quality Management, Factory manager, Manager, Chief Operating Officer, Technical Office Dept, HSQE Technician.

Nr edition/company	Nr participants from company	Sector
1	2	Food
2	1	Food

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3	3	Construction
4	1	Construction
5	5	Chemical
6	2	Food

Table 12: In-company participants A3E

The In-company training consisted of 3 meetings:

- an online meeting for the SME and the auditing company to get to know each other. In this meeting, the SME described its activity and facilities and detailed its concerns and needs in relation to energy efficiency measures.
- A first face-to-face visit in which the auditing company collected all the information necessary to prepare the pre-audit report.

Prior to this first visit, both companies were in contact by email or telephone to share information on invoices, equipment inventories and previous studies carried out.

The auditing company needed, at least, a couple of weeks to collect all the information and to prepare the report.

- In the second visit, the auditing company went again to the premises of the SME to explain in detail the report and all recommended measures, solve any doubts that may exist, give its expert opinion on how the measures can be implemented with a roadmap and give advice on existing incentives.

Summary of the reports realized by the auditors, description of structure
An example of report could contain:

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3. Conclusions and lessons learnt during training

Italy

IIPLE

Validation of web-based training

As described in D4.1 "Training webinars", the aim of the web-based modules was to catch the attention of companies, introducing the topics to be discussed during the training and to attract potential participants to in-situ and in-company.
IIPLE has developed its 4 videos with this specific purpose, showing and introducing financial incentives, norms to be considered, possible strategies and best practices from local SMEs to set an example for the others.
The videos produced by IIPLE have been seen more than 1400 times and the evaluation is very positive. This means that the structure and approach of the videos was adequate to the purpose; all the viewers have expressed interest in following also the in-situ training phase.

Validation of in-situ training

The whole consortium had to rethink the in-situ training programme after the outbreak of COVID health emergency; all the editions of the training have been implemented with an online modality, from April 2021 to May 2022.
The type of training (frontal and synchronous lessons) has not represented an obstacle as it was easy to implement also through the platform GotoMeeting. Instead, what has not been easy is the effective involvement of participants and SMEs in the training activity; the reasons are several:

- The characteristics of the construction sector and, specifically, of the small and medium sized enterprises in the Italian scenario. Most of them are family run and possess only a couple of rooms as office; the major part of micro and small SMEs hasn't even a storehouse for materials and machineries.
  The biggest energy consumptions, for them happen on building site and are often chargeable to the final client. In this case, running an energy audit or considering energy efficiency measures is pointless. This is the observation received mostly by the SMEs we have contacted.
- The current scenario at national level of the construction field. In Italy, since 2020, the government has approved a big financial measure for reconstruction and renovation of buildings and implants. This has caused an incredible increase in the work load for construction companies, which had no time to devote to training their employees or focussing on the topic of energy efficiency.
- To these reasons can also be added a more structural one: as the enterprise is formed by few workers, they must be all involved in the daily activities to guarantee the economic survival of the company.

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- The SMEs of this sector still show a strong resistance to changes and a modest willingness to innovate.

All these aspects summed up and provoked considerable difficulties in the involvement of participants in the in-situ courses; IIPLE had to double the efforts in communication and dissemination of this opportunity. To the usual channels (newsletter to the local database, involvement of strategic intermediaries, IIPLE social networks...) have been also added national paid campaigns on Facebook and Instagram as well as local events and webinars to present the activity and urge to participate.
Moreover, the involvement of intermediaries such as business associations, financial organizations and public institutions at the local level has contributed to amplifying communications on the need to adopt energy saving measures also for SMEs.

From the contents point of view, the training programme has been developed starting from the acknowledgement that the construction sector is one of the most demanding on the natural resources (raw materials, energy) and contributes to an enormous emission of greenhouse gases. The focus of the lessons, therefore, has been on the energy green transition in act and which will have a major impact on the companies of this field.

Validation of in-company training

The in-company training has been implemented as originally designed by partners. IIPLE, with the support of an energy auditor, has implemented in situ visits to companies in order to collect information and data on the energy consumptions.
Luckily, the security measures linked with COVID emergency was less severe when the in-company activity started, therefore all the meetings have been held in presence, with the exception of the first introductory one.
The knowledge of the energy auditor of the in-situ programme presented during the previous phase has been extremely helpful in understanding the needs of the companies and the strategies to save energy to suggest in order to catch their attention.

In example, what has emerged is the strong interest from SMEs in the construction sector on the topic of energy communities. Some companies have indicated, following in-company training, their intention to carry out feasibility studies regarding the implementation of energy communities or the inclusion of their company in existing communities.

In conclusion, IIPLE experience in the construction sector has highlighted that there is still a lot of work to be done in the construction sector to create an environment conducive to the adoption of energy saving measures and energy audit. The activities carried out within Innoveas represent only a small part, but are the fundamental starting point to drive a real change in the sector.

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CBG

Validation of web-based training

In accordance with the consortium CBG developed, produced and published its own videos modules separately, but in synergy with IIPLE, covering complementary topics that were considered highly relevant for Italian companies.

The videos were developed with the support of professional video makers and involving strategic experts having deep knowledge on the topics addressed by the single video module, namely: Incentives in Italy for Small and Medium Enterprises, Consumption and energy efficiency in Lombardy region, energy efficiency best practice in the food and construction sector as well as best practice in the chemical industry.

The video material is available on the Innoveas online website in the Italian section of the training platform tab as well as in YouTube, in INNOVEAS channel.

Overall, several positive feedbacks were received both on the target contents, as well as on the smart and friendly format. More than 700 views were received overall, and a positive increasing trend has been confirmed.

It has been also underlined the importance of keeping the videos up-to-date, both in terms of the information already provided, as well as in terms of new contents that will arise following European trends and regulation. Moreover, it was suggested that a sort of roadshows of companies having successfully implemented and experience in energy efficiency methods would be definitely interesting.

Validation of in-situ training

The main deviation highlighted of the in-situ training refers to the online modality, instead of the face-to-face training planned as stated into the Description of Action, due to the COVID pandemic. Accordingly, the training structure itself had to be revised, causing both positive as well as negative effects.

On the one hand, the possibility of holding remote lessons, allowed a higher number of participants. Indeed, if more in-situ modules were foreseen in order to address the target number of participants (see D3.3 for details), the threshold was achieved with the three implemented modules and without decreasing the quality of the training supplied. All the three modules were developed and planned on a modular base, with several different lessons, in order to address the needs and willingness of the attendees being sure to cover all the main topics of interest. CBG experienced a quite good number of participants in the first half of 2021, that slightly decreased in the second half of the year, probably linked with the opening of companies' plants and the decreasing intensity of the COVID restrictions. Moreover, the involvement of energy cluster and other linked associations, supported the communication and the dissemination of the training.

Coming to the negative aspects, it was clear that the commitment and the effective involvement of people partly decreased because of the online modality. Indeed, at the

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beginning the involvement of industrial experts coming from companies that are leaders in the energy efficiency field was planned with the scope of holding part of training at the company premises. This would have given the possibility to attendees to concretely see the main methods and tools addressed, definitely increasing the participants active involvement and commitment.

Validation of in-company training

Six companies of different sectors (the selected enterprises belonged to the 3 project sectors and linked supply chains) with an overall number of sixteen participants were involved in the in-company training activities, underling quite a good attendance in terms of numbers and involvement. Each company involved in the training employees belonging to different areas, mainly the company managing director (especially for the very small size companies), quality and energy responsible as well as the operations managers.

The in-company activities were performed following a hybrid structure: the first part, where the company was requested to fill in the questionnaire was online, then the results and the suggestion for improvement were performed at the company premises. The last part was the most appreciated by the companies.

During the activities, an effective active involvement was underlined, despite the involved participants were not always able to provide the needed information to address the auditors request. The main faced issues refer to the huge increase cost of energy and the willingness to find suitable incentives able to support the company in introducing energy efficiency innovation, as suggested by the energy experts involved.

Overall, this activity was the one that achieved the highest rate of satisfaction by the involved participants with respect to the whole capacity building programme activities performed in the frame of INNOVEAS. This is probably due to the fact that activities performed specifically for a single company are considered more valuable, being tailored for the company specific needs.

Germany

UTBW

Validation of web-based training

For web-based modules, originally, the Consortium has evaluated the possibility to jointly develop, implement and translate it in the local languages. Due to the different starting conditions in the participating countries, it was decided later that it would be more effective for each country to develop, produce and publish its own video modules. In this way, the respective target groups could be better addressed. In addition, however, this approach also placed greater demands on financial (material costs) and human resources. The result, however, justifies this approach. The jointly developed structure of the offer has left enough room to address country-specific characteristics. The videos were very well received (see numbers in D3.3).

The videos have not received much evaluations, probably it has not been adequately signalled.

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Here the biggest challenge, as anticipated, was the personnel and financial effort, higher than originally planned. However, the result and the number of views of the videos repaid the effort.
We have received direct feedback that the videos are also recommended as internal training in some companies and that even concrete measures (especially on the basis of videos 3-5) have been derived. What we underestimated was that the link to the evaluation of the videos was quite hidden from the viewers' point of view and was not easy to notice. We should have pointed this out more actively. In this respect, we can only make a few statistical statements about the composition of the entirety of visitors and their satisfaction with the videos, as we have too little data on this.

Validation of in-situ training

For the in-situ trainings, the Covid situation forced us to rethink the concept completely. Face-to-face meetings or workshops in groups were out of the question. Whether and how the original considerations could simply be translated into web seminars was not clear at the beginning. However, in the phase before the development of the training programme, we had planned the first stakeholder workshop, whose implementation, originally planned as a face-to-face event, then had to be converted to online. We had often implemented similar formats as face-to-face events before, but this was a first for us online. In the course of the event, we realised that the scheduled duration of 2.5 hours, which is very entertaining and effective in a face-to-face event, is not so easy to implement in the online format. This was already mentioned by participants in the chat during the event. During the evaluation, we received more and more feedback that the depth with which the content was dealt with was very welcome, but that a shorter format would be much more helpful and useful for the participants. This led us to believe that we could reach more companies and people with a modular concept with shorter teaching units than with the concept of a two-day training. In order to meet the expressed need, the design was set up so that individual topics were delineated as sharply as possible, in order to be able to offer events that focus on a specific topic or even an important section of a topic.

Thus, the concept of a modular structure was born, which deviates in its form from the original plan. Overall, we had assumed that the duration of the individual modules would be based on common teaching concepts, which is why we considered 90 minutes per module to be optimal. However, it quickly became apparent that some issues in the field of energy efficiency, audits, climate management and implementation of measures often need to be examined from different perspectives in order to be able to provide the participants with sufficient information. For this reason, we have abandoned the 90-minute principle in the course of the events and have extended individual modules to up to 2h15min if necessary. And it turned out that the participants sometimes even took this without a break.
Another advantage over the original concept was that we were able to search for the optimal speakers for each topic of a module and thus achieved an excellent technical depth that a single speaker could never have offered across all topics. There were between one and four speakers per module. Instead of the planned 16 hours of teaching content, which, after

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deducting the necessary breaks, tended to result in about 12 hours of teaching; we were able to offer more than 50 hours of teaching content, from which the participants could put together their own individual program. By offering the possibility to catch up on missed modules in the video study of the recordings, we offered the participants additional flexibility if participation was not possible in synchronous modality. Through the requested confirmations of participation, we were able to see that this offer was also well received, at least in these cases. Nevertheless, all participants generally preferred live participation in order to take part in the discussions. We could also clearly see from the views of the videos that the demand was even much greater than the data in D3.3 indicate, in line with the project requirements and targets.

In the case of in-situ training, the main problem was how to adapt the planned concept to the new Covid situation. Here, too, we found a manageable solution from our point of view and from the point of view of the stakeholders by relying on the modular structure with short events. What remained was the financial problem of consumed material costs, which were no longer sufficient to pay. This also spoke for the modular concept, as it is much more likely to win some expert pro bono for an input of 1h than for a whole day. On the other hand, it would have been operatively impossible to get so many experts together on the same days, and possibly several times. This also spoke in favour of the modular solution. Thematically, the required contents could be very well mapped in individual modules. What is difficult about such a model, however, is the perception of continuity by the potential participants, since no one can easily commit to such a programme for a period of several months. From this point of view, the block event would have made more sense, as this creates a higher degree of commitment to also participate in the entire programme of two (or one) day(s). The close and quick sequence of the individual modules and the constant communication with previous and potential new participants, even directly after the individual modules, cushioned this well.
The statistics show that we were able to gain a continuously growing pool of participants who put together their own program from the modules offered and also used the recordings of missed modules. However, participants control had to be handled much more loosely with the modular concept. The evaluation of the individual modules (which was relatively well accepted for online events with a good 10% of participants in each case) was used to continuously develop the programme. Here, the advantage of the modular concept became apparent through the flexibility in relation to the participants' enquiries in the free text fields or through direct letters via email or LinkedIn.
The difficulty of addressing the target group precisely, as mentioned above, proved to be even more difficult due to the online formats. Although we specifically addressed the target group(s) of SMEs from the food, construction and chemical sectors via multipliers and stakeholders, we still had a strong spread into other areas and sectors. Especially in Baden-Württemberg, the sectors addressed in the project are not those that essentially shape the economic structure. In this respect, we had to open ourselves up to other sectors, which was not a disadvantage in terms of the visitor potential of our web seminar tool.
Another aspect detected is the fact that the modules were also interesting for energy consultants even at the in-situ stage, as the participant structure shows. We could not and did not want to refuse their participation. All participating energy consultants are also active in the construction, food and chemical sectors and take the knowledge gained from our offers into their daily practice with SMEs from the addressed sectors. Here, too, we have personal

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feedback that many of the insights gained from our training programme have found their way into on-site implementation at SMEs. For us, the main objective of the project was always to contribute to climate protection with the offer and to support SMEs in taking the path in this direction and continuing it consistently. Both the evaluation and the personal feedback on the in-situ trainings show that this was successfully achieved.

Even though we did not stick 100% to the intended target groups and had to expand our scope in this respect, we can safely say that the participants we finally reached were extremely satisfied with the offers.
The evaluation shows that the participants benefited from the programme and were able to take away a lot of implementation knowledge. It is in the nature of things that the evaluation can vary from module to module with the multitude of offers from different speakers, but the overall picture shows that the combination of management approaches, offers to reduce obstacles, supporting tools and technical content enabled a rounded programme from which everyone could put together their optimal edition. Especially the variety and the possibility to choose a personal programme (and with the recordings to flexibly design one's own curriculum) was well received. In addition, of course, we know nothing of the actors who engaged with the recordings but did not request a confirmation of participation. So here we have reached many times more people who can use the acquired knowledge in practice, but who do not appear in the statistics in D3.3. Most of the contents developed will retain their validity and usefulness over a few years, with the exception of information with a time limit, such as the funding programmes.

Validation of in-company training

The original plan for the in-company trainings was not conclusively defined, at least in terms of contents. This openness was very helpful for the its development at national level. UTBW, through its existing contacts with the KEFF network, came up with the idea of basing the in-house workshop on a kind of pre-audit, which in our case could be covered by the KEFF-check. This model also seemed to make sense in the consortium. In this respect, the energy check was assumed to be the starting point for each in-house workshop. For the second part of the workshops, UTBW again developed a modular concept with different contents, which were discussed in advance with the responsible participant from the company. Accordingly, the focus of the workshops was determined individually. An outstanding event for the concept of the in-house workshops was the publication of ISO 50005 in September 2021. This is a version of ISO 50001 that has been scaled down for SMEs and makes it possible to gradually build up an energy management system and, if necessary, to continue it up to 50001. From UTBW's point of view, this is the ideal introduction to the topic of energy management, especially for SMEs, and offers lower entry hurdles than the 50001, due to the fact that certification is not required. The following content elements were available for selection for the inhouse workshops:

- Climate change and motivation for action – mandatory (from our point of view)
- Climate management
- Ecocockpit (CO2 balance tool)

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- SBTs (Science Based targets) tool
- EnMS: ISO 50005, achievement of level 1
- EnMS team (Energy Team)
- EnMS: Responsibilities (matrix)
- EnMS: Identify key consumers
- EnMS: Action plan from the KEFF-check results (utility analysis) - mandatory

From this, an individual approach was put together for each company according to its specific needs.
Despite the extensive communication of the in company training offer, it was unexpectedly difficult to attract any participants at all (this may also be due to the prevailing opinion in Baden-Württemberg that something that costs nothing is not worthy). We mentioned it in every web seminar, in every follow-up email with the training materials, the KEFF moderators promoted it in their networks, there were LinkedIn posts, we promoted it at a joint event with the VDI (Association of the Chemical Industry), there were talks with the association for construction companies "solid unit", personal calls to participants of the web seminars from the target sectors, but the circles addressed remained strangely reticent. In order to increase the number of participants, we had to decide by a deadline to open the workshops to other sectors in order to reach the number of planned workshops. This is how the participant structure deviates from the originally addressed sectors. Again, at the time, our main point of view was that the overall goal of this project is the potential reduction of CO_2 emissions in SMEs through improved energy management.

One of the ambitious assumptions is that small and medium-sized enterprises want to send several employees to such a workshop at once. Even the participation of two employees caused so much pain for most companies that in two cases the announced second participant had to cancel at short notice because he had "something more important" to do in the company at the time of the workshop. Other companies were honest enough to say from the outset that they could not afford to send more than one person in the current situation.
In this respect, we had to accept that the current entrepreneurial reality, at least in Germany, is characterised by scarce resources in all areas (including personnel).
Another mistake (if not naïve belief) was the optimism that the workshop could completely convince the participants of the benefits of an energy audit or the introduction of an energy management system. Ironically, this only worked the other way around. With ISO 50005, we were at least able to convince one company to consider abandoning ISO 50001, as ISO 50005 provides more degrees of freedom for SMEs and does not require certification. The long-term idea behind this is that an upgrade to 50001 is possible at any time.
All small companies (<10 and <50) concluded that the KEFF check (comparable to a pre-audit) is sufficient for them and that they can continue to work on this basis. In the same way, the elements that we presented from climate management and ISO 50005 were examined in detail for their suitability for the company and what seemed useful to the company was selected without aiming for one of the levels from the standard. But in the end, even the creators of the standard emphasise that this is possible. We can only hope that at least the selected elements will be continued.

In the in-company training we also paid attention to a modular design in order to be able to respond to the specific needs of the participating companies. Although a scheme was

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developed along which the contents, the participants themselves were able to determine where the emphasis should be placed or which parts were fundamental. The prepared MURAL board and the corresponding presentation were always available in full. This also made it possible to make spontaneous adjustments in the course of the workshop. In some cases, for example, it proved to be very useful to add a detailed energy policy to existing corporate principles after all, or to compare an existing energy team with an optimal desired team.
It worked well that despite the existing design for implementation, each of the workshops ended up being different and all participants were able to take away the optimal knowledge for themselves. Thanks to the extensive material we provided afterwards (energy team, energy policy, utility value analysis, working aids for ISO 50005, CO_2 balance in Eco cockpit, SBTs in the SBT tool), each company was able to build directly on the workshop results and continue working on its own. From our point of view, we achieved our main goal of "self-empowerment" (decision-making ability for EE measures) with every participant.
What struck us about all participants was the strong focus on the measures. The evaluation and the examination of the feasibility for the company indicate that in the end, selected measures are actually implemented step by step and only through implemented measures is energy saved and CO_2 avoided in concrete terms. An audit alone does not achieve this.

Poland

NAPE

Validation of web-based training

NAPE prepared 6 videos in total. Videos ran on a dedicated YouTube channel; therefore, the number of companies and participants was not easy to clarify.
Nevertheless, total number of views for NAPE video was 1389 for 6 videos accordingly:

Video nr.	Views
1	387
2	254
3	293
4	280
5	90
6	85

Web-based modules were used to promote the in-situ trainings. All participants were asked to watch all modules and evaluate those. When it comes to on-line surveys we did not have much power or influence to encourage participants to fulfil them.

Validation of in-situ training

To attract the attention of SMEs NAPE has established cooperation with several actors who are active on the national market. For example, BNP Paribas, who is a financial institution providing dedicated loans and other financial instruments for improving energy efficiency in the SMEs sector. BNP Paribas have supported Innoveas activities in the scope related to promotion of the trainings, inviting the SMEs and taking active part as trainers in the module dedicated to financing the measures. Besides that, BNP Paribas is currently developing its own

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internal group of energy advisors, and after Innoveas' joint trainings they provided feedback on additional unexpected benefits - increased know-how of BNP Paribas energy advisors. The other supporting partner was ISOQAR, who is a certification body interested in developing the market for ISO 50001 standard related to the Energy Management Systems. Similarly, to the previously mentioned organisation, ISOQAR actively supported Innoveas in the scope of promotion, inviting the SMEs and taking part in trainings for the lessons dedicated to energy management systems.

The main obstacle identified during the implementation of action was lack of time of SMEs representatives to attend the training. Due to slow economic period in the beginning of pandemic, focus of SMEs in Poland was on retrieving the lost revenues and restore their position on the market. Nevertheless, we were able to attract a higher number of SMEs but with a lower rate of representatives caused by previously mentioned lack of time. When talking about Polish SMEs in the production sector they are usually understaffed and on constant production, therefore the number of representatives who are able to attend all-day training is lower than expected. The growing interest in the training in our opinion was also caused by the growing prices of energy carriers in Poland in the end of 2021 and beginning of 2022. Our observations are that the raising costs of production were the best motivator to look in to the energy use and possible savings. During the training the interest of participants was focused on the non-investable ways to optimise energy usage and surprisingly on white certificate scheme (state financial support scheme for energy efficiency investments) which is easily available on the Polish market for over 9 years and was not known for many SMEs. With regards to that; the important role of energy auditor or energy advisor was underlined during the training.

In general, the trainings were evaluated very positively, the trainers received positive feedback, interest in implementation of energy efficiency measures was expressed, and the trainers were very often contacted by SMEs for further consultation. It can be stated that thanks to the trainings, most trainees understood the importance of energy consumption implications (in terms of climate and cost aspect) and decided to place more emphasis on energy efficiency in their companies' operations.

Validation of in-company training

NAPE has concluded 6 in-company trainings according to the steps planned. The number of participants was lower than expected due to limited availability and adequacy of competences of local staff but trainers always strongly advised to share the results of the training (energy analysis and recommendations, training videos and material) among all employees. The assessment of work done by NAPE was in all cases high and the interest in further cooperation was strongly underlined by participating SMEs.

The main difficulties identified during in-company trainings consisted of:

- Limited investment capital which might be spent on energy efficiency improvement. The companies taking part in the trainings were reporting that priority in spending available capital is on investments in increase of production, or investments in launching new lines and producing a new type of products.

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- Lack of detailed energy consumption data. Mostly only invoices (for energy costs controlling) were collected, which resulted with small resolution of data measured only on main energy meters (for the whole company). Such a situation makes it more difficult to correctly identify energy intensive areas and production lines, which is crucial to focus on during the energy audit.
- Low level of awareness within the local staff regarding the influence of correctness of technical inspection and maintenance of the energy consuming equipment. This aspect has led to the conclusion that often simple restoration of nominal parameters of technical equipment may cause significant energy savings.
- Lack of highly skilled personnel in terms of energy efficiency in SMEs which might benefit most from the advice given by energy auditors. Smaller size (and budget) of enterprises result in a situation, where technicians are often recruited from the lower-paid personnel. Such situations do not favour implementation of high-end innovative technical solutions due to competency barriers.
- Despite the fact of very positive evaluation of provided training, it seems that there will be very limited will to pay for similar training in future. However, there is a will for paying for the energy auditing services, especially if connected to obtaining any kind of financial support from the state programs.

The main strengths and positive outcomes identified during in-company trainings consisted of:

- General attitude of SMEs management is strongly in line with the European energy conservation goals. This is caused primarily by rising energy costs, but climate responsibility is declared by few SMEs as a close-second. Those SMEs are often already within supply chains of big industries where carbon footprint becomes an important aspect.
- During the in-company trainings energy auditors have been performing simplified energy audits. In most cases significant potentials for reducing energy consumption and its cost were identified. This observation proves that the SME sector may as a whole have significant potential for reducing carbon footprint and strengthening the energy security of the EU economy if supported adequately by energy experts.
- Focusing during the trainings also on energy cost optimisation resulted with higher interest from the SMEs side. It was observed that in the Polish SME sector financial aspects attract the highest attention, and they will be an important driving force to implement energy efficiency measures. Additionally, presenting energy-saving investments in the form of a profitability analysis made it possible for decision-makers to compare them to alternative ways of using investment capital, and thus increased the propensity to implement them.
- Most companies taking part in in-company trainings have declared their will to undertake energy efficiency measures and install RES on a significant scale.

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Slovenia

LEAG

Validation of web-based training

For what concerns web-based modules, comparing what was planned and what was implemented is quite simple: we followed the description of action and we made 5 national videos, that give the viewer a lot of useful information. There are some differences in the length of the movies as some are a bit longer than others.

During preparation of web-based modules, we encountered quite some issues in finding people and especially SMEs that were willing to be recorded. All process for the production of the videos takes tremendous amount of time and effort.

Furthermore, there were issues because of the global pandemic. Regarding the feedback we received from the people who watched the videos, they have been evaluated as well prepared. In general, the videos are too long for the average viewer. Because of this, the majority of viewers leaves the videos before the end. This gives us indication that in future efforts, we need to prepare more shorter videos, even more oriented; maximum length of the videos should be 1:30.

Validation of in-situ training

At the beginning of the project no one thought about conducting in-situ trainings online. We planned to make the in-situ trainings in person, in a classroom/public place, but were not able to do that because of the global pandemic. Therefore, we were forced to conduct in-situ trainings online. Sessions were probably a bit less personal, and more difficult to follow, but overall, we reached our goals. On the other hand, online trainings proved to be very useful, easy to attend (no commuting needed, no additional expenses for the SMEs, etc.).

During the engaging phase, we realised that SMEs are very busy, especially the case of micro companies where few people need to take care of everything (business, finances, promotion, legal paperwork, etc.). Especially during the first edition of trainings it showed that the number of representatives who are able to attend half day training is lower than expected. This has also emerged in the questionnaires, where people who attended the trainings reported that the length of the trainings is too long. Their feedback was, therefore, to make trainings a bit shorter, packed with crucial information. Systematically and optimized approach for SMEs is not necessary the best option. For example: if we are to optimise the production, it is better to come up with a possible solution that saves 15% of energy in 2 hours, than to search for an optimised solution that would save 20% of energy in a week.

To conclude, when approaching SMEs, we found out that it is extremely important to show result quickly. This applies to in-situ, in-company or web-based trainings.

Therefore, most of our issues were connected with motivating SMEs to participate to lessons. Our first training session had smaller attendance than the second. For the second we devoted even more time and effort into promotion.

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In situ trainings were found very useful, and in general we had good feedback. For further trainings we would try to find speakers from companies that offer some sort of solutions and work in companies that provide certain solutions (heating, cooling, ventilation, appliances, etc.). Lecturers where graded positively, and participants were happy with the trainings. Like stated previously feedback also showed that participants would like to talk about concrete measures and examples even more. Most SMEs taking part in in-company trainings have showed interest and intent to implement energy efficiency measures. They also indicated that they have plans and fund for necessary energy saving and RES measures.

The trainings we have done have opened a lot of new doors to SMEs and collaboration with agencies, institutes, and chambers for further activities. During the trainings we have developed collaboration with chamber of commerce, chamber of agriculture and chamber of crafts and entrepreneurship. We are now collaborating in helping SMEs in preparation of energy related documentation (simplified energy audits, calculations of energy consumption, etc.) needed for applying on various calls. We are also discussing participation in EUREM trainings, and also including training material in our activities in the field of SECAP (Covenant of Mayors). We are now getting recognized by companies and are therefore able to get in touch with them. And this is crucial for any kind of collaboration. During the trainings it was evident that SMEs face a diverse spectre of issues regarding energy costs, determining best course of actions in order to improve energy efficiency, how to apply for subsides, etc. This results that SMEs need some sort of free of charge help. Trainings proved to be a good approach.

Validation of in-company training

The in-company trainings have proved to be more effective than in-situ trainings. One of the possible reasons for that is SMEs that decided to take in-company trainings already aims to work in improving their energy efficiency. This is why they are more engaged and usually already know what they want.

We offered training, and a sort of pre-audit. We then analysed their energy consumption, processes, and talked about possible measures of savings. Through the training with our experts, they were informed about possible measures and possible steps they can take in order to enhance their energy efficiency, lower their energy consumption, and improve sustainability.

During the in-company trainings, we realized that SMEs and companies in general have lots of problems regarding energy efficiency, and especially their costs. In the flood of information and possibilities it is difficult to find the best solution to the problem. During our visits we found out a lot of problems that could be easily avoided or repaired.

This shows that there are a lot of difficulties in SMEs, that they simply cannot resolve by themselves. They need the help of trained and experienced experts. That is why we feel that in-company trainings are very beneficial, and have the biggest effect. These types of trainings are also better, because SMEs are more engaged and open for collaboration. In company

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trainings were evaluated very positively. SMEs that we visited were very open for collaboration. They indicated that they will implement various energy efficient measures, and also adopt better energy efficiency management. In general, they were interest in using renewable energy sources. They also had some plans and also allocated funds for implementation of RES measures. Plans for implementation of energy audit varies. Some participants have gained the necessary information during the trainings, and therefore do not need detailed energy audit. In some companies that we trained we also found out that due to low use of energy and already optimized production, energy audit is not recommended. In general, participating SMEs were all very interested in use of RES and implementation of energy efficient measures. This is evident due to participation in the trainings. Interest in implementation of ISO 50001 is not very high. This indicates that SMEs option for solutions that are easier to obtain (energy audit, trainings, consultancy, etc.).

Spain

A3E

Validation of web-based training

The Web-based modules in the Spanish training platform have achieved 3,839 views in total.
A lot of media campaigning was done, involving mainly the collaborating companies.
In addition, all participants in the training programme were also invited to watch the videos.
These videos caused great interest, especially the first one and the success stories as the companies were very proud to be able to share their experience.

However, the response rate to the questionnaires has not been very high, only 33 questionnaires answered. Many people must not have found the link.
The video that received the most ratings was the first one with 16 ratings. The questionnaire for the second video was answered by only 6 people, and the videos of the success stories received 4 (for the food video), 3 (construction) and 4 (chemical).
In addition, the first video is also the best rated in terms of meeting expectations, quality and usefulness.
In this sense, the worst rated, which was also the least evaluated, was video 4 on the success story in a construction company, especially its usefulness.
Of the success stories, however, the one on the chemical sector obtained good results. Although only 4 people rated it, both the quality and the usefulness of this video have been well valued.
We believe that the reasons for so few evaluations may be the fact that the link to evaluate them was not easily found and, on the other hand, that once the first video has been evaluated, the participants do not want to bother to fill in more forms.

Validation of the in-situ training

In the in-situ trainings it was more difficult to involve people. The first of the editions in April 2021 for food companies was pretty satisfactory and the participants were very much involved. There were 16 people from 16 different companies and all those registered

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attended. And we closed the quota to reach the target number of attendees in order to make the group more interactive.
Likewise, the second edition made with food companies held in October 2021 also received a lot of interest. We had 25 people registered and 20 attendants.
Business associations and other intermediary organisations that have taken an interest in the project have been our ally. They have helped us to reach many more companies and these companies have also been interested in attending the training of trainers.
A very important step was to establish these relationships prior to the implementation of the training programme.
Curiously, despite having good relations with several associations of companies in the chemical sector, the level of participation has not been very satisfactory.
On the contrary, the second of the seminars, in May 21 aimed at chemical companies, 12 people registered, but only 6 of them attended the lessons.
We believe it has something to do with the chemical sector, as the November edition, although better than the May edition, also had a similar effect.
It is possible that our network of contacts in the chemical sector was not very large and for that reason special effort was made to strengthen these networks. We created a good relationship with three associations of chemical companies that disseminated all our information to their companies.
It may also be that it was not a good time for chemical companies, which were busy manufacturing sanitary and disinfection products against COVID.

Also striking is the absenteeism and the low involvement of participants from this sector in this type of activities.
The calls in the construction sector, held in June and September, were more successful, especially the June edition with 19 people registered and participants (from 15 different companies). In September, possibly because many had not yet returned from holidays, the figures dropped a bit with 15 registered and 13 attendants from 11 different companies.
In general, the numbers of people participating are not very high, but the number of companies is. We have managed to reach a large number of companies, although of each one only one person has usually signed up.
In order to increase the number of participants we could have called each of the enrolled people and try to obtain subscriptions from their own company.
To improve attendance, telephone outreach to the company can also be good approach. This was done from the third edition onwards for people who had not attended the first two days.
Apart from this difficulty in reaching the target number of participants, the development of the sessions was very positive.

In general, the evaluation questionnaires were very positive. The participants were quite satisfied with the training.
The least positive feedback, in some cases, may have been that it was more difficult for some speakers to keep the attendees engaged. It is not easy with such short and online sessions. In some cases, the speakers had 15-minute sessions.
The fact of having so many speakers has been more complex in its management and has made some lectures short, making it more difficult for the teacher to engage attendees, but on the other hand, in the course have been able to raise multiple solutions for SMEs, having a very wide range of alternatives for when they want to hire these services.

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At the end of the sessions, most of the companies said they were much more aware of energy savings and efficiency, and many were interested in implementing measures for better energy management.

Validation of in-company training

For the In-Company training, due to the low interest of the chemical companies of the second edition, it was decided to choose two companies from the first edition, although they were the two from the food sector because they showed much more interest.

Within each in-Company training, the participants were from 1 to 5 people. As we have already seen, companies do not have much time and staff for this type of activities.

The greatest difficulty in this part was to get the auditing companies to cover all similar contents, including new aspects that are not normally included in a pre-audit, such as the aid available for each recommended measure, the subject of marketing or environmental recommendations and so on.

The auditing companies have been very professional and have spent more hours than stipulated because they have collected all the information requested from the company and have carried out high quality studies with very useful results.

Of the in-company trainings conducted, 4 companies were very satisfied and 2 were quite satisfied.

2 of the companies, after this pre-audit, say they will carry out a full audit. the rest of them are not sure.

On the other hand, all of them will adopt better energy efficiency management and adopt renewable energies in their company.

Not so clear if they will implement an ISO 50001 energy management system.

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3.1.1. Overall conclusion

This capacity-building programme has included different types of actions and strategies targeting companies in the construction, chemical and food processing sectors. The requirements of this training offer were defined through interviews with key people from SMEs, with stakeholders with different backgrounds and through questionnaires. The programme was based on different activities: web-based modules (videos) that provide basic knowledge and help to frame the topic of energy efficiency in SMEs, and innovative training activities (In-Situ and In-Company training) to find solutions and provide direct support to companies in order to analyse the situation and define appropriate strategies.

The final considerations on the 3 types of training based on national feedbacks, can be summarized as follows:

Web-based modules

In all the countries involved in the training (Italy, Germany, Poland, Slovenia and Spain), the web-based modules mainly have had the objective of capturing the attention of companies on the topics of energy transition and attracting potential participants for in-situ and in-company trainings.

Each partner has developed, produced and published their own video modules in their respective language. In this way, the different starting conditions of the countries involved were taken into account and the respective target groups were better addressed.

The web-based modules were considered effective in all countries of the partnership, especially for providing basic information on energy issues and on the advantages of implementing an energy saving measures and audit. Furthermore, the web-based modules provided targeted information on regulatory aspects and on the availability of incentives to support companies in the energy transition. Finally, the good practices described in the videos have been a stimulus for many SMEs to participate in the subsequent training steps proposed by the INNOVEAS Project.

The number of views of all videos showed that the formula adopted (short videos embedded in YouTube) proved effective for a first set of training to be considered as the entry point for the entire capacity building programme. In the first stage, many media campaigns have been carried out in all countries to obtain a high number of views.

It is evident that this type of training in fact represents only a first step in a training course which must necessarily be longer and more articulated so that it is also possible for SMEs to overcome the barriers that prevent them from adopting energy saving measures.

In-situ training

In- situ training has been addressed to company staff with the direct involvement of external experts to illustrate real and practical experiences in the field of energy auditing and energy efficiency.

The main highlighted deviation of the on-site training refers to the online mode, instead of the expected face-to-face training. Due to the health emergency linked to COVID-19, the training was carried out online by all the partners involved in the training activities. Consequently, the training structure itself had to be revised, with both positive and negative effects.

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On the one hand, the possibility of holding lessons remotely has allowed for a greater number of participants. Coming to the negatives, the engagement and effectiveness of people's engagement has partly decreased due to the online mode. All practical applications related to energy management and saving measures have been deferred in the in-company training.
The recipients of the in-situ training were mainly key profiles of the SMEs as well as entrepreneurs of construction, chemical and food processing sectors, in all countries involved in these activities.
In- situ training was divided into 4 lessons/modules for a total of 16 hours for all Partners, with the exception of the German partner which has adopted a different method.
The contents provided have considered the specificities of each country.
In Italy, the contents of the in-situ trainings have been identified around the concept of Energy Transition, experimented for the construction sector. For the other sectors it has instead been focused on two type of formats: Transformation talks and Energy management course.
In Poland, a program called "Improving Energy Efficiency in Your SME" has been developed aimed at improving energy efficiency in SMEs in the food or chemical production sector by suggesting ways to optimize and control energy use and source of funding for energy efficiency measures.
In Slovenia, the course "Increasing energy efficiency in small and medium-sized enterprises" has been implemented. The main goal was to empower and educate SMEs on tools, actions and measures to improve energy efficiency, increase the use of energy from renewable sources, make an important contribution to the fight for the reduction of the environmental impact and the conservation of nature.
In Spain, an on-site training entitled "Towards zero-emission industrial SMEs" has been organized with the aim of providing the elements necessary to understand the ecological transformations underway and show the range of solutions towards the energy transition and the decarbonisation of SME activities.
In Germany, there was a deviation from the general model envisaged by the partnership for in situ training; in fact, the implementation of the training program was based on short modules (1.5 h – 2.25 h) instead of editions based on a two-days training. UTBW has implemented a sort of catalogue training consisting of 29 different on-line webinars from which to select those of greatest interest.
The overall delivery of the training, as well as the quality of the content covered has been appreciated by the participants in all countries. The on-site trainings were in fact evaluated positively also in terms of effectiveness and therefore validated in all the countries involved.
In general, interest in implementation of energy efficiency measures was expressed by the SMEs, even if the adoption of energy saving measures rarely occurred at the end of the training.
The participants also reported a series of topics to be further explored, among which the following are highlighted: energy audit in details, how to implement the energy transition, non-repayable loans and mentoring for start-up, green public procurements, new consumers trends, theorization of LCA requirements, carbon footprint, reporting and sustainability tools.
Most of the companies that took part in the training, being micro or small businesses, have not expressed their intention to activate energy certification processes based on ISO 50001:2018

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In-company training

In company training has been organised on demand by a specific sample of SMEs in each country with the involvement of different staff members in each company. The activity has been carried out by consultants from intermediary organisations or energy auditors including the same contents of the in-situ training but tailoring the intervention to the company peculiarities so as to deliver a sort of pre-audit assessment.

These companies were selected among the in-situ training participants. All three productive sectors have been considered: construction, chemical and food processing.

In-company training was focused on the need to operate a change of approach and paradigm with reference to the concept of energy efficiency and energy audit. An important role has in fact been attributed to the process of "energy transition" whose main technical and non-technical aspects have been addressed with the key profiles of the SMEs involved.

The bespoke training approach specifically for in-company training, adopted by all partners, was evaluated very positively by the companies involved. Furthermore, the coaching and support of the Energy Auditor made it possible to outline energy saving measures and an initial roadmap for their implementation.

In multiple situations that emerged during the in-company training, the partners noted that SMEs need the help of qualified and experienced Energy Auditors. That is why we believe that in-company training courses are very beneficial and have the greatest effect on energy transition of SMEs.

During the implementation of the in-company training it emerged more prominently that the cost of energy is now the subject of significant attention. To address the cost of energy and dependence on imported fossil fuels, it is necessary to push SMEs to operate according to energy efficiency criteria and switch to renewable energies. The time has really come for SMEs to change their production paradigm by entering a new business model capable of producing social value, limited environmental impact and, of course, profit.

In conclusion, the capacity building programme has been able to actively engage, in the majority of cases, companies that are already on the energy transition path and recognise the relevance of the commitment towards this aim and want to improve. This result demonstrates that the Consortium is on the right track and that the programme has been designed in an accessible, useful and captivating way.

A small but significant number of SMEs was engaged starting from a low level of awareness and interest towards the mentioned topic. This is a relevant result which helped the consortium to draw the conclusion that the capacity building programme has been designed in an effective way and that only minor changes at local level could help attract an even higher number of SMEs.

The training model proposed in the capacity building programme developed in the Innoveas project is therefore validated.

The validation also derives from the processing of the data provided by the users and beneficiaries as described in the deliverable D3.3"Performance report".

The proposed training model has the advantage of being flexible and modular, consisting of several tools (training videos that frame the theme of energy efficiency in its many aspects, on-demand training for small groups of SMEs, consultancy to individual

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companies in order to carry out an energy pre-audit) that meet different needs of these enterprises.

The target numbers described in the project were substantially achieved but with great promotional efforts implemented by all partners. Through the capacity building programme, the partners tried to give priority to the cultural growth of SMEs on energy efficiency issues, to raising awareness in the field of energy auditing and related energy saving measures by illustrating the benefits and opportunities for SMEs.

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4. Annexes

4.1. Profiles of trainers and auditors at IIPLE

- Sergio Bottiglioni, a Civil Engineer, associated partner in an architecture and engineering studio but also active in training and teaching activities, both in VET centres and universities. For this studio, he is also in charge of the research and transfer of technologies for sustainable projects.
  He is local delegate of AICARR (Italian Association of Air Conditioning, Heating and Refrigeration) and accredited as an energy certifier by the Emilia Romagna Region.
  The main topics of interest, also included in the training contents of Innoveas programme are: mechanical plant design for the use of renewable sources; environmental compatibility studies of building interventions; environmental quality control activities; consultancy and support for eco-sustainability of interventions.
- Paolo Pezzana who has a relevant specialisation in sociology (Anthropology of religion and cultural change). Since 2010, he is Consultant Responsible for training and generative leading of communities in the public administration and third sector. The main topics that he has discussed in the Innoveas training programmes are: the concept of social generativity, assessment of impact and contributory sustainability, Generative design in the construction field.
- Federico Pinato who has a degree in Economics and Management, with a specialisation in Economics of resources and sustainable development. Currently, he is working as project officer for sustainable investments in an energy agency. His focus is on green marketing projects, corporate social responsibility, compensation or philanthropic activities, fundraising.
- Andrea Zanfini is the energy auditor involved in the activity; he has been selected within the list of IIPLE's independent contractors, after the analysis of its curriculum, in line with the profile requested for the implementation of the in-company activity. He will also be involved in other activities related to the Innoveas project, such as transdisciplinary workshop, final conference and so on. He has a degree in Environmental sciences, with a specialisation in Environment and territory sciences. He has then completed his training, attended the professional course for Energy Managers at ENEA and has obtain several certifications and qualifications issued by certification bodies and the Emilia Romagna Region.

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4.2. Profiles of trainers and auditors at A3E

- Penélope López, Graduate in Environmental Sciences, Master in Renewable Energies, with experience in dissemination in the sustainable energy sector. Project Manager at A3E.
- Vincent Caroff, Diploma in Energy, specialising in Industrial Energetics, with experience in conducting energy audits and other energy studies. Head of energy projects at ROZO.
- Sara Jimenez del Caso, PhD in Electricity Markets, Mining Engineer specialising in Energy. Director of the Energy Purchasing Department at NESS for the last 5 years, in which she coordinates a team that provides advice and management of energy purchasing, tenders and central purchasing, supply monitoring, PPA, and Outsorcing for gas and electricity suppliers
- Javier Arnaiz, Technical Telecommunications Engineer and Official Master in Renewable Energies, expert in energy markets and focused on the electricity sector with a transversal knowledge from generation to electricity consumption by the end customer. Operations Manager at Switching Consulting
- José María Álvarez Pérez, Senior Mining Engineer: Specialisation in Energy and Fuels. Energy Engineer: Specialising in Energy Management and Use. PhD: Thesis "Externalities of energy markets". CEO & Founder of Switching Consulting.
- Urko García, Degree in Energy Engineering, Master's Degree in Renewable Energy and Energy Efficiency. Operations consultant at Switching Consulting S.L.
- Jaime Fernández, Degree in Physics and MBA with experience as sector coordinator in AENOR certification of thermal insulation and insulating glass units. Technical Director at Andimat.
- Mariano Navarro, Industrial engineer with more than 10 years of experience in energy audits in industry, in the design and efficient management of water distribution systems and in the design of energy recovery and storage systems. Manager at ACL Sistemas de Ahorro y Eficiencia Energética.
- Nicolás Capo, Architect specialising in the use of new technologies and digitisation of the sector. Postgraduate degree in data analysis and machine learning from EADA. Head of development and new business models at Alotark.
- Aitor Mira, Graduate in Electrical Engineering, Energy Auditor in Industry and Building and Executive MBA. More than 5 years of experience in the industrial energy efficiency sector and service sector as head of the Energy Efficiency Department in Konery and Territorial Delegate in the Region of Murcia of A3E.
- María I. Cubillo, Mining Engineer, specialist in Metallurgical and Industrial Process Engineering and MSc in Economics of Energy Building Management and Master MBA. Certified as CMVP in IPMVP, Legend in Energy by the Association of Energy Engineers. Lead auditor in building and industry. Technical Expert in ISO-17020 and Technical Auditor in ISO-17021 and ISO-17024. Award for the best mining engineer 2018. Managing Director at SinCeO2.
- Lidia González del Cura, Graduate in Environmental Sciences. Training and experience as a professional technician in Environmental Product Analysis: LCA, Ecolabelling, Carbon and Water Footprint, and Climate Change and Carbon Footprint, among others. Head of the Sustainability Department at SinCeO2 Energy Consultancy.
- Francisca Molina, Master in Tax, Accounting and Fiscal Consultancy. Expert in Marketing, with a validated degree in Marketing and Commercial Management. Expert in Talent Management and Leadership tools. Expert in Quality and Business Excellence. Master

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in Corporate Social Responsibility. Member of the Chair of Commercial Excellence of the Complutense University of Madrid. Manager at Selezziona.

- Jaime Manteca, Graduate in Economics and master's degree in Auditing and Higher Accounting. Experience as a development worker for the AECID and as project manager and international coordinator of the COPADE Foundation. Professor of the Ibero-American Master in Cooperation and Development (MICID) at the University of Cantabria. Member of the board of directors of the NGDO Network of Madrid. Head of the Certifications Area of the COPADE Foundation.
- David Gordejuela, Industrial Engineer. Certified Professional in Measurement and Verification of Energy Savings (CMVP). Certified Professional KNX Partner, with Advance recognition. Quality Systems Manager. Professor of Electrical Installations and Renewable Energies at the Public University of Navarra. Extensive experience in installation and energy efficiency projects. Project Manager of the company Nasei Ingeniería S.L.
- Pol Carreras Roca, Energy Engineer. Postgraduate in Building Energy Simulation - BIM. Master's Degree in Energy Management and Sustainability. Accredited energy auditor according to RD 56/2016. Energy auditor accredited by ENAC code CP-EAE20200004. Product Energy Manager at Tandem HSE.
- Esther Moreno, Graduate in Environmental Sciences, master's in environmental management in the company, with experience in the field of consultancy and specifically in technical assistance to companies in the implementation of environmental management systems and carbon footprint measurement. Sustainability and Climate Change Consultant at AUREN.
- Juan Villar, Technical architect, with experience from 2004 to 2011 as production and site manager and as manager of the construction department in several civil engineering and housing construction companies. Currently and since 2011, he has been working as a Technical Architect prescriber at Somfy Spain.
- Carlos Guijarro, Technical Specialist in Computer Science (specialising in Computer Management) with additional training in Accounting and Finance at C.E.F., with more than 30 years of professional experience. In the last 13 years, dedicated to the financial world, especially equipment leasing. Head of New Business Development and Sustainability at Rent & Tech.
- Gerardo Rodríguez Vázquez, Industrial Engineer, Master Executive in Management and Business Administration and is CMVP certified in measurement and verification of energy savings and member of the Local Board of CMVP Spain. Since 2008 he has been working at the EnergyLab Technology Centre, where he is the Technical Director, coordinating the different technical business units of the centre: Sustainable Building, Industry, Bioenergy and Mobility and Infrastructures.
- David Blanes, Degree in Forestry Engineering, Master's Degree in Forestry Engineering and master's degree in Geographic Information Systems (ESRI). Professional experience in the improvement of its hydraulic network, for more efficient management of the network and in the detection of illegal wells for the protection of the Tablas de Daimiel National Park. Sustainability Consultant for AUREN.
- Matias Ryberg, bachelor's in business administration and MBA in CSR and Organisational Performance Management. Extensive experience in the financial sector and specifically in ESG risk assessment for the sector. Expert consultant in sustainability at Auren, actively participating in the development of projects related to the definition of strategic sustainability plans, SDGs, development of sustainability reports and their verification.

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- Juan Carlos Serna, Graduate in Chemical Sciences, master's in environmental Pollution, Master in Total Quality Management, Master in Eco-audits and Environmental Business Planning. He has held positions of technical responsibility in Industrias Químicas Satecma, as well as coordinating the Quality and Environmental Management Systems and internal auditing of these systems.
- Ana Guerrero, bachelor's in medical Biochemistry and master's in chemical biology, PhD in Immunology and Infectious Diseases and Expert in Management and Promotion of Social and Solidarity Economy Enterprises. Founder and Director of Dicha&Hecho.
- Víctor Criado, Technical Architect and Civil Engineer. He began his experience in energy efficiency in Germany, working at the Passivhaus Institut where he received accreditation as Passive House Designer. Speaker at the UPM Course on Wooden Construction. Technical Architect at 100x100biopasiva.
- Cristina Vela, Head of the Integrated System at Juan José Albarracín S.A.
- José Alfredo Martín, Degree in Business Administration and Management, Accredited Coach Training and Certification, Social Entrepreneurship. Acumen Fellow Candidate. Co-founder at apadrinaunolivo.org

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4.3. Profiles of trainers and auditors at CBG

- Simone Franzò, Professor at Politecnico di Milano in Management Engineering;
- Luca Vecchiato, Energy responsible at IMQ, ECO – Management;
- Sabina Belli, Product Marketing Director ELSP ABB
- Fabio Moioli, Direttore Divisione Consulting Services, Microsoft Italia
- Andrea Temporiti, Global Head of Digital ABB
- Antonio Lobosco, Politecnico di Milano
- Paolo Torri, responsabile Consorzio Energia Lombardia Nord
- Alessandro Baldelli, experts in energy savings
- Desirèe Scalia, LE2C Lombardy Energy Cleantech Cluster
- Lombardy Energy Consortium director, experts in energy savings certifications.
- LE2C Lombardy Energy Cleantech Cluster experts with a master degree in in European Economics, a Masters in International Relations and an MBA in International Business and Sustainability with focus on entrepreneurship.
- LE2C Lombardy Energy Cleantech Cluster experts in entrepreneurship, circular economy and open innovation.
- University Milano Bicocca expert in advanced technologies for innovation, Public Law and Policy della School of Law di Berkeley member.
- University Milano Bicocca experts in banking and finance.
- Sergio Giacomo Carrara, ABB

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4.4. Profiles of trainers and auditors at UTBW

General Introduction
- Joana Schönborn (SustainableThinking GbR)
- Diana Wang (Institut für Energieeffizienz in der Produktion EEP, Universität Stuttgart)
- Dr. Uli Jakob (Dr. Jakob energy research GmbH & Co. KG)

Management - DIN EN 16247
- Marko Geilhausen (Geilhausen Consulting & Coaching)

Management - ISO 50001 and ISO 50005
- Gülen Ak (Nachhaltigkeitsbeauftragte, Zeller+Gmelin GmbH & Co. KG)

Management - EMAS
- Frank Kermann (Umweltgutachterausschuss)
- Fabian Eder (Umweltgutachterausschuss)
- Dr. Stefan Müssig (Umweltgutachterausschuss)
- Wolfgang Störkle (Schwörer Haus)

Management - EnMS in practice
- Michelangelo Paradiso (ECA Concept GmbH)

Tools – the e-tool
- Marcel Quinten (Saar-Lor-Lux Umweltzentrum GmbH)

Tools – budget calculator
- Ewald Schäfer (Energieagentur NRW GmbH)

Funding programmes
- Torsten Volkmann (Spitzmüller AG)

Tools - CO_2 calculator
- Andreas Flad (KlimAktiv Consulting GmbH)

Tools – energy report tool
- Dr. Michael Krutwig (krumedia GmbH)

Management - climate management
- Ellen Leibing (Arqum Gesellschaft für Arbeitssicherheits-, Qualitäts- und Umweltmanagement mbH)

Networks and initiatives – KEFF and energy efficiency networks
- Jasmin Fiebag (Regionale Kompetenzstelle Energieeffizienz, KEFF Stuttgart)
- Akamitl Quezada (Initiative Energieeffizienz- und Klimaschutz-Netzwerke)

Find the right energy consultant
- Jürgen Römhild (Umwelttechnik BW GmbH)
- Jürgen Bühler (Sommerkeller12 – Architekten und Effizienzberater)

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- Roland Eppler (Ing.-Büro für Energieeffizienz und Energiekonzepte Südseite)

Management - energy controlling
- Rolf Wagner (econ solutions GmbH)
- Dr. Michael Krutwig (krumedia GmbH)

Technology: Compressed air
- Nathalie Bizer (Mader GmbH)

Technology: Photovoltaics
- Thomas Uhland (Solarcluster Baden-Württemberg)
- Christoph Hecklau (focusEnergie GmbH und Co. KG)
- Klaus Schurig (Schreinerei Schurig GmbH)

Technology: electric drives
- Prof. Dr.-Ing. Martina Hofmann (Hochschule Aalen)

Technology: ventilation
- Jürgen Layer (Ingenieurdienstleistungen Layer)
- Manfred Müller (Rosenberg GmbH)

Technology: pumping systems
- Ali Ersin (KSB SE &Co. KGaA)
- Markus Nowak (KSB SE &Co. KGaA)

Tools: Ecocockpit – CO_2 calculation
- Jil Munga (IHK Südlicher Oberrhein)

Technology: Waste heat utilisation
- Dr. Erik Heyden (Umwelttechnik BW)
- Martin Pfränger (Umwelttechnik BW)
- Karsten Uitz (IMAKA Energie- und Umwelttechnik GmbH)
- Ralph Jeschabek (ALMIG Kompressoren GmbH)

Technology: regenerative heat
- Prof. Dr. Uli Jakob (dr. jakob energy research GmbH & Co. KG)
- Christian Zahler (Industrial Solar GmbH)

Technology: Combined heat and cold
- Prof. Dr. Uli Jakob (dr. jakob energy research GmbH & Co. KG)
- Bernd Hebenstreit (EAW Energieanlagenbau GmbH)

Technology: Lighting
- Christof Loerwald (RIDI Leuchten GmbH)
- Alexander Bischel (Boehringer Ingelheim Pharma GmbH &Co. KG)

Technology: Building refurbishment
- Frank Hettler (KEA Klimaschutz- und Energieagentur Baden-

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- Württemberg GmbH – Zukunft Altbau)
- Thomas Fiehn (Fiehn Gebäudeautomation GmbH)
- Norbert Unterharnscheidt (e.systeme21 GmbH)

Management: Energy efficiency and climate protection – best practice
- Gülen Ak (Zeller+Gmelin GmbH & Co. KG)
- Stefan Schurr (Ensinger Mineral-Heilquellen GmbH)
- Diana Wang (ColibrIT Stuttgart)

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4.5. Profiles of trainers and speakers at NAPE

- Marek Amrozy – Head of Energy Efficiency Department and Proxy in NAPE. Recommended Auditor of the Association of Energy Auditors in scope of audits under the Thermo-modernization Act and energy audits of enterprises. Author or co-author of over 500 energy audits of buildings, heating networks, heat sources (including renewable) and industrial facilities. Author of several dozen pre-project concepts of renewable energy sources. Verification coordinator for several hundred investments implemented in enterprises in the field of energy efficiency. A consultant advising companies on improving energy efficiency as part of projects financed by PARP, Central Europe Program, Intelligent Energy Europe, European Bank for Reconstruction and Development, European Investment Bank. Member of the 211 Technical Committee in the Polish Committee for Standardisation.
- Tomasz Kułakowski - A graduate of engineering and master's studies at the Faculty of Civil Engineering at Warsaw University of Technology. Currently continuing his doctoral studies on energy efficiency of buildings. Specialises in energy audits of enterprises and RES profitability analysis. Conducted several dozen air-leak tests of buildings, including passive buildings, NF15 and NF40 and is certified in this respect by the Polish Institute of Passive Buildings. In the National Energy Conservation Agency, he works as an analysis specialist at the same time being an active collaborator with Energy Conservation Foundation and member of the Association of Energy Auditors.
- Olaf Dybiński - Energy analysis specialist at the National Energy Conservation Agency. Experienced energy auditor, author and co-author of many energy analyses of buildings regarding the assessment of BREEAM certification, dealing in particular, with developing building models for dynamic energy simulations and energy optimization of newly designed buildings and modernised. Co-author of the concept of pre-project innovative sources; energy for modern office buildings. Co-author of many energy audits and energy efficiency audits of buildings and industrial plants. Audit verifier in Green Initiative and Polseff2 programs. Member of the association IBPSA and the Association of Energy Auditors (recommended auditor Associations in the field of audits under the Thermo-modernization Act and energy efficiency audits).
- Paweł Kędzierski - Senior lecturer at the Faculty of Building Installations, Hydrotechnics and Engineering of Environment, graduated from the Faculty of Environmental Engineering at Warsaw University of Technology and the Faculty of Management at University of Warsaw. Cooperates with the National Energy Conservation Agency, the Energy Conservation Foundation and Polish Center for Accreditation. Deals with energy use rationalization in buildings, heat sources and heating networks, energy auditing and accreditation, and supervision of research laboratories. Teacher in the field of heat exchange, heating, and design processes at heating, heating and ventilation, and evaluation energy buildings training. Recommended Auditor of the Association of Energy Auditors in area of audits under the Thermo-modernization Act.

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- Adrian Chmielewski - Energy analysis specialist at the National Energy Conservation Agency. Experienced energy auditor, author and co-author of many energy analyses of buildings regarding the assessment of BREEAM certification. Co-author of many energy audits and energy efficiency audits of buildings and industrial plants.
- Aleksandra Rutkowska - Manager for International Financial Institutions and Development Programs at BNP Paribas Bank, financing small and medium enterprises, product, business process management system (BPMS), Specialties: the structural funds of the European Union for Small and Medium Enterprises.
- Piotr Kukla - director of audits and energy planning in Polish Foundation for Energy Efficiency. Graduated from many courses and trainings, including: an energy auditor course, cost estimation in construction, training in the assessment and verification of energy efficiency improvement based on the IPMVP protocol (international protocol for assessment and verification of efficiency) and training on the principles of preparing an Investment Feasibility Study. He is also authorised to prepare energy performance certificates obtained through the state examination. Polish Foundation for Energy Efficiency was operating ELENA support for SME's offered by BNP Paribas

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4.6. Profiles of trainers and auditors at LEAG

- Jure Eržen

M.sc. Civil engineer
B.sc. Electro energetics
Consultant for the Infrastructure, sustainability, construction, and energy. Mr. Eržen is qualified European energy manager and DGNB consultant. He graduated at the Faculty of Civil and Geodetic Engineering, University of Ljubljana. He led Horizon 2020 project named MODER. He is also responsible for energy management of public buildings, preparation of detailed energy audits, local energy concepts (SECAPs) and other technical documentation. He holds a DGNB and PHPP certificate.

- Staš kos

M.sc. Mechanical engineer
Mr. Kos is Deputy Director at Local Energy Agency of Gorenjska and is an expert in Infrastructure, Environment, Spatial planning end Energy. He graduated at the Faculty of Mechanical Engineering, University of Ljubljana. Mr. Kos is qualified European energy manager responsible for implementing Local energy concepts in Municipalities, and certified IR camera expert. He is coordinating and supervising work on energy bookkeeping for municipalities. He is an author of 1 scientific article.

- Črtomir Kurnik M.sc international and diplomatic studies

Consultant for the Economy and Promotion. Mr. Kurnik is Director at Local Energy Agency of Gorenjska and is qualified European energy manager and certified accountant. He has obtained a master's degree at International and diplomatic studies. He is responsible for economy, promotional activities, reports and coordination of LEAG projects as SEAP and Green Twinning. He has experiences in commercial sector on cost cutting projects, analytical work, calculations and negotiations.

- Dr. Boris Sučić

Energy management, environment management, support in decision making in energy and industry, modelling and optimisation of energy processes and holistic planning in energy represent the main fields of his work. He is the leader of energy manager training following the EUREM programme. He has written numerous science articles published in international and domestic journals and conferences and he is also an author of handbooks for various seminars and trainings. He has gained many practical experiences in the implementation of several domestic and international projects as a coordinator or a team member, especially in the field of energy efficiency, and in performing more than 100 energy audits in industry and buildings.

- Marko Pečkaj

M.sc. Mechanical engineer

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He is an expert with experience in energy management systems in industry and buildings and the development of sustainable transport. Working at Jožef Stefan institute, he has managed and participated in numerous projects dealing with energy audits, municipal energy planning, feasibility studies, energy system modelling, development of support program software and handbooks, and measurements in industry and buildings. He is also a lecturer at EUREM training and a GHG emissions verifier.

- Dr. Marko Matkovič

He graduated from the Faculty of Mechanical Engineering in Ljubljana and received his doctorate from the Faculty of Technical Physics in Padua. His main field of work includes experimental research on heat transfer and fluid mechanics between single-phase and two-phase flows, pure fluids and mixtures. Prior to joining JSI, he worked as a higher education teacher - assistant professor and self-employed - mechanical installation designer, and at the Jožef Stefan Institute he led the establishment of an experimental laboratory in the field of fluid mechanics and heat transfer of multiphase flows. After the opening of the laboratory, he joined the Center for Energy Efficiency, where at the level of a partner JSI coordinates the implementation of the LIFE IP CARE4CLIMATE project and participates in the rationalization of energy use of various energy plants. He is the co-author of three patents and numerous scientific research articles.

- M.sc Edvard Košnjek electro engineer

He holds a bachelor's and a master's degree from the Faculty of Electrical Engineering, University of Ljubljana. For most of his career, he worked in an electricity distribution company, where he served as Head of Service, Adviser to the Management Board for Technical Affairs and Strategy, Executive Director and Deputy President of the Management Board. Until 2020, he was also an active member of the international association Eurelectric and GIZ slovenske elektro distribucije, in which he worked as a member or chairman of the Technical Affairs Group, the ICT Group and coordinated the work of the Smart Grids Group. In 2020, he joined the JSI-CEU. He actively participates in local, national and international projects in the field of energy efficiency, energy communities, green technologies, merging sectors and assists in the preparation of strategies for sustainable development of large companies and regional strategic environmental energy studies. As a lecturer, he is involved in Targeted Training for Energy Management in the Public Sector (within the LIFE IP CARE4CLIMATE project) and training for energy managers under the international EUREM program.

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4.7. T4.1.2 and T4.1.3 Guidelines for in-situ and in-company

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innoveas
The power of energy audits

Guidelines for in-situ and in-company training

T4.1 Implementation of the training products (T4.1.2 and T4.1.3)

AUTHORS : IIPLE

DATE : 28.12.2020

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Table of Contents

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1. Forewords

Deliverable "D3.1 Training and Capacity building requirements" provides inputs on how to design the training programs to be developed, aiming at overcoming the behavioural and organisational constraints which hamper the effectiveness of measures for the implementation of energy audits in SMEs. This action is supported by interviews and surveys to evaluate the expectations of the potential beneficiaries of the action.
Together with the work done on WP2 "State of the art, needs and barriers assessment", the deliverable highlights the emerging requirements for the Capacity building programme, in terms of barriers /constrains, expectations and needs.

Deliverable "D3.2 - Capacity building plan" clearly defines the overall structure of the Capacity building programme.
The deliverable summarizes:
- the essential requirements for the training;
- the training activity in terms of available instruments, assessments, and tools;
- the preliminary contents of each activity;
- the expected number and type of participants;
- the performance indicators to monitor the effectiveness of Capacity building programme.

Following previous steps, the goal of this guideline is to provide additional and more detailed information and suggestions about two specific training activities: T4.1.2 "In-situ for groups of companies" and T4.1.3 "In-company training", to help each partner in preparing the training activities.
Among the different beneficiary of Innoveas project, these activities are specifically addressed to SME's managers and relevant profiles.

Tasks T4.1.2 and T4.1.3 follow T4.1.1 "Web based modules" in which both the context and the scope of energy audits and case studies are presented. This means that the participants are supposed to have a realistic idea of the purpose and benefit of an Energy Audit.

Before starting the training, the suggestion is to **run a webinar** addressed to people potentially interested about it, in order to promote the activity, clarify the organisation and contents, to answer to questions and get feedbacks. Such activity has thus to achieve more targets: to create interest, to increase expectations and to interact with participants

The present document, as a guideline, collects contents and ideas shared by the Innoveas partners in the first half of the Project. It aims to suggest general rules and contents that can be interpreted and further developed according to each partner needs and national/local specific situation.

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2. About Capacity Building Programme

It's important to stress that the Capacity Building Programme has to be seen as a whole process in which each specific activity uses specific instruments and training strategies that are effective not by themselves but as a part of a holistic approach.
The goal of Innoveas is to empower the SMEs, as final beneficiaries of the action, making them conscious of financial and non-financial benefits of moving towards the energy transition. This action requires a cross disciplinary approach and a specific strategy to innovate SMEs processes and to support the "enabling environment".
Capacity building activities have to improve the skills, resources and ability of participants involved to implement, monitor and assess energy efficiency projects to get over actual routine.
The energy and green transition have a defined starting point which is an initial audit to get a clear understanding of the situation and what kind of actions can be implemented.

A new narrative about energy audits has to be suggested. Energy audits are tools, not goals, and must result in a climate action. This requires to manage a process in which each actor and stakeholder should consider themselves as important players toward a common goal.
The training activities are thus addressed to key actors of a SME that will benefit of a new control power over their own business and become facilitators of the energy transition.

Although empowerment as a concept can be referred to individuals, the target is to overcome the separation of roles and responsibilities that exists among SME key actors.
Innovative training tools should make possible that the individuals join together to help one another, learn together, and develop skills for collective action oriented to a new business model free of CO2 emissions.
This is a multi-dimensional social process in which individual, SME and community are strongly connected. Personnel (of a single SME) and collective benefits (of the society) should be always kept together as well as the capability to understand how indirect benefits can be transformed in real financial profit.

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3. The training

Tasks T4.1.2 “In-situ for groups of companies” and T4.1.3 “In-company training” are specific activities of the Capacity Building Programme, involving SME’s key actors.
Participants in the two activities should have accomplished T4.1.1 “Web based modules” and thus have a minimum level common background.

Both in situ and In-company training will be developed in Italy (IIPLE and CBG), Germany (UTBW), Spain (A3E), Poland (Nape) and Slovenia (LEAG). The organisations will use for the purpose their own resources and/or external consultants.

According to the Application form the following table shows the target numbers for each partner.

		Types of Training	Number of Editions	Number of partecipating companies to all editions	Number of people	Micro Enterprises < 10 employees	Small enterprises >10 employees <50	Medium enterprises >50 employees <250	Target Sectors
IIPLE	IT	Web-Based	12	108	280	65	35	8	Construction
		In situ for group of companies	6	35	90	20	12	3	
		In companies	3	6	25	3	2	1	
CBG	IT	Web-Based	12	130	310	80	40	10	Construction Chemistry Food
		In situ for group of companies	8	42	95	30	8	4	
		In companies	6	8	30	5	2	1	
UTBW	DE	Web-Based	12	93	210	60	25	8	Construction Chemistry Food
		In situ for group of companies	12	31	85	20	8	3	
		In companies	6	9	25	4	3	2	
A3E	ES	Web-Based	12	108	280	65	35	8	Construction Chemistry Food
		In situ for group of companies	6	35	90	20	12	3	
		In companies	3	6	25	3	2	1	
NAPE	PL	Web-Based	12	50	210	30	15	5	Chemistry Food
		In situ for group of companies	6	20	60	12	6	2	
		In companies	5	6	22	3	2	1	
LEAG	SI	Web-Based	12	45	120	25	15	5	Construction Food
		In situ for group of companies	4	16	40	8	6	2	
		In companies	3	5	15	2	2	1	

Table 1 Target numbers of trainings

It is important to remember that the numbers indicated in the Application Form are binding and can not be modified.

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Both in-situ and in-company activities **are supposed to be run in presence**. Due to the pandemic situation and with the aim to keep the timing for the Project, it may happen that some edition has to be run on-line but still **in synchronous mode**. In this second case specific strategies have to be developed in order to ensure the quality and effectiveness of the training and take care of the aspects underlined in chapter n.7.
In case of e-learning the platform used should at least allow:
- a full interaction among the group of participants, also as individuals, and the teacher;
- to share documents and materials;
- to work in classroom groups.

If the health situation would make possible to carry out the action in presence this is strongly recommended and any effort in that direction has to be encouraged and supported.

4. Questionnaire on energy efficiency values & KPIs

According to work package "WP3 – Monitoring impact indicators for the energy efficiency values", the impact of the Capacity building implementation has to be evaluated. This requires estimating the primary energy and CO_2 emissions saved as result of the actions carried out.
A specific methodology to perform such assessment has been defined and KPI's value will be developed. In any case, in order to have a better evaluation of the impact, it seems important to profile participants and classify the SMEs involved in the different training activities.
This will be basically done by means of a questionnaire prepared by JER to get strategic information about the participants, to evaluate their level of commitment about energy transition, action already performed in their company.

JER will contribute following materials:

- Two ppt slides on INNOVEAS KPIs (Annex 8. KPIs Input.ppt)
- Consent file on Questionnaire on EE KPIs (Annex 6. Consent file.docx)
- Questionnaire on EE KPIs (Annex 5. Questionnaire on KPI_3.0.docx)

Preliminary information on the materials is given in the Annex 5, 6 and 8. The questionnaire carried out by JER will help identifying and quantifying the energy related impact of the INNOVEAS project.

Following steps are required to conduct the short questionnaire and will secure most useful answers of the training participants:

Steps:

1. <u>In advance to the training:</u>

1.1. Tell your participants to collect information of their energy consumption and energy situation in the company (especially energy amount, energy source, renewable energies).

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1.2. Include the two ppt slides on INNOVEAS KPIs into your training presentation. If you have any questions on the content of slides, do not hesitate to contact JER.
1.3. Print the questionnaire & the consent file prepared by JER.

2. At the beginning of the training:
2.1. Hand out the printed questionnaire & the consent file to the training participants and ask them to fill in and sign the consent file and the first page of the questionnaire before the training actually starts.

3. During the training:
3.1. Present the two slides on INNOVEAS KPIs and inform the participants about the importance of the questionnaire to identify the INNOVEAS KPIs.

4. After the training:
4.1. Ask the participants to complete the questionnaire.
4.2. Collect the signed consent files and filled in questionnaires.
4.3. Send all the collected files as pdf scan via email to IIPLE.

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5. In-situ training

The following paragraphs give an overview of the in-situ training and specify some possible contents. As already mentioned, on the basis of a common working framework each country has the possibility to **modify and adapt** these suggestions.

Structure of training
The second step of the Capacity Building Programme for SMEs is the so called "in-situ" training for groups of companies, which is intended to provide a more accurate knowledge to the participants, to better explore the topic related issues as here summarized.

Duration	16 hours
Editions	See table 1
N° of participants for each edition	10-15 people

Some mandatory steps:
- the partner will collect information on the participants of each training edition through template in Annex 3 (personal information, SME, role inside the company..) for the development of D4.3 Capacity Building Report - CBG,
- the partner will keep track of the effective presence of participants during the training courses through a participant registry (see Annex 1),
- the partner will collect the training materials to be uploaded on the official Innoveas training platform (these materials will be available only for users registered on the Innoveas website),
- the partners will ask the participant to fill in the questionnaires for the overall evaluation of training courses and project impact, by using the templated provided by IIPLE in Annex 4 (for the development of D4.2 Validation Report on Trainings – IIPLE).

Target
This training activity is addressed to SMEs members who should have already completed the whole web-based modules. It seems important to have in this action mixed classes with people coming from different SMEs with different backgrounds. This is necessary in order to enhance participation, exchange experience and simulate the complexity of the reality in which people with different knowledge and specific goals have to join and work together for a higher common objective.

<u>Before the training</u>

- Develop and run a **webinar** addressed to people potentially interested about the in-situ and in-company training to promote the activity. Webinar should illustrate the Capacity Building Programme and the innovative approach suggested for the training. This has to be strongly related with the Project issues and some preliminary results should be shown. The communication should clarify that the Project has clearly in mind the barriers and constrains that limit SMEs but a new approach is suggested to overcome them and help SMEs to innovate their business in the direction of energy transition. Webinar has to clarify training organisation and create curiosity about the

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contents. An interaction with participants is required, even to answer to simple questions.

- Once a class group is formed with about 15 people, participants are requested to accomplish T4.1.2 Web based modules and watch the videos in their own language before joining the class.
- Participants should fill in the questionnaire about the SME they represent and its energy consumption (see Annex 5 provided by JER). It will happen that some data of the questionnaire will be easily found, while others, as for example data about energy consumption (how much and how), will be more difficult. This can be a useful starting point for the training, to discuss about the level of awareness about energy consumption.

Possible contents

This training programme is developed as a path, during which the partners of INNOVEAS will lead the participants from the theoretical knowledge and concepts, to the practical skills and tips tailored on the characteristics of each SME. The innovation provided by the project deals with the interactivity of the Capacity Building Plan: the representatives of the SMEs will be asked to actively participate during the courses, with reports and practical exercises in class.
The training could be divided into **modules (for instance 4 modules of 4 hours, for a total of 16 hours)**, which should lead the participants to a full comprehension of the topics and a practical ability to implement some of the procedures described by the lecturers.

Module 1

The first module is developed as an introduction lesson on the need to act now, the concept of energy audit and the existing barriers; in this first phase, the trainers will involve directly the participants that are welcome to share their point of view in relation with their specific sector and work field. It's important to ask participants about the perceived barriers and constrains that limit the application of an energy audit and energy saving measures. Once the barriers are clear a new perspective based on climate change and potentiality of the energy audit should be suggested.

- The need to act now
  - Climate change is happening now, and its consequences are devastating
  - Connecting the climate to carbon, energy, pollution and public health
  - Connecting fossil fuels to plastics and other material inputs derived from oil and gas
  - Connecting climate change to loss of biodiversity
  - The climate goals for 2030 and 2050
  - The need to act now and more effectively is a moral and ethical obligation
- Overcome the barriers
  - Name the perceived barriers and the "accumulation effect" that block the action
  - Analyze the barriers and the dependence on "human factor"
  - Present climate goal as a superior objective for a SME
  - Focus on individual goals depending on the position in the company and collective goals for the SME
  - Present the transition as a process for the continuous improvement
  - Start to mention the "enabling factors"
- The Energy audit as a starting point

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- Discuss how participants are aware of energy consumption of their companies in terms of quantity and variables that affect consumptions
- Present energy audit potential and its limit following a “traditional approach”
- Extend the concept of energy audit to a “climate audit”
- Show free and easy audit tools to get preliminary data

Module 2

The second module will deal with the benefits of energy efficiency measures.
While the first module is intended to activate personnel and corporate social responsibility, the second one will present concrete benefits for the Company. Benefits are shown in a new perspective putting evidence in the indirect and non-financial ones.

- How to evaluate the benefits
  - direct and indirect costs related to energy consuming
  - evaluate the externalities associated to energy consumption
  - saving money on energy bills seems not enough to engage a SMEs
  - the need of a comprehensive overview of costs and benefits
- Climate audit
  - carbon footprint calculation
- Non-financial benefits of action and business opportunities
  - Re-inventing the relationship with Consumers, Clients, Suppliers, Communities, Employees
  - Re-inventing the business-model (Products, Services) for a resource constrained world
  - Alignment with needs and values of consumers
  - Managing the risk of supply chain deselection is a matter of survival

Module 3

The third module will be developed on the concepts of green economy and strategies for green marketing and communication. Since the non-financial benefits are greater than the financial ones, a clear overview of the green evolution of the market is presented. Consumers and customers are more and more aware of climate change and they tend to modify their habits to be green. Companies can get new business opportunities and be more appreciated by the market if they turn green and communicate effectively their choices. More organisations are making an effort to implement sustainable business practices. They recognize they can make their products more attractive to consumers, while also reducing expenses in packaging, transportation, energy and water usage, and more.

- Green economy and marketing
  - green economy against business-as-usual practice
  - green economy: opportunities and challenges
  - green economy: some data
  - what is perceived as “environmentally friendly”
  - enabling conditions for structural change
  - strategies and planning

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- Energy/Environmental Certification
  - ISO 50001, Emas, ISO 14001
  - how third-party certifications are perceived
- Green communication
  - the concept of “green reputation”
  - basis for a green marketing
  - how to tell and “certify” company social responsibility

Module 4

The fourth module will be the most practical, as it will provide participants with tools and instruments to deal with financial aspects and incentives, as well as to identify energy efficiency measures tailored on their SMEs.

This module summarizes the different concepts expressed in the other ones and try to adapt them to the reality of the SME involved in the training.

In order to give the participants, clear and real demonstrations of the positive consequences of the new approach on CO2 emission fighting, a practical exercise on a calculation of audit of carbon footprint could be suggested. This could be a general case suggested to the classroom or a self audit. In this second case self audit is presented in module 1, participants try to fill in at home and in this last module is discussed.

- Activate an enabling environment
  - policies and collective actions
  - funding programmes
  - networks
  - consultants
- Possible actions
  - switching to renewable energies
  - efficiency of buildings
  - efficiency of plant and machinery
  - efficiency of transport, storage, and logistics
  - material resource efficiency
  - carbon sequestration
  - measuring and reaping the benefits
- The players for the energy transition
  - ESCOs and auditors
  - financial institutions
  - Industrial associations
  - policy makers
  - multi-actor approach and stakeholder dialogue
  - the need of an “Alliance”
- Exercise
  - exercise on climate audit and/or carbon footprint calculation
- Customized solutions
  - evaluate own SME critical and positive aspects
  - create an own roadmap for green transition

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6. In-company training

The following paragraph gives an overview of the in-company training activity and provides information that each partner is free to modify and adapt to each specific case.
This training is to be held at the Company headquarter and involves personnel of the SME with different functions.
At least 6 people have to be engaged.
For the scope of the action we imagine **12 man-hours for each Company**, including at least 2 visits: one at the beginning to collect data and information and one at the end to share and discuss results.

Some mandatory steps:
- the partner will collect information on the participants of each training edition through questionnaire template in Annex 3 (personal information, SME, role inside the company..) for the development of D4.3 Capacity Building Report - CBG,
- the partner will keep track of the effective presence of participants during the training courses through a participant registry (see Annex 1 provided by IIPLE),
- the partner will collect the training materials to be uploaded on the official Innoveas training platform (these materials will be available only for users registered on the Innoveas website),
- the partners will ask the participant to fill in the questionnaires for the overall evaluation of training courses and project impact through the questionnaire in Annex 4 (for the development of D4.2 Validation Report on Trainings – IIPLE).

As already mentioned this training must be tailored and adjusted to the situation considering:
- the type of SME (business sector, size, n. of employees, ...),
- background of the people involved,
- participation to other Innoveas tasks (i.e. T4.1.2).

Training structure
Following the flow of the INNOVEAS Capacity Building Programme, the final step is the so called “In-company training” addressed to a restricted number of participants, with the main purpose of performing an analysis of their situation with the help of an Innoveas expert.
In-company training is to be considered as a mentoring process for the SME, able to involve the owner and the key figures of the company, in order to focus on their specific situation and suggest solutions to start a process of continuous improvement.
This can drive to a sort of **pre-energy audit** targeted on the specificity of the single company, and a roadmap for green transition.

Target
This training activity is aimed at SME members who should have already completed the web-based modules, and possibly also the in-situ training. The necessary requirements in order to participate in the in-company training is the knowledge (at least at a basic level) of what an energy audit is and of the main aspects of the reference legislation.
Each partner will elaborate specific training according to the type of SME involved, to reach the following objectives:
- Suggest a new approach to energy audit,

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- Experiment the new role of the Energy Auditor who should be a partner of the SME and follow the entire cycle of energy efficiency: from the audit to the adoption of effective measures, to the management of financial aspects of the project,
- Provide a clear description of EA benefits: not only the financial ones, as SMEs could imagine,
- Activate the "enabling environment" and the alliance for the CO2 transition,
- SMEs create a roadmap for their own green transition and an action plan.

Possible contents

The SME will be assisted by an expert who, starting from an analysis of the company's costs and bills, will be able to discuss with the key profiles of the company in order to:

- collect typological data of plants, vehicles and buildings with acquisition of consumption trends, use of plants, etc.;
- analyse the global cost associated to energy consumption;
- analyse hidden energy costs (resources, waste, etc...);
- provide an estimation of externalities and environmental cost of energy consumption;
- analyse measures aimed at containing consumption and improving the performance of the building stock;
- define a calculation model;
- analyse critical aspects and possible solutions;
- analyse "green reputation" and how to implement a green marketing strategy;
- evaluate "enabling factors" in terms of funding, expert assistance, certification processes, etc...;
- draw up a programmatic intervention plan and a roadmap detailing different steps to start a continuous improvement process;
- develop an action that is not limited to enhancing energy performance, but goes further, aiming decisively at improving sustainability.

Of course, the activities previously described have to be balanced with the Project resources and scope.

A compromise has so to be found. What we think important is that this action should "open the mind" of the company and make them approach the subject of energy consumption and CO2 emission fight in an innovative way. It's so important to deal and discuss all the aspects even if there isn't enough time to examine them accurately. To get the scope of the SME capacity building and empowerment of their key representative, it is necessary to deeply interact with different people of the SME including the management and try to direct them to collective goals.

This activity should end with a report in which to describe the SME involved in the action, the work performed, SME attitude towards energy transition and the roadmap defined.

In order to best focus on next Innoveas activity and provide further suggestions to "WP6 Exploitation and Sustainability" personnel suggestions coming from the partners on "what helps" are welcome.

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7. Some general recommendations

From the previous concepts it is important to point out that training activities can't be reduced to simple frontal lessons in a classroom, but require different strategies aiming to:
- support participation;
- promote personnel experience sharing;
- enhance cooperative learning;
- train on problem solving;
- use effective communication.

SUPPORT PARTICIPATION

Participation is one of the essential aspects of a successful empowerment activity.
It is a people-oriented approach in which **participant feels a high degree of personal commitment**.
Participation allows a mental process that make people feel really concerned by the action as subjects and not only objects. In frontal lessons, participants have a passive role and communication is only oriented from the speaker to the audience. Since through participation the communication is two-way relationship, people are more concerned and
take more responsibility.
To support the participation also means to make clear that everybody is involved in the climate change issues. This call for action requires to feel a social responsibility and a duty towards the planet.

PROMOTE PERSONNEL EXPERIENCE SHARING

Promoting the possibility of participants to share their own experience, doubts and point of view it's an effective way to be inclusive, to effectively integrate class groups and to improve learning.
Moreover, when the learning activity starts from personal experiences, people feel more concerned and more motivated.
We should expect that participants have exactly in mind the barriers and the constrains Innoveas has deeply investigated in the first part of the project. To give them the possibility to share their point of view and then help them to look at the question in a different way, can be a linear and effective process to overcome the problems.
All the training process should start from people and come back to them, which means that we should offer concrete inputs and suggestions strongly related to participant's experience.

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ENHANCE COOPERATIVE LEARNING

The need of a new collective approach for the energy transition naturally calls for cooperation as the way to work together to accomplish shared goals. This attitude should be promoted also during training activities. Within cooperative activities individuals seek outcomes that are beneficial to themselves as well as to all other group members.

In a SME each person responsible of a specific area usually “defends its territory” and is not so open to change its working procedures or routines. A sort of competition occurs among different areas and each one pursues personal goals. A new mentality must be promoted. Environmental goals must be seen above the others as primary objectives. Following a multidisciplinary approach each SME key actor can be an important actor towards the green transition. Create working group in which to promote cooperative learning can develop a natural way of acting and interacting to create a sort of “ecosystem” of the diverse actors.

USE EFFECTIVE COMMUNICATION

The way to communicate with SMEs is a crucial point. Advantages of energy audit and energy efficient projects are often presented by auditors in a technical way and benefits are not completely understood. Since SMEs have generally little time and resources and that the beneficiary of the training actions could have different backgrounds it’s important to develop a “new language” to communicate. This is not a simple task. The communication has to be adjusted according to the audience. It’s necessary to find a compromise between the precision of issues coming out from a technical approach and the need to be understandable even from non-technical subjects. It’s not a question of using slogans or talking in a vague way, but to develop a “driving narrative” that places SMEs at the forefront of energy transition and pushes on direct and indirect benefits.

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8. Timing

The following timing (tentative) has been shared on 22nd January among the partners.

- On February 2021 first webinar to present the activity
- By March 2021 to the end of November 2021 implement the **In-situ training** for groups of companies (T4.1.2)
- By April 2021 to the end of January 2022 implement the **In-company training** (T4.1.3)

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Annexes:

1. Annex 1: Facsimile of participants registry (to be filled by Innoveas partners)
2. Annex 2: Description of the in-situ training class (to be filled by Innoveas partners)
3. Annex 3: Participant registration form template (to be filled by participants during the enrolling phase)
4. Annex 4: Questionnaire for the evaluation of training (to be filled by participants at the end of the training edition, when the 16 hours are completed)
5. Annex 5: Questionnaire on KPI prepared by JER (to be filled by participants during the first training lesson, to foster discussion and collect information for KPI)
6. Annex 6: Consent file available to use for the energy-related questionnaire
7. Annex 7: Facsimile certificate of attendance
8. Annex 8: Presentation slides on energy-related KPIs prepared by JER (to be shared with participants during the in-situ training)

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