



# D3.3 – Performance report

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## Technical References

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<sup>1</sup> PU = Public

PP = Restricted to other programme participants (including the Commission Services)

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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.

## Disclaimer

This document reflects only the author's view. The Agency and the European Commission are not responsible for any use that may be made of the information it contains.

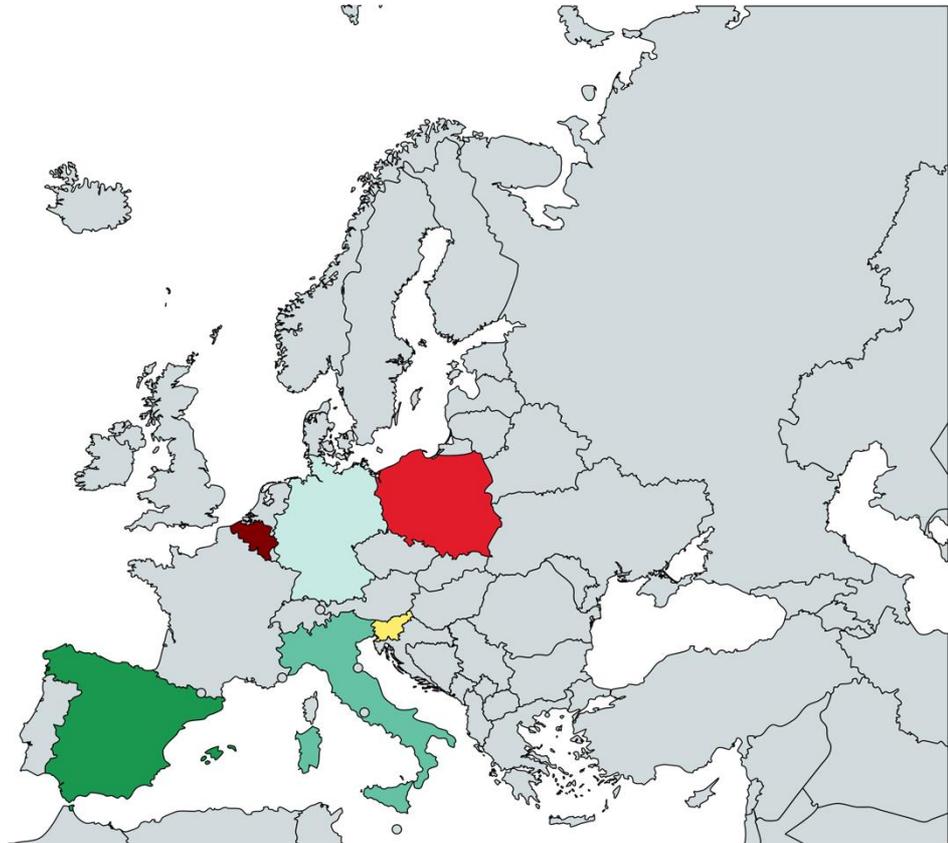




# Partners

**innoveas partners**

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



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# 1. Executive summary

Given the nature of the project as a pilot meant to validate training products, monitoring of their implementation and beneficiaries feedback is crucial, in order to adjust the trainings based on companies' needs, preferences and possibilities. A set of metrics regarding companies' satisfaction as monitoring Key Performance Indicators have been established before implementing the pilot activities so as to get a good understanding of the Capacity Building Program overall performance and properly feed **D4.2 - Validation Report on Trainings** devoted to summarise the results of the training programme and thus to provide an evaluation of the activities in order to deliver a final plan which can be further replicated in other areas and contexts.

**Chapter 2** describes the tools, the indicators and the methodology used to collect and then process data / feedbacks from the participants to the 3 different actions, namely the Web-based modules, the IN SITU training and the IN COMPANY training, as described. The analysis, and thus this document, has taken a parallel track assessing from one side the performance of the training delivered and, from the other, the impact of the same training in the mid-long terms with reference to the Key Performance Indicators set in the Description of the Action.

**Chapter 3** is centred on measuring the Capacity Building Program effectiveness moving from the same participants perception of the logistic / organisation of the courses, the quality of the contents and the same experts / teachers and the real effectiveness of the contents / subjects delivered with a view of their concrete use and application within their daily action in their company.

In general terms participants have appreciated the overall training organization and logistic as well as the overall quality of the contents delivered. The same effectiveness has been confirmed by the most of the participants but the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) has been confirmed only in limited cases.<sup>1</sup>

**Chapter 4** shows the environmental and economic impact of the project as there are given numbers about the energy that can be saved throughout the trainings and renewable energy quotas that will be reached. Thereby the amount of CO2 emissions that will be saved is calculated as well as the investment that gets triggered through the energy measures. Here, the numbers are compared to the numbers given by the GA.

The chapter also shows the methodology that had been developed to evaluate these data and to show the impact. This was realised by using questionnaires which asked the participants of the trainings for data like the demand of energy or their motivation to act in different fields of energy efficiency or renewable energies.

**Chapter 5** tries to draw some conclusions presenting a common scenario for the consortium partnership as a whole giving evidence of the common and shared conditions without anyway anticipating any 'interpretation' and follow-up strategies being exactly the purpose of D4.2.<sup>2</sup>

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<sup>1</sup> Also for those who completed the training process participating also to the IN COMPANY training activity the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) has been limited to few cases.

<sup>2</sup> Exactly in that sense this Deliverable can be considered a real bridge towards the validation processed in D4.2.





# 2. Performance indicators and monitoring

## 2.1. Assessing performance

Given the nature of the project as a pilot meant to validate training products, monitoring of their implementation and beneficiaries feedback has been crucial. Obtaining feedback after the courses and in the longer run on the actions taken at company level has been embedded in the protocol of any training (of any type) delivered in the project. In addition, the task has also been devoted to updating the measurement of the potential impact that the project delivered for what concerns energy efficiency, which estimations has been provided in the Description of the Action.<sup>3</sup>

More in details the Capacity Building Programme for SMEs has been implemented in its 3 main components as initially planned, being:<sup>4</sup>

- **Web-based modules** consisting of a set of short videos uploaded on the INNOVEAS YouTube channel representing the first entry-point to the training phase with the aim of introducing the main topics of the training, catching the interest of SMEs to whom the training is addressed, finding the expected number of participants for the following phases of the capacity building process;
- **In situ training** organised for group of companies' staff members mainly in the premises of intermediaries and training institutes. In general, it consisted of 16 hours of training with the direct involvement of external profiles and experts also to illustrate real and practical experiences;
- **In company training**, be 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.

The tools used for assessing the performance have been Questionnaires administered on-line for both the Web-based modules and the In-situ training<sup>5</sup> and on a paper format for the In Company. More in details the 3 surveys had the following structure:<sup>6</sup>

WEB BASED MODULES – On a Likert scale from 1 (*min*) to 5 (*max*) participants have been asked to rate:

- The grade the course contents met the expectations

<sup>3</sup> More specifically this is the part of this paper referred to impacts and KPIs.

<sup>4</sup> The details of the Capacity Building Programme for SMEs have been already introduced and explained in *D3.2 - Capacity building plan, D.4.1. - Training Webinars* and *D5.5 - Training Toolkit* which includes all the key materials to be further used for future training modules and capacity building activities in a simple and easy-to-use way.

<sup>5</sup> Being also the in-situ training held on-line given the persisting COVID-19 restrictions.

<sup>6</sup> Annex 1, 2 and 3 are reporting the tools on their integral form.





- The quality of the information provided
- The relevance of the information provided to job action

IN SITU TRAINING – On a Likert scale from 1 (*min*) to 4 (*max*) participants have been asked to rate:

- The overall organisation of the courses in terms of *i)* the material, *ii)* the tools, *iii)* the secretary desk, *iv)* the availability of the coordinator and *v)* his/her ability
- The overall quality of the courses in terms of *i)* a general overview, *ii)* the length, *iii)* the clarity and efficacy of the trainers and *iv)* their ability to involve participants
- The overall effectiveness of the courses in terms of *i)* the personal perception on contents acquisition, *ii)* the usefulness in involving other members of the company, *iii)* the likelihood that the company will implement an energy audit, *iv)* the likelihood that the company will adopt a more energy efficient management, *v)* the interest in adopting renewable energies in the company, *vi)* the interest in participating to a free energy pre-audit in the company and *vii)* the interest in adopting a Certified energy management system (e.g. ISO 50001:2018)

IN COMPANY TRAINING – On a Likert scale from 1 (*min*) to 4 (*max*) participants have been asked to rate:

- the overall effectiveness of the action in terms of *i)* the likelihood that the company will implement a full energy audit, *ii)* the likelihood that the company will adopt a more energy efficient management, *iii)* the interest in adopting renewable energies in the company, *iv)* the interest in participating to a free energy pre-audit in the company and *vii)* the interest in adopting a Certified energy management system (e.g. ISO 50001:2018)

In this sense D.3.3 provides the background for D4.2 [*Validation Report on Trainings*] where all the feedbacks and inputs from the participants will allow the final assessment of the Capacity Building Program and the drafting of framework for its validation.

## 2.2. Assessing impacts and KPIs

As described in 2.1 the trainings can be separated in three different types. These are the web-based modules, In-situ trainings and In-Company trainings. All types are based on similar methodologies but had to be adopted as the data given for the input clearly differ.

- The output of the **Web-based modules** consists of two main factors. First the click numbers and the remaining time are taken to evaluate several audits that will be generated through the videos. Second the impact itself is calculated by taking the average values of the In-Company trainings in account.
- The impact of the **In-Situ trainings** is evaluated by questionnaires that ask the participants for data like the demand of energy. As the questionnaires are only filled





in partly there had to be taken average values. Thus, showing the impact ranges are given.

- Regarding the **In-Company trainings**, the values are much more exact than in the In-Situ trainings. This is caused by the more exact data from the Questionnaires coming from a decided check of one company.

All impacts regarding the energy are quantified by four energy KPI that are

- Energy savings
- Renewable Energies
- CO2 emission savings
- Triggered investments

The calculations are précised and results are given in the section 4.1.





## 3. Performance evaluation

### 3.1. Italy - IIPLE

#### 3.1.1. Web based modules

In order to maximise the impact and also structure the country intervention on a more rational basis IIPLE and CBG implemented a joint program deploying 8 videos to be used in both the territorial contexts. In details these are the videos implemented by IIPLE:

- **Video 1 - An introduction to energy audit for small and medium-sized enterprises.** The goal is to convey information about energy efficiency measures, to increase the number of energy audits carried out within companies.
- **Video 3 - Audit and energy efficiency.** Policies and tools to support SMEs in Emilia Romagna. This training video concerns the goals of CO2 reduction, as established by the European Community, and their transposition at regional level in Emilia Romagna. The video's aim is to present the policies and concrete opportunity that are available in Emilia Romagna region and that can help SMEs to innovate their business towards sustainability and energy transition.
- **Video 5 - Construction companies and green economy in Emilia Romagna.** The video describes the good practices of energy efficiency adopted in the construction sector of Emilia Romagna. The role of SMEs in this sector, is absolutely relevant in guaranteeing an efficient use of energy during the construction and the whole life cycle of the building.
- **Video 6 - Construction companies towards the green economy: best practices in Emilia Romagna.** This video presents a best practice of the Emilia Romagna region: Appennino Construction Cooperative (CEA). CEA is a virtuous example for SMEs, as a reality concerned with aspects of green and circular economy, disposal of construction waste and adoption of energy efficient measures.

The total views of each single video from November 2020<sup>7</sup> are recorded in the next table:

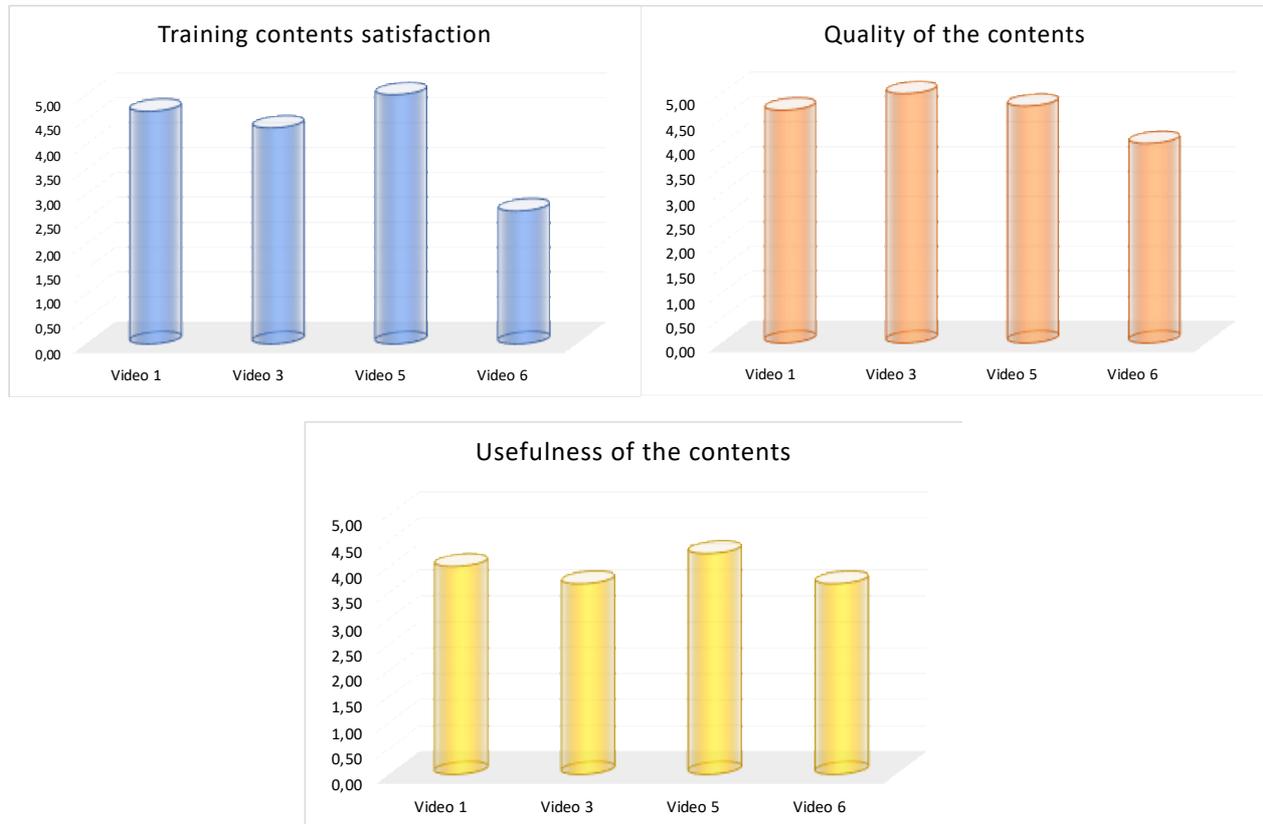
Video 1	Video 3	Video 5	Video 6
474	100	284	556

As the following charts show Video 5 has been in general highly positive assessed both in terms of quality / satisfaction of the contents provided and also on the level of usefulness as perceived by the viewers. On the contrary Video 6 has recorded the lower scores despite the highest number of views.

<sup>7</sup> Being the moment when the web-based part was formally completed in the INNOVEAS platform.



### Chart n° 1: web-based module evaluation<sup>8</sup>



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.

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### 3.1.2. IN SITU training

The 16-hour programme has been divided into 4 lessons. Because of the health emergency related to COVID-19, the training has been implemented in online synchronous modality, through the GotoMeeting platform.

The target group addressed consisted of entrepreneurs and technicians of building and plant companies, producers of building materials, energy auditors and energy managers. Professionals and practitioners of the construction sector have also been involved in the training courses.

In short, the course aimed to provide the necessary elements to understand the current ecological transformations and, in the short and medium term, the scenarios of the energy transition and have been displayed in the following 4 modules:

- 1. Scenario and challenges.** The current reference scenario and the policies in place towards a decarbonised society - SMEs in the construction sector facing the challenges

<sup>8</sup> For the details on the survey see § 2.1 and Annex 1. The histogram expresses the average of the scores expressed by the sample referred to each single video in the 3 dimensions of the survey (as per § 2.1).

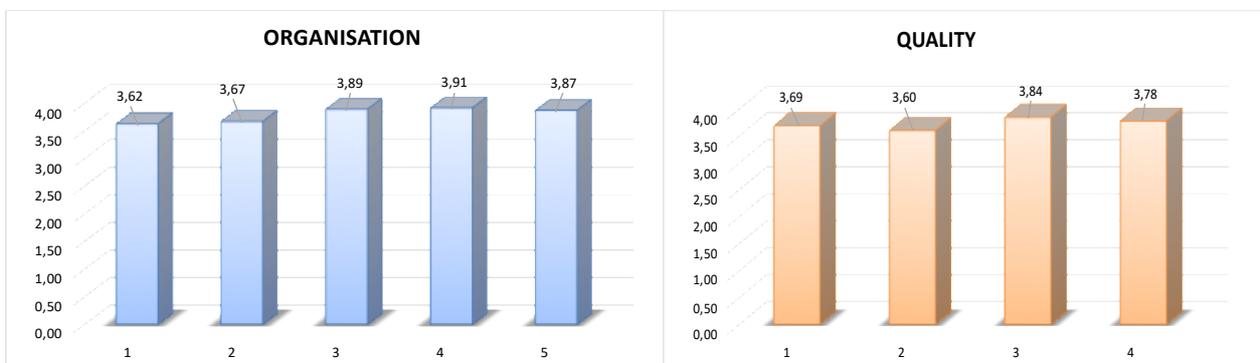


of the energy and ecological transition - Energy audit as a pre-requisite for efficiency processes - Ways in which the INNOVEAS European Project can address the energy transition in SMEs - Which barriers can hinder the energy transition - Which activities can promote the implementation of energy audit in SMEs.

- 2. The transformative forces resulting from the energy and ecological transition.** The energetic and ecological transition: meanings and implications in the short, medium- and long-term period - Simulation and analysis of scenarios for SMEs in the construction sector - Economic enhancement of non-financial aspects - The contributory approach to the energy and ecological transition: why now? Why me? Why us? - The Energy Audit as a means to activate a “generative change”.
- 3. Generate shared value and improve your positioning in the market.** What generating a shared value in your business starting from a greener approach means - What it means for companies to have a green strategy in terms of organization and market positioning and what skills and competences this requires - Contribution, Impact and Reputation: how social generativity helps us make choices that are better for us, for our business and for the community - Certification criteria and measurement of environmental impacts: GRI Standard (Global Reporting Initiative Standards) - Which “Alliances” support energy transformation.
- 4. Methods and tools to activate transformative processes.** New trends in consumers, procurement and public funding - The green evolutions of the market - Environmental marketing and green reputation - Sustainable investments to become a socially and environmentally responsible company - Voluntary energy-environmental certifications - The measurement of impacts: the concept of ecological footprint - Methods and tools for the energy and environmental transformation of the company: the MARC approach for the fight against climate change.

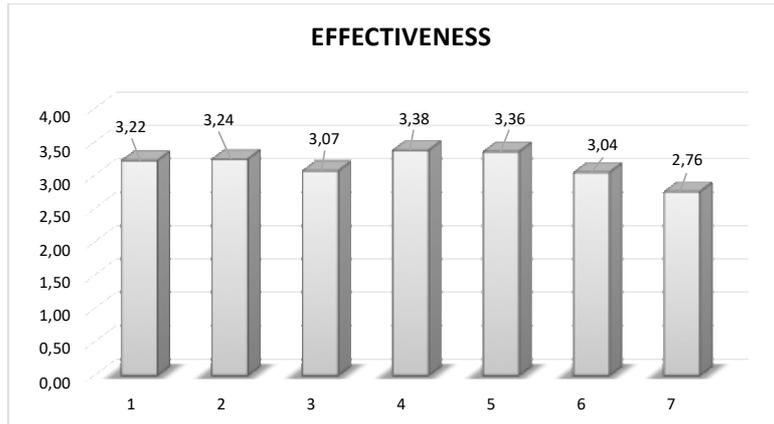
In total 70 participants took part to the 5 editions of the training coming from 57 different SMEs in the target sector.

Chart n° 2: IN SITU training evaluation<sup>9</sup>



<sup>9</sup> For the details on the survey see § 2.1 and Annex 1. The histogram expresses the average of the scores expressed by the sample referred to the single topic investigated in each of the 3 dimensions of the survey (as per § 2.1).





As the charts show in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the hosting staff*) as well as the overall quality of the contents delivered. The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been highly appreciated whereas the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was not widely spread.

Most interesting topics	Less interesting topics	Topics to be further explored
<ul style="list-style-type: none"> <li>• Energy audits</li> <li>• Psychological consequences of investing in energy efficiency</li> <li>• Climate crisis and new consumer habits</li> <li>• Constraints and barriers, externalities</li> <li>• Shared value and purpose approach</li> <li>• MARC approach</li> <li>• Environment, construction and energy transition</li> <li>• Green marketing</li> </ul>	<ul style="list-style-type: none"> <li>• Circular economy</li> <li>• Environmental marketing</li> <li>• Philosophies partially avulse from the economic reality of SMEs</li> </ul>	<ul style="list-style-type: none"> <li>• Energy audit in details</li> <li>• How to implement the energy transition</li> <li>• Non-repayable loans and mentoring for start-up</li> <li>• Green public procurements</li> <li>• New consumers trends</li> <li>• Theorization of CAM and LCA requirements</li> <li>• Carbon footprint</li> <li>• Reporting and sustainability tools</li> <li>• Energy diagnosis and certification</li> </ul>

\*The table quotes the different answers collected by the participants to the IN-SITU training activity anonymously, thus conflicting views simply reflect the opinion of different people.

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### 3.1.3. IN COMPANY training

IIPLE has designed the in-company training activity as a free consultancy, aimed at small and medium-sized enterprises in the construction sector interested in triggering an energy efficiency path through a preliminary energy audit; the aim is, with the support of an energy auditor/expert, to identify critical issues, areas for improvement and the expected direct and indirect benefits of a complete energy audit.

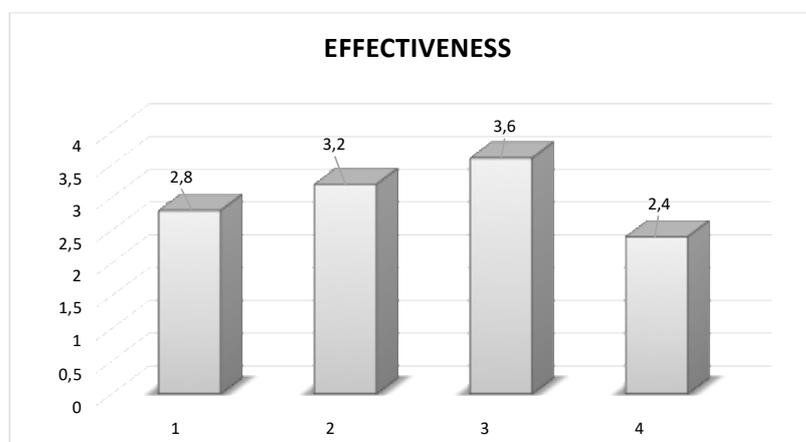
The innovative aspect offered by the in-company activity developed by IIPLE, is the focus on the need to make a change in approach and paradigm with reference to the concept of energy efficiency and energy audit; an important role is attributed to the "energy transition" process, intended as an opportunity to be primary players in a constantly evolving market.

Consulting in the company has been therefore configured as a pre-audit, during which the energy auditor has:

- illustrated the benefits, not only economic, of the energy audit and the adoption of energy efficiency measures;
- listed the main technical and non-technical aspects of the energy transition process;
- collected wasteful data and indicators on the energy consumption of buildings, warehouses, construction sites, machinery;
- evaluated and suggested energy saving strategies;
- sensitized and informed the company staff about the potential economic and non-economic achievable benefits.

In total 10 participants took part to the activity coming from 5 different SMEs in the target sector. All of them have highly appreciated the overall quality and efficacy of the activity implemented, whereas the likelihood that the company will implement follow-up measures is not completely shared by all the participants. The same real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was not concretely assured.

**Chart n° 3: IN COMPANY training evaluation<sup>10</sup>**



<sup>10</sup> For the details on the survey see § 2.1 and Annex 1. The histogram expresses the average of the scores expressed by the sample referred to the single topic investigated by the survey (as per § 2.1).



### 3.2. Italy CBG

#### 3.2.1. Web based modules

In order to maximise the impact and also structure the country intervention on a more rational basis IIPLE and CBG implemented a joint program deploying 8 videos to be used in both the territorial contexts. In details these are the videos implemented by CBG:

- **Video 2 - Italian incentives for SMEs.** The purpose is to understand why Italian SMEs don't perform Energy Audits. Often, the reason is a lack of economic resources to undertake this type of investments.
- **Video 4 - Peculiarities in Lombardy.** The video aims to highlight the peculiarities in Lombardy on energy efficiency in SMEs and the advantages derived from energy audits.
- **Video 7 - Best Practice in food and construction in Lombardy.** The video aims to show best practices in two companies (respectively from food and construction industry) located in Bergamo regarding energy efficiency measures. Two companies located in the province of Bergamo, operating in the food and construction sector, show their path of energy efficiency.
- **Video 8 - Best Practice in chemical industry in Lombardy.** The video aims to show best practices in two companies (from chemicals industry) located in Bergamo regarding energy efficiency measures. Two companies located in the province of Bergamo, operating in the chemical sector, show their path of energy efficiency.

The total views of each single video from November 2020 are recorded in the next table:

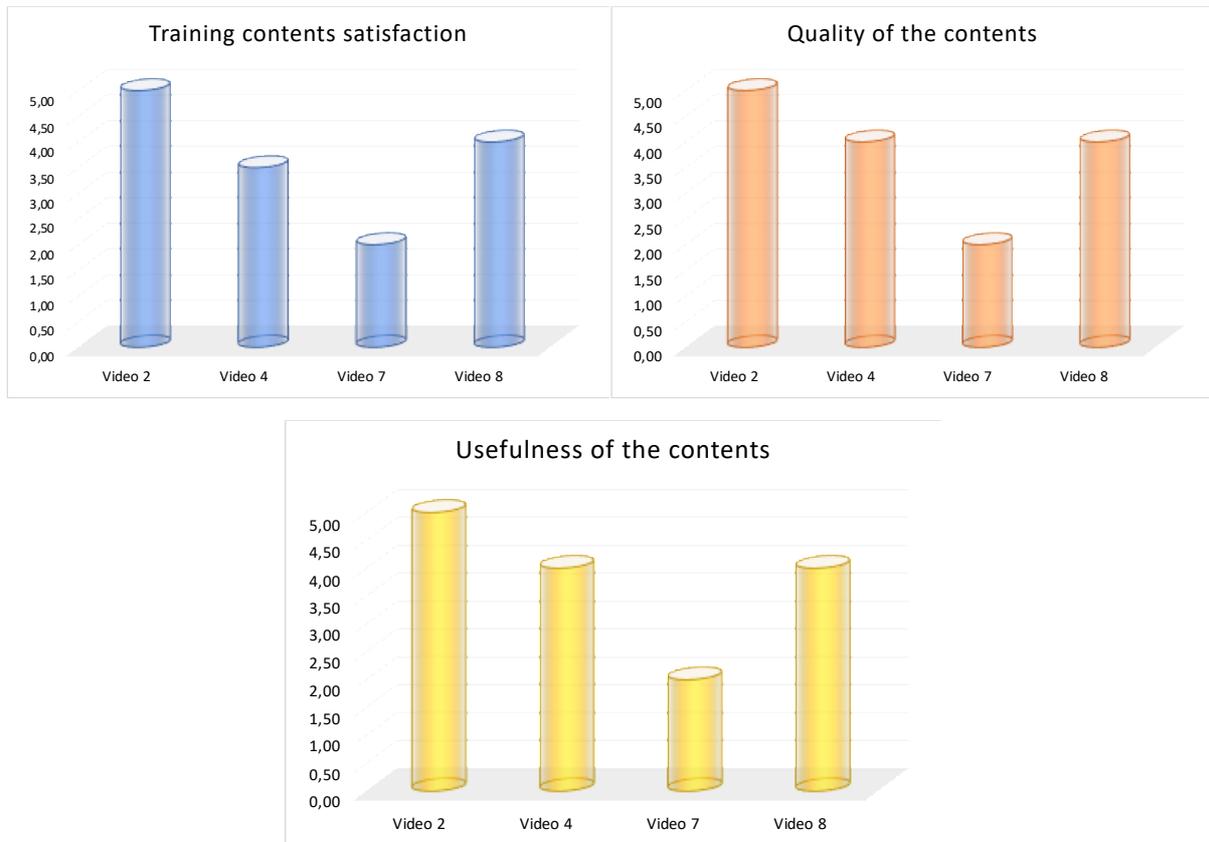
Video 2	Video 4	Video 7	Video 8
243	99	168	160

As the following charts show Video 2 has been in general highly positive assessed both in terms of quality / satisfaction of the contents provided and also on the level of usefulness as perceived by the viewers. On the contrary Video 7 has recorded the lower scores despite the high number of views.





**Chart n° 4: web-based module evaluation**



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.

### 3.2.2. IN SITU training

The in-situ activities for CBG have been focused on two type of formats: Transformation talks and Energy management course. All the trainings have been delivered on-line.

#### **1) Transformation Talks: take control of your company's electrical management. With digital transformation, the future is in your hands.**

Addressed to entrepreneurs and technicians from SMEs in constructions, chemicals, foods and manufacturing companies it had the objective of 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. Modules have been split into:

- Introduction - Saving and optimizing: achieving sustainability through energy efficiency.
- Sustainability and SMEs: energy efficiency in the Italian market.
- Energy audit: the importance of having everything under control





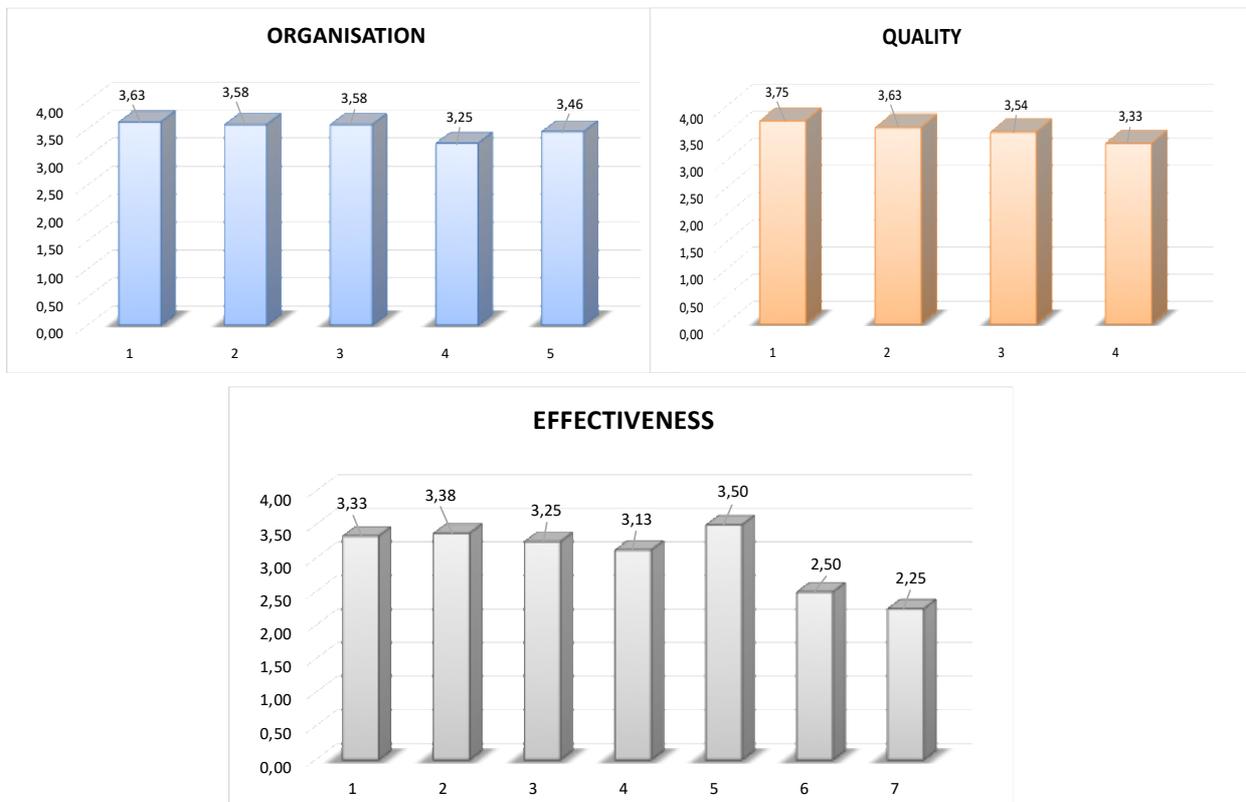
- Electricity distribution: technological solutions for a new energy identity.
- Maximizing opportunities: regulatory frameworks, projects and incentives for innovation.

**2) Energy Management.** Addressed to entrepreneurs and technicians from SMEs in constructions, chemicals, foods and manufacturing companies it had the objective of supporting corporate personnel who want to deepen the issues of energy efficiency of buildings and production facilities and auxiliary. It deepened the issues related to energy efficiency in the company, the Energy Audit tool and energy monitoring systems. The team of experts also provided an overview of the methods and tools and incentives to make these changes in the company. Modules have been split into:

- Energy efficiency: a lever for the competitiveness of the company
- Energy efficiency: a lever for the company's competitiveness
- Energy: economic opportunities - cost and investment management
- Green marketing and improvement of corporate image

In total 99 participants took part to the training coming from 76 different SMEs in the target sector.

**Chart n° 5: IN SITU training evaluation**



As the charts show in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the*





*hosting staff*) as well as the overall quality of the contents delivered. The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been highly appreciated whereas the real interest in participating to a free energy pre-audit for the same company and in adopting a Certified energy management system (e.g. ISO 50001:2018) was not specifically concrete.

Most interesting topics	Less interesting topics	Topics to be further explored
<ul style="list-style-type: none"> <li>• Energy audits</li> <li>• Energy incentives</li> <li>• Energy efficiency tools</li> <li>• Best practices</li> </ul>	<ul style="list-style-type: none"> <li>• Laws and regulations</li> <li>• Electricity distribution</li> </ul>	<ul style="list-style-type: none"> <li>• Green marketing</li> <li>• Green reputation</li> <li>• Financial instruments for the implementation of the energy transition</li> <li>• Circular economy</li> <li>• Carbon footprint</li> </ul>

\*The table quotes the different answers collected by the participants to the IN-SITU training activity anonymously, thus conflicting views simply reflect the opinion of different people.

#### 3.2.3. IN COMPANY training

The in-company training activity began with the mailing of the ENERGIA 360 questionnaire to the company. The company had the duty of filling the energy questionnaire and then the questionnaire was sent to the energy auditors who performed the analysis to assess the energy knowledge of the company management and produced a report with the performance of the company and suggestions of future actions to improve energy efficiency.

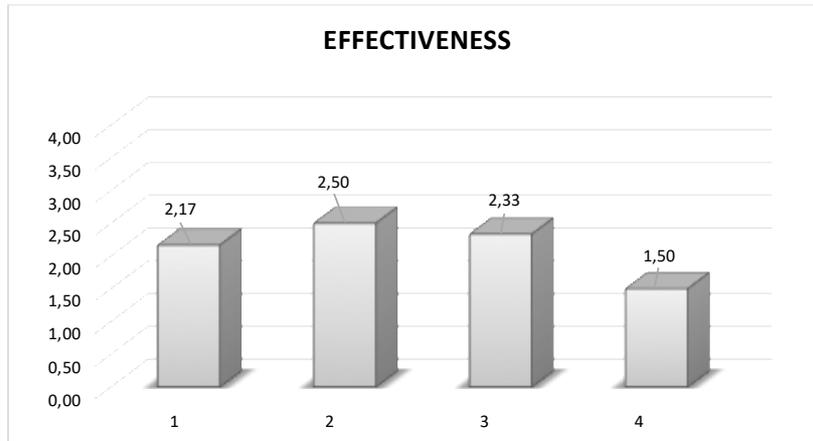
After the report production, a meeting in the company headquarter has been organized in which CBG explained the INNOVEAS project to the company management, along with the annexed questions. In addition, the auditors explained the report to the company management and finally provided suggestions to the company in developing possible measures to improve the company performances

In total 16 participants took part to the activity coming from 6 different SMEs in the target sector. All of them have appreciated the overall quality and efficacy of the activity implemented, whereas the likelihood that the company will implement follow-up measures is not completely shared by all the participants. The same real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was really weak as an average on all the participants.





Chart n° 6: IN COMPANY training evaluation





### 3.3. Germany

#### 3.3.1. Web based modules

Following the project shared structure, in Germany UTBW implemented the following 5 videos:

- Video 1 – Advantages and benefits of an energy audit for SMEs**

The aim of the first video is to raise awareness and motivation for the implementation of an energy audit and to implement energy efficiency measures.
- Video 2 – Special features and support for EAs in Germany and Baden-Württemberg.**

The aim of the second video is the demonstration of initiatives and networks as well as funding opportunities to support small and medium-sized companies in the implementation of energy audits and energy management systems.
- Video 3 – Best practice energy management in the field of construction, stone and earth.** The objective of the third video is to raise awareness and motivation for the implementation of an energy audit and to implement energy efficiency measures. The example of Merkle GmbH & Co. KG shows that an energy audit can also be successfully implemented in a medium-sized company.
- Video 4 – Best practice: Energy management in the field of food production.** The aim of the fourth video is to raise awareness and motivation for the implementation of an energy audit and to implement energy efficiency measures. The example of Ensinger Mineral-Heilquellen GmbH shows that an energy audit can also be successfully implemented in a medium-sized company in the food industry. The development of environmental and energy management over 20 years is shown.
- Video 5 – Best practice: Energy management in the field of chemistry production.** The fifth video aims to raise awareness and motivation for the implementation of an energy audit and to implement energy efficiency measures. The example of Zeller+Gmelin GmbH, shows how a medium-sized company in the chemical industry carried out an energy audit, implemented an energy management system and successfully implemented measures to improve energy efficiency.

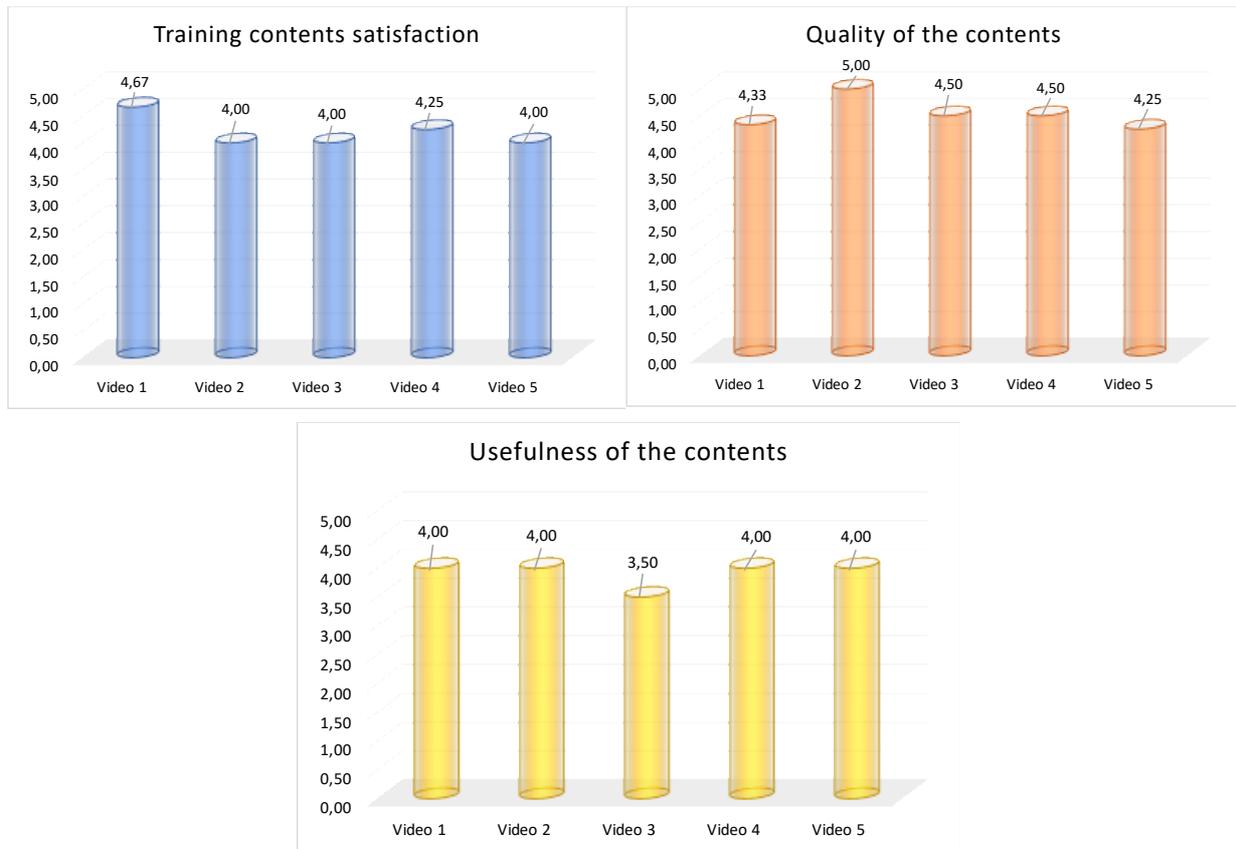
The total views of each single video from November 2020 are recorded in the next table:

Video 1	Video 2	Video 3	Video 4	Video 5
828	332	637	726	1.402

In general, all the videos received a high score in all the fields and the same records of the views have been quite significant.



### Chart n° 7: web-based module evaluation



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.

### 3.3.2. IN SITU training

In Germany UTBW to test the INNOVEAS Capacity Building Program opted for a different approach: instead of running several editions of the same training package<sup>11</sup> UTBW implemented a sort of catalog training consisting of 29 different on-line webinars from which to select those of greatest interest. The idea has been to offer the participants a wide range of different knowledge from which everyone could compile their “own edition” by combining the modules of their personal interest. Thus, it was not mandatory for each participant to attend all the individual modules of a particular edition in order to put together his or her own edition. Rather, each participant could design his or her own personal edition. Nevertheless, the INNOVEAS structure was fully respected by compiling thematically oriented editions.

Following this approach, the program was addressed to CEOs of SMEs, employees of SMEs, energy consultants, energy managers, auditors and other stakeholders previously identified as relevant and the whole structure was divided into the following modules:

<sup>11</sup> As the case of all the other partners.



1. **Certifications and management systems for energy efficiency in SMEs.** In this module the participants have learnt what certification options and management systems are available for energy efficiency and climate protection. Which system makes sense for which company and where are the hurdles to implement it?
2. **Energy efficiency in practice.** In this module the participants have been provided with methods and tips to increase and maintain energy efficiency in the company. First of all, the connection between climate change and energy efficiency has been explained. Afterwards, support networks have been introduced, as well as it has been explained how auditors can be found and support programs have been presented.
3. **Tools for energy efficiency in the company.** The purpose of this module is to present various tools that offer participants in the companies an introduction to climate protection, energy efficiency and management. Thereby the interest as well as the knowledge about energy consumption and emissions of the company shall be strengthened.
4. **Energy efficiency in practice II.** The goal within this series of events is to teach the participants various energy saving options and climate protection measures. Depending on the trade, different areas are addressed, technical basics are explained, problems and their possible solutions are pointed out, and hurdles are removed by means of illustrative examples from practice so that the participating SMEs and stakeholders receive the final push in the direction of energy efficiency

Out of the hundreds of attendances to all the webinars in total 64 participants took part to at least 6 different webinars<sup>12</sup> out of the catalogue coming from 31 different SMEs in the target sector.

As the charts show<sup>13</sup> in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the hosting staff*) as well as the overall quality of the contents delivered.<sup>14</sup> The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been highly appreciated whereas the interest in participating to a free energy pre-audit in the own company and the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was definitely not relevant.<sup>15</sup>

### Chart n° 8: IN SITU training evaluation

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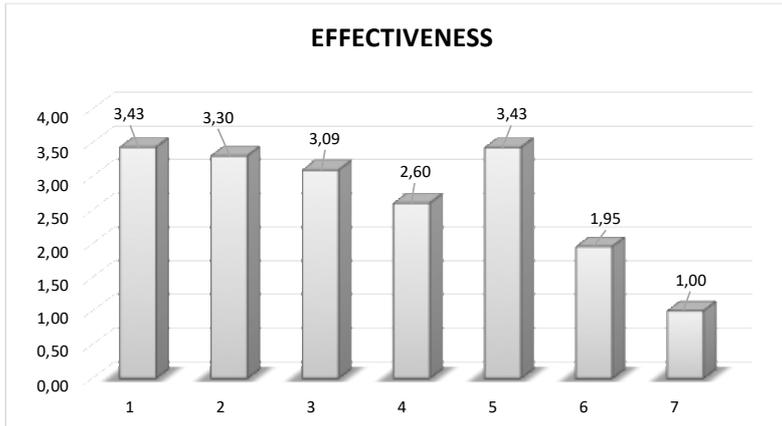
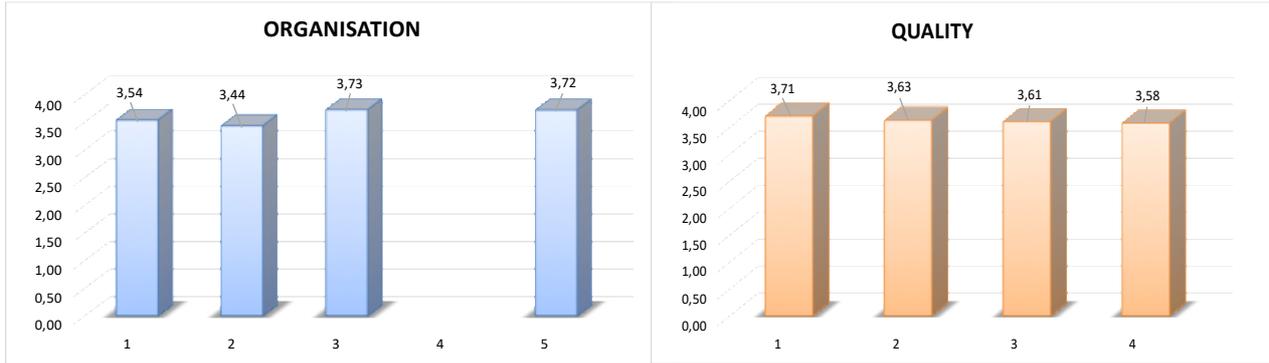
<sup>12</sup> This has been set as the minimum requirement to acquire the basic knowledge provided by Capacity Building Program under this catalogue approach and thus to be included in its testing and assessment.

<sup>13</sup> In order to maintain a conformity and linearity with the other regions the evaluation has considered the training as a whole and not each single webinar providing then assessments based on the average calculation as it's been the case for the different training modules in the other regions

<sup>14</sup> The peculiar formula used did not require a close contact with the coordinator therefore participants did not assess his / her availability.

<sup>15</sup> These scores were the lowest recorded in all the region: probably the catalogue approach did not allow the participants a level of knowledge deep enough to perceive the benefits of the audits itself and the training providers to transmit the whole spectrum for the picture so as to share all the principles and benefits of the audit.





Considering the specific approach used where the participants had the chance to select the most interesting topics from a catalogue of 29 different webinars the indication of the most & worst interested topics made not a real relevance for this assessment. In general, the participants expressed a positive feedback on the topic related to the selected webinar with the only suggestion of providing always concrete examples and best & worst practices coming from the ‘business world’.

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### 3.3.3. IN COMPANY training

The in-company trainings have been designed in two phases:

#### Phase 1

Carrying out a KEFF check in the company. Within the framework of a pre-audit, the most important energy consumers in the company have been identified and named during an on-site inspection of the company. In addition, possible potential for energy savings has been pointed out. The company thus received a written report of the inspection which is the base for phase two.

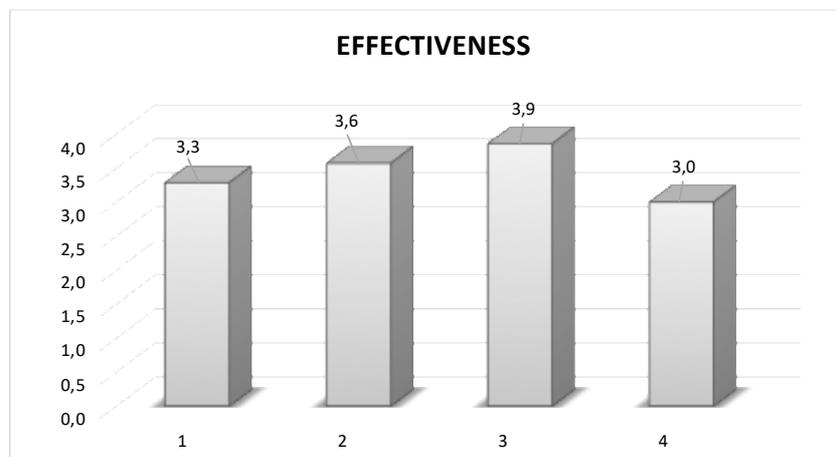
#### Phase 2

The results of the KEFF check (KEFF report) have been discussed with a selection of employees in a joint workshop and thus a roadmap for implementation has been developed. At the beginning, the attitudes and motives of the employees involved were determined in order to be able to derive starting points for the motivation for energy efficiency measures. The employees were activated by describing their personal starting points for energy efficiency and also telling their personal "climate story" based on the Warming Stripes. In a presentation by the facilitator, the key findings on climate protection have been highlighted in a short presentation.

The core of the workshop was then a utility value analysis of all potential measures for improving energy efficiency derived from the KEFF report. From this, an initial roadmap for implementation has been developed for the company.

In total 9 participants took part to the activity coming from 9 different SMEs in the target sector. All of them have highly appreciated the overall quality and efficacy of the activity implemented, as well as the likelihood that the company will implement follow-up measures is totally shared by all the participants. Anyway, the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) encountered some doubts and was not totally confirmed by all the participants.

**Chart n° 9: IN COMPANY training evaluation**





### 3.4. Spain

#### 3.4.1. Web based modules

Following the project shared structure, in Spain A3E implemented the following 5 videos:

- **Video 1 – Introduction to energy audit.** The purpose of the training videos is to provide basic information to enterprises in order to create a sense of curiosity and awareness on the advantages of energy audits, so therefore start approaching SMEs to be involved in the Capacity building programme. The purpose of this first video is to introduce and present what an energy audit is, to understand how a company consumes energy and which are the possibilities to improve energy performances.
- **Video 2 – Incentives to energy audits and energy efficiency measures for SMEs.** The purpose of the training videos is to provide basic information to enterprises in order to create a sense of curiosity and awareness on the advantages of energy audits, so therefore start approaching SMEs to be involved in the Capacity building programme. The purpose of the second video is to inform about supporting policies and incentives (both at national and regional level) to promote energy transition of business companies.
- **Video 3 – Best Practices in the food industry.** The purpose of the training video is to provide basic information to enterprises in order to create a sense of curiosity and awareness on the advantages of energy audits, therefore start approaching SMEs to be involved in the Capacity building programme. The purpose of third video is to illustrate advantages, possibilities and results from best practices in the food industry.
- **Video 4 – Best Practices in the construction industry.** The purpose of the training video is to provide basic information to enterprises in order to create a sense of curiosity and awareness on the advantages of energy audits, so to start approaching SMEs to be involved in the Capacity building programme. The purpose of fourth video is to illustrate advantages, possibilities and results from best practices in the construction industry.
- **Video 5 – Best Practices in the chemistry industry.** The purpose of the training video is to provide basic information to enterprises in order to create a sense of curiosity and awareness on the advantages of energy audits, therefore start approaching SMEs to be involved in the Capacity building programme. The purpose of the fifth video is to illustrate advantages, possibilities and results from best practices in the Chemistry industry.

The total views of each single video from November 2020 are recorded in the next table:

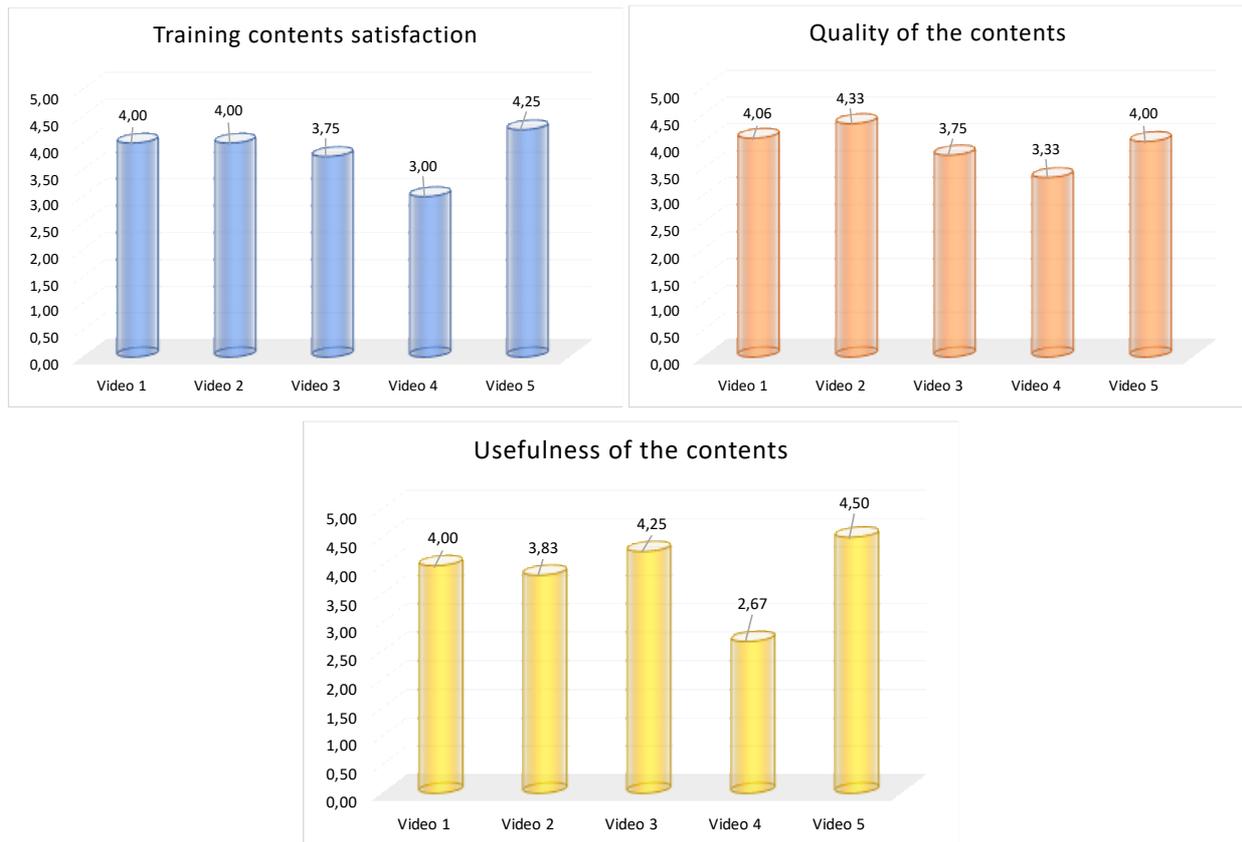
Video 1	Video 2	Video 3	Video 4	Video 5
1.161	268	304	449	1.657





As the following charts show Videos 1 and 5 have been in general highly positive assessed both in terms of quality / satisfaction of the contents provided and also on the level of usefulness as perceived by the viewers, being also the ones with the highest number of views. On the contrary Video 4 has recorded the lower scores despite the good number of views.

**Chart n° 10: web-based module evaluation**



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.

### 3.4.2. IN SITU training

The 16-hour programme has been divided into 4 lessons. Because of the health emergency related to COVID-19, the training has been implemented in online synchronous modality.

The target group addressed consisted of Managers, energy managers, quality and environmental managers and maintenance personnel of SMEs.

In short, the course with a title *“Towards zero-emission industrial SMEs”* 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 and have been displayed in the following 4 modules:

#### 1) INTRODUCTION





- Introduction to the course and presentation of the participants
- Need to act now
- Overcoming obstacles:
- Energy audit as a starting point

### 2) ENERGY EFFICIENCY BENEFITS

- Economic savings (bill optimization, power purchase),
- Energy savings with monitoring and remote control of energy consumption
- Energy savings with thermal insulation
- Energy efficiency measures in food, chemistry and construction companies
- Conclusions: Assess the benefits, costs vs. Benefits
- Climate audit: carbon footprint calculation

### 3) GREEN ECONOMY AND ENABLING ENVIRONMENT

- Green economy and green marketing
- Certificates
- Enabling context: Regulatory framework, Energy Agencies and public support; Private financing mechanisms

### 4) IMPLEMENTATION

- Other measures and possible actions
- Case Studies: Measures implemented and results in SMEs
- Climate Audit/Carbon Footprint Exercise in food, chemical and construction companies
- Tailor made solutions: Positive and negative aspects of each SME, Roadmap to energy transition

In total 84 participants, coming from 68 different SMEs in the target sector, took part to the training.

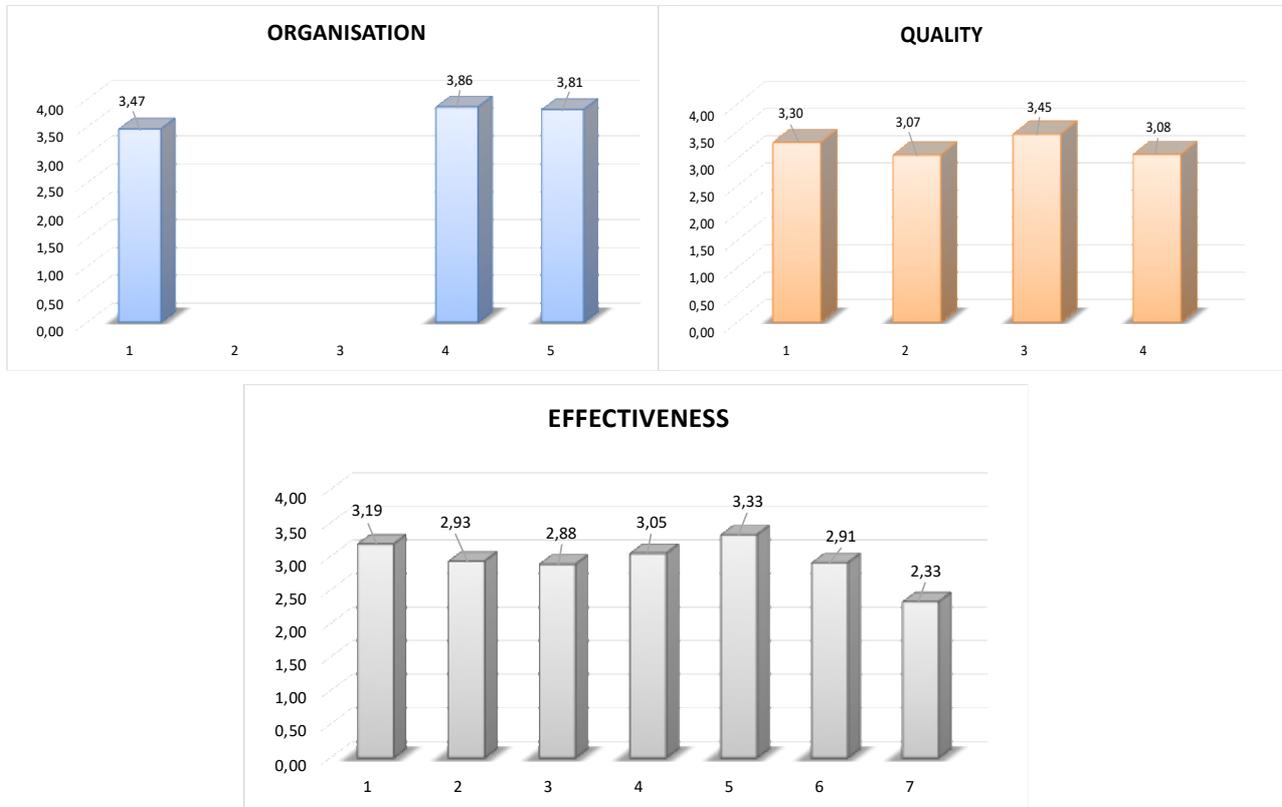
As the charts show in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the hosting staff*) as well as the overall quality of the contents delivered.<sup>16</sup> The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been appreciated whereas the real interest in participating to a free energy pre-audit for the same company and in adopting a Certified energy management system (e.g. ISO 50001:2018) was not jointly shared by all the participants.

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<sup>16</sup> Having held the whole training on-line the partner here did not ask the participants to rate the available training tools neither the secretary desk service, whereas other partners considered relevant to let the participants assess services anyway provided.



Chart n° 11: IN SITU training evaluation



Most interesting topics	Less interesting topics	Topics to be further explored
<ul style="list-style-type: none"> <li>• Energy audits</li> <li>• Examples of improvement actions / real cases</li> <li>• Calculating the carbon footprint</li> <li>• Reputation and Green Marketing</li> <li>• Energy incentives</li> <li>• Energy efficiency measures and different types of renewable energy and its operation</li> </ul>	<ul style="list-style-type: none"> <li>• Legislation and regulations</li> <li>• Optimization of the invoice, purchase of energy</li> <li>• Corporate Social Responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiation for the purchase of energy</li> <li>• Green marketing</li> <li>• Green reputation</li> <li>• Financial instruments</li> <li>• Circular economy</li> <li>• Carbon footprint calculation</li> <li>• Energy audits for energy efficiency</li> </ul>

\*The table quotes the different answers collected by the participants to the IN-SITU training activity anonymously, thus conflicting views simply reflect the opinion of different people.

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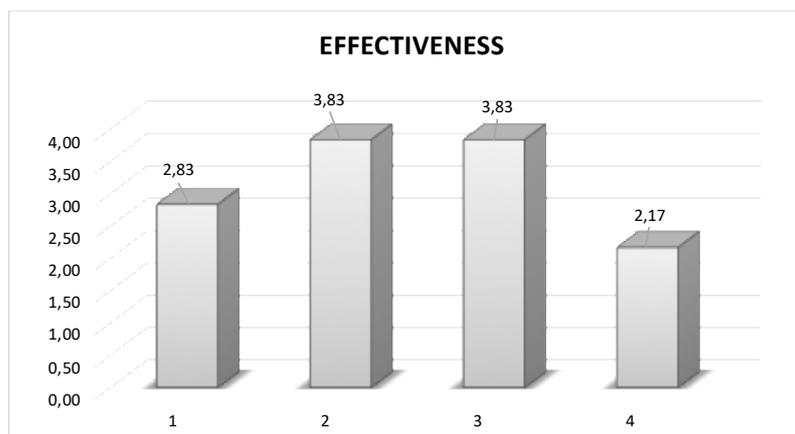
### 3.4.3. IN COMPANY training

A very interested company is selected among the in-situ training participants. The In-company training consists of 3 meetings:

- i. an online meeting for the SME and the auditing company to get to know each other. In this meeting, the SME describes its activity and facilities and details its concerns and needs in relation to energy efficiency measures;
- ii. a first face-to-face visit in which the auditing company will collect all the information necessary to prepare the pre-audit report. Prior to this first visit, both companies are in contact by email or telephone to share information on invoices, equipment inventories and previous studies carried out. The auditing company will need a couple of weeks to collect all the information and to prepare the report;
- iii. in the second visit, the auditing company comes 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.

In total 15 participants took part to the activity coming from 6 different SMEs in the target sector. All of them have highly appreciated the overall quality and efficacy of the activity implemented, whereas the likelihood that the company will implement follow-up measures is not completely shared by all the participants. The same real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was really weak as an average on all the participants.

**Chart n° 12: IN COMPANY training evaluation**





### 3.5. Poland

#### 3.5.1. Web based modules

In line with the project shared structure, in Poland NAPE implemented the following 6 videos:

- **Video 1 - What is Energy efficiency and how to proceed with an audit in SME.** The first video explains what is the energy efficiency and how to measure it and what the energy audit is and steps to conduct an audit in SME.
- **Video 2 - Energy management system – ISO 50001 and ESCO formula.** The second video explains how to introduce EMS in SMEs and how to implement it according to ISO regulations; to explain how ESCOs formula works and how it can be used in SMEs.
- **Video 3 - Programme „Energia Plus”.** The purpose of the third video is to introduce the national support programme „Energia Plus” run by National Fund for Environmental Protection and Water Management. Target audience: All enterprises including SME’s.
- **Video 4 - White Certificate scheme.** The fourth video explains and introduces the national support scheme “White Certificates”. The video contains the explanation of what are the White Certificates and how the entrepreneur can obtain them. Detailed procedure on requirements, documentation and necessary steps is explained.
- **Video 5 - Heat pumps in food processing.** The purpose of the fifth video is to explain how the heat pump works and how it can be used in food processing sector. The video contains a technical explanation on how the heat pump works.
- **Video 6 - 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.

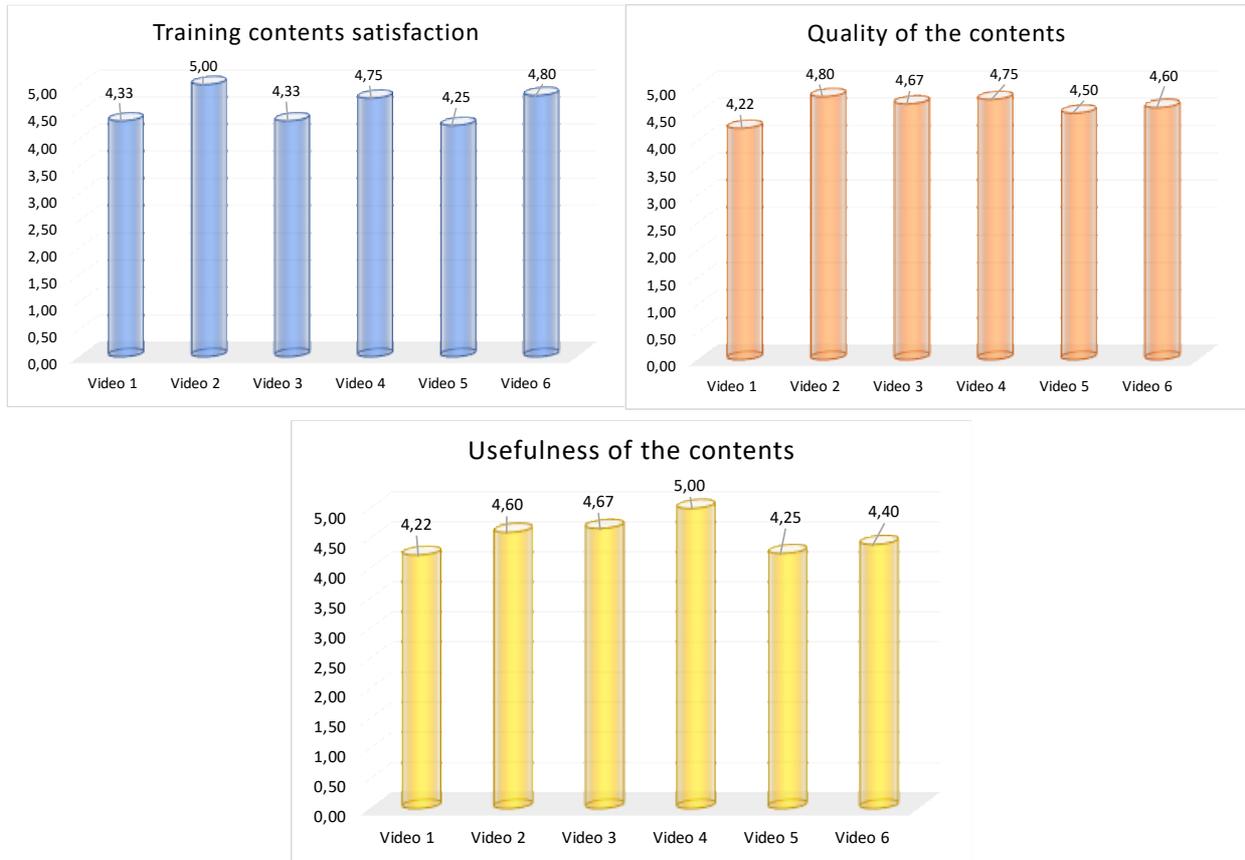
The total views of each single video from November 2020 are recorded in the next table:

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

As the following charts show Videos 2 and 4 have been in general highly positive assessed both in terms of quality / satisfaction of the contents provided and also on the level of usefulness as perceived by the viewers, being also among the ones with the highest number of views. Anyway, all the videos have recorded a ‘more than good’ level of satisfaction.



### Chart n° 13: web-based module evaluation



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.

### 3.5.2. IN SITU training

The 16-hour program has been divided into 4 Modules. Because of the health emergency related to COVID-19, the training has been implemented in online synchronous modality. The target group addressed consisted of personnel of SMEs in the food or chemical production sectors.

In short, the course with the title *“Improvement of energy efficiency in your SME”* aimed to improve energy efficiency in SMEs from food or chemical production sector suggesting ways to optimize and control energy usage, source of financing of energy efficiency measures. In details the course has been displayed in the following 4 modules:

#### Module 1

What is energy efficiency and enterprise energy audit. Workshops: calculating the energy balance and unit energy costs for a product.

#### Module 2





Methods of searching for improvements - examples of modernization and methods of calculating their energy, ecological and economic effect. Workshop: Estimating which devices have the greatest potential for energy savings.

### Module 3

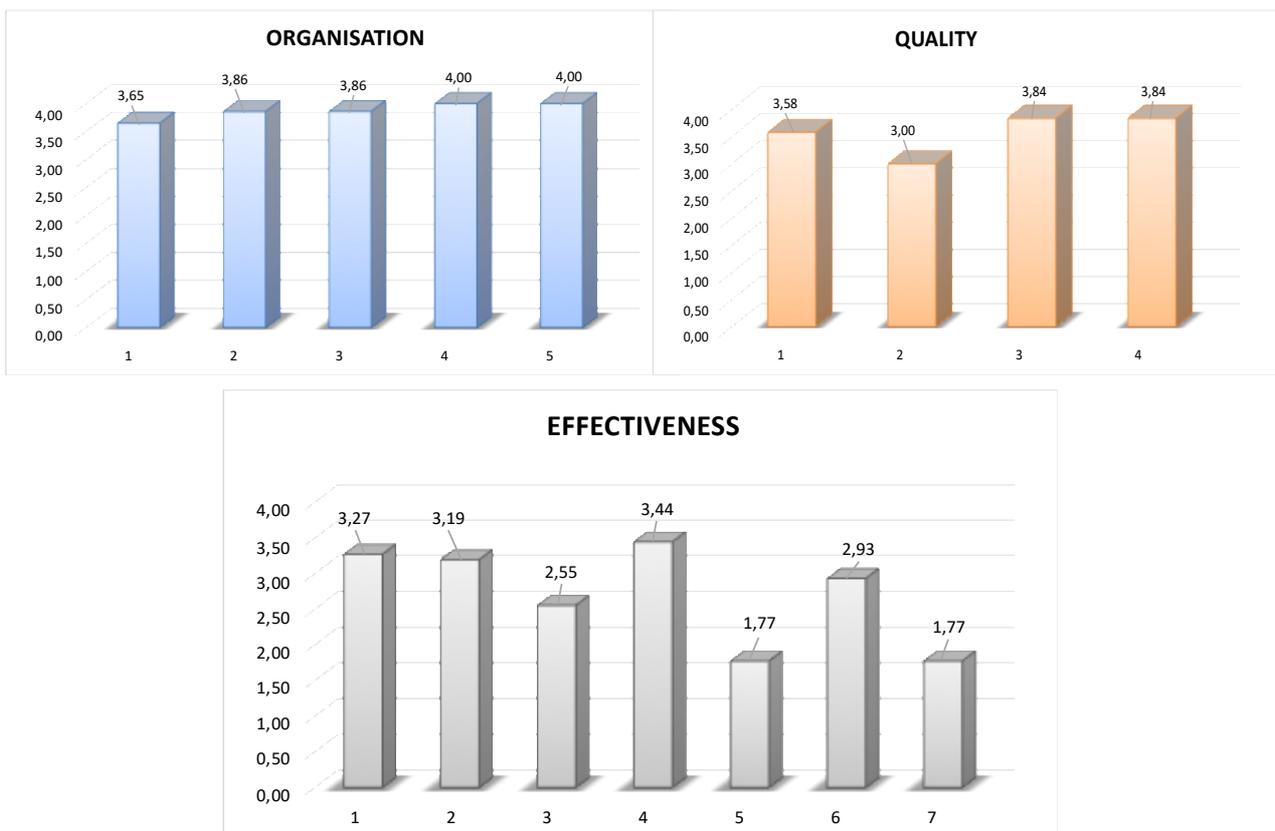
Energy Management Systems according to the ISO 50001 standard, and non-investment methods of reducing energy costs. Workshop: ISO 50001 implementation plan in a sample organization.

### Module 4

Financing the improvement of energy efficiency - support programs, white certificates. Energy costs, tariffs, adjustment of the ordered power. Workshops: calculating the possibility of co-financing the modernization.

In total 51 participants took part to the training coming from 44 different SMEs in the target sector.

Chart n° 14: IN SITU training evaluation



As the charts show in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the hosting staff*) as well as the overall quality of the contents delivered. The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been appreciated whereas the real interest in





adopting renewable energies in the company and in adopting a Certified energy management system (e.g. ISO 50001:2018) was not specifically concrete.

Most interesting topics	Less interesting topics	Topics to be further explored
<ul style="list-style-type: none"> <li>• White Certificate Scheme</li> <li>• Financing the investments</li> <li>• Energy savings</li> <li>• ESCOs</li> <li>• Heat recovery</li> <li>• CO2 emissions</li> <li>• Energy management systems</li> <li>• Energy audits</li> <li>• Energy incentives</li> <li>• Energy efficiency tools</li> <li>• Best practices</li> </ul>	<ul style="list-style-type: none"> <li>• Financial loans</li> </ul>	<ul style="list-style-type: none"> <li>• Heat recovery</li> <li>• Energy audit</li> <li>• Financial instruments for the implementation of the energy transition</li> <li>• White Certificate Scheme</li> <li>• Costs reduction</li> </ul>

\*The table quotes the different answers collected by the participants to the IN SITU training activity anonymously, thus conflicting views simply reflect the opinion of different people.

### 3.5.3. IN COMPANY training

In company training is a structured cooperation with an SME, based on logic defined in energy auditing methodology. It can be therefore divided in 6 distinctive steps:

1. **Opening meeting** – training with representatives responsible for energy usage, CO2 emission.
2. **Data collection** – energy auditor explains how-to and collect data with the SME
3. **Fieldwork** – joint cooperation with SME Training Leader on the premise of an SME, walk-through, interviews with employees and inventory of energy sources, assess the existing energy use in the facility, examine operating procedures and user behaviour that affect consumption and energy efficiency.
4. **Data analysis** – analysis of the existing state of energy consumption and possible improvements.
5. **Report** – Trainer presented typical draft of the report from energy audit which will allow SME Training Leader to develop own report.
6. **Closing meeting** – SME Training Leader, backed up by the Trainer, presented the report to the SME training group. The Trainer provided dedicated training on main outcomes and ways to improve energy efficiency and strategies to reduce CO2 emission, and possible scenarios for achieving climate neutrality in this particular SME. The conclusions were discussed preferably with the SME management representative during workshop.

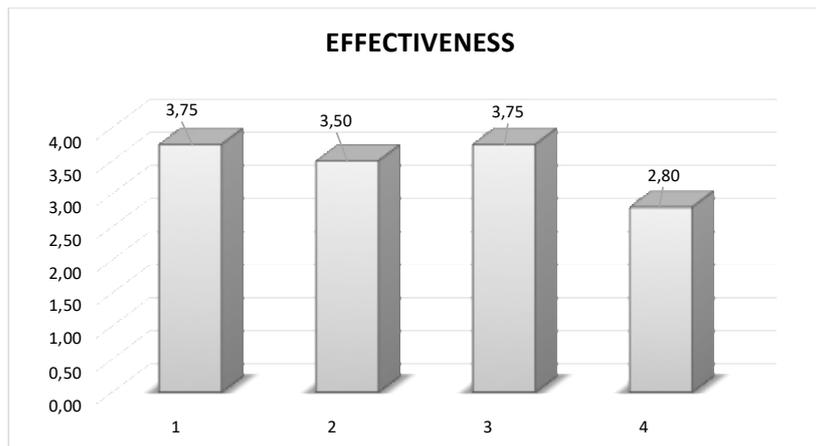
In total 22 participants took part to the activity coming from 6 different SMEs in the target sector. All of them have highly appreciated the overall quality and efficacy of the activity





implemented, and the likelihood that the company will implement follow-up measures is almost shared by all the participants. The same real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was confirmed by the most of the participants resulting on a good average.

**Chart n° 15: IN COMPANY training evaluation**





### 3.6. Slovenia

#### 3.6.1. Web based modules

Following the project shared structure, in Slovenia LEAG implemented the following 5 videos:

- **Video 1 – Basic information on energy audits.** The first video focuses on introducing the viewer with energy audit and key steps in conducting the audit in small and medium enterprises. It presents why it is important to address the subject of energy efficiency in the project and how to approach the process of energy auditing of the company.
- **Video 2 – Subsidies: Eco fund.** Making an energy audit and investing in energy efficiency represent can be a major financial burden for small and medium-sized enterprises. As increasing energy efficiency and reducing emissions is one of the key challenges of modern times, it is essential that these types of measures are also financially supported. In Slovenia, the Eco Fund plays a leading role in the field of allocating subsidies for energy efficiency measures. Fund's main purpose is to promote development in the field of environmental protection. Video 2 is a talk with Eco Fund representative who offers useful information about subsidies that are available.
- **Video 3 - Local peculiarities.** Slovenia has set itself ambitious targets. Concrete measures will be taken to secure a 36% decrease in greenhouse gas emissions by 2030 relative to 2020. Another target for 2030 is to increase energy efficiency by at least 35% and increase the share of renewable energy to at least 27%. LEAG believes that it is important for SMEs in Slovenia to know and understand key aspect and goals regarding energy efficiency and environment. That is why we had representative of Ministry of Infrastructure to talk about local peculiarities. The second part of the video is a interview with representative of SIQ that is certified for issuing ISO50001. She talks about ISO certificates and local properties.
- **Video 4 - Examples of good practice in the construction sector.** It is extremely important for SMEs to obtain information through the eyes of their peers, fellow entrepreneur or person who is dealing with similar views and challenges. That is why LEAG has interviewed the director of SME Gorenjske elektrarne, to share his experience regarding energy efficient measures in company, challenges on their path, advises and views on energy efficiency, ISO 50001, and renewable energy sources.
- **Video 5 - Examples of good practice in the food sector.** In the first 3 videos LEAG mainly talked with experts and policy makers, that have a different point of view and are most often not familiar with everyday challenges, issues and way of thinking in SMEs. Therefore, this video aims to present experiences and concrete actions, described directly by the persons that have got benefits from them. LEAG have interviewed two companies that are operating in food sector in Slovenia.

The total views of each single video from November 2020 are recorded in the next table:

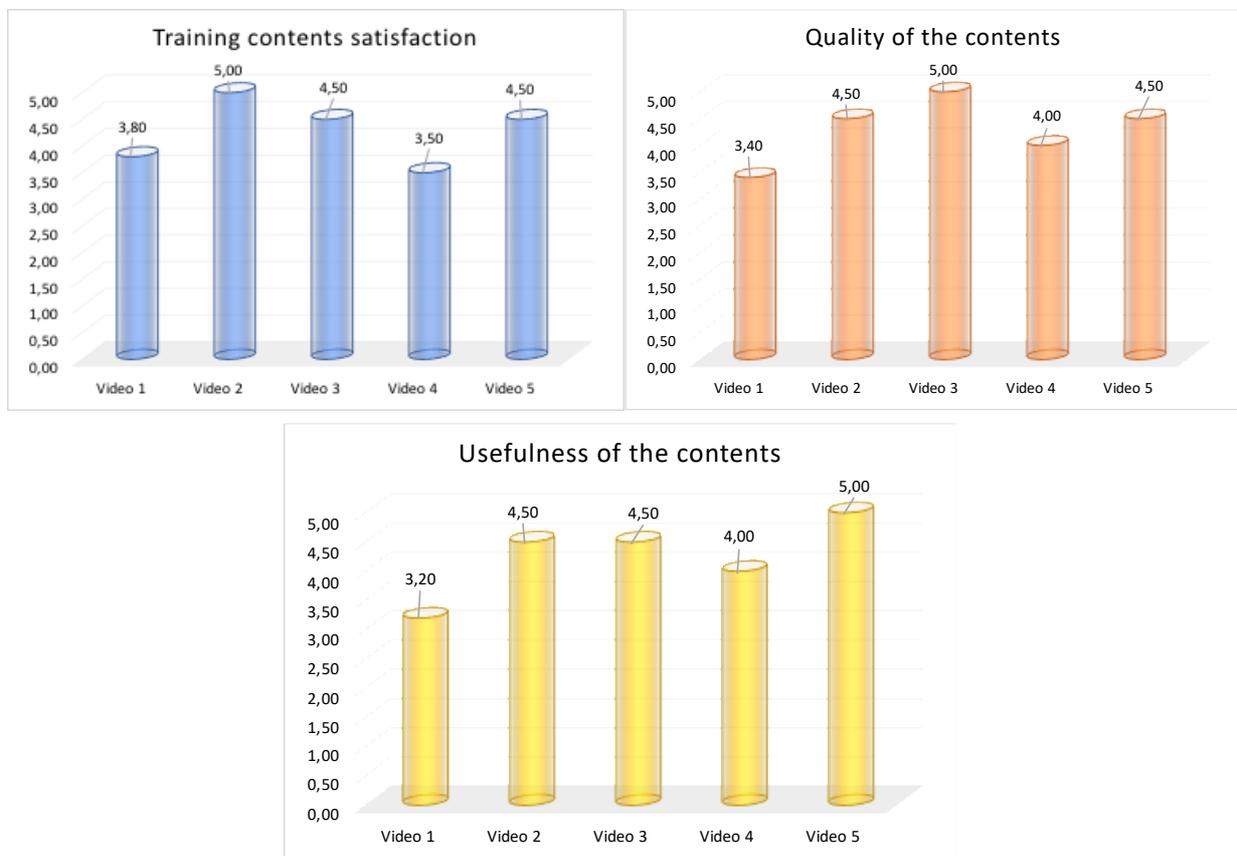




Video 1	Video 2	Video 3	Video 4	Video 5
113	106	69	106	83

In general, all the videos received a high score in all the fields with the only exception of video 1 [*Basic information on energy audits*] whose feedbacks have been just less than good both in terms of quality / satisfaction of the contents provided and also on the level of usefulness as perceived by the viewers, despite the fact that it was the ones with the highest number of views.

**Chart n° 16: web-based module evaluation**



Finally, all the viewers participating in the poll declared themselves interested in following also the other videos on this part of the Capacity Building Program.





### 3.6.2. IN SITU training

The 16-hour program has been divided into 4 lessons. Because of the health emergency related to COVID-19, the training has been implemented in online synchronous modality. The target group addressed consisted of personnel of SMEs in the construction, chemistry and food sectors.

In short, the course with the title *“Increasing energy efficiency in small and medium-sized enterprises”* aimed to empower and educate SMEs about the tools, actions and measures that they can use to improve their energy efficiency, rise usage of renewable energy sources, reduce their expenditure, improve their products and activities, consolidate their market position and make an important contribution to the fight to reduce environmental impact and nature conservation. In details the course has been displayed in the following 4 modules:

#### **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)

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)

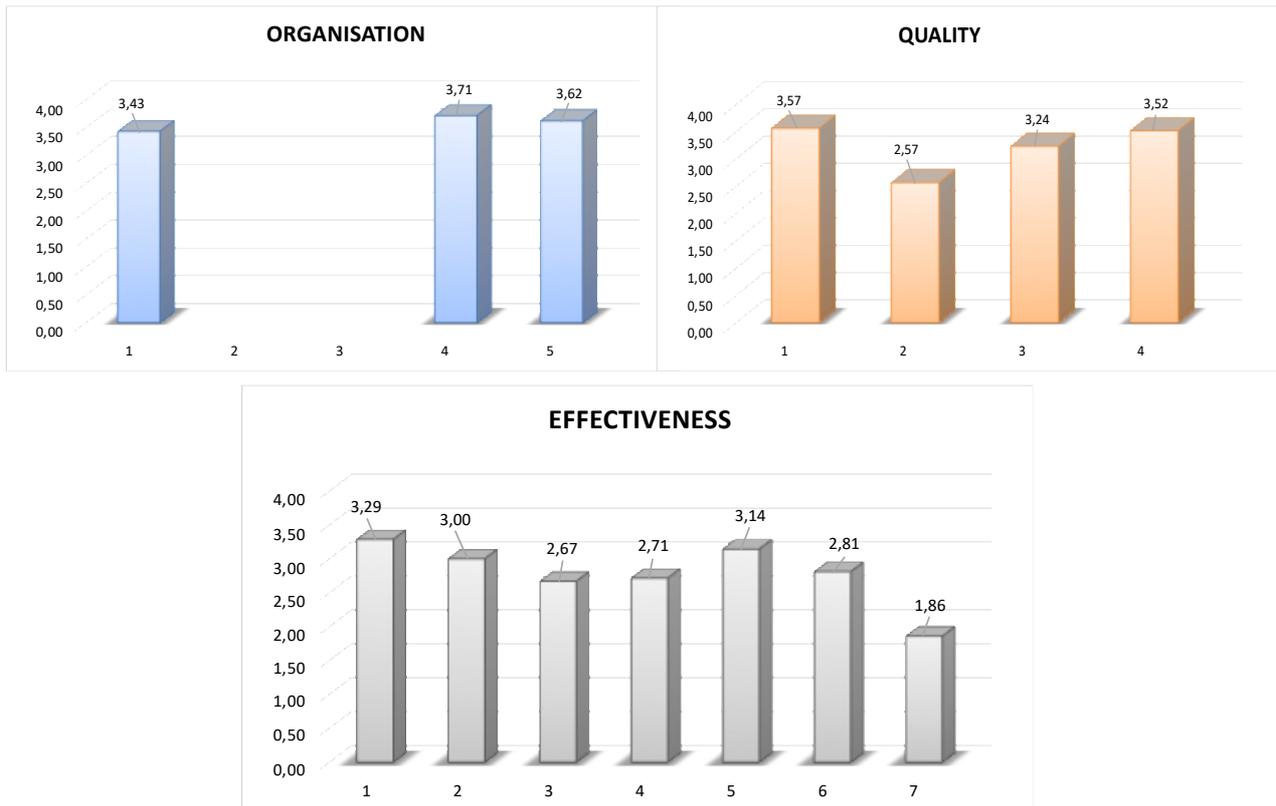
In total 48 participants took part to the training coming from 35 different SMEs in the target sector.

As the charts show in general participants have highly appreciated the overall training organization and delivery (*in terms of materials and tools provided and the support by the hosting staff*) as well as the overall quality of the contents delivered (the only perplexity was



related to the length of the course).<sup>17</sup> The same effectiveness of the in-situ training (*intended as the effective ability to acquire the contents and their relative usefulness within the business process*) has been appreciated whereas the real interest in participating to a free energy pre-audit for the same company and in adopting a Certified energy management system (e.g. ISO 50001:2018) was not jointly shared by all the participants (*here the average shifts from “not at all and “few” interested*).

**Chart n° 17: IN SITU training evaluation**



Most interesting topics	Less interesting topics	Topics to be further explored
<ul style="list-style-type: none"> <li>• Thermography, economic analysis of projects</li> <li>• Renewable energy sources, examples from practice</li> <li>• Energy audits</li> <li>• Financing energy efficiency projects</li> <li>• Energy efficiency tools</li> <li>• Energy management in buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Laws and regulations</li> <li>• Collecting energy consumption data</li> <li>• Energy management</li> <li>• Integration of RES systems in buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Energy reduction measures</li> <li>• Practical advice and examples of good practice</li> <li>• Financial instruments for the implementation of the energy transition</li> <li>• Useful and realistic technical solutions</li> <li>• Cooling solutions</li> </ul>

<sup>17</sup> Having held the whole training on-line the partner here did not ask the participants to rate the available training tools neither the secretary desk service, whereas other partners considered relevant to let the participants assess services anyway provided.



<ul style="list-style-type: none"> <li>• Energy communities and infrastructure integration</li> <li>• Heating and influencing factors</li> <li>• Thermal inspections in SMEs</li> </ul>		
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\*The table quotes the different answers collected by the participants to the IN-SITU training activity anonymously, thus conflicting views simply reflect the opinion of different people.

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### 3.6.3. IN COMPANY training

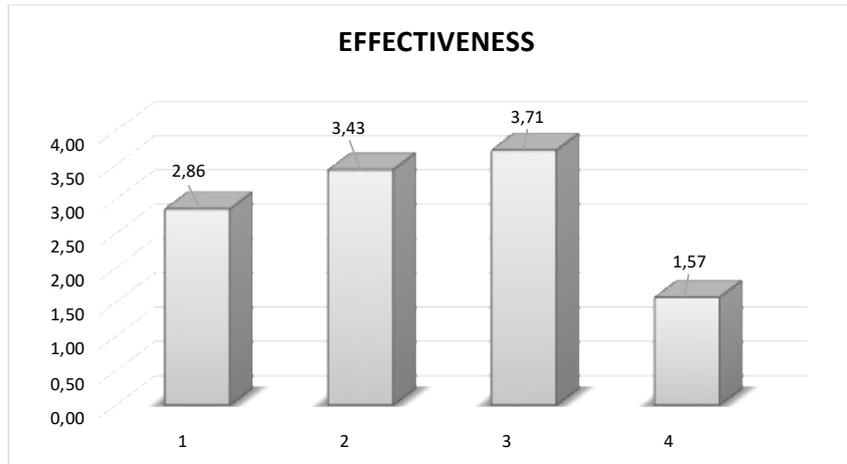
In company trainings were offered and promoted throughout the INNOVEAS promotion campaign. Promotion for individual trainings and pre-audit was done in public events, through various online meetings with different stakeholders, flyers, emails, direct phone calls and especially in in-situ trainings. In order to produce an even bigger impact and help SMEs in the first steps of their efforts for improving energy efficiency, the partner visited and helped them with instructions, measurements, inspection and solutions for lowering their energy usage and expenses. We got in touch with the companies with the help of chambers, as stated above. This collaboration proved out to be crucial, because it could be difficult for not familiar actors (in this case LEAG) to gain the trust of SMEs in order to visit them. SMEs in Slovenia are careful with information and allocation of their time and resources. We designed our trainings in three phases. We held an online meeting/phone call – where we presented SMEs with the plan, instructions about gathering the necessary data (energy expenses, specifications, basic information, etc.), pre-audit content, and time frame of the visit, and pre-audit process. We then visited the companies, inspected their facilities, production lines, disused possibilities for improvement, looked through their energy expenses etc. We presented them our training materials, and we discussed which topics would be most suitable for them. Then we presented them the topics with the emphasis on the actions that were most suitable for their company. In the third phase results of the pre-audit with recommended measures were presented.

In total 15 participants took part to the activity coming from 7 different SMEs in the target sector. All of them have highly appreciated the overall quality and efficacy of the activity implemented, whereas the likelihood that the company will implement follow-up measures is not completely shared by all the participants. The same real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was really weak as an average on all the participants.





Chart n° 18: IN COMPANY training evaluation





## 4. Impacts evaluation [KPIs]

### 4.1. Description of KPIs

In the following, the four Key Performance Indicators (KPIs) of INNOVEAS are described. These KPIs are indicators to measure the success of the project. This offers the opportunity to analyse and assess the projects outcomes.

The description includes the potential of energy savings (*Table 1: Energy KPI - Energy Savings*Table 1), the potential of renewable energy production (Table 2), the potential of CO<sub>2</sub> emission savings (





Table 3) and investment in renewables and EE that are triggered by INNOVEAS (

Table 4).

The methodology of the calculations to identify the KPIs is described in the following chapters.

*Table 1: Energy KPI - Energy Savings*

KPI Name	Final energy savings
Typology	Energy Indicator
Type of assessment	Quantitative
Unit of measure	GWh/year
Description	The calculated final energy savings show the amount of electrical and thermal energy that can be saved by energy saving concepts, provoked by INNOVEAS. Saving energy is one of two energy KPIs so it's an indicator that can be changed directly.

*Table 2: Energy KPI - Renewable Energy Production*

KPI Name	Renewable Energy Production
Typology	Energy indicator
Type of assessment	Quantitative
Unit of measure	GWh/year
Description	The Renewable Energy Directive of the EU says that the share of renewables has to be increased to 32 % by 2030, which will be supported by INNOVEAS. To validate the impact of INNOVEAS, the Potential of renewables has to be calculated here. This KPI can be changed directly as well.





*Table 3: Ecological KPI - CO<sub>2</sub> emission savings*

<b>KPI Name</b>	<b>CO<sub>2</sub> emission savings</b>
<b>Typology</b>	Emission indicator
<b>Type of assessment</b>	Quantitative
<b>Unit of measure</b>	tons/year
<b>Description</b>	The CO <sub>2</sub> emission savings can be done by using less energy or rising up the level of renewable energies. So, this KPI is a result of changing the energy KPIs. Because of its role in climate change this KPI can be taken as indicator of support on climate protection. As CO <sub>2</sub> is not that easy to regulate, this KPI can only be changed indirectly by improving the energy KPIs.

*Table 4: Economic KPI - Triggered Investments in Renewable energies and energy efficiency*

<b>KPI Name</b>	<b>Triggered Investment in renewables and EE</b>
<b>Typology</b>	Economic indicator
<b>Type of assessment</b>	Quantitative
<b>Unit of measure</b>	Euro
<b>Description</b>	INNOVEAS will raise the investments in renewable energy. To evaluate that impact this fourth KPI has to be depicted. Like CO <sub>2</sub> , this KPI can only be changed indirectly by improving the energy KPIs.



## 4.2. INNOVEAS targets

### 4.2.1. Clarification about the precision of the data

Before having a look on the calculations and energetic impact of the project it must be clarified that the results may have a tolerance because of the assumption that had to be made.

Many assumptions were made as there had to be assumed a basic that doesn't differ within the calculations. Simplifications needed to be taken as every participant has his own specifications that can't be fully considered. Variables mentioning all calculations are average values that must be assumed.

These factors lead to some inconsistency into the calculations but are inevitable as of the variance of the training participants.

### 4.2.2. Calculation of INNOVEAS targeted impacts

The calculation of the targeted INNOVEAS impacts considers two different scenarios in energy saving potentials in different fields, to picture the range of impacts. The two scenarios differ in the level of energy efficiency measures. The first scenario considers improvements in energy efficiency between 5 % to 30 %, depending on the consumer. The second scenario assumes a higher level in energy efficiency. In fact, the energy efficiency ranges between the double and triple rate of scenario 1. Thus, a reduction of energy consumption is considered in the range from 10 % to 70 %. In the following, scenario 1 is also referred as “target 1” or “minimum”, whereas scenario 2 is referred as “target 2” or “optimum”. Table 5 shows the reduction in energy consumption for different applications.

*Table 5: Saving potentials for two different scenarios*

Energy saving potentials	Process heat	Mechanical energy	Space heating	Lightning	Cooling
Share of final energy (%) <sup>18</sup>	64.4	21.8	8.7	1.5	1.4
Scenario 1 = low savings (%) <sup>19</sup>	5	10	10	30	10
Scenario 2 = high savings (%) <sup>20</sup>	10	20	25	70	30

### **Final energy savings**

<sup>18</sup> [https://www.bmwi.de/Redaktion/DE/Downloads/Energiedaten/energiedaten-gesamt-pdfgrafiken.pdf?\\_blob=publicationFile&v=14](https://www.bmwi.de/Redaktion/DE/Downloads/Energiedaten/energiedaten-gesamt-pdfgrafiken.pdf?_blob=publicationFile&v=14), last access on June 5<sup>th</sup>, 2017

<sup>19</sup> Christian Lehmann, Energy Efficiency in Germany – Potential, Measures & Lessons Learnt, AHK Conference “Opportunities for Energy Efficiency in South Africa”, May 31<sup>st</sup>, 2017, Johannesburg, South Africa

<sup>20</sup> [https://www.dena.de/fileadmin/dena/Bilder/Newsroom/Mediathek/Infografiken/Einsparpotenziale\\_in\\_Industrie\\_druck.jpg](https://www.dena.de/fileadmin/dena/Bilder/Newsroom/Mediathek/Infografiken/Einsparpotenziale_in_Industrie_druck.jpg), last access on June 5<sup>th</sup>, 2017





Energy savings are the first step to make processes more climate friendly and is strongly dependant on energy efficiency measures. To estimate the potential energy savings bound to INNOVEAS project, following five variables have been consulted. For the first three points literature values need to be taken.

- Statistics on final energy consumption (electrical + thermal)

Source: 45urostat nrg\_105a (2017), nrg\_106a (2017)

- Statistics on CO<sub>2</sub> emissions

Source: 45urostat env\_ac\_ainah\_r2 (2017)

- Number of companies per targeted sector

Source:

- Percentage of savings per scenario and sector

Source: see Table 5

- Distribution of energy by field of application (e.g. space heating)

Source:

Equation 2.1 shows the energy consumption  $Q_n$  of one field of application, e.g. space heating. Therefore, it's needed to know the average total energy consumption of one company from one sector, which is given by the division of the total energy consumption  $Q_{e+th}$  and the number of companies in this sector  $company_{tot/sec}$ . Additionally it must be known how many companies per sector take part at the questionnaire of INNOVEAS. So finally, the average of total energy consumption is multiplied by the number of companies of the sector who take part on INNOVEAS  $company_{sec}$ , the chosen saving scenario  $scen_{1,2}$  and the distribution of the specific field of application  $dis_n$ . In table 6 the default values of the distribution by each field of application are shown.

Table 6: Distribution of fields of application

Field of Application	Process Heat	Mechanical Energy	Space Heating	Lighting	Cooling
Distribution (%)	64.4	21.8	8.7	1.5	1.4

By summarizing the energy demands of the different fields, the total energy savings of one sector can be calculated.

Note: n is the indices of the different fields of application like Process Heat or Space Heating.

$$Q_n = \left( \frac{Q_{el.+th.}}{company_{tot}} \right) * (dis_n * \%scen_{1,2}) * company_{sec} \quad [2.1]$$





$$Q_{\text{company\_tot}} = \sum_{k=0}^n (Q_1 + Q_2 + \dots + Q_n) \quad [2.2]$$

$Q_x =$	<i>amount of energy (consumption or savings)</i>
$company_{\text{tot}/\text{sec}} =$	<i>whole number of companies in the sector</i>
$dis_n =$	<i>distribution of the field of application</i>
$scen_{1,2} =$	<i>scenario</i>
$company_{\text{sec}} =$	<i>number of companies in the sector, participating in INNOVEAS</i>

### Renewable Energy production

In the second step, the required energy should partly be replaced by renewable energy. To calculate the potential of renewable energy production, it's necessary to know the following variables.

- List of selected sectors with number of companies per sector
- The EU energy directive, which shows the goal of portion of renewable energy

Equation 2.3 shows the potential of renewable energy  $Q_{re,n}$ , triggered by the 35 % goal of the European renewable energy directive and calculated on the number of companies by sector  $company_{\text{sec}}$ , participating at INNOVEAS survey. As factor of increasing the renewable energy,  $a$  is assumed to be 1.35.

$$Q_{re,n} = \left( \frac{Q_{re,tot,current,sec}}{company_{\text{tot}/\text{sec}}} \right) * a * company_{\text{sec}} \quad [2.3]$$

$a =$	<i>factor of the share of renewable energies</i>
$Q_{(re,tot,current,sec)} =$	<i>renewable energy that is currently used in total in one sector</i>

### CO2 emission savings

The annual savings of emissions of CO<sub>2</sub> is an environmental KPI that can be taken as the decisive factor in general. To make a statement about the potential of saving climate change driving gases it's essential to know the following variables.

- List of selected sectors with number of companies per sector
- The EU energy directive, which shows the goal of portion of renewable energy

Thereby the saved emissions  $e_{\text{saved}/\text{sec}}$  of one sector can be calculated like following. The total emissions of one sector  $e_{\text{tot},\text{sec}}$  have to be divided by the absolute number of companies  $company_{\text{tot}/\text{sec}}$  in that sector. Further the result has to be multiplied by the number of participating companies  $company_{\text{sec}}$  of the sector and the division of the total energy consumption  $Q_{\text{tot},\text{sec}}$  and the scenario  $scen_{1,2}$ .





$$E_{\text{saved/sec}} = \left( \frac{e_{\text{tot,sec}}}{\text{company}_{\text{tot/sec}}} \right) * \left( \frac{Q_{\text{tot,sec}}}{\text{scen}_{1,2}} \right) * \text{company}_{\text{sec}} \quad [2.4]$$

$$Q_{\text{company\_tot}} = \sum_{k=0}^n (Q_1 + Q_2 + \dots + Q_n) \quad [2.5]$$

*E = emissions of CO<sub>2</sub> per sector*

### Triggered Investments in renewables and EE

To estimate the triggered financial impact, the investments in renewables and energy efficiency measures, 50 € per MWh saved are assumed. So the only variable that must be known is the amount of energy that will be saved or provided by renewables. It easily can be multiplied.

For the estimation of the investments in sustainable energy, triggered by INNOVEAS, the calculation assumes that all investments should have a payback time of at least 3 years.

### 4.2.3. INNOVEAS targeted impacts

The project KPIs are based on the calculations described in previous chapter 4.2.2. They're also already stated in the Grant Agreement in chapter 2.1.1 (Estimations of energy-related impacts).

*Table 7: INNOVEAS targeted impacts*

	Energy savings [GWh/year]	Ren. energy production [GWh/year]	CO <sub>2</sub> emission savings* [ktons/year]	Triggered Investments [mio€]
Scenario 1	392	100	221.0	59
Scenario 2	824	100	465.3	124

*\*Updated numbers for CO<sub>2</sub> emissions, based on corrected calculation.*

To get the whole impact of INNOVEAS the results of the evaluation of the questionnaires must be extrapolated on the real number of participants by the trainings. The following table shows the goal of the number of companies to participate, appointed in the Grant Agreement.





	Types of training	Number of editions	Number of participating company to all editions	Number of people	Micro enterprises employees				Targeted sectors
					< 10 employees	Small enterprises 50 employees	< 250 employees	Medium enterprises < 250 employees	
HIPLE	Web-based	12	108	280	65	35	8	Construction	
	In situ for groups of companies	6	35	90	20	12	3		
CONFINDUSTRIA	In-companies	3	6	25	3	2	1	Construction	
	Web-based	12	130	310	80	40	10		
UTBW	In situ for groups of companies	8	42	95	30	8	4	Construction	
	In-companies	6	8	30	5	2	1		
A3E	Web-based	12	93	210	60	25	8	Construction	
	In situ for groups of companies	12	31	85	20	8	3		
NAIVE	In-companies	6	9	30	4	3	2	Chemistry	
	Web-based	12	108	280	65	35	8		
LEAG	In situ for groups of companies	6	35	90	20	12	3	Food	
	In-companies	3	6	25	3	2	1		
SI	Web-based	12	50	210	30	15	5	Food	
	In situ for groups of companies	6	20	60	12	6	2		
SI	In-companies	5	6	22	3	2	1	Food	
	Web-based	12	45	120	25	15	5		
SI	In situ for groups of companies	4	16	40	8	6	2	Food	
	In-companies	3	5	15	2	2	1		



### 4.3. INNOVEAS results

The INNOVEAS project raised the awareness and spread the topic of energy audits, addressing SMEs. By performing informative webinars, in-situ trainings, and in-company trainings both SME representatives and energy auditors were trained in terms of energy efficiency, renewable energies and many other topics.

However, during the INNOVEAS project period, no energy audit was supervised. Therefore, the INNOVEAS results do not picture direct results of energy audits, but rather indirect results. Those indirect results origin from the high number of trainings and people and SMEs reached by the project. The methodology to quantify the INNOVEAS results is explained in the following chapter 4.3.1.

#### 4.3.1. Methodology of impact quantification

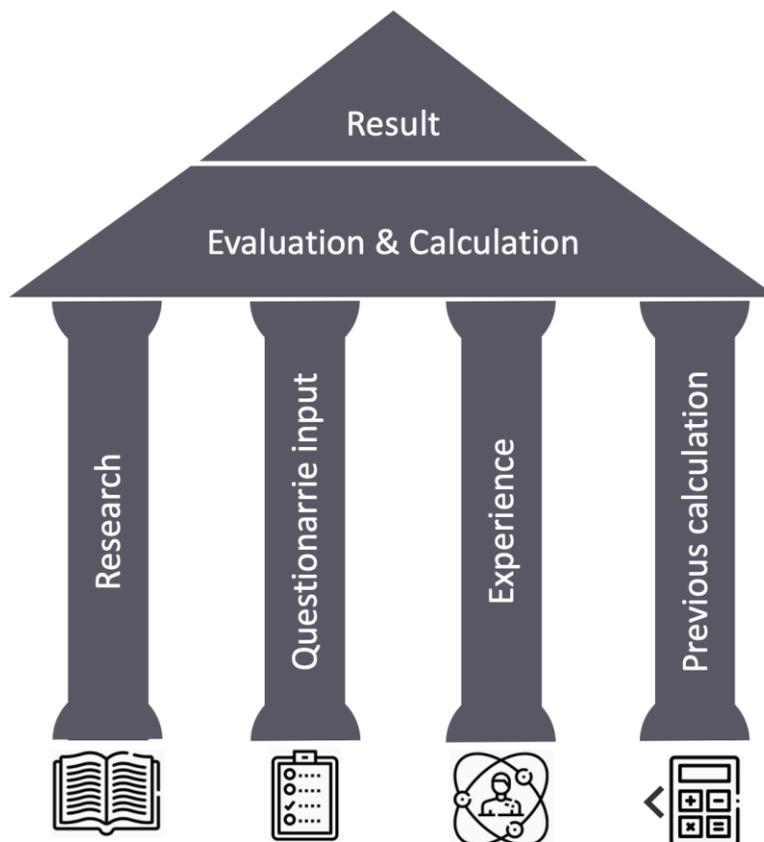


Figure 1: Flow of determination of impact provoked by INNOVEAS

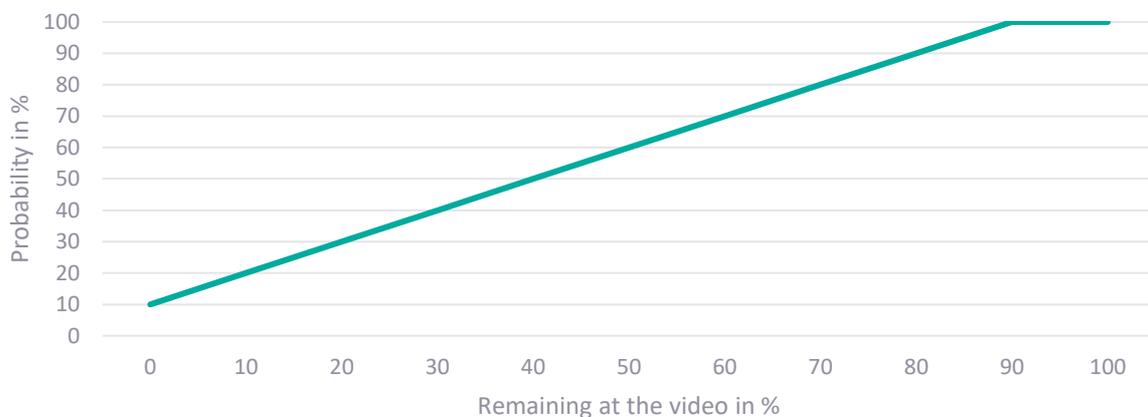


The online actions of INNOVEAS include both webinars and online provided training videos. The webinars put focus on awareness raising and informing participants on the INNOVEAS trainings. The training videos, uploaded and publicised on YouTube, offer more detailed information in national language and face specific thematic fields. The core-impact of web-based actions refers to the training videos. The impact of webinars results in a higher number of participants in the in-situ and in-company trainings, each having a separate impact methodology. Following the three different types of trainings will be shown separately as the methodology differs with every type.

### **Web-based**

To quantify the impact of the YouTube videos, the unique average view duration per training video was analysed. The date of collection was 12<sup>th</sup> of April 2022. The average view duration gives information, how many viewers stayed tuned for how many minutes of the video.

Taking the remaining time into account there must be assumed how many companies will have at least a pre-audit, comparable with an in-company training. The following graph shows with which probability one of four companies will do a training, regarding the time of remaining.



*Figure 2: Assessment of Probability to do an energy audit after web-based training, linked to remaining time*

To get an absolute impact of the videos, its assumed that an audit resulting of the video has the same impact as an In-Company training. In the first step for every % of the video the number of audits is calculated. Afterwards the number of audits is summed up per country and charged out with the results of the In-Company trainings.





$$\text{Audits}_{rem} = 0.28 * \text{prob}_{rem} * n_{watch} \quad [3.1]$$

$$\text{Audits}_{all} = \sum \text{Audit}_{remaining} \quad [3.2]$$

$$\text{EnergyKPI}_{1,2,3,4} = \text{Audits} * \text{EnergyKPI}_{avg \text{ of } 1,2,3,4/country} \quad [3.3]$$

- Audits<sub>rem</sub>* = *Audits generated by n% of the video*
- prob<sub>rem</sub>* = *Probability of an audit in dependence of remaining (Figure 2)*
- n<sub>watch</sub>* = *Number of viewers that have watched the Video for n%*
- Audits<sub>all</sub>* = *Sum of number of audits per country*
- EnergyKPI* = *The 4 different Energy KPI*
- EnergyKPI<sub>avg of 1,2,3,4/country</sub>* = *Avg. values from the 4 different EnergyKPI from In-company*

#### **In-Situ**

To get a fact-based result of the impact of INNOVEAS the trained companies had to be asked for a few specific data like the energy consumption. Therefore a questionnaire was developed by JER so the participants can give feedback how much they were moved to change or improve their energy systems by the trainings, carried out within INNOVEAS. It can be seen as two parts, the first one for hard facts with measurable parameters like their demand and use of energy and a second one with self-assessment about the trainings.

The first part asks for different data like the demand of energy. Thereby it's separated into conventional energy sources like gas, oil, coal, and energy in general and renewable energies like photovoltaic, solar thermal, heat pumps and biomass. All questions can be answered by giving absolute numbers of the use of energy or by giving the percentage of the different sources of energy. Furthermore, the participants are asked if they want to act in energy efficiency. This question is also separated in different types of energy use. The types are vehicles, building heating, building cooling, ventilation, lighting, manufacturing machines, process heating and process cooling.

To get an idea of how big the impact of INNOVEAS can be, the questionnaire also asked the participants for their gain of motivation to improve their energy system and knowledge about energy efficiency, renewables and energy audits throughout INNOVEAS. The complete questionnaire is shown in the appendix in part 6.2 – Tools for impact evaluation.

To get evaluable questionnaires, there were held meetings between JER and each partner who did trainings. By evaluating the filled in questionnaires it becomes obviously that not





every participant knows all values or takes the time to fill in everything correctly. Also, sometimes data seem to be very unrealistic. By filling in the questionnaires there are a few barriers that must be handled. These barriers are described in the Deliverables 2.1, 2.2 and 2.3 by K&I and UTBW.

To get more airtight statements out of the evaluation, every partner was evaluated separately. The evaluation looks like shown below in Figure 3.

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4												
5												
6		<b>I. General</b>	<b>#1</b>	<b>#2</b>	<b>#3</b>							
7		Sector	Chemical	Chemical	Chemical							
8		Gender	Male	Female	Female							
9		Position	Owner	Higher Management	Owner							
10		<b>II. Previous Information</b>										
11		<b>II.I - Information</b>										
12		Energy Efficiency	20%	60%	20%							
13		Renewable Energies	60%	60%	80%							
14		Energy Audit	40%	20%	0%							
15		<b>II.II - Motivation</b>										
16		Energy Efficiency	0%	0%	0%							
17		Renewable Energies	40%	80%	60%							
18		Energy Audit	0%	0%	20%							
19		<b>III. Previous Information</b>										
20		<b>III.I - Energy consumption</b>										
21		Electricity	12500	80%	300000							
22		Gas	5000	20%	40000							
23		Oil	0	0%	0							
24		Coal	0	0	0							
25		Other	0	0	0							
26		<b>III.II - Renewables</b>										
27		Solar (PV)	4000	0	8000							
28		Solar Thermal	0	0	0							
29		Heat Pumps	0	0	5000							
30		Biomass	0	0	0							
31		Other	0	0	0							
32		<b>IV. Upcoming activities</b>										
33		<b>IV.I - Energy Efficiency</b>										
34		Vehicles	20%	not in use	0%							
35		Building heating	40%	60%	40%							
36		Building cooling	not in use	not in use	not in use							
37		Ventilation	60%	80%	0%							
38		Lighting	20%	60%	0%							

Figure 3: example for input page of INNOVEAS evaluation (Energy KPI)

### Barriers by evaluating the data

By evaluating the data there could be identified a few different difficulties. As already mentioned not of all not all companies filled in the Equation completely so average values of the other companies had to be used. For example, at declaring the energy consumption many companies only provided percentile values, some didn't give any information about that. Another problem about the questionnaires is the quality of the given values. Sometimes values were unrealistic or without units that fit to the numbers. In this case also average values were taken as reference.

### In-Company

While the In-Situ trainings were created as events to inform the participating companies and give a short Q&A, the In-Company trainings were going a lot more into detail.





The calculations of the In-Company training are based on a questionnaire like already seen in the In-Situ trainings. But as there is only one specific company trained and the training goes a lot deeper, the questionnaire must be adopted a bit. So, the structure is as follows.

First there are contemplations of the use of energy itself and the distribution of different energy sources. Second the questionnaire focuses on the energy efficiency and asks for potentials to save energy, but also for planned investments in efficiency measures. The topic of the third part is the renewables. Thereby the question is, which renewables will be used, how much and what the company plans to invest there.

### 4.3.2. Impact of INNOVEAS

#### *General Information*

For the evaluation of the impact of INNOVEAS a few general assumptions had to be made.

1. **CO<sub>2</sub> emissions per energy source**

Following, the main sources are checked about their CO<sub>2</sub> emissions in g/kWh.

- Electricity	295.80
- Gas	220.00
- Oil	278.64
- Coal	400.00
- Average	298.61

2. **Distribution of companies**

Regarding the 327 companies of In-Situ trainings and 34 companies of In-Company trainings it can be assumed that the results are representative for companies in general coming from the sectors food, chemical and industry and out of one of the participating countries.

#### *Web-based activities*

Because of the situation with Covid19, the Web-based trainings had to be modified, so videos in national languages were distributed on YouTube. To evaluate the impact of the web videos, the click numbers as well as the statistics of remaining by the viewer were considered. This is shown in Table 8. Thereby it was calculated how many energy audits will probably be done in response of people watching the videos. These numbers of audits were analyzed per country. The audit-specific impacts are based on the results of the In-Company trainings in each country. The impact of the In-Company trainings can be found in the "In-Company-Section" below.





- Germany: 3,898
- Italy: 2,161
- Poland: 1,422
- Slovenia: 534
- Spain: 3,893

Additionally, there is need the distribution of remaining at the video. The following graph shows how long the audience has stayed tuned at the videos in the different countries. As we can see, in all countries the picture is more or less the same. Between 20 % and 90 % of the time of the videos only about 10 % of the audience was leaving.

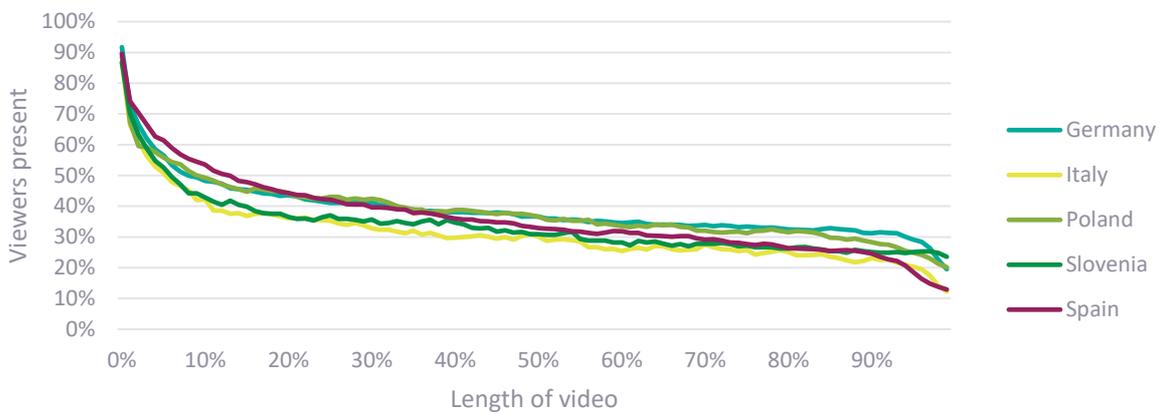


Figure 4: Remaining time at web-based trainings per country

As already mentioned, the absolute click numbers are one of the main factors to calculate the impact of the videos created throughout INNOVEAS. Following the click numbers of the specific information videos are shown. Additionally, there where clicks generated on the INNOVEAS channel by publishing videos from the trainings, but these where not considered as the videos do inform about a specific topic and do not advertise in general to integrate an energy audit in the company.

Table 8: Klick-numbers of web-based trainings per country

Country	Clicks
Germany	3,898
Italy	2,161
Poland	1,422
Slovenia	534
Spain	3,893
<b>Total</b>	<b>11,908</b>





Resulting of the click numbers, the time of remaining and the results of the In-Company trainings (following below) the impact of the videos is calculated as follows.

*Table 9: Results of web-based trainings per country (Energy KPI)*

	Energy savings [GWh/year]	Ren. energy production [GWh/year]	CO <sub>2</sub> emission savings* [ktons/year]	Triggered Investments [mio €]
<b>Spain</b>				
Scen 1	31.8	109.8	30.5	38.5
Scen 2	47.6	164.0	45.6	57.6
<b>Italy</b>				
Scen 1	155.9	140.5	38.9	72.9
Scen 2	232.9	209.9	58.1	108.9
<b>Poland</b>				
Scen 1	11.4	9.9	6.1	1.1
Scen 2	17.0	14.8	9.0	1.6
<b>Slovenia</b>				
Scen 1	99.2	49.5	39.4	31.2
Scen 2	148.3	74.0	58.9	46.6
<b>Germany</b>				
Scen 1	1.4	1.1	0.3	31.0
Scen 2	2.2	1.7	0.5	46.3

The following shows the total results of the impact of the whole web-based trainings.

*Table 10: Total results of Web-based trainings (Energy KPI)*

Total				
Scen 1	299.8	310.9	115.2	174.7
Scen 2	447.9	464.4	172.1	260.9





#### *In-Situ Trainings*

The first step of the evaluation must be a rating of the feedback, given by the training participants. The following scheme shows the number of participants and participating companies, which is also much important to calculate the whole impact of the trainings and INNOVEAS itself.

Training numbers	Number of people	Number of companies
	374	327

The following scheme shows how many questionnaires could be used in the end. Thereby it is separated in the number of questionnaires that are fully completed and such that are only partly completed.

Received Questionnaires	partly completed	fully completed	Total
	25	97	122

As having a look on the quota of receiving feedback, it becomes apparent that 37.3 % of company representatives sent questionnaires. Around 80 % of the received data was fully completed and completely useful in terms of INNOVEAS impact quantification. As this quote is good to evaluate average values, the impact can be calculated, based on the data coming from the questionnaires. The following table is showing the absolute results of the In-Situ trainings. Because of problems by finding trainees coming from one of the three sectors in Southern Germany the German Partners results are listed separately in a later part.





Table 11: Results of In-Situ trainings, excl. UTBW (Energy KPI)

	Energy savings [GWh/year]	Renew. energy production [GWh/year]	CO <sub>2</sub> emission savings* [ktons/year]	Triggered Investments [mio €]
<b>Spain</b>				
Scen 1	26.6	7.4	14.8	2.5
Scen 2	56.1	28.0	49.1	3.9
<b>Italy CBG</b>				
Scen 1	55.4	50.6	40.1	4.4
Scen 2	122.4	145.6	132.2	10.9
<b>Italy IIPLE</b>				
Scen 1	24.5	19.8	12.9	2.4
Scen 2	58.1	56.5	33.8	5.3
<b>Poland</b>				
Scen 1	11.6	11.1	7.3	1.5
Scen 2	27.4	32.0	19.0	2.2
<b>Slovenia</b>				
Scen 1	3.3	0.8	1.1	1.3
Scen 2	6.9	2.2	2.6	1.3
<b>Total</b>				
Scen 1	121.3	89.7	76.1	12.1
Scen 2	270.9	264.3	236.7	23.7

As shown in the Figure 5 below, the sectors of the in-situ trainings are distributed mainly on food, construction and chemical but also for 14 % on other sectors.

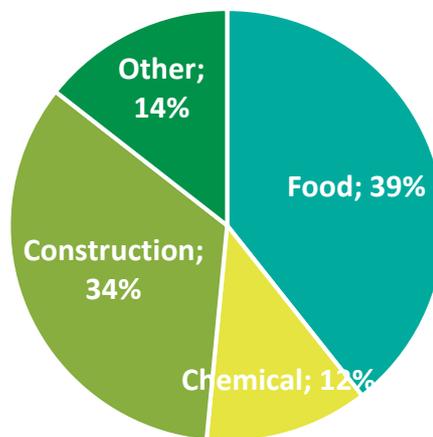


Figure 5: Distribution of sectors in the In-Situ trainings





Additionally, the participants were asked if they are well informed and motivated INNOVEAS. Thereby there was a range to rate between 1 and 5. The results look like shown in Figure 6. Thereby it can be seen that the INNOVEAS trainings had a good benefit to most of the companies. As usual, some companies pulled down the average but in general most answers were around 4 of 5 points.

This doesn't differ a lot between the information and motivation and not between the different topics. Only the Energy Audits are a bit better in gaining knowledge. Here it can be assumed that many participants learned most about energy audits, comparing to the other topics.

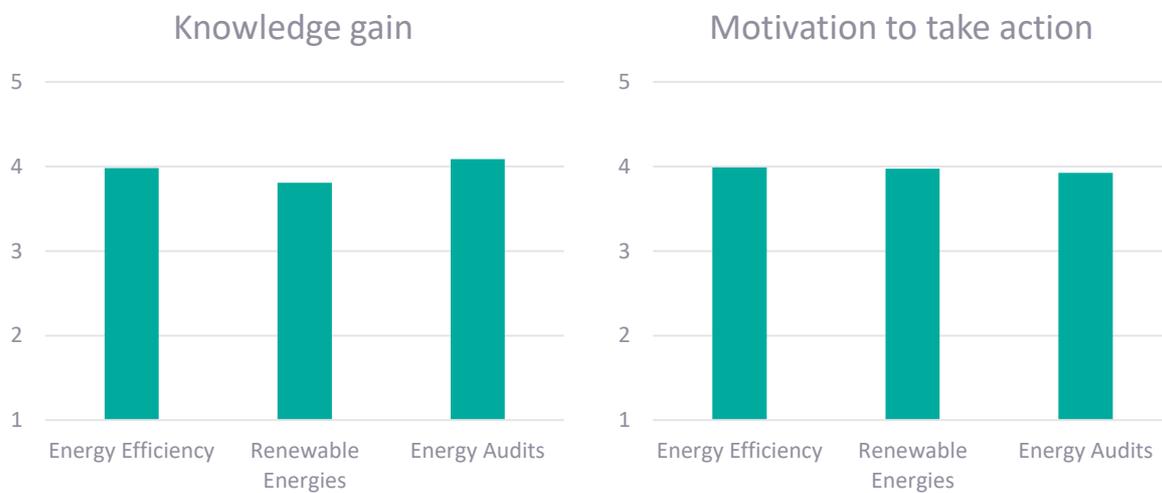


Figure 6: Knowledge gain and Motivation of Participants after INNOVEAS trainings

As already mentioned, the German partner UTBW had to handle some struggles in finding training companies from the three sectors in Southern Germany. Basically, Covid turned everything upside down at first. By switching to virtual formats, this circumstance was solved very well, at least in terms of the feasibility of the events themselves. The problem was rather how to adapt the planned concept to the new situation. Here, too, they found a manageable solution from their point of view and from the point of view of the stakeholders by relying on a modular structure with short events. At the same time, it had to be ensured that the entire concept could be implemented with personnel input from external experts. 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 organizationally impossible to get so many experts together on exactly one or two days, and possibly several times. This also spoke in favor 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 program 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 program 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 the partner UTBW was able to gain a continuously growing pool of participants who put together their own “edition” from the modules offered and used the recordings of missed modules. However, participant 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 program. 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. The license of the software for the web seminars was designed for 100 participants each but could be extended in individual cases. Nevertheless, one can see from the statistics that despite contacts to the respective multipliers, this deviation continued throughout the entire training program. This also shows that the modular approach was also interesting for energy consultants even at the in-situ stage, as the participant structure shows. UTBW could not and did not want to refuse their participation, as these actors ultimately act in the market in the service of the project’s objectives. 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, UTBW has personal feedback that many of the insights gained from their training program have found their way into on-site implementation at SMEs. For UTBW, 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 (at least partially) successful.

Regarding these points the following assumptions were made by calculating the impact generated by UTBW:

- Every auditor will train at least one company, coming from the three sectors. Thereby every auditor stands for one company in the calculations.





- The distribution of the sectors is the same as seen in the whole INNOVEAS project by the other partners
- The average values of the other partners can be taken as basis of the calculations for the German partner

Table 12: Results of In-Situ trainings from UTBW (Energy KPI)

	Energy savings [kWh/year]	Ren. energy production [kWh/year]	CO <sub>2</sub> emission savings [ktons/year]	Triggered Investments [mio €]
Germany				
Scen 1	1.6	68.4	74.7	11.4
Scen 2	25.8	205.1	246.4	19.6

#### In-Company Trainings

The In-Company trainings were done in 39 companies, where 64 people took part.

Training numbers	Number of people	Number of companies
	64	39

By calculating the impact of the In-Company trainings, other than calculating the impact of the In-Situ trainings, there was no need of using average values. As every company or auditor of the pre-audit was asked to give feedback by filling in the In-Company questionnaire or giving a report, the information was available in high quality. Comparing the raw data from the In-Situ and In-Company trainings it becomes clear, that the data of the In-Company trainings are much more exact in general. Reasons for that are the specific contemplation of one company where an auditor for example discusses the amount of money that can be invested in energy savings and renewables. Moreover, data of energy demand were given more accurate as the auditors identified them within the pre-audit.

The results of the evaluation look as follows.





Table 13: Results of the In-Company trainings (Energy KPI)

	Energy savings [kWh/year]	Ren. energy production [kWh/year]	CO <sub>2</sub> emission savings [ktons/year]	Triggered Investments [mio €]
Spain	2.4	2.1	0.6	1.1
Italy CBG	1.5	4.1	1.1	1.7
Italy IIPLE	0.1	1.4	0.4	0.2
Poland	3.8	1.9	0.0	1.2
Slovenia	0.2	0.1	0.0	3.8
Germany	2.1	0.3	0.7	0.1
Total	10.1	9.9	2.8	8.1

Like in the In-Situ trainings the companies came from the three sectors of INNOVEAS but also from other sectors, as shown in the Figure 7 below.

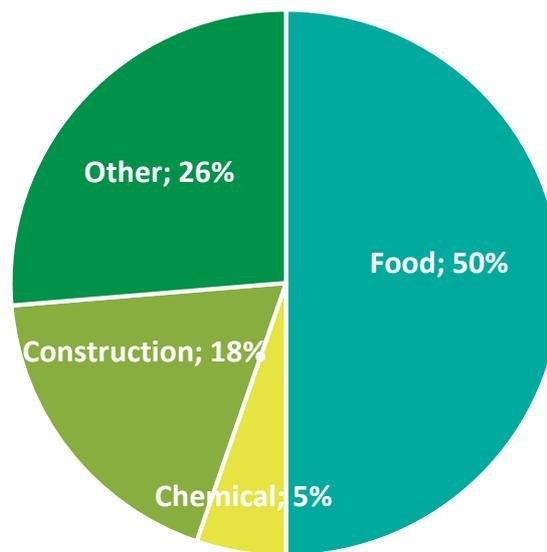


Figure 7: Distribution of sectors in the In-Company trainings

### TOTAL INNOVEAS and Comparison with GA

Hereby a total resume is made. The result shows the addition of all three types of trainings; Web-based, In-Situ and In-Company. The first table shows the direct impact of INNOVEAS which are energy savings and the use of renewable energies.

The results show that annually between 435 and 739 GWh savings of energy could be generated by INNOVEAS. Also, between 394 GWh and 699 GWh will be generated by renewable resources.





Table 14: Total results of INNOVEAS – Energy Savings + Renewable Energies

		Energy Savings [GWh/year]	Renewables [GWh/year]
Scenario 1 (minimum)	Grant Agreement	392	100
	Results	425	389
Scenario 2 (optimum)	Grant Agreement	824	100
	Results	715	679

The second table shows the indirect impact of INNOVEAS which are the CO<sub>2</sub> emission savings that can be counted on about 200 to 446 kilotons per year. The other indicator are the investments. These can be determined on about 194 to 289 million Euro.

Table 15: Total results of INNOVEAS – CO<sub>2</sub> Savings + Triggered Investments

		CO <sub>2</sub> Savings [ktons/Year]	Investment [Mio. €]
Scenario 1 (minimum)	Grant Agreement	221	59
	Results	194	194
Scenario 2 (optimum)	Grant Agreement	465	124
	Results	423	289

Having a look on the results by comparing them with the goals of the GA it shows that the main targets nearly all reached the goals. Regarding the results of renewable energy production, it must be kept in mind that there was no range given in the GA but in the final calculations there was used a variation. One reason for the lower CO<sub>2</sub> emission savings is that the initial values have been enhanced since the GA had been written.

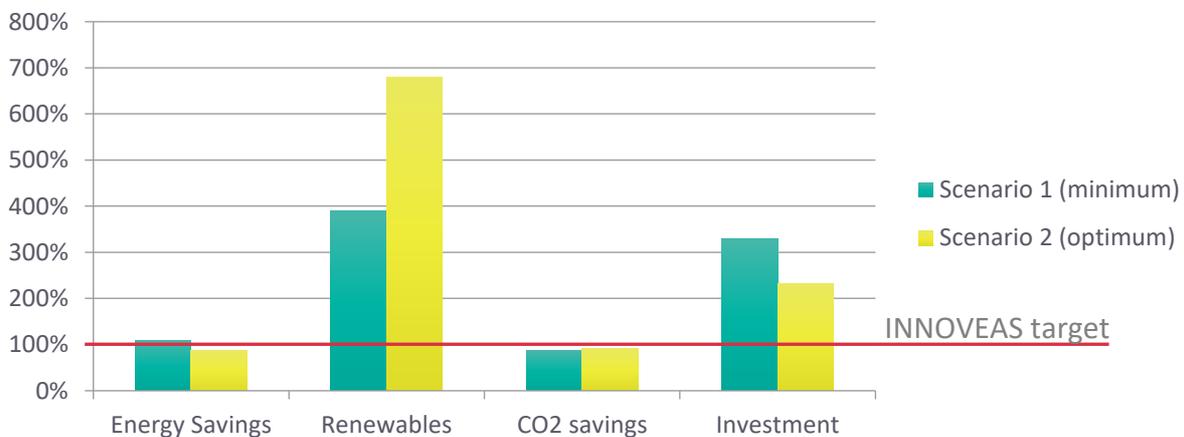


Figure 8: Numbers reached and comparison to GA





# 5. Conclusion

## 5.1. Comparing training performance

Drawing real conclusions intended as providing a sort of ‘interpretation’ of all the data collected and processed with a view to the validation of the Capacity Building Program as a whole and thus setting the strategies for its follow-up is not the purpose of this Chapter neither of this Deliverable, being rather such a purpose the mission of Deliverable 4.2.

On the contrary this conclusion is intended to shortly sum up the major findings presented in this paper stressing similarities and peculiarities recorded in the different countries / regions and thus again paving the way to the validation of a common INNOVEAS Capacity Building Program.

There’s no need to say that the purpose of such an aggregated picture is not at all to provide a sort of ranking between the regional experiences but, on the contrary, to confirm the initial assumption that all the territorial contexts participating to this project were sharing the same constraints and needs.

### WEB BASED MODULE

As the following charts show a significant difference between regions in the evolution of this part of the training has not been recorded in all the 3 dimensions of the analysis:

1. in general, the level of satisfaction with the contents has been always more than good with the lowest scores normally recorded for the best practices’ videos;<sup>21</sup>
2. the same perception of the quality of the contents provided by the videos showed some highs and lows between the same videos and thus the different regions but in general the overall perception has been more than good;
3. in general, the level of usefulness of the contents provided with reference to the viewer’s daily work has recorded low scores than the previous two dimensions with the exception of the Polish and the Slovenian cases, where the average scores have been somehow aligned on these investigated 3 aspects.

Also the number of the views of all the videos far exceeded the initially expected target showing that the adopted formula (short videos embedded into YouTube) turned out to be quite effective for a first set of training to be considered as the entry point for the whole Capacity Building Programme.

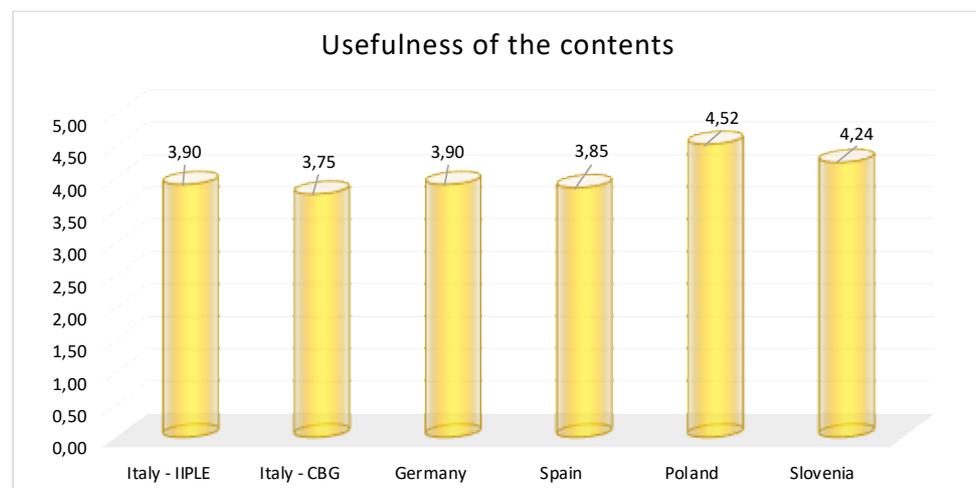
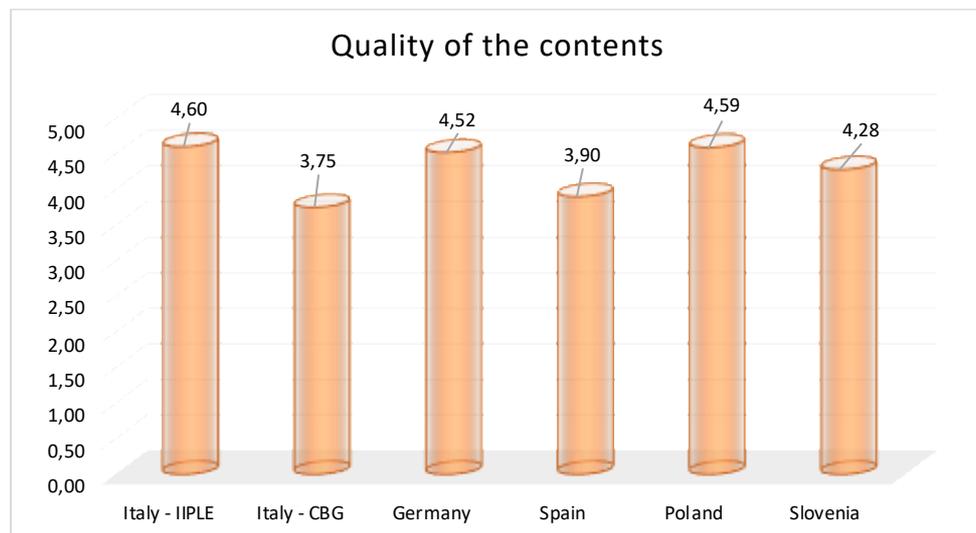
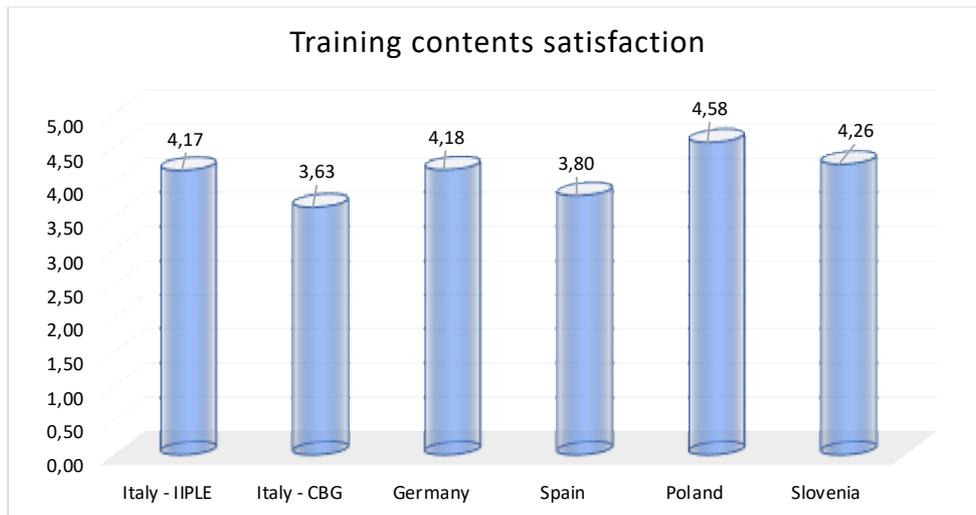
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<sup>21</sup> This is clearly due to the peculiarity of the same subject and the interest of the participant to the specific business case / sector presented.





Chart n° 19: web-based module evaluation as aggregate per country<sup>22</sup>



<sup>22</sup> As previously described the Likert scale here was running from 1 (*minimum*) to 5 (*maximum*).





### IN SITU TRAINING

Also in the case of the training performed in the IN SITU modality the participants perception of the overall organisation / logistics and the quality of the contents delivered does not show major differences discrepancies between the different regional contexts, outlining a spread and shared “more than good” evaluation in all the specific fields of the analysis.

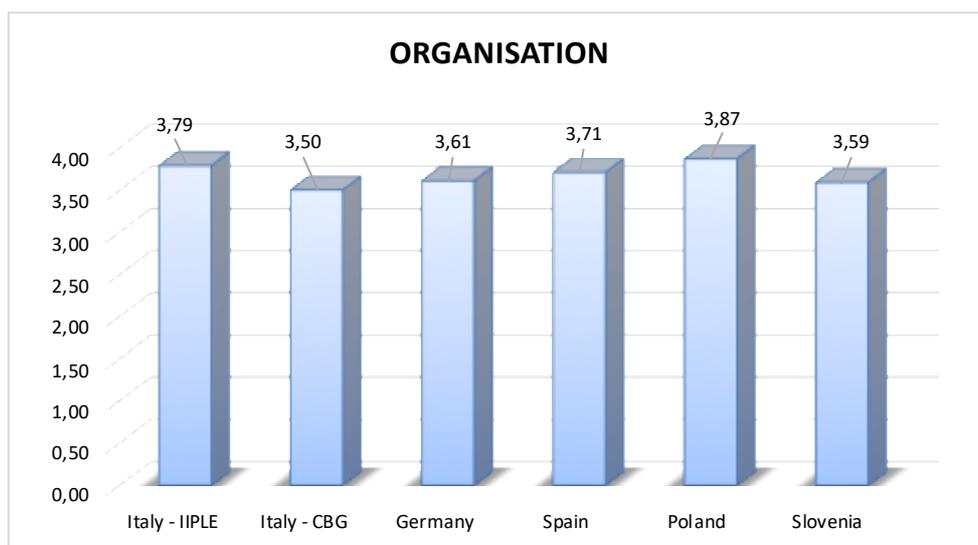
When it comes to evaluating effectiveness, the scenario becomes less homogeneous with an overall satisfaction rate remarkably lower (than the two previous dimensions) and with evident differences between some regional contexts.

D4.2 is going to drive the proper conclusions out of these differences with a view on the validation and the drawing of follow-up strategies, but here already it can be anticipated a general consideration on the effectiveness of the two approaches used by the partners:

- a. a structured training intervention built on a set of modules to be attended by all the participants run in different consequent and similar editions (to reach the target number) *versus*
- b. the display of a catalogue of various webinars where each participant could have chosen the most appropriated and interesting.

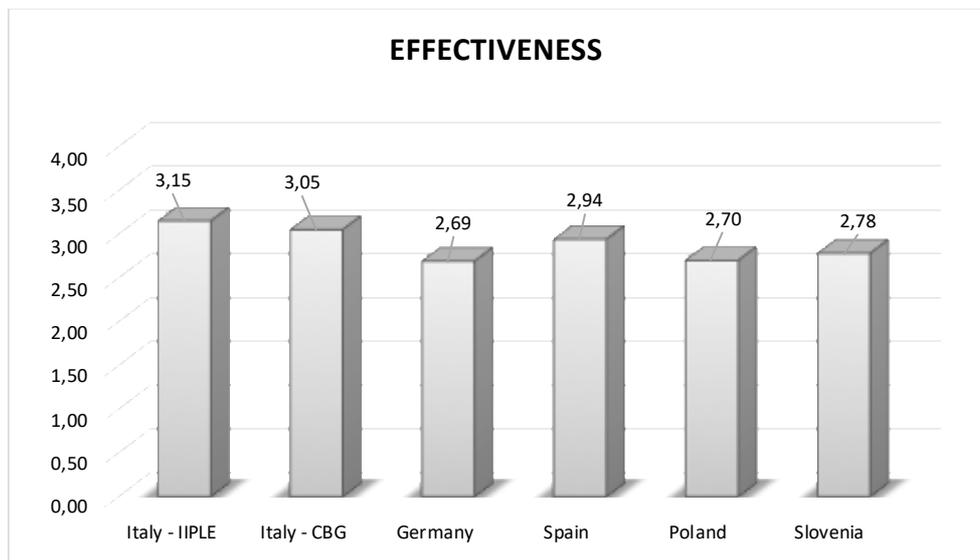
Where the second approach has been used the lowest scores on the overall effectiveness of the training have been recorded, and especially the interest in participating to a free energy pre-audit in the own company and the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) obtained the far lowest scores out of the involved regions. Probably the catalogue approach did not allow the participants a level of knowledge deep enough to perceive the benefits of the audits itself and the training providers to transmit the whole spectrum for the picture so as to share all the principles and benefits of the audit.

**Chart n° 20: IN SITU training evaluation as aggregate per country<sup>23</sup>**



<sup>23</sup> In this case the Likert scale here was running from 1 (minimum) to 4 (maximum).





### IN COMPANY TRAINING

This last part of the capacity building programme differs noticeably from the first two from the heterogeneity of the satisfaction expressed by the target participants between the partners regions.

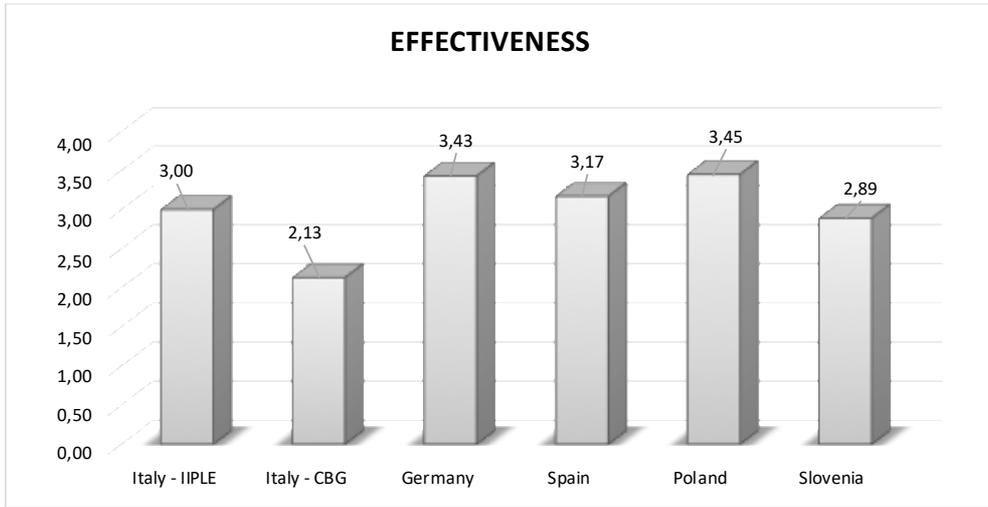
Feedbacks have been more than positive in both Poland and Germany whereas in the case of CBG Italy the average of the participants were only partially convinced of the effectiveness of the action with reference to their company welfare. Especially the real interest in adopting a Certified energy management system (e.g. ISO 50001:2018) was confirmed only in one of the participating companies not meeting any interest in all the others.

D4.2 is going to investigate possible causes (if any in particular) for this low result trying to detect possible scenarios for improvement even exploiting strategies and approaches implemented in other contexts having recorded a higher appreciation.





Chart n° 21: IN COMPANY training evaluation as aggregate per country<sup>24</sup>



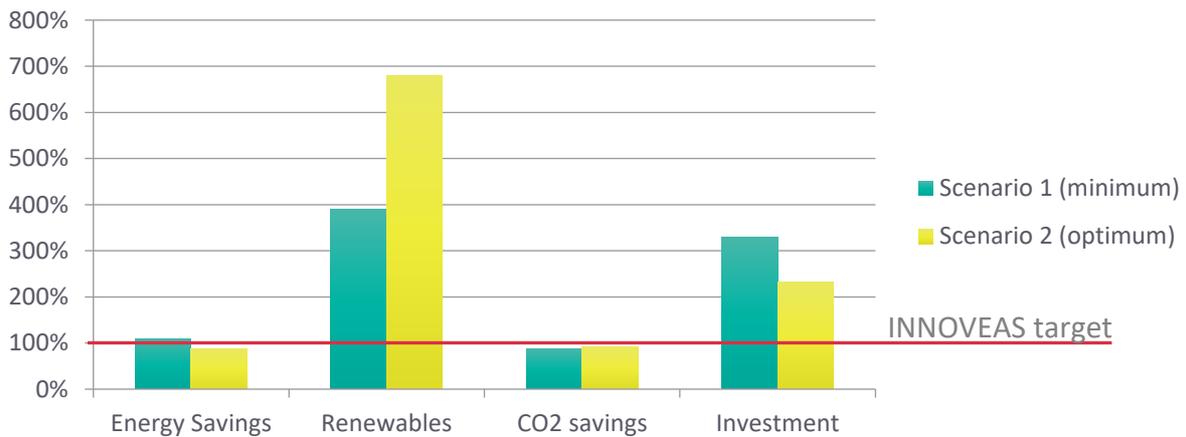
<sup>24</sup> Also in this case the Likert scale here was running from 1 (minimum) to 4 (maximum).





### 5.2. Comparing impacts

A possibility to quantify the impact of the project with hard numbers the four energy KPI can be considered. Thereby the opportunity is given to compare the results with the numbers expected in the GA. As seen in the section 4.3.2 the following chart is showing the results of the project, comparing to GA.



Regarding the average values of participants large differences between the partners and countries can be seen in all sections.

#### IN SITU TRAINING

The following table shows average values per company of every partner regarding the In-Situ trainings. It becomes clear that every partner has another part of the impact, partly the numbers are factorised nearly ten times. Regarding UTBW there are no values because of the already described issues UTBW had by getting participants and the calculation methodology to calculate the impact of UTBW by using the average from the project.





Table 16: In-Situ, Average impact per Company per partner

	energy saved	renewable energies	Co2 emissions	investment
partner	MWh/a	MWh/a	t/a	€
A3E	627	269	484	48,787
CBG	1357	998	2.014	78,313
IIPLE	724	669	410	68,222
LEAG	146	42	53	37,227
NAPE	488	546	331	34,731
UTBW	-	-	-	-
AVG	668	505	658	53,456

### IN COMPANY TRAINING

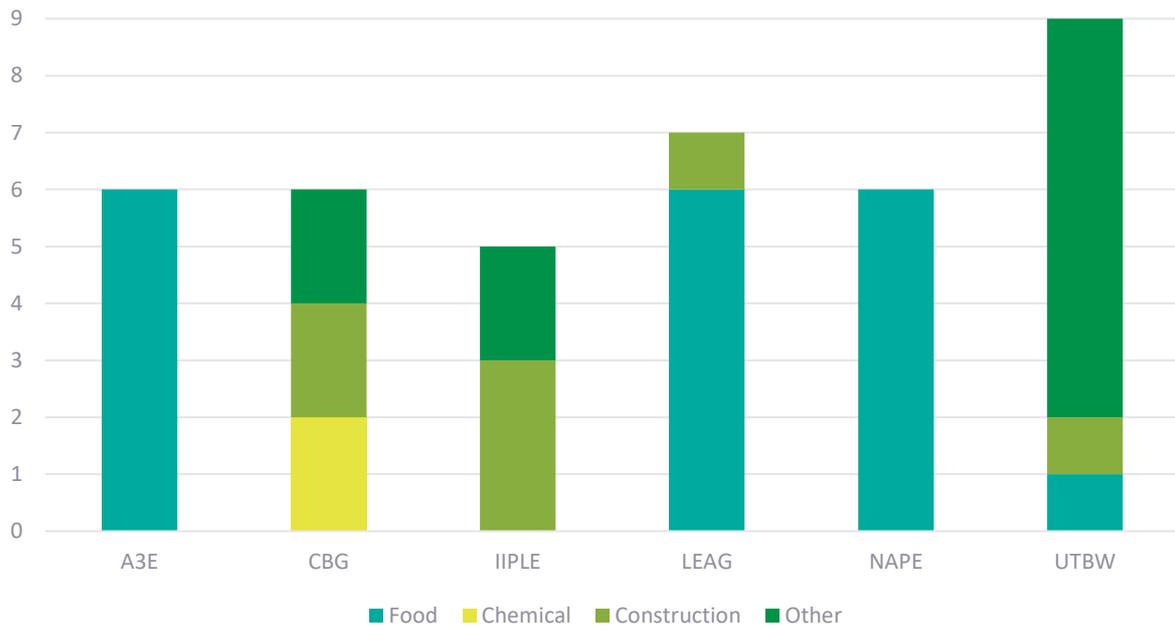
Regarding the In-Company trainings the results show that there are big differences between the partners as already seen in the In-Situ trainings.

Table 17: In-Company, Average impact per Company per partner

	energy saved	renewable energies	Co2 emissions	investment
partner	MWh/a	MWh/a	t/a	€
A3E	398	358	99	185.842
CBG	257	680	190	285.399
IIPLE	19	271	75	48.400
LEAG	25	19	5	537.873
NAPE	628	314	250	197.520
UTBW	234	38	74	13.594
AVG	260	280	115	211.438

The variance seen in Table 17 also has to do with the kind of company. The have a look on the dedicated impact per company and sector following the chart shows the distribution of the sectors considered by the partners.





*Figure 9: Distribution of sectors per partner*





## 6. Annexes

### 6.1. A.1 – Tools for performance evaluation

#### Web Based Modules

The evaluation of web-based modules has been based on a simple pop-up survey with the following structure:

- Did the course content meet your expectations? \* *Likert scale from 1 to 5*
- How do you rate the quality of the information provided? \* *Likert scale from 1 to 5*
- How do you evaluate the usefulness of the information provided for your work? \* *Likert scale from 1 to 5*
- Are you also interested in following the next video of the INNOVEAS Project? \* *Likert scale from 1 to 5*

If you are interested in receiving more information about free training opportunities, please indicate: Name & Surname \_\_\_\_\_ / Email address \_\_\_\_\_

#### SURVEY SAMPLE FOR THE POLISH VIDEOS

**Ocenjevanje video posnetkov za projektno usposabljanje INNOVEAS**

Zahvaljujemo se vam za sodelovanje v tem modulu, ki je del projekta INNOVEAS – H2020 I.D. 847095. Prosimo vas, da si vzamete 2 minuti časa, da ocenite video, tako da odgovorite na naslednja vprašanja.

Prosimo podajte svojo oceno na lestevici od 1 do 5.

*Najlepša hvala za vaše sodelovanje!*

Kakšen trening ste videli? \* \*

Je vsebina tečaja izpolnila vaša pričakovanja? \* 1 2 3 4 5

Kako ocenjujete kakovost posredovanih informacij? \* \* 1 2 3 4 5

Kako ocenjujete uporabnost informacij, ki so na voljo za vaše delo? \* \* 1 2 3 4 5

Vas zanima naslednji videoposnetek projekta INNOVEAS? \* \* Da  Ne

Če vas zanima več informacij o možnostih brezplačnega usposabljanja, navedite naslednje podatke: ime, priimek in e-poštni naslov

Ime \_\_\_\_\_ E-naslov \_\_\_\_\_

POŠLJI





# IN SITU training

PARTNER LOGO	QUESTIONNAIRE FOR THE EVALUATION OF TRAINING
--------------	--

Name of course:		
Edition:	Year:	Training location:

*Dear participant to training,*  
*We kindly ask you to express – through the following questionnaire – your evaluation on the training course you have attended; the answers will help us to improve the offer.*  
*Thank you for your collaboration.*

*The consortium of Innoveas Project*

Instructions for filling the questionnaire

Please, answer each question with a score from 1 to 4 by ticking the preferred option.

1	2	3	4
NOT AT ALL	PARTLY	ENOUGH	VERY

DATE:

.....

PERSONAL INFORMATION (OPTIONAL):

Name .....

Surname .....

 <small>The power of energy audits</small>	 <small>Co-funded by the Horizon 2020 programme of the European Union</small>
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PARTNER LOGO	QUESTIONNAIRE FOR THE EVALUATION OF TRAINING
--------------	--

OVERALL EVALUATION OF TRAINING COURSE				
1. Are you satisfied by the course?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
2. Are you satisfied by the length of the course?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
3. Are you satisfied by the training material (if provided)?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
<input type="checkbox"/> What have been the most interesting topics?  <input type="checkbox"/> What have been the less interesting topics?  <input type="checkbox"/> Which topics would you like to study in-depth?				

EVALUATION OF THE PREMISE				
4. Are you satisfied by the training tools (projector, whiteboard, computer, etc), of the classrooms and labs?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
5. Are you satisfied of the secretary desk (availability in giving information, help in the registration, etc)?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY

EVALUATION OF THE COORDINATOR				
6. Was he/she available?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
7. Was he/she able to organize and plan the activities?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY

 innoveas <small>The power of energy suits</small>	 Co-funded by the Horizon 2020 programme of the European Union
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PARTNER LOGO	QUESTIONNAIRE FOR THE EVALUATION OF TRAINING
--------------	--

EVALUATION OF TRAINERS/TEACHERS										
N	Name of trainer	Topics	8. Was he/she clear and understandable?				9. Was he/she able to involve the participants in the discussion?			
			1	2	3	4	1	2	3	4
1			1	2	3	4	1	2	3	4
2			1	2	3	4	1	2	3	4

EVALUATION OF SPECIFIC KNOWLEDGES OF INNOVEAS PROJECT				
10. How much do you think you have learned on the topic of energy efficiency process for companies?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
11. Do you think it would be useful to include other staff members of your company into this training programme?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
12. How likely is it that your company will implement an energy audit?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
13. How likely is it that your company will adopt a more energy efficient management?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
14. Are you interested in adopting renewable energies in your company?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
15. Are you interested in participating to a free energy pre-audit in your company?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
16. Are you interested in adopting a Certified energy management system? (ISO 50001:2018)	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY

	 <small>Co-funded by the Horizon 2020 programme of the European Union</small>
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# IN COMPANY training

PARTNER LOGO	QUESTIONNAIRE FOR THE EVALUATION OF IN-COMPANY ACTIVITY
--------------	---

Name of course:		
Edition:	Year:	Training location:

*Dear participant to training,*

*We kindly ask you to express – through the following questionnaire – your evaluation on the in-company activity you have attended; the answers will help us to improve the next visits.  
Thank you for your collaboration.*

*The consortium of Innoveas Project*

### Instructions for filling the questionnaire

Please, answer each question with a score from 1 to 4 by ticking the preferred option.

1	2	3	4
NOT AT ALL	PARTLY	ENOUGH	VERY

DATE:

.....

### PERSONAL INFORMATION (OPTIONAL):

Name .....

Surname .....

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PARTNER LOGO	QUESTIONNAIRE FOR THE EVALUATION OF IN-COMPANY ACTIVITY
--------------	---

OVERALL EVALUATION OF THE IN-COMPANY ACTIVITY				
1. Are you satisfied by the in-company activity?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY
2. Was the description of the energy path clearly explained by the auditor?	1 NOT AT ALL	2 PARTLY	3 ENOUGH	4 VERY

EVALUATION OF SPECIFIC KNOWLEDGES OF INNOVEAS PROJECT				
3. How likely is it that your company will implement a full energy audit?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
4. How likely is it that your company will adopt a more energy efficient management?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
5. Are you interested in adopting renewable energies in your company?	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY
6. Are you interested in adopting a Certified energy management system? (ISO 50001:2018)	1 NOT AT ALL	2 FEW	3 ENOUGH	4 VERY

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## 6.2. A.1 – Tools for impact evaluation

### 6.2.1. Questionnaire of In-Situ trainings



#### Questionnaire for Task 3.3

##### I. General:

II In what industrial sector do you work?

- Construction
- Chemical
- Food
- Other: \_\_\_\_\_

##### II. Previous information:

II.I How well informed are you about energy efficiency, renewable energies and energy audits?

	Not informed at all			Very well informed	
Energy Efficiency	<input type="checkbox"/>				
Renewable Energies	<input type="checkbox"/>				
Energy Audits	<input type="checkbox"/>				

II.II How well motivated are you to take action in energy efficiency, renewable energies and energy audits?

	Not motivated at all			Very motivated	
Energy Efficiency	<input type="checkbox"/>				
Renewable Energies	<input type="checkbox"/>				
Energy Audits	<input type="checkbox"/>				





### III. Energy consumption:

III.I Please give numbers on your energy consumption based on the energy source. Numbers for renewable energies are asked in the next question. Please fill only \*kWh\* OR \*%\*.

Electricity	_____ kWh	_____ %
Gas	_____ kWh	_____ %
Oil	_____ kWh	_____ %
Coal	_____ kWh	_____ %
_____	_____ kWh	_____ %

III.II If you use renewable energies in your company, please give numbers on the energy amount or the percentage of how much energy you consume based on renewables. Please fill only \*kWh\* OR \*%\*.

Solar (PV)	_____ kWh	_____ %
Solar Thermal	_____ kWh	_____ %
Heat Pumps	_____ kWh	_____ %
Wood	_____ kWh	_____ %
_____	_____ kWh	_____ %

### IV. Upcoming activities:

IV.I How likely is it for you, to take action in energy efficiency in the following fields?

	less likely			more likely	
Vehicles	<input type="checkbox"/>				
Building heating	<input type="checkbox"/>				
Building cooling	<input type="checkbox"/>				
Ventilation	<input type="checkbox"/>				
Lighting	<input type="checkbox"/>				
Manufacturing machines	<input type="checkbox"/>				
Process heating	<input type="checkbox"/>				
Process cooling	<input type="checkbox"/>				
Other: _____	<input type="checkbox"/>				





**IV.II** How likely is it for you, to take action in renewable energies in the following fields?

	less likely			more likely	
Vehicles	<input type="checkbox"/>				
Building heating	<input type="checkbox"/>				
Building cooling	<input type="checkbox"/>				
Ventilation	<input type="checkbox"/>				
Lighting	<input type="checkbox"/>				
Manufacturing machines	<input type="checkbox"/>				
Process heating	<input type="checkbox"/>				
Process cooling	<input type="checkbox"/>				
Other: _____	<input type="checkbox"/>				

**IV.III** Do you plan any activities to take action in either energy efficiency or renewable energies.

	YES	NO
Activities are planned:	<input type="checkbox"/>	<input type="checkbox"/>

**IV.IV** If you plan any activities, how will it reduce your energy consumption?

Please fill only "kWh" OR "%".

Electricity	_____ kWh	_____ %
Gas	_____ kWh	_____ %
Oil	_____ kWh	_____ %
Coal	_____ kWh	_____ %
_____	_____ kWh	_____ %





## V. Impact of the INNOVEAS training:

V.I Compared to the beginning, did your level of information about energy efficiency, renewable energies and energy audits change? (You can give the same level as in the beginning if nothing changed)

	Not informed at all			Very well informed	
Energy Efficiency	<input type="checkbox"/>				
Renewable Energies	<input type="checkbox"/>				
Energy Audits	<input type="checkbox"/>				

V.II Compared to the beginning, did your level of motivation to take action in energy efficiency, renewable energies and energy audits change? (You can give the same level as in the beginning if nothing changed)

	Not motivated at all			Very motivated	
Energy Efficiency	<input type="checkbox"/>				
Renewable Energies	<input type="checkbox"/>				
Energy Audits	<input type="checkbox"/>				





## 6.2.2. Questionnaire of In-Company trainings



### Questionnaire on energy efficiency related values & KPIs for in-company trainings

#### I. General

**LI** In which industrial sector is the company active?

- Construction
- Chemical
- Food
- Other: \_\_\_\_\_

**LII** How many employees work in the company?

- < 10
- < 50
- < 100
- < 250

**LIII** Are you a company representative?

- Yes
- No, I am an energy auditor.
- No, I am \_\_\_\_\_

**LIV** If you are a company representative, please mark the most suitable answer for your position in the company.

- Owner
- Higher Management
- Lower Management
- Project Manager
- Labourer
- Other: \_\_\_\_\_





## II. Energy consumption

### II.I What kind of energy do you consume, and how much per year?

If you don't know your total energy consumption, please consider the process(es) which have been focused on during the in-company training.

Please fill the total numbers and mark the relevant unit. If you don't know the total numbers, please fill in the shares.

- Total company energy consumption
- Process(es): \_\_\_\_\_

Electricity	_____ kWh	_____ %
Gas	_____ kWh/m <sup>3</sup>	_____ %
Oil	_____ litre	_____ %
Coal	_____ kWh	_____ %
Petrol	_____ litre	
Diesel	_____ litre	
other: _____	_____ kWh	_____ %

## III. Energy efficiency

### III.I How much energy could be saved by proposed energy efficiency activities?

Please fill the total numbers and mark the relevant unit. If you don't know the total numbers, please fill in the shares.

Electricity	_____ kWh	_____ %
Gas	_____ kWh/m <sup>3</sup>	_____ %
Oil	_____ litre	_____ %
Coal	_____ kWh	_____ %
Petrol	_____ litre	
Diesel	_____ litre	
other: _____	_____ kWh	_____ %





### III.II Do you plan to perform any recommended energy efficiency measures?

	NO		maybe	Yes	not considered
Electricity	<input type="checkbox"/>				
Gas	<input type="checkbox"/>				
Oil	<input type="checkbox"/>				
Coal	<input type="checkbox"/>				
Petrol	<input type="checkbox"/>				
Diesel	<input type="checkbox"/>				
other: _____	<input type="checkbox"/>				

### III.III How much are you willing to invest into energy efficiency measures?

\_\_\_\_\_ €

## IV. Renewable energies

### IV.I Do you use any renewable energy source at the moment?

- YES
- NO

### IV.II If you use any renewable energy sources, please fill in how much energy you use per year.

Please fill total numbers and mark the relevant unit for your answer.

Solar (PV) \_\_\_\_\_ kWh/m<sup>2</sup>  
 Solar Thermal \_\_\_\_\_ kWh/m<sup>2</sup>  
 Heat Pumps \_\_\_\_\_ kWh  
 Biomass \_\_\_\_\_ kWh  
 other: \_\_\_\_\_ kWh

### IV.III Do you plan to use renewable energies in the future?

	NO		maybe	Yes
Solar (PV)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solar Thermal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heat Pumps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





**IV.IV** If you are going to install renewable energies in the future, what would be the output per year?

Please fill total numbers and mark the relevant unit for your answer.

Solar (PV)	_____ kWh/m <sup>2</sup>
Solar Thermal	_____ kWh/m <sup>2</sup>
Heat Pumps	_____ kWh
Biomass	_____ kWh
other: _____	_____ kWh

**IV.V** How much are you willing to invest into renewable energies?

\_\_\_\_\_ €

