



# 03

## Net-UBIEP newsletter

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## 1. Information materials for professionals

Focusing on the energy aspects, the engineers and architects, need to be prepared for designing NZEB buildings, both in the case of new buildings as well as for refurbishment of existing ones. To achieve this important result, they need not only to respect national, regional, local legislation, but they need to change their perspective and design and construct keeping the “end in mind”. This means that they need to consider, since the beginning of the project, the request of the final users in relation to the energy performance and building comfort during the use, they also need to accomplish to the maintenance requirements and information for the end of the life cycle of the building and its components/equipment.

To be able to focus on energy aspects in a BIM, professionals, must have certain competences and skills. Therefore the European partners in the NetUBIEP project have developed a BIM Qualification framework which describes these competences and skills. This BIM Qualification framework can be found [here](#).

Based on the associated learning outcomes, learning materials for the professional were developed. These learning materials were subsequently translated in the national language.

Next: each country tested the training materials in three sessions in late 2018 and early 2019. Feedback on the developed materials from the participants were gathered by using two different questionnaires: one before a course and one after the course. Based on the results the learning materials are improved.

The training of Professionals is essential for the implementation of the use of BIM. This is especially the case during the design and construction phases. Four strategic objectives can be set:

### Strategic objectives

- Include the competences defined by net-UBIEP for the Professionals in the recurring training of designers, engineers and constructors. The use of the materials produced by net-UBIEP could be used for such training.
- Introduce an additional module in the basic qualification proposed by buildingSMART international in order to obtain an international recognition.

- Introduce the use of openBIM in the university curricula of civil, HVAC and electrical engineers, in the architects curricula and in the surveyors professional schools.
- To create and maintain a network of trainers to implement the developed qualification framework and to advance the developed learning materials.

A possible output could be:

- a new or modified qualification schema which is accepted by the engineers and architects associations and/or at university level.
- Also a qualification framework and more standardized learning materials can be input for certification programs.
- Another output is a network of trainers which regularly exchange information, best practices and new developments regarding BIM and energy efficiency.

## 2. Information materials for public administration

### 2.1 The role of the Public Administrations

The Public Administration its main function is to be the competent authority who makes the final approval and permission of the project design, in line with the regulations in force. Additionally, governments have the function of setting the rules to be followed. They will deal with any of the aspects that a building project may affect environment, occupational health and safety for workers, energy, waste, etc. Administrations are per se promotor and owners of the buildings.

Focusing on the energy aspects, the Public Administration is the figure who pilot the new constructions in the NZEB implementations, controlling the respect of national regulatory and legislative requirements in the field of energy performances for the constructions and the materials used.

### 2.2 Learning outcomes for Public Administrations

The learning outcomes addressed to the Public Administration have the following objectives:

- LO1. identify the advantages of using BIM during the construction, management, maintenance and refurbishment of nZEB or of existing buildings because of the decrease of the life cycle cost in order to support communities. See and overcome barriers with the purpose to have a successful adoption of BIM, communicating value, benefits and investments associated with it. Incorporate information about BIM, staying up to date on BIM trends, current developments and new directions and evaluating new BIM related technologies;
- LO2. ensure compliance with BIM standard, using code checking software to verify the respect of them and to list the requirement for automatic code checking and managing software e-permit;
- LO3. establish requirements for the management, coordination and preserving of data related to energy performance during the lifecycle of the building in the CDE, knowing the importance of the respect of the information requirements through all the supply chain, evaluating the completeness of the information delivery plan and ensuring the storage of the models for the future. Identify representation of information maturity level of the models regarding predefined LOD/LOI indicators in the level of detail request;

- LO4. identify, digitalize and update graphic and non-graphic elements in standard formats for their sharing in the CDE (such as maps, SE@AP indicators, materials and components requirements, etc.). Use design software and read the 3D model in order to verify the respect of requirements, the various participants and roles in the sustainable construction project. Propose modifications due to problems related to BIM systems for obtaining NZEB;
- LO5. define performance indicators depending on the use of the building, climate zone, influence on the global environment during its whole lifecycle and manage and analyze data for the calculation of NZEB energy performance. Define the QA monitoring methodology with measurable QA criteria as part of the contract and measure and analyze the defined QA input data for the definition and management of performance gaps;
- LO6. distinguish between different RES solutions and technologies, identifying the sustainability requirements, advantages and disadvantages according to climate zone, building uses and the global environment and evaluate the resilience of the building to future climate changes;
- LO7. preserve the foreseen energy performance and evaluate the completeness of the maintenance plan, being able to explain / understand it for the training and instructing of facility managers and building users;
- LO8. conduct a successful tender and contracting, with compliance to legal and technical aspects of green procurement, having knowledge on legislation, technical aspects, state and rules for the using of public funding and international good practice. Negotiate and take the necessary legal steps if the contractual requirements were not met, defining appropriate guarantees that apply if there are identified deviations / beaches of the contract;
- LO9. evaluate the completeness of the handover strategy, monitoring whether the contracted performance is met, and make correction when there are differences between "as built" and the final BIM Model;
- LO10. ensure the correct recycling and decommissioning of the building, in the respect of local, national and international laws;
- LO11. facilitate BIM communication between different stakeholders.

### 2.3. Roadmap for the exploitation of the Net-UBIEP results

Particular attention has been devoted to dissemination among decision makers in public administrations and among owner/tenant associations as these targets, can “impose” the employment of qualified professionals and workers or provides incentives to use qualified BIM experts.

For three years after the end of the project Net-UBIEP will provide tools to Public Administrations to increase their competences on BIM related to Energy Efficiency. Besides the already planned activities, the partners will identify, in each country, the decision makers at national and regional level to present the results of the project to promote the use of BIM in all the construction industry. In particular they have contacted **public administration** (competent minister and/or regional departments) to introduce BIM model for energy performance in the building regulation.

As an example, on 19<sup>th</sup> October 2018 the NetUbiep project was presented before 40 representatives of the Spanish Local Administrations. The participants shown a great interest in BIM, particularly in the trainings developed by the NetUbiep project.



During other seminars where the public institutions attended, they had access to the training materials addressed to the Public Administrations.

### 3. Information materials for technicians

#### 3.1 Technicians and BIM

For future smart buildings and digital construction, technicians need to be ready to manage the digital model of a real building when installing or maintaining plants as well as structures. To put it simpler, to provide better services at lower prices the market will require more efficient maintenance and the use of digital information.

The main objective of Net-UBIEP training materials for technicians is to teach them how to use BIM to view the HVAC systems and facilities, maintain them by updating the model with all the information required for any future use during the entire life cycle of a building.

#### 3.2 The role of Technicians

In the preparatory phase the technicians need to use the specific terminology used in BIM (BEP, PIM, MIDP, etc.) and need to have a general overview of rules and technical standards for improving energy performance.

The idea of the Net-UBIEP training for technicians is to provide knowledge about BIM and energy efficiency which they need to:

- recognize the advantages of BIM compared to traditional methods,
- understand the life cycle of the project information; how the information is specified, produced, exchanged and maintained
- recognize the added value of using open solutions to ensure interoperability
- be aware of the collaboration in the Common Data Environment
- be aware of the national legislation for the digitalization of the building sector
- be aware of the indicators which are considered important in their Regional/Local environment in relation to:
  - o Sustainable Energy Action Plan (SEAP) or Sustainable Energy and Climate Action Plan (SECAP)
  - o Thermal Plant cadaster
  - o Energy performance certification cadaster

- Green products comprehensive of energy carriers compulsory according to the green public procurement

The majority of technicians are potentially ready for the “digital revolution” because they only need to use their mobile devices or tablets but they lack the familiarity with the BIM terminology and they lack responsibility regarding the correct information management during the construction process which are to be used for the management of the building.

In order to visualize the model and have access to the different requirements established by designers and end users technicians will not need to be equipped with licensed software because their tasks can be performed using free BIM software.

Focusing on the energy aspects, the technicians have to know the best solutions for NZEB both in the case of new buildings as well as for the refurbishment of the existing one. They need to know the national regulatory and legislative requirements for NZEB. In particular they need to know very well the technical standards related to the technology they are installing. At the same time the European BUS initiative has demonstrated that they also need a good understanding of any other technology related to NZEB. They finally need to know the rules for the recycling and/or disposal of obsolete materials/equipment.

### 3.3 Learning outcomes for technicians

The learning outcome can be viewed in the deliverable: D15.A – D3.2.A Requirements for Learning Outcomes for Target Groups. The deliverable can be downloaded from the web site [www.net-ubiep.eu](http://www.net-ubiep.eu).

The „*Training material for technicians*“ can be viewed in the deliverable D20 - D3.7 Training Materials for Technicians. The deliverable can be downloaded from the web site [www.net-ubiep.eu](http://www.net-ubiep.eu). The deliverable is translated into partners' national languages and can be found in the national web sites.

Additionally, e-learning courses were developed for technicians containing webinars, lectures, dictionaries, short quizzes to test Your knowledge etc. And can be found in partners national web sites <http://www.net-ubiep.eu/hr/e-learning-4/>.

### 3.4 Roadmap for the exploitation of the Net-UBIEP results

It is evident that technicians and producers of technologies for energy efficiency is still a difficult target to reach as they do not see an immediate application. Their role will become more and more critical when contractors will decide or will be obliged to implement the BIM model with the real buildings during the construction. Meeting with the leading trade associations as well as the leading producers could be very important to start the process for the exploitation of the Net-UBIEP results.

**Strategic objectives for the exploitation of Net-UBIEP results among the technicians are the following:**

- Define a roadmap with the main stakeholders for their progressive involvement in BIM revolution
- Involve producers in the definition of the requirements for the Data Dictionaries developed by BuildingSMART International

**Measures for the exploitation of Net-UBIEP results among the technicians are the following:**

- Agreement with national and European platform on building construction.
- Distribution of the training materials and the dissemination of the e-learning courses, developed by the partners, among the professional associations to reach more and more workers.

**Possible outputs of the exploitation of Net-UBIEP results among the technicians are the following:**

- MoU signature with professional and craft associations interested in promoting the individual qualification for the use of BIM for energy performance improvement.
- Involvement of main European producers into the definition of BuildingSMART Data Dictionaries.
- Educated workforce of technicians

#### 4. Information materials for owners

For a non-technical owner of a building is difficult to understand the importance of energy saving but it is easier to focus on cost savings and comfort increasing. Very often, owners have superficial test of the building plants and do not evaluate the real energy costs in the lifetime of the building. Potentially, the BIM 7D model could provide them a simple tool to analyze the energy consumption and to manage the costs. In order to achieve this advantage, they have to learn how to define their requirements and how to control that those requirements are met. Therefore, they need to acquire the right competences to have all the process under their control as they are paying not only for the real building but also for the “virtual building” completed with all the information they need to manage the building during all its lifecycle. The NZEB and the refurbishment should be presented as a solution to reduce cost of management and improve the comfort of the building as the engineers will find the best solution to have always adequate temperature and micro-environment control improving health conditions.

There is a need, for Owners, to understand the usefulness and economic benefits of using BIM. BIM helps to decrease the costs for the management and the maintenance of buildings, but only if owners, tenants and facility managers are ready to invest on the realization of a 3D-model of the building populated with all the information necessary to optimize the building management. A nuanced view of return on investment for BIM considers three dimensions:

- ORGANIZATION DIMENSION. Are benefits measured at the project level or the firm level?
- STAKEHOLDER DIMENSION. What specific role does the company occupy in the project system?
- MATURITY DIMENSION. How much depth of BIM experience does the company have?

By considering BIM adoption and ROI assessment across these three dimensions, owners may be better able to understand how measurement and technology innovation can be combined strategically to inform progress toward future levels of BIM maturity.

Design and construction teams are contracted typically to deliver a structured information handover package to support a client’s asset operations and maintenance at a project’s end. However, not often this handover information is checked for completeness, accuracy and appropriateness. Without sophisticated digital handover tools, contractors are scrambling to gather project information

retrospectively at practical completion to deliver to the owner. Much of this information is inaccurate and/or incomplete. BIM gives owners a multidimensional model of the as-built asset, but more importantly, the opportunity to develop a structured digital information source of the asset so that the design can be modified and approved while testing its constructability. In the future, the facilities manager has the opportunity to influence the quality of the information they receive, including a complete digital representation, and a geospatial view, with all relevant project and handover information detail included.

Communication, seminars and awareness campaign conducted during Net-UBIEP project implementation potentially will help owners to be at least curious to understand better the BIM world and to provide knowledge about BIM and energy efficiency, which they need to:

- be aware of advantages and value of using BIM on all stages of building life cycle for different uses;
- be aware of advantages of using BIM technologies for improving energy performance of a building;
- define employer information requirements and ensure that information requirements are properly transferred to all project participants.

Based on the associated learning outcomes, learning materials for the owners were developed. Each country tested the learning materials in seminars in late 2018 and early 2019. Feedback on the developed materials from the participants were gathered by using questionnaires filled during the seminars.

## 5. Qualification bSI

The net-UBIEP partnership has agreed to proceed with buildingSMART Professional Certification Program being the global benchmark for openBIM training.

buildingSMART International (bSI) is the organization working for quality assurance and standardization in the digitalization of the built asset industry.

The Professional Certification Program exists to support training organization to deliver internationally standardized and recognized training content. buildingSMART will not be delivering training itself, but will be defining learning outcomes and managing the approval of training providers and the testing and qualification of individuals.

The bSI Program goals are:

- To standardize and promote openBIM training content
- To support and accredit training organizations
- To test and certify individuals

The bSI Program is divided into two phases.

Phase 1, which is entitled Individual Qualification, focusses on knowledge-based learning.

Phase 2, which is a more comprehensive Program that addresses applied learning within the field. The current focus of buildingSMART, and of net-UBIEP partnership, is individual Qualification.

Individual Qualification, or knowledge-based learning, has been designed to introduce the basic concepts and principles of openBIM. This focusses on theory-based learning that does not include software training or hands-on practice.

The agreement with bSI is to develop additional modules related to the use of BIM to improve energy performance of buildings. In order to have a better recognition in all Europe, net-UBIEP has joined to a network of other three European Projects on the same subject.

Following this decision, the partners are now working on the definition of learning outcome that cover all the lifecycle of a building.

These the provisional subjects of the modules which will be agreed with the other partnerships:

- Mod. 1 Understand which information of existing situation is necessary to specify, produce, exchange, maintain and/or refurbish
- Mod. 2 Understand which information are necessary to specify, produce, exchange, and maintain during the preliminary design
- Mod. 3 Understand which information are necessary to specify, produce, exchange, and maintain during the technical design
- Mod 4 Understand which information are necessary to specify, produce, exchange and maintain during the construction
- Mod. 5 Energy management in the operational stage-principles, tools and methods for smart energy management, underpinned by BIM

## 6. National section - Croatia

### 6.1 Training - experiences

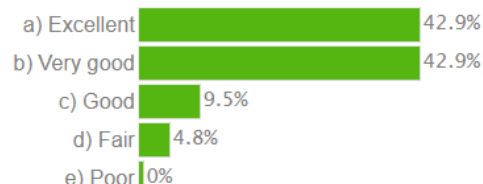
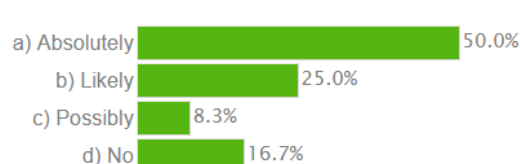
All training courses were conducted in Croatia aiming at different target groups in the period from December 2018 until April 2019.

University of Zagreb, Faculty of Civil Engineering organized 2 courses for Public Authorities, Owners and building administrators were held with 56 participants and 3 courses for professionals with 93 participants in total.



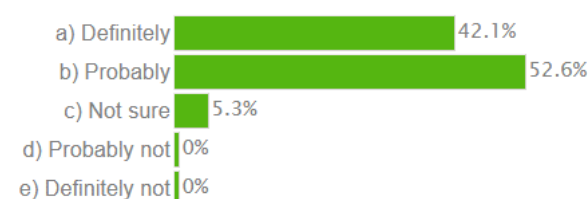
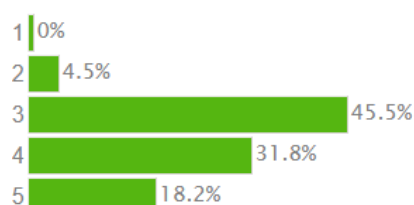
Survey and interviews among different target groups were conducted using questionnaires developed and used during courses. The survey is tailored specifically for each of the 4 target groups. Questionnaires were prepared in order to validate defined competence lists and trainee satisfaction with the course and instructor (trainer) effectiveness.

The progress training participants made during the courses and efficiency of the courses, and their satisfaction with the courses were measured using this survey. The following diagrams show basic information about the satisfaction of training course participants.



Would BIM certification, support or training, benefit Your colleagues?

What overall rating would You give the course?



How much new information did you receive in the training course?

Rate on the scale from: 1 (none) to 5 (a lot of new information)

Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!

## 6.2 E-learning

At the moment of writing this newsletter more than 350 entries to the webinars (e-learning) were logged.

e-learning published on the Net-UBIEP web page can be found here: <http://www.net-ubiep.eu/hr/e-learning-4/>. Croatian partners used recorded webinars and Moodle system to develop e-learning content, where lectures and videos on practical examples of using BIM tools for different applications related to energy efficiency and NZEB can be found. Additionally, e-learning users can test their knowledge playing different games and filling in quizzes.

## 6.3 Events performed and planned

In total, Croatian partners have participated to 20 dissemination events which were focused on energy efficiency in buildings and targeted to public authorities, architects, engineers, technicians and building managers. Some of these events were also organized or co-organized by the University of Zagreb, Faculty of Civil Engineering. In all of these, the importance of BIM and NZEB competences was enhanced and discussed where also other Horizon 2020 projects like BIMCERT were presented.



Next events are planned as dissemination and exploitation events, out of which the first event will be held on July 1<sup>st</sup> in Croatian city of Rijeka. This event will be focused on presenting e-learning materials and on how to use BIM in energy efficiency projects.

The additional events are planned in October or November, but for the additional details please follow the project web site: <http://www.net-ubiep.eu/hr/home-hr/>

## 7. Situation in the Netherlands

### 7.1 Performed and planned events

March 12<sup>th</sup>, March 26<sup>th</sup> and May 14<sup>th</sup>:

In the coming years the construction and installation companies will construct NZEB buildings or modify existing buildings to achieve NZEB. This means a lot of extra engineering with a central role for BIM. Thanks to smart algorithms, the models are able to immediately provide insight into the expected energy performance and problems such as heat leaks and air leaks. To achieve this professionals (engineers and architects) are trained in three sessions. In this practical training powerful principles and possibilities about BIM in relation to NZEB are introduced. These trainings for professionals took place at March 12<sup>th</sup>, March 26<sup>th</sup> and May 14<sup>th</sup>.

24<sup>th</sup> of June:

Next to courses for professionals, BIM coaches and trainers are approached to create a network of trainers. A meeting is planned for 24<sup>th</sup> of June with the purpose to become acquainted with each other and to introduce the NetUBIEP Qualification framework and also the available BIM learning materials.

### 7.2 Exploitation strategy

For each target group we have different strategies:

Public Administration:

Strategy: Dissemination through Dutch municipalities. For building permits and asset management objectives, municipalities are encouraged to request BIM models from designers and contractors.

Possible output: Commitment from municipalities to request BIM models for checking building permits and asset management

Professionals:

Strategy: Dissemination learning material through a new network of professional educators. We help the professional educators with the necessary education material and marketing activities

Possible output:

- New qualification schema accepted by the engineers and architects associations and or at University level for the use of BIM for energy performance improvement.
- A network of professional educators who are equipped with objective education material based on BIM skills and competences.

Technicians:

Strategy:

- Dissemination through industry associations, construction companies and installers.
- BIM ILS for nZEB

Possible output:

- MoU signature with craft associations interested to promote the individual qualification for the use of BIM for energy performance improvement.
- Involvement of main European producers into the definition of BuildingSMART Data Dictionaries.
- Educated workforce of technicians.

Tenants/Owners/Building administrators:

Strategy: Usage of BIM for nZEB publications based on NET-UBIEP material for owners and tenants.

- Possible output: MoU signature with owners associations interested to require the BIM model for the management of buildings to improve the energy performance.
- Usage of BIM for nZEB publications for tenants and building owners.

## 8. National section - Italy

### 8.1 Training – experiences

In early 2019 ENEA completed most of the seminars planned by organizing two seminars for professionals and two for the PA. a total of 60 professionals were trained and > 150 technical officials and managers of the PA.

In Terni city the seminar about “The role of professionals of construction supply chain in order to get a better performance energy using the BIM: the NET UBIEP project” attended by architects and engineers from the regional area, with focus on cultural heritage refurbishment design and the application in performance contracts energy and real estate management to reduce the consumption and to produce energy from renewable sources integrated in the building using BIM tools like the Common data environmental and BIM’s library.



In Oristano city the seminar about “Building Information Modeling: Innovation e new frontiers for infrastructure and cities sustainable- NET project UBIEP” attended by technical officials and managers of the PA and some architects and engineers from the regional area.

Focus on the challenges of the cities and the role of the municipalities for an energy transition that affects all sectors and thanks to the bim tools it can also implement the management and monitoring of the SECAP “Sustainable Energy Climate Action Plan”.



In Pescara city the seminar on "Building Information Modeling: Innovation e new frontiers for sustainable infrastructures and cities - NET UBIEP Project "attended by technical officials and PA managers and some architects and engineers from the regional area.

Focus on the training the public administration as foreseen by the ministerial decree with in order to adopting the Bim method for the management of public tenders.



Survey and interviews were conducted using questionnaires developed before and after the course in order to extract some consideration and make an analysis.

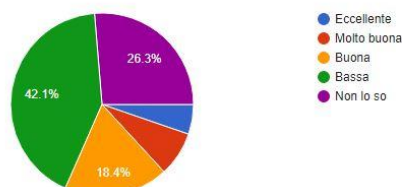
Questionnaires were prepared in order to estimate the knowledge about BIM methodology , the difficult to diffuse it and trainee satisfaction with the course and trainer effectiveness.

The following diagrams show basic information about some important consideration after the courses.

- Before the course more than 40% had low knowledge of Bim but is aware of the importance of get them, in fact more than 50% expects to apply Bim methodology in energy efficiency projects as soon as possible:

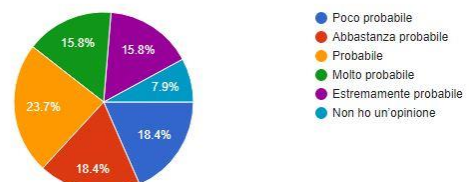
22. Come giudica le sue competenze in BIM (conoscenze, abilità, responsabilità e autonomia) ?

38 responses



26. Secondo lei, quanto è probabile che la sua azienda / organizzazione applicherà il BIM su progetti relativi all'efficienza energetica?

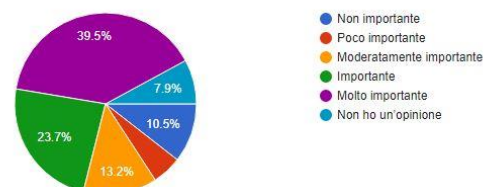
38 responses



- Moreover, the interviewees believe that it is also important for the PA and the Ministries to push the use of Bim for energy efficiency projects.

27. Secondo Lei, quanto è importante che PA e Ministeri preposti impongano l'uso del BIM al fine di incoraggiarne l'attuazione nei progetti di efficientamento energetico?

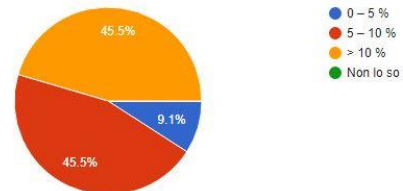
38 responses



- the interviewees after the course indicate that the increase in productivity and energy savings exceeds 10% by demonstrating that technicians and entrepreneurs and managers are aware of the benefits that the Bim can bring.

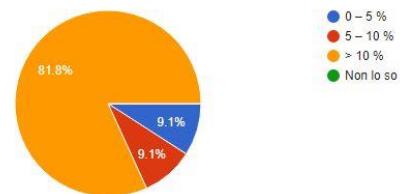
11. Si prega di valutare, quanto è possibile aumentare la produttività utilizzando il BIM, dopo questo corso di formazione?

11 responses



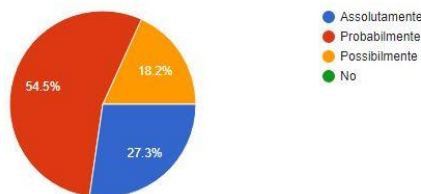
12. Valuta, quanta energia ti aspetti di risparmiare applicando le conoscenze acquisite durante questo corso di formazione sul BIM. Quanto sarebbe migliorato il tuo progetto / esecuzione / controllo di conformità / uso dell'edificio rispetto alla procedura standard?

11 responses



15. La certificazione BIM, il supporto o la formazione sarebbero utili a lei o ai suoi colleghi?

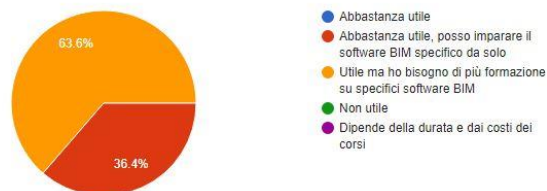
11 responses



- There is an awareness of the importance in order to have a certification of skills after a specific training, but the greater part more than 60% expects specific training on the use of a specific software and not on the Bim process.

16. Cosa ne pensi dell'educazione formale sul BIM e sui vantaggi derivanti (senza l'utilizzo di software specifici)?

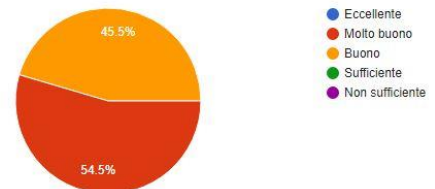
11 responses



- The interviewees at the end of the course believe they are satisfied with the topics and contents presented and also with the trainer. Also the didactic material is satisfactory.

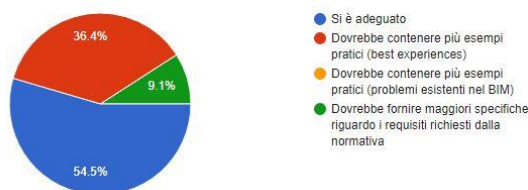
19. Quale valutazione generale daresti al corso?

11 responses



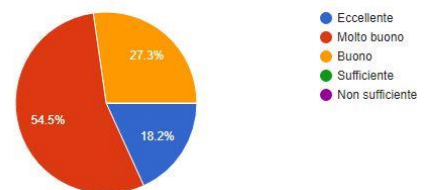
26. Il materiale didattico è abbastanza completo?

11 responses



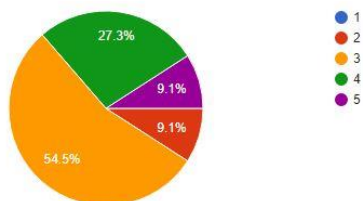
21. Quale valutazione generale daresti al / ai formatore / i?

11 responses



23. Quante nuove informazioni hai ricevuto nel corso di formazione ?  
Valuta sulla scala da: 1 (nessuna) a 5 (molte nuove informazioni)

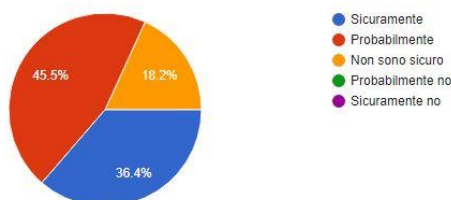
11 responses



- More than 50% to have received new information, considering the course valid to increase knowledge and they say (80%) that are available to disseminate training courses among their colleagues and contacts

28. Saresti disposto a divulgare i corsi di formazione BIM tra i tuoi contatti e collaboratori? Senza obbligo di farlo!

11 responses



## 8.2 E-learning

The first e-learning course on the use of BIM to improve the energy performance of buildings was published on the [www.formazione.enea.it](http://www.formazione.enea.it) platform. Although the course is designed specifically for technicians, it can be useful for anyone who wants to learn about this use of Building Information Modeling. To view the course you must register for free. The title of the course is BIM, training for technicians.

The first video lesson of the course on BIM and its diffusion is available on-line to get an improvement in the energy performance of buildings.

During the first lesson the issues related to the strategies to be adopted to implement BIM within a public or private company will be addressed.

To access the ENEA E-learn platform click here: <http://www.net-ubiep.eu/it/iframe-test/>

On the e-learning web page <http://www.net-ubiep.eu/it/e-learning-5/>, a video was also uploaded showing how it is possible to design a photovoltaic system, starting from the geographical data and the survey of an existing building. The photovoltaic project, made with software, is "federated" to the architectural project obtained by importing an ifc file. The software allows, once the system has been identified, to simulate shading and therefore optimize the design choices. Finally, the report to be printed for the presentation of the project to the competent authorities can be created with simple mouse movements.

## 8.3 Events performed and planned

ENEA participated in various events focused on energy efficiency in buildings and aimed at public authorities, architects, engineers, technicians and building administrators, such as the Covenant Mayors for Climate and Energy in Brussels in March, EU Sustainable energy week 18-20 June Brussels, BUILD UP skills workshop at CONSTRUMAT'19 in Barcelona, as well as bringing the net-ubiep project into the network of European projects "BIM Alliance" and working with them in order to align skills about Bim

ENEA also participated in training seminars on Certified Circular Economy (Genoa) and Energy management experts update seminar in the civil and industrial sector (Milan) with its own researchers who presented guidelines, tools and case studies for the application of Bim in energy efficiency of buildings.

Next events are planned as dissemination and exploitation events, out of which the first event will be held on July 18<sup>th</sup> in Messina. This event will be focused on e-procurement for Public Administration. Another is scheduled for September for professionals and the BIM methodology for design and management of the construction works.

The additional events are planned will be published on the web page: <http://www.net-ubiep.eu/it/events-5/>

## 9. Situation in Slovakia

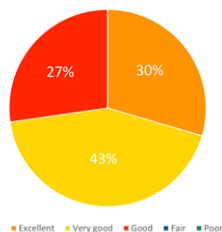
### 9.1 Trainings

From October 2018 to May 2019, 6 training sessions were conducted in Slovakia in total, 2 for public administration, owners and tenants, 1 for technicians and 3 for professionals. All trainings had 177 participants in total. Participants also filled in surveys in order to analyse trainee satisfaction with courses and trainers. The diagrams below show that trainee satisfaction with courses and trainers was quite high.

During these training sessions, the content of 6 training modules for the Net-Ubiep BIM Academy Slovakia were tested and consequently fine-tuned for the training sessions to be organised by the academy during the project and beyond its expiry.

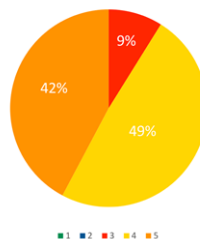


Overall rating of training?

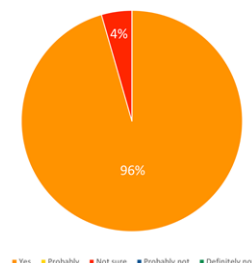


How new information given?

1- none, 2-little, 3-mostly new, 4-very much new, 5-completely new



Would you recommend to others?



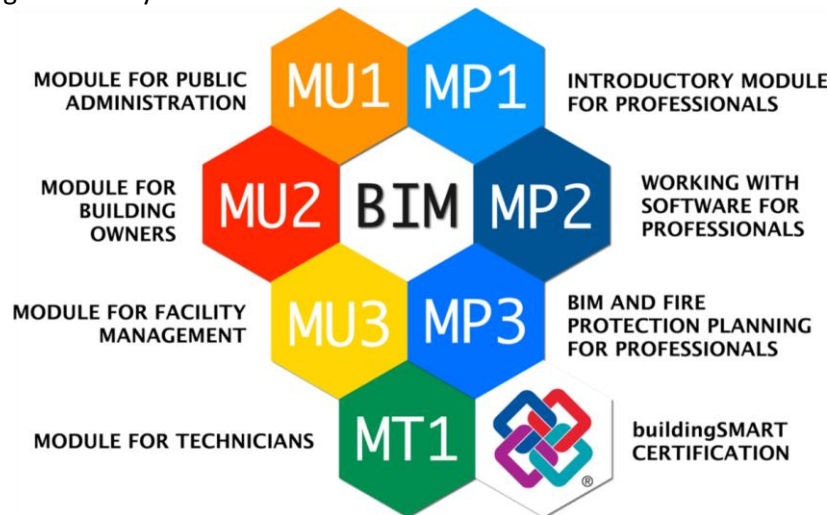
### 9.2 Performed and planned events

In total, Slovak partners participated and/or organised 15 dissemination events, which targeting different stakeholders (public authorities, engineers and architects, technicians, building owners and tenants, operators along the buildings' value chain). Most notable events were training sessions organised by Net-Ubiep BIM Academy Slovakia and Net-Ubiep Open Days organized during International Fair Coneco/Racioenergia 2019 construction fair on 27 and 28 March 2019. Open days included a training session for technicians and demonstration of applications supported by BIM engine such as augmented reality and virtual reality.

### 9.3 Exploitation strategy

The project set up the Net-Ubiep BIM Academy in Slovakia that offers 6 modules and 1 certification module (in cooperation with buildingSMART). The training structure is open and new modules will be

developed as needs be. The academy is underpinned by a partnership (MoU signed) affiliating key stakeholders and SMEs, including those delivering BIM related services and innovations to the market. The academy will be disseminating the skills and know-how shared among members of the partnership to accelerate the adoption of BIM and applications beyond BIM that are a follow-up to inception digitalization bought about by BIM.

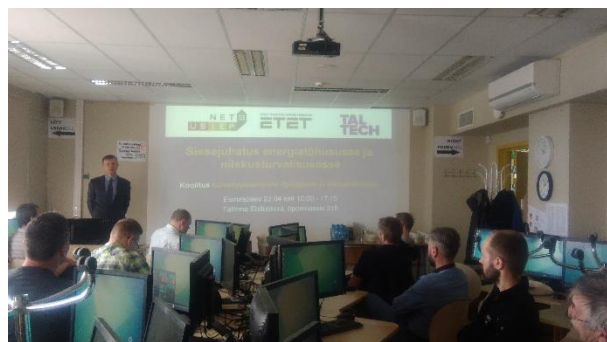


## 10. National section - Estonia

### 10.1 Trainings and events

All face to face training courses were conducted in Estonia aiming at different target groups in the period from October 2018 until April 2019.





Training	Date	Participants
<b>Classroom trainings</b>		
Public administration Seminar	22.10.2018	43
Public administration Handbooks	15.03.2019	52
Tenants Seminar	23.10.2018	21
Tenants Handbooks	05.11.2018	13
	15.11.2018	40
Professional (Arch.Eng.) Classroom Course	9-25.01.2019	51
<b>E-learning</b>		
Professional E-Course (BIM I)	02-05.2018	13
	02-05.2019	38
Professional E-Learning Course	08.2019	50
	05.02.2019	10
Technicians E-Learning Course	22.04.2019	17

Survey and interviews among different target groups were conducted using questionnaires developed and used during courses. Questionnaires were prepared in order to validate defined competence lists and trainee satisfaction with the course and instructor (trainer) effectiveness.

BIM and NET-UBiep project topics was presented in many events:

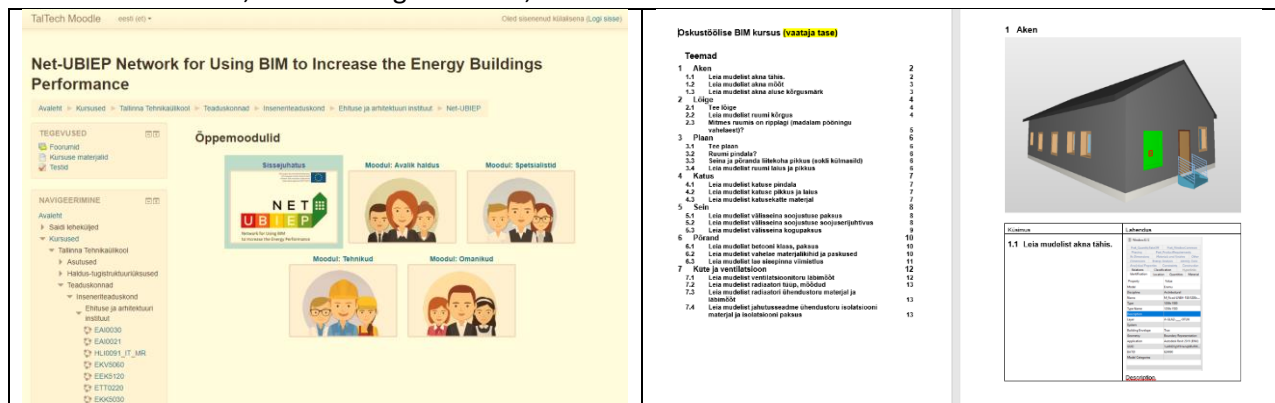


Event	Date	Participants
Annual national conference BIM Summit	14.11.2018	107
	22.02.2019	93
Annual national conference Knowledge-base	26.04.2018	250

Construction	23.04.2019	250
Annual conference named 'Project Manager's Day'		200
Construction technology	28.02.2018 22.02.2019	100 100

## 10.2 E-learning

In TalTech Moodle, Self-learning materials, videos and tests are available:



## 10.3 NetUBIEP National Roadmap in Estonia

Several striving have been conducted to define BIM qualification system. New architects and civil engineers qualification standard includes BIM as the basic knowledge. Therefore the special qualification is not wanted. Priority objective will be voluntary education based on NetUBIEP and buildingSMART's BIM certification system and "Plan B" (if there is a general demand for it): Develop BIM Qualification Standard aligned with the buildingSMART's BIM certification. The premise for applying for the BIM Qualification would be that each applicant has either the degree or existing qualification in any construction related discipline (e.g., structural engineering, architecture, degree in carpentry. BIM for energy efficient planning, design, construction and maintenance of buildings will be to the university curricula. Professional training programs for the energy efficient planning, design, construction and maintenance of buildings will be developed at the TalTech and Tallinn University of Applied Sciences.

## 11. National section – Lithuania

### 11.1 Training - experiences

All seminars and training courses for different target groups were conducted in Lithuania in the period from December 2018 until April 2019. Public Organization "Digital Construction" and Vilnius Gediminas technical University organized two seminars for Public Authorities and Owners with 61 participants in total. Three trainings for professionals were held in Vilnius Gediminas Technical University classrooms at Faculty of Civil Engineering with 60 participants in total. The lectures of seminars and classrooms were

representatives from industry partners, Public Organization “Digital Construction” and Vilnius Gediminas Technical University.



Seminars for Public Authorities and Owners

Table. Main figures of seminars.

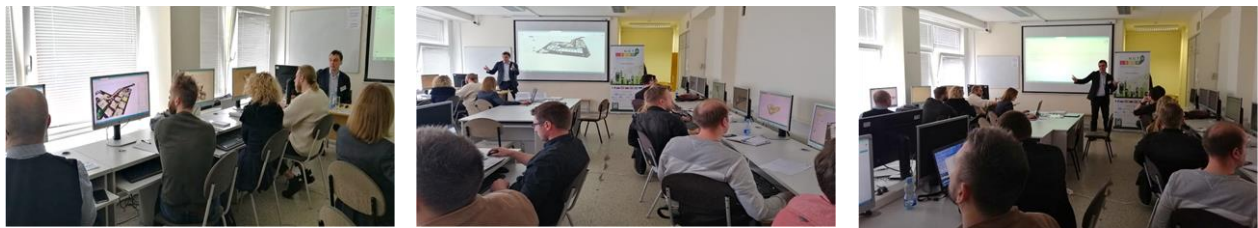
Seminars	Registered	Participated	Attendance rate, %
1 <sup>st</sup> seminar for Public Administration and Owners (2018-12-10, Vilnius, Lithuania)	38	34	90
2 <sup>nd</sup> seminar for Public Administration and Owners (2019-04-04, Klaipėda, Lithuania)	32	27	84
<b>Total</b>	<b>70</b>	<b>61</b>	<b>87</b>
			Response rate, %
Filled questionnaires Owners		27	
Filled questionnaires PA		9	
<b>Total Filled questionnaires</b>		<b>36</b>	<b>59</b>



1<sup>st</sup> trainings for professionals



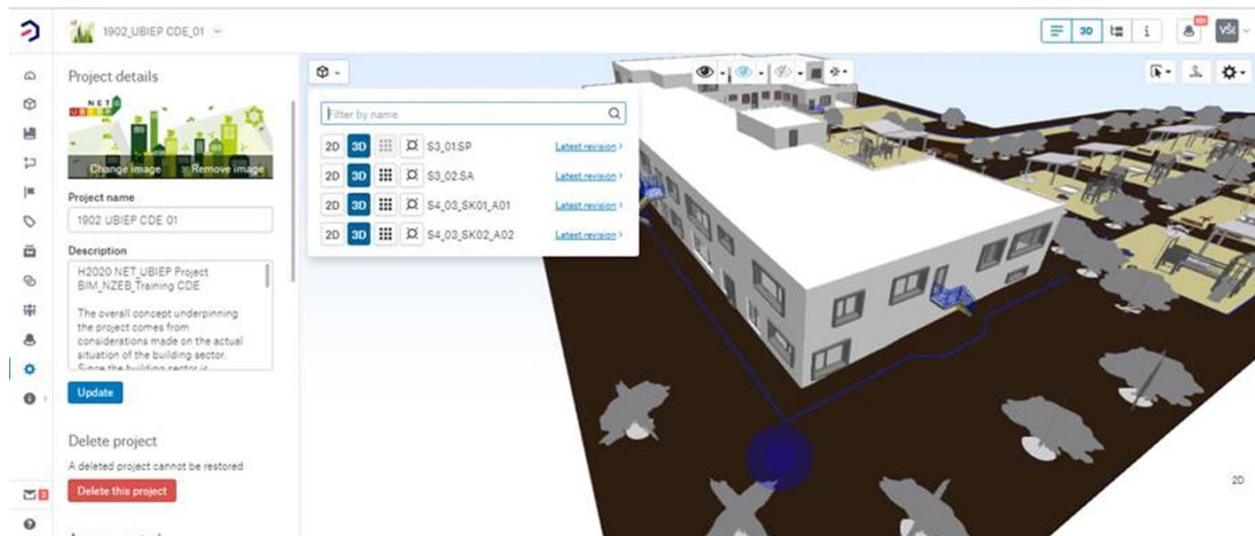
2<sup>nd</sup> trainings for professionals



3<sup>rd</sup> trainings for professionals

A new model of practical trainings for BIM has been developed, combining theoretical part with application examples (case studies) and practical tasks. The system of documents and methodology developed by DigCon and partners was used for the trainings: system of documents, i.e. templates of EIR, BEP, LOD, BIM Use cases, etc. After the training, the majority expressed a desire to continue the trainings. Real BIM project management web platform BIMSyc (CDE) has been used as a platform for communication between trainers and participants of trainings. Training platform BIMSyc used real BIM model files and related information. The illustration presented below depicts main facts about seminars and trainings conducted in Lithuania, as well the partners who provided the real cases for seminars and trainings.



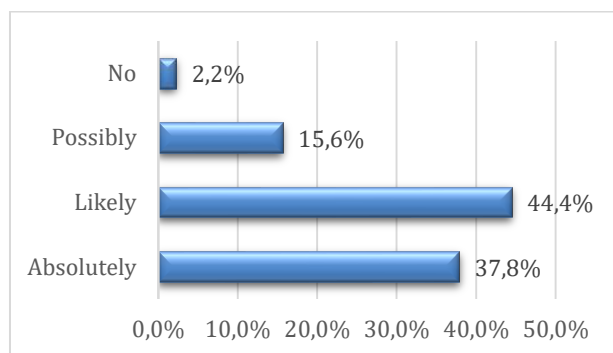


To complete the questionnaires, tasks were created through the CDE environment in BIMSync platform. This resulted in a high percentage of responses (Pre- 95%, Post -75%).

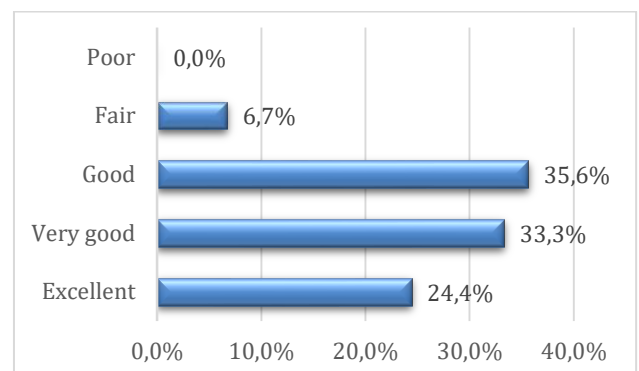
Table. Main figures of trainings.

Trainings	Registered	Participated	Attendance rate, %
1 <sup>st</sup> classroom for professionals (2019-03-01)	25	24	96
2 <sup>nd</sup> classroom for professionals (2019-03-29)	26	19	73
3 <sup>rd</sup> classroom for professionals (2019-04-10)	23	17	74
<b>Total</b>	<b>74</b>	<b>60</b>	<b>81</b>
			Response rate, %
Filled questionnaires Pre-training		57	95
Filled questionnaires Post-training		45	75

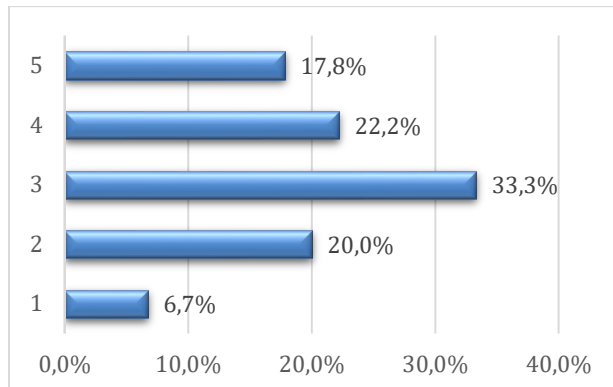
The progress, training participants made during the courses, their satisfaction with the courses, and the efficiency of the courses were measured using the post-training survey. Some results of the survey depicted in following diagrams.



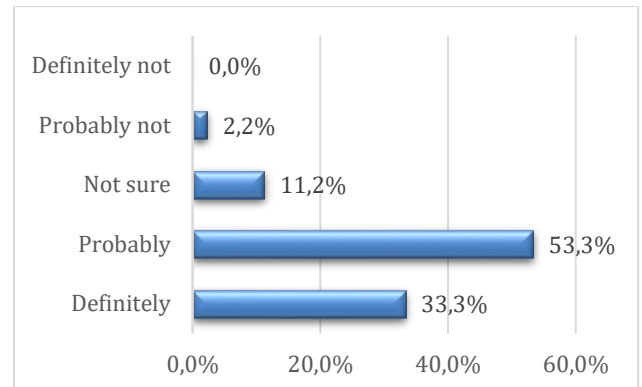
The distribution of responses to the question "Would BIM certification, support or training, benefit Your colleagues?"



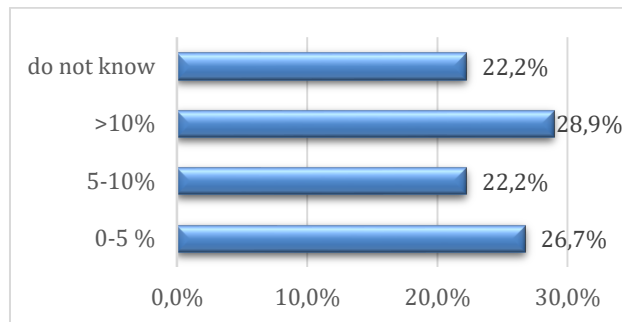
The distribution of responses to the question "What overall rating would You give the course?"



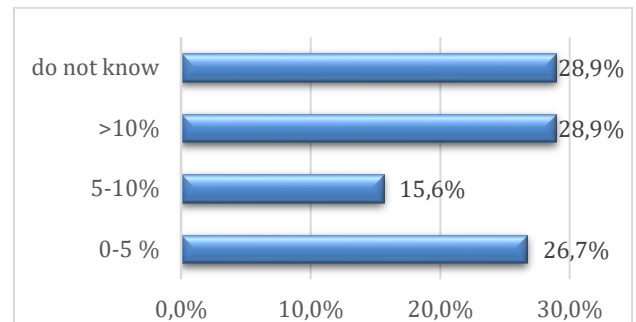
The distribution of responses to the question "How much new information did you receive in the training course (Rate on the scale from: 1 (none) to 5 (a lot of new information))?"



The distribution of responses to the question "Would You be willing to disseminate the BIM training courses among Your contacts and associates?"



The distribution of responses to the question "How much can You increase your productivity by using BIM, after this training course?"

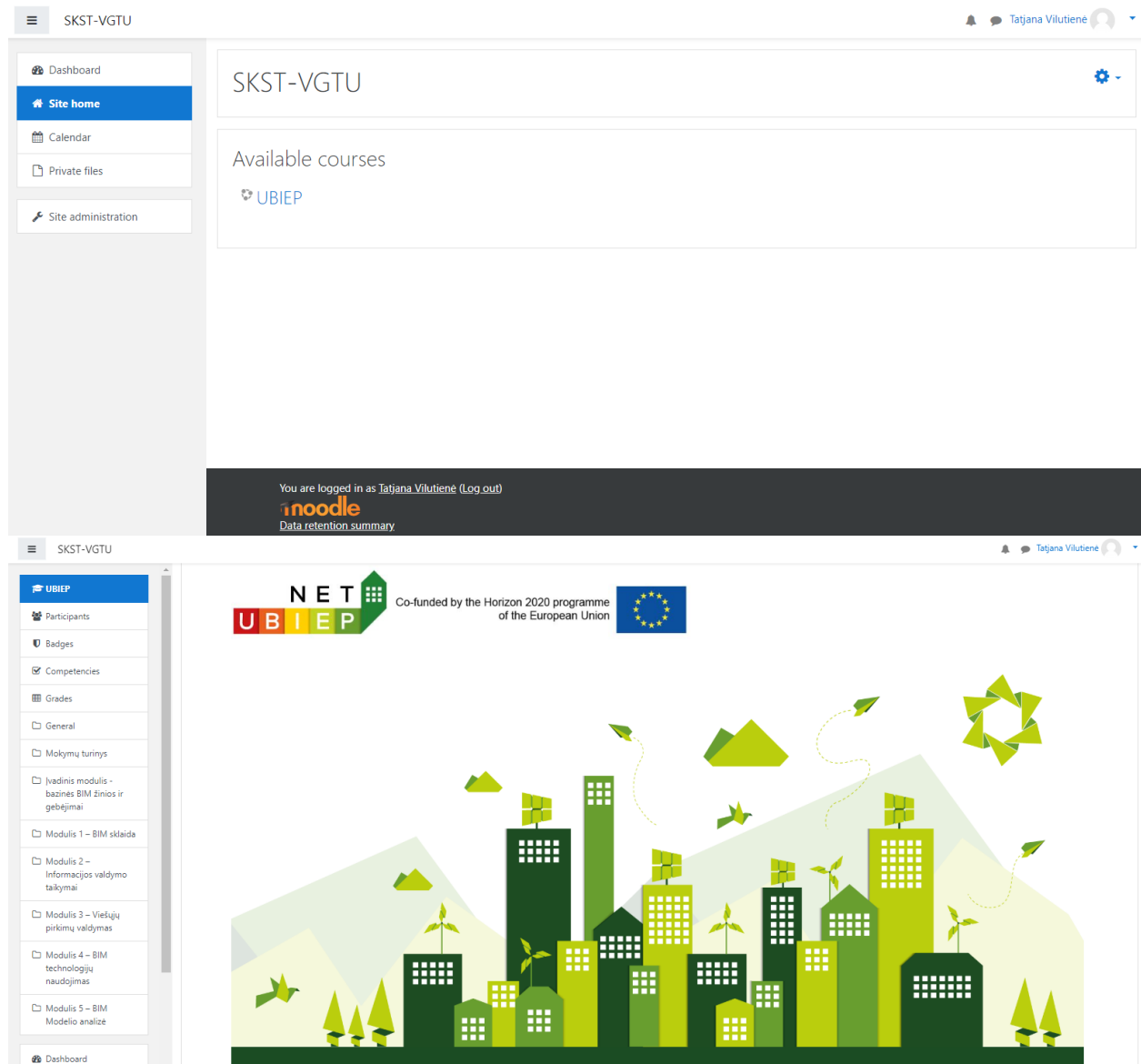


The distribution of responses to the question "How much energy do You expect to save by applying knowledge gained during this BIM training?"

## 11.1 E-learning

For E-Learning courses for professionals the Moodle platform was launched in Vilnius Gediminas Technical University (<http://skst.vgtu.lt/>).

The Moodle course contains five Modules presented in Training material for Technicians and includes real case studies accessed through BIM project management web platform BIMSinc.



## 11.2 Events performed and planned

Lithuanian partners have participated in seven dissemination events, which were focused on energy efficiency in buildings and targeted to public authorities, architects, engineers, technicians and building managers.

The additional events are planned in November, for the details please follow the project web site: <http://www.net-ubiep.eu/lt/events-6/>

## 12. National Section – Spain

### 12.1 Experience training (Seminars) and performed events

#### June 14<sup>th</sup> 2018, Technical Forum Andece, Madrid

On June 14<sup>th</sup> 2018, Net-Ubiep was presented by José Antonio Tenorio from Instituto Eduardo Torroja de Ciencias de la Construcción (IETCC-CSIC), in the workshop "Consumo de Energía casi nulo: soluciones constructivas industrializadas en hormigón" ("Nearly zero energy consumption: industrialized construction solutions in concrete"), organised by Asociación Nacional de la Industria del Prefabricado de Hormigón in Madrid. Event attended by about 60 professionals.



#### July 12<sup>nd</sup> 2018, Presentation at Working Group Housing Industrialisation Project (PIV), Madrid

Conference presentation of the project of the Working Group Housing Industrialisation Project (PIV), by Javier González –Fundación Laboral-, composed of representatives of: university institutions, architecture and engineering firms, developers, construction companies, manufacturers and installers, etc. Meeting attended by 21 professionals.



#### October 16<sup>th</sup> and 17<sup>th</sup> 2018, Seminars with Public Administration, owners, companies, etc., Madrid

On October 16<sup>th</sup> and 17<sup>th</sup> 2018 the NetUbiep project was presented by José Antonio Tenorio from IETCC-CSIC and Javier González, head of International Projects of Fundación Laboral, before 40 representatives

of the Spanish Local Administrations, in Instituto Eduardo Torroja de Ciencias de la Construcción (IETCC-CSIC) and in Consejería de Transportes, Infraestructura y Vivienda of Comunidad de Madrid. The participants shown a great interest in BIM, particularly in the trainings developed by the NetUbiep project.



During other seminars where the public institutions attended, they had access to the training materials addressed to the Public Administrations.

#### **November 13<sup>rd</sup> and 17<sup>th</sup> 2018, ePower&Building the Summit Construtec'18, Madrid**

Presentation of the projects of Fundación Laboral, between Net-Ubiep was referenced on ePower&Building the Summit, I Congreso Europeo de Construcción, Habitabilidad, Economía y Liderazgo ("I European Congress of Construction, Habitability, Economy and Leadership"), Construtec'18. The meeting was attended by more than 80 people and at the fair were delivered 100 Spanish leaflets of the project.



#### **April 25<sup>th</sup> 2019, Training Workshop in BIM for engineers and architects, Madrid**

On 25<sup>th</sup> April 2019 More than 50 construction sector professionals (52) met today at the [Instituto Eduardo Torroja de Ciencias de la Construcción of the CSIC \(IETCC-CSIC\)](#) to attend the [training workshop on BIM and Nearly Zero Energy Buildings \(nZEB\)](#), which the organisation organises in collaboration with [Fundación Laboral de la Construcción](#).

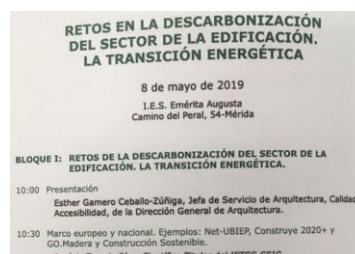
The conference, which is part of the training and dissemination activities of [Net-UBIEP](#) and [Construye 2020+](#) project, initiatives that belong to the European Union's [Horizon 2020](#) research and innovation programme and in which both Spanish organisations participate, has been aimed at engineers and architects with the aim of updating and complementing their knowledge in new methodologies and construction systems design.

The attendees included representatives of construction companies and business associations; public bodies and administrations; professional education and training centres, as well as trainers from the sector; professional associations in energy efficiency; technicians, consultants and specialists in energy efficiency, renewable energy systems and nZEB; and researchers specialised in green competences, BIM methodology and Lean Construction, who received at the end of the session access to a free 6 hours course on BIM, which is provided by Fundación Laboral de la Construcción and complements the training workshop.



### May 8<sup>th</sup> 2019, Challenges of decarbonization of the building sector, Mérida

In the conference "Retos de la descarbonización del sector de la edificación. Transición energética" ("Challenges of decarbonization of the building sector. Energy transition"), José Antonio Tenorio –IETCC-CSIC- offered the European and national framework, through the contribution of projects such as Net-Ubiep, on May 8<sup>th</sup> 2019 in the presence of some 50 professionals, in Mérida (Badajoz-Spain).



### May 16<sup>th</sup> 2019, Workshop "Digital construction skills" at Construmat'19, Barcelona

Dissemination of Net-Ubiep in the "Digital Construction skills: enabling the energy transition in Europe's building stock" workshop, organized by Build Up Easme from European Commission, at Construmat'19 fair. 100 English triptychs were distributed.



### Planned events

#### October 2019, Open Day/Dissemination event, Madrid

The event will take place during the last two weeks of October 2019 where a participation of 50/100 attendees is foreseen.

## 12.2 Exploitation strategy

Particular attention has been devoted to dissemination among decision makers in public administrations and among owner/tenant associations as these targets, can “impose” the employment of qualified professionals and workers or provide incentives to use qualified BIM experts.

For three years after the end of the project Net-UBIEP will provide tools to Public Administrations to increase their competences on BIM related to Energy Efficiency. Besides the already planned activities, the partners will identify, in each country, the decision makers at national and regional level to present the results of the project to promote the use of BIM in all the construction industry. In particular they have contacted **public administration** (competent minister and/or regional departments) to introduce BIM model for energy performance in the building regulation.