DELIVERABLE: D27 - D4.7

Survey and or interview among all different Targets

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Network for Using BIM to Increase the Energy Performance

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A. Deliverable Details	
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B. Short description

This report presents the results of a survey and/or interview conducted among all different target groups to validate the list of competences needed to work with BIM on NZEB (Nearly Zero Energy Building).

The report contains 4 different questionnaires tailored specifically for each of the 4 target groups (**stakeholders**) of the Net-UBIEP project. **Decision makers** of different stakeholders were asked to complete respective questionnaires **before the training courses begun**. The purpose of the questionnaires tailored for specific stakeholders was to determine the level of knowledge and experience regarding BIM, identify current practices of BIM in the projects related to energy efficiency and asses their views on the training needs and importance of training.

On the other hand, questionnaires tailored for **training participants** were prepared in order to validate defined competence lists for all the different targets groups as well as trainee satisfaction with course and instructor (trainer) effectiveness. **Training participants**, professionals and workers belonging to the different target groups were asked to judge on their competences **before the training as well as after the training**. The purpose of the "Pre training questionnaire" was to assess initial level of knowledge, experience and current practices regarding BIM. "Post training questionnaire" contains the same or similar questions as a "Pre training questionnaire" which serve to determine in simple ways the progress training participants have made during the courses and efficiency of the courses. Questions about the completeness or redundancy of the foreseen schemes and training courses were also included in the "Post training questionnaires".

Finally, this report contains the results of the survey among all stakeholders involved in the validation process and feedback analysis.

The report does not contain sensitive information and the collected data is being treated confidentially following the rules of General Data Protection Regulation 2016/679.

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C. Results of the survey among all training participants involved in the validation process and feedback analysis

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C.1 Short description

This chapter will present results of the survey among all training participants and will analyse their feedback about the courses organised within the project Net-UBIEP.

Validation of BIM Qualification Models and training materials was implemented in each partner country by the partners with more experience in training activities such as Universities and Training Centres. Mainly one partner per country organised and performed training, and these were as follows: ENEA (IT), FLC (ES), TUT (EE), FCE (HR), Dig.Con. (LT), ISSO (NL), ViaEU (SK).
Classroom Courses for Professionals, Public administration, Tenants, Owners and Building administrators were conducted in national languages Croatian, Dutch, Estonian, Italian, Latvian, Slovak, Spanish. Validation of training material and assessment for the target groups mentioned above on how to use BIM for the energy performance was conducted during these classroom courses using questionnaires.

The results presented in this chapter were gathered using the questionnaires tailored for training participants and shown in chapter "G. Pre training questionnaire" and chapter "H. Post training questionnaire" of this deliverable.
Questionnaire tailored for **training participants** were prepared with the goal of validation of defined competence lists as well as trainee satisfaction with course and instructor (trainer) effectiveness. **Training participants** were asked to judge on their competences **before the training as well as after the training**.

Good quality practices of education are based on three pillars:

- clear definitions of learning outcomes,
- design and structure of the programme course,
- evaluation and monitoring of the learning outcomes

Two types of questionnaires were used to cover these three pillars of good education and to simultaneously perform a self-assessment of competences gained by the participants during the course.
The purpose of the "**Pre training questionnaire**" was to assess initial level of knowledge, experience and current practices regarding BIM. "**Post training questionnaire**" contains the same or similar questions as a "Pre training questionnaire" which serve to determine in simple ways the progress training participants have made during the courses and efficiency of the courses. Questions about the completeness or redundancy of the foreseen schemes and training courses were also included in the "Post training questionnaires".

The main goal of the survey results is to provide information for future activities, based on the experience during the Net-UBIEP project. Therefore, this survey will set guidelines for the project deliverable *D4.8 Review of the three dimensional matrix*, as well as the overall evaluation of the courses conducted within the Net-UBIEP project.

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C.2 Learning outcomes and training programme

Both learning outcomes and training programme were explored and defined in details in previous project activities. All the partners followed the learning outcomes defined in deliverables *D14 - D3.1 Three-dimensional Matrix* and *D15 - D3.2 Requirement for learning outcomes* as well as the training materials developed as deliverables *D16 - D3.3 Multimedia Handbook for Public Administration on BIM; D17 - D3.4 Multimedia Handbook for Owners, Tenants and Building Administrators; D18 - D3.5 Contents for Professionals (Engineers and Architects) on BIM competences* and *D19 - D3.6 Guideline for Professionals on BIM competences*.

Therefore, in this chapter a summary of the main information is presented, as detailed information can be found in the respective Deliverables.

The classroom courses followed somewhat different structure in every partner country but as mentioned before have always included all the learning outcomes and training content defined in respective deliverables. Additionally, each respective partner developed their own training aids (i.e. power point presentations,) which then followed their course structure.
Partners used different systems for validation of training courses, but all using the questionnaires developed for this purpose in *D27-D4.7 Survey and or interview among all different Targets*. Some countries used GoogleForms, other partners used free web based voting solution (VoxVote) for interactive presentations and real time feedback from the course participants, BIMSync (CDE) platform was also used to evaluate training, while the fourth option was to use hardcopy questionnaires. The participants filled questionnaires anonymously during classroom courses in order to get their honest opinion and validation.

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Table 1 Overview of the number of training participants

Partners' country	Course type	No. of participants	Total per country
Croatia	1st classroom course for professionals	21	**148**
	2nd classroom course for professionals	34	
	3rd classroom course for professionals	37	
	1st classroom course for PA Owner Tenant BA	42	
	2nd classroom course for PA Owner Tenant BA	14	
Estonia	1st classroom course for professionals	50	**219**
	2nd classroom course for professionals	-	
	3rd classroom course for professionals	-	
	1st classroom course for PA Owner Tenant BA	95	
	2nd classroom course for PA Owner Tenant BA	74	
Italy	1st classroom course for professionals	41	**247**
	2nd classroom course for professionals	19	
	3rd classroom course for professionals	42	
	1st classroom course for PA Owner Tenant BA	107	
	2nd classroom course for PA Owner Tenant BA	38	
Lithuania	1st classroom course for professionals	24	**132**
	2nd classroom course for professionals	19	
	3rd classroom course for professionals	17	
	1st classroom course for PA Owner Tenant BA	34	
	2nd classroom course for PA Owner Tenant BA	38	
Slovakia	1st classroom course for professionals	15	**89**
	2nd classroom course for professionals	13	
	3rd classroom course for professionals	12	
	1st classroom course for PA Owner Tenant BA	36	
	2nd classroom course for PA Owner Tenant BA	13	
Spain	1st classroom course for professionals	54	**101**
	2nd classroom course for professionals	-	
	3rd classroom course for professionals	-	
	1st classroom course for PA Owner Tenant BA	23	
	2nd classroom course for PA Owner Tenant BA	24	
The Netherlands	1st classroom course for professionals	9	**57**
	2nd classroom course for professionals	7	
	3rd classroom course for professionals	14	
	1st classroom course for PA Owner Tenant BA	17	
	2nd classroom course for PA Owner Tenant BA	10	
		IN TOTAL	**993**

It has to be said that not all training participants were willing to participate the validation surveys and also that for different reasons not all training participants answered all the questions from the questionnaires.

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All in all, total number of training participants who answered both Pre training questionnaire and Post training questionnaire is sufficient to draw reliable conclusions about the developed training materials and training courses within the Net-UBIEP project.

Table 2 Overview of the number of training participants surveyed

Partners' country	No. of participants surveyed	
	Pre training questionnaire	Post training questionnaire
Croatia	93	64
Estonia	44	75
Italy	50	21
Lithuania	57	45
Slovakia	47	46
Spain	0	11
The Netherlands	16	7
IN TOTAL	**307**	**269**

C.3 An overview of the training participants surveyed

From the surveyed trainees, the largest share were architects, engineers and people from construction companies (Figure *1*), while their role in their respective companies was quite spread and covered roles like project managers, project engineers, designers, company owners etc., which means higher level personal (Figure *2*). This indicates that the companies and institutions found Net-UBIEP courses on BIM to be an opportunity for decision makers and leading personal to get a valuable BIM training or insight on BIM.

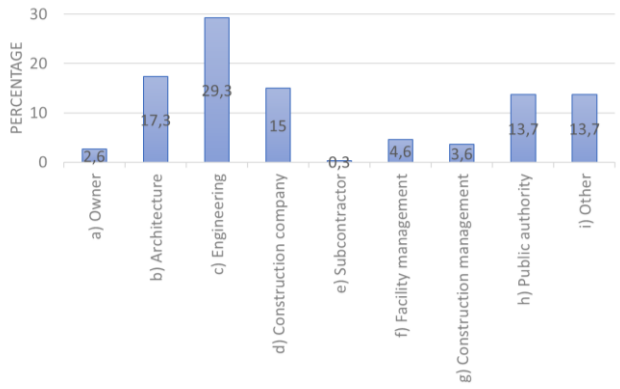

Figure 1 Which of the following best describes your company/organization's type?

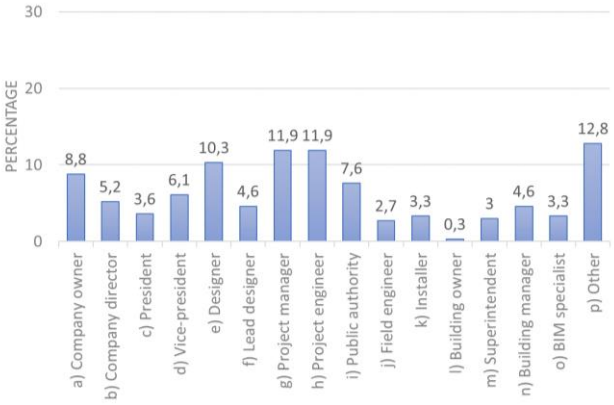

Figure 2 What role do you perform within your company?

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If one looks at the experience of training participants, 35 % had less than 5 years of working experience, 20 % had 5 – 10 years of experience, 28% had 10 – 20 years of experience, while 17 % had more than 20 years of work experience (Figure 3). This data shows that BIM interests primarily younger population (up to approx. 35 years old) but also significant number of more experienced people are interested in BIM training. Vast majority of trainees' companies/organizations are focused on residential and commercial buildings (Figure 4).

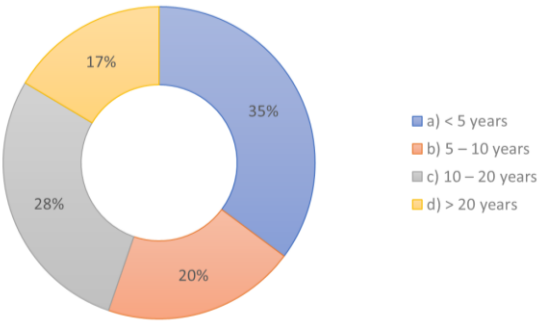

Figure 3 How many years have you been working as a professional in your discipline?

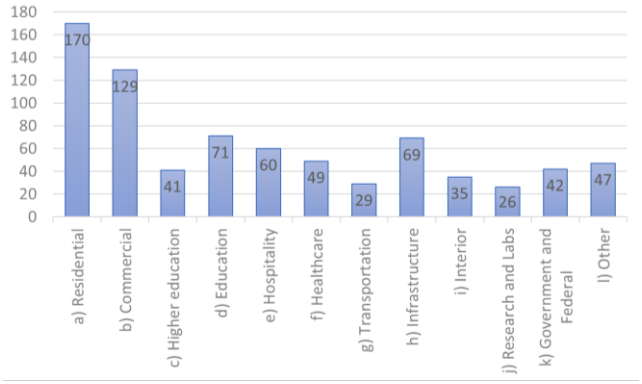

Figure 4 What type of construction projects does your company/organization focus on?

Figure 5 and Figure 6 show that majority of trainees use BIM in their typical projects, no matter if they typically work on smaller projects (less than 50,000 EUR) or large projects (more than 10,000,000 EUR). This results are contrary to the usual belief that BIM is used primarily for large projects and shows that BIM implementation is slowly succeeding and due to its benefits is being used for all project sizes.

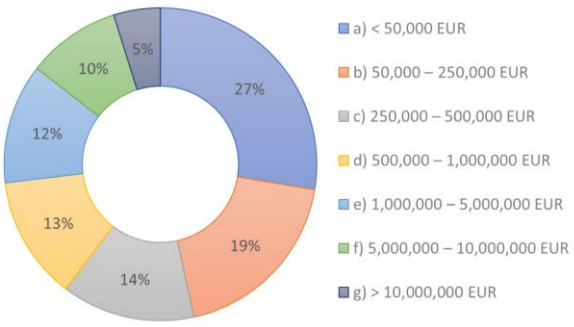

Figure 5 What is the typical project value range your company/ organization is involved in?

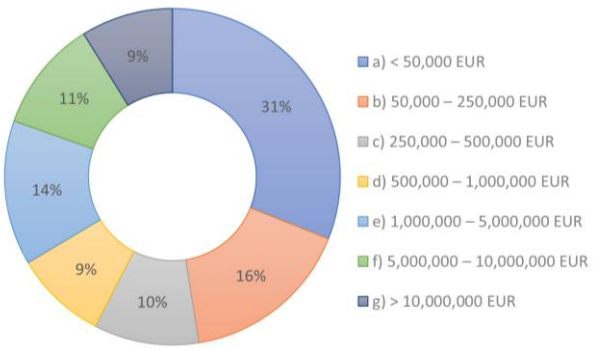

Figure 6 What was project value for which you used BIM?

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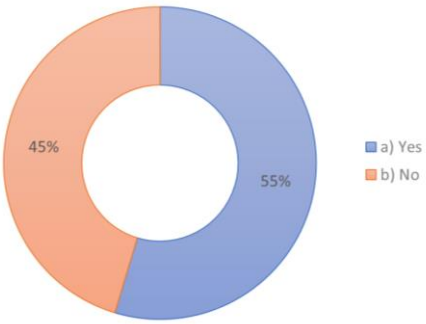

Figure 7 Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?

If one looks at the BIM experience of classroom course participants, 45 % of them have declared that they or their company/organization currently doesn't use BIM (Figure 7) while a slight majority currently uses BIM. This means that validation of training materials developed through the Net-UBIEP project was performed by approximately equal number of BIM users and BIM novices. Consequently, a good overview about the complexity and usefulness of the training materials could be acquired. Looking at the trainees who never used BIM before the course, as much as 33 % said they are not aware of the BIM approach, while 67 % are aware of the BIM approach (Figure 8). And finally, even though they participated BIM courses, 11 % of training participants feel it's not likely at all that they will be using BIM in future (Figure 9).

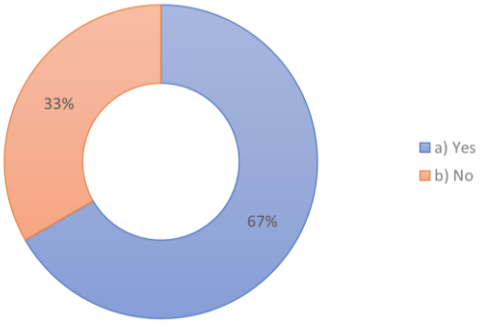

Figure 8 * If you have not had experience with BIM, are you aware of the BIM approach?

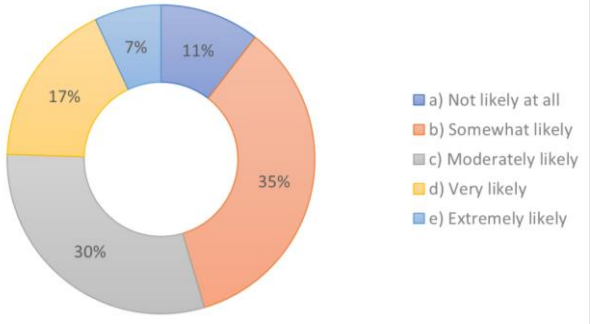

Figure 9 * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future?

Out of training participants who have3 BIM experience they use BIM relatively equally for creating BIM models and using BIM tools for analysis without any model creation as well as for both BIM model creation and analysis of BIM models created by others (Figure 10). A significant number of training participants (42 %) have had less than 1 year of BIM experience at the moment of training, 17 % had 2-3 years of experience and 24 % had 4-5 years of experience while only 17% had more than 6 years of BIM experience (Figure 11). Figure 12 shows an astonishing fact that among those who use BIM, as much as 47 % used it in less than 10 % of their projects within last 5 years, while only 26 % of training participants used BIM in more than 50 % of their projects in the last 5 years. These numbers lead to the conclusion that many companies are still inexperienced in using BIM, don't exploit all of its advantages and could be in a stage where they realized that BIM training is essential and needed for better implementation of BIM.

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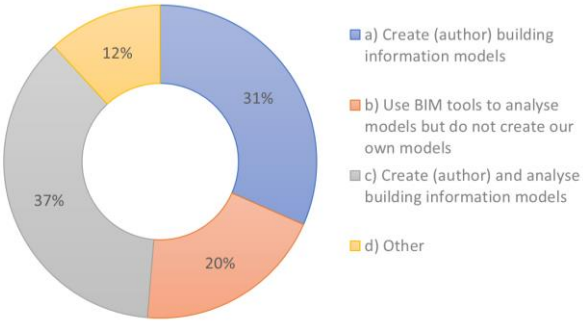

Figure 10 ** At which level does you company/organization utilize BIM?

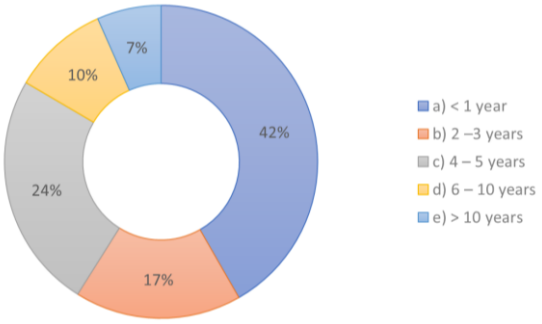

Figure 11 ** How many years has it been since your company/organization first implemented BIM?

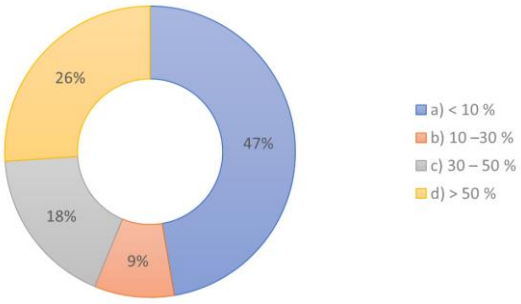

Figure 12 ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?

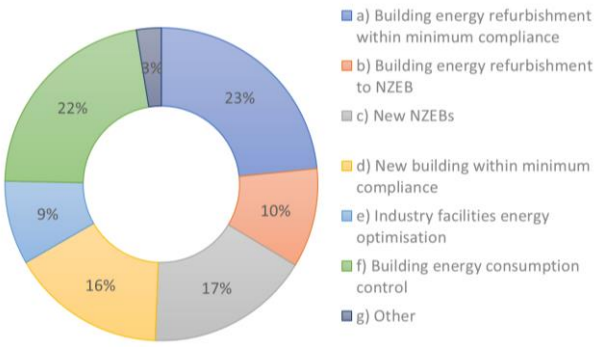

Figure 13 ** How were Your BIM projects related to increasing energy efficiency?

Training participants also used BIM in relation with increasing energy efficiency in buildings where in most cases BIM was used for building energy refurbishment within minimum compliance (23 %) and building energy consumption control (22 %). This result is reasonable since energy audits and energy renovation of buildings are quite common tasks of engineers to date, while it is expected that using BIM as an optimization tool for new NZEBs will increase in the following years.

C.4 Validation results

Figure 14 and Figure 15 show the difference in trainees view on their belief about the implementation costs associated with BIM. It is evident that before the Net-UBIEP classroom courses only 31 % of training participants think that it is worth investing in BIM and that investment pays off while 22 % did not have an

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opinion before the course. The same question asked to the training participants after the Net-UBIEP classroom courses throughout Europe shows that now in total 51% of training participants believe that BIM investment is worth. The rise of 20 % in favor of BIM can thus definitely be associated with Net-UBIEP classroom courses and insight that training participants gained on BIM. If this result is compared with the number of trainees which currently use BIM (Figure 7) it can be concluded that 22 % who don't have an opinion are not BIM users while even some BIM users are still BIM sceptics.

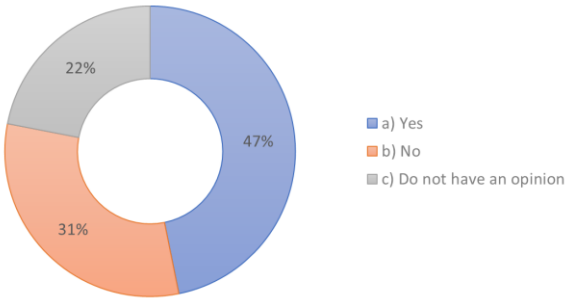

Figure 14 Pre-training: Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?

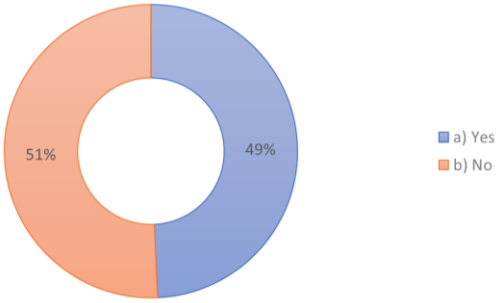

Figure 15 Post-training: Do You think that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?

As shown in Figure 16, this could be connected with the lack of BIM-knowledgeable design professionals on the project (associates who do not use BIM), the cost of implementation (software, hardware and training costs), reluctance to change business as usual thinking (also, 47 % of trainees use BIM in less than 10 % of their projects - Figure 12). Other possible barriers for BIM implementation as trainees see them are knowledge gaps in the fundamental understanding of BIM's advantages, while lack of BIM interoperability which still exists is perceived as a barrier but with less intensity compared to other suggested barriers.

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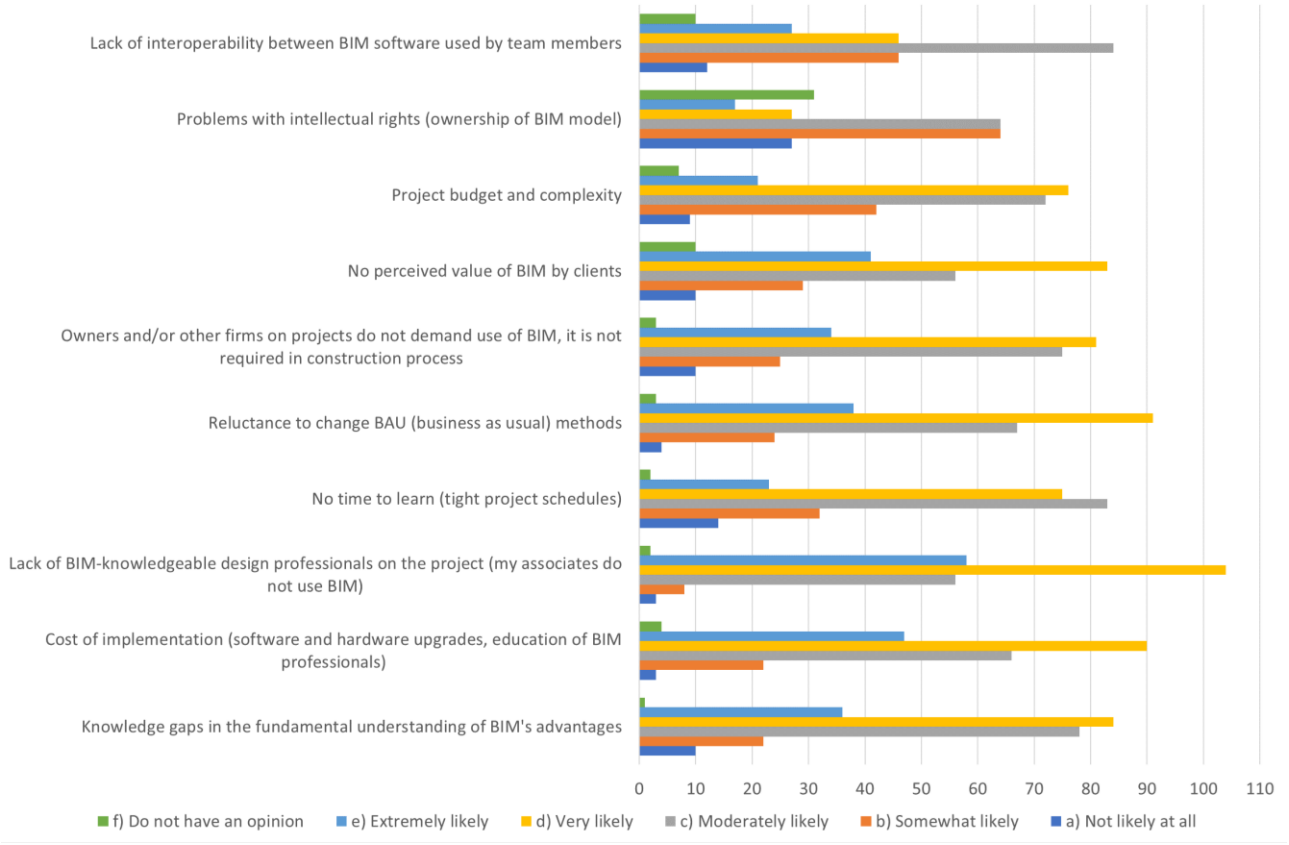

Figure 16 Post-training: What do you consider as barriers for BIM implementation?

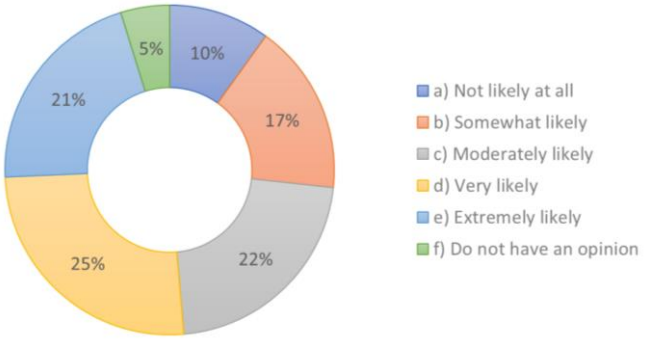

Figure 17 Pre-training: In your opinion, how likely is it that your company/organization will require (be required) to apply BIM on energy efficiency related projects?

Pre-training questionnaire was asking training participants what is their opinion on how likely is it that your company or organization will require or be required to apply BIM on energy efficiency related projects. The answers of training participants (Figure 17) leads to a conclusion that just a small portion (21 %) saw the full potential of using BIM in energy efficiency and are convinced that this potential will be used in future. Other training participants were more or less skeptical, while 10 % of participants thought it's not likely at all to interconnect BIM and energy efficiency.

On the other hand, post training questionnaire showed that trainees now recognize the need to utilize BIM in order to design, check compliance, construct, use and manage NZEBs in future (Figure 18), where as

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much as 47 % feel the need for both large and small buildings, while only 5 % & 11 % of trainees respectively, are still convinced that business as usual methods will be enough or don't know after the full session of Net-UBIEP classroom courses.

Additionally, training participants think that key tasks related to energy efficiency which will be the most affected by implementation of BIM are Energy performance modeling, Cost analysis and lifecycle costing (Figure 19). On the other hand, it is deemed by Net-UBIEP classroom course participants that identifying as built situation using BIM, valuing completed work and compliance checking, storage of documentation and information about the building are not as important. This could indicate that respective chapters in training materials should be amended with more useful information, more practical examples etc. to make BIM users appreciate the value of accurate and digitized information in as-built BIM model.

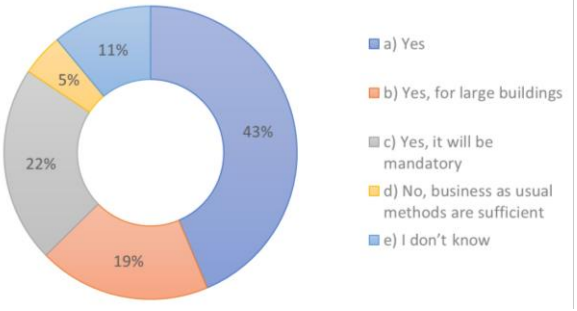

Figure 18 Post-training: In Your opinion, will You need to utilize BIM in order to design/ check compliance/ construct/ use/manage nZEBs in future?

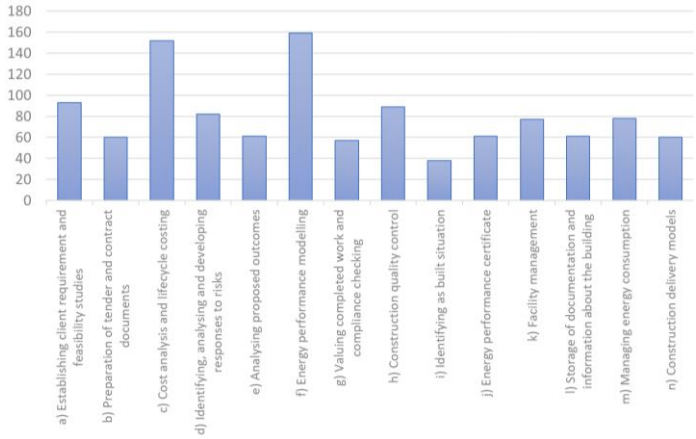

Figure 19 Post-training: What do You think are key tasks related to energy efficiency which will be the most affected by implementation of BIM?

Classroom course attendants were then asked to rate the business benefits that their company and/or organization could have due to the use of BIM on energy efficiency related projects (Figure 20). As the most business benefits offered were recognized as very beneficial, it can be concluded that training participants recognized the messages which were conveyed to them through courses. Mostly they would like to advance the quality of their projects, increase the accuracy of cost estimations and increase the productivity and efficiency.

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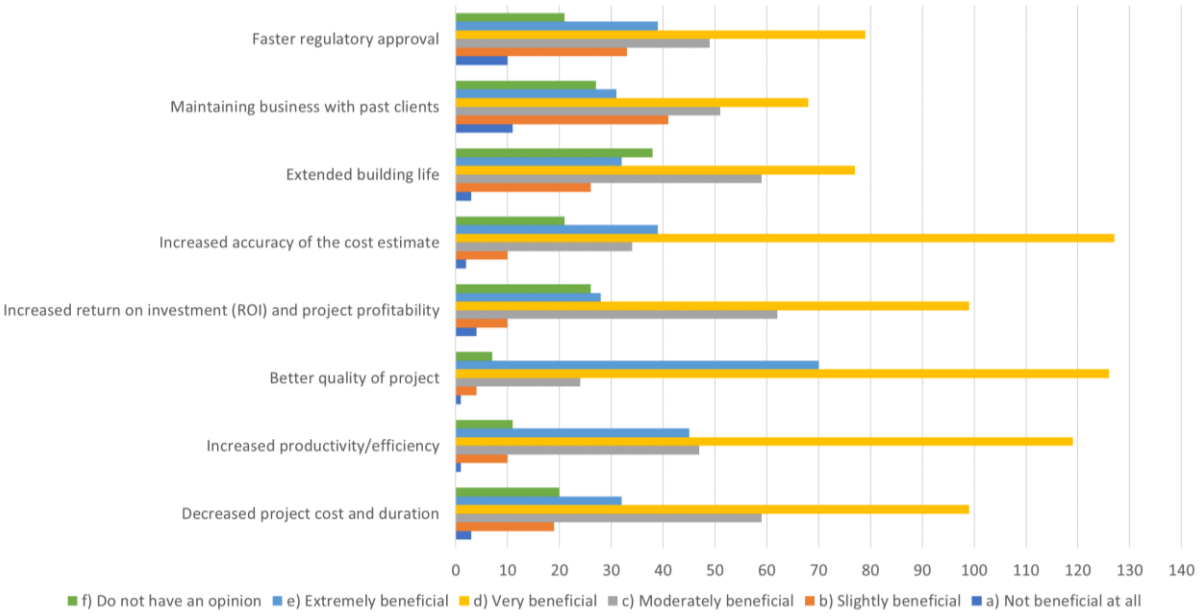

Figure 20 Post-training: Rate the business benefits that Your company/organization could have due to the use of BIM on energy efficiency related projects.

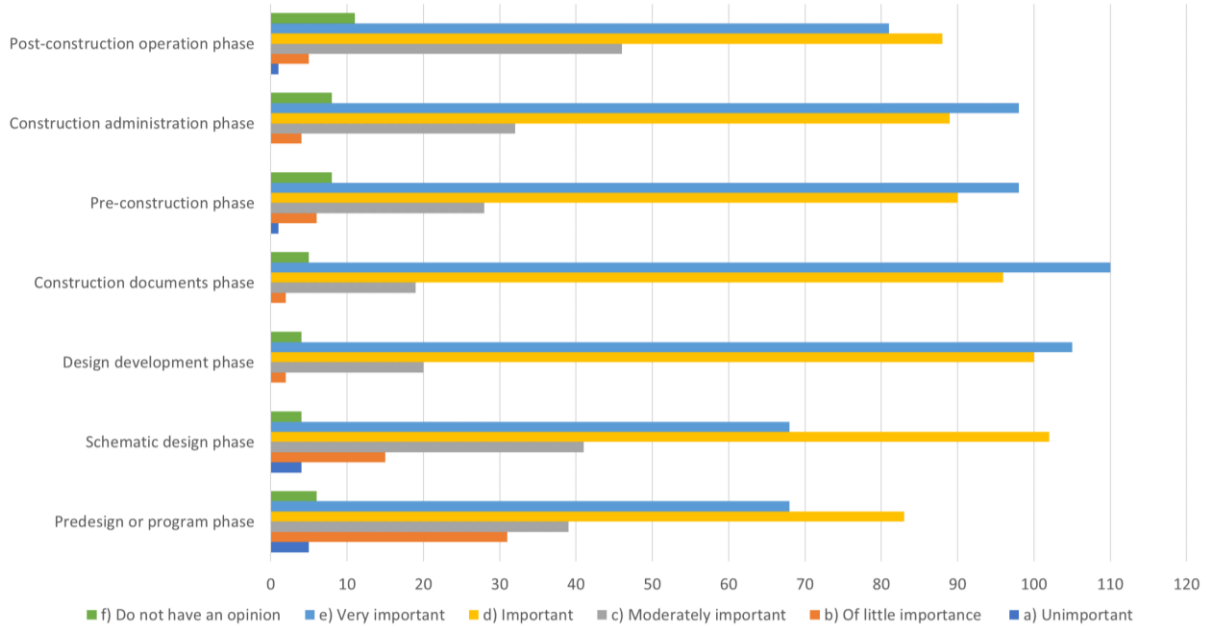

Figure 21 Post-training: In Your opinion, how important would it be to use BIM in different phases of future energy efficiency related projects?

When asked about the importance of BIM use in different phases of energy efficiency related projects, as very important and important, phases following and including the design development phase were emphasized (Figure 21). Here, one can conclude that Net-UBIEP training materials could be additionally

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amended in order to better describe the advantages and benefits of using BIM in predesign and schematic design phase where decisions making process could be verified using BIM tools.

When comparing Figure 22 and Figure 23, it is evident that training participants correlate their energy savings due to applying their newly gained BIM competences with increased productivity due to the use of BIM.

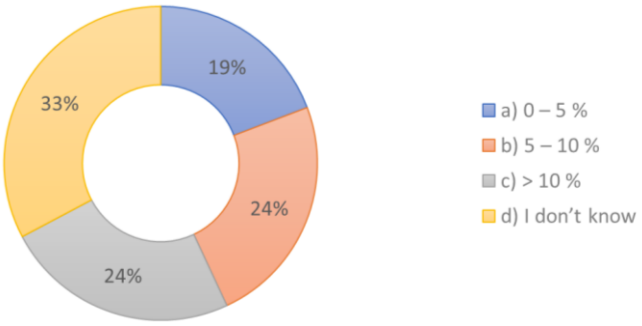

Figure 22 Post-training: Please assess, how much energy do You expect to save by applying knowledge gained during this BIM training How much would Your design/execution/compliance check/building use be improved compared to the standard practice?

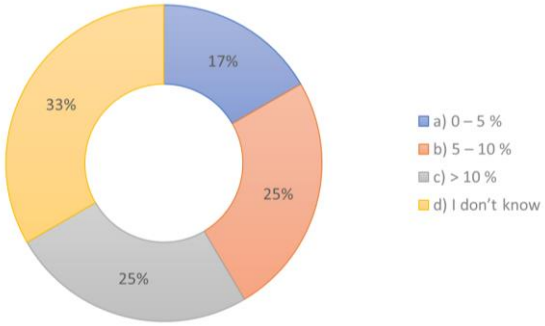

Figure 23 Post-training: Please assess, how much can You increase your productivity by using BIM, after this training course?

It is evident from the training validation results that 82 % of participants feel BIM certification, support or training would absolutely (46 %) or likely (36 %) be beneficial to their colleagues which is a good indication of their view about the necessity of certification courses (Figure 24). When asked about learning BIM processes without using software, 26 % of Net-UBIEP classroom course participants say this kind of training on BIM and advantages of BIM would be useful, while as much as 45 % of training participants are finding it useful but they seek for more training on specific BIM software (Figure 25).

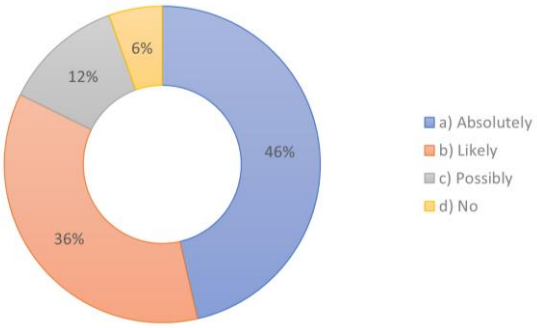

Figure 24 Post-training: Would BIM certification, support or training, benefit Your colleagues?

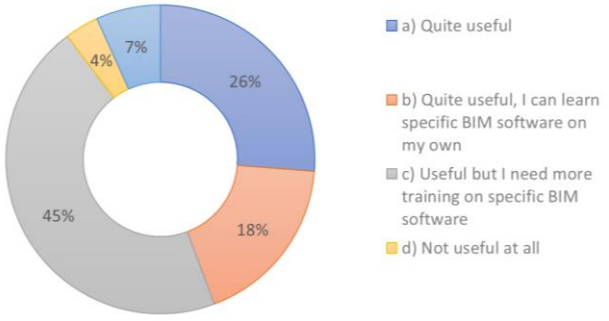

Figure 25 Post-training: What do You think about formal education about BIM, advantages of BIM and BIM processes (without using specific

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software)?

Since 66 % of course participants are already using BIM (or intends to use it in near future) the overall rating of the course as good (33 %), very good (41 %) and excellent (21 %) is very encouraging and positive for the developed training materials and classroom courses held within the Net-UBIEP project (Figure 26). Trainers received positive overall rating of very good (41 %) and excellent (39 %) (Figure 27).

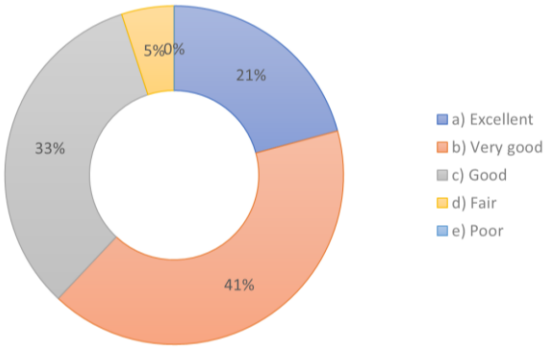

Figure 26 Post-training: What overall rating would You give the course?

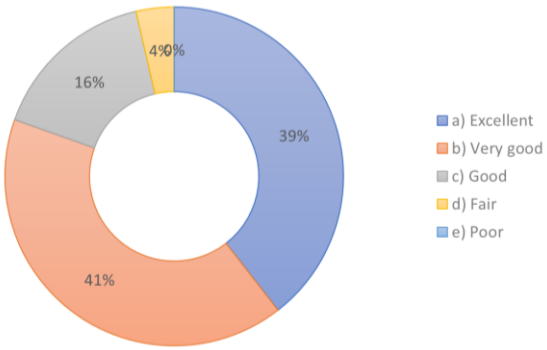

Figure 27 Post-training: What overall rating would you give the trainer(s)?

The majority of training participants agree and strongly agree that the course corresponded to their expectations, and especially that the course increased their interest in BIM and energy efficiency (Figure 28). Additionally, the coursework and assignments were designed appropriately and in respect to prior competences for the majority of training participants and with relevant topics which were deemed as useful. The general opinion is that Net-UBIEP training materials contain sufficient number of images and videos containing course content and that Net-UBIEP course materials were clear and well written. A strong agreement is also evident with the statement that the Net-UBIEP courses were clear and course content was organized and easy to follow.

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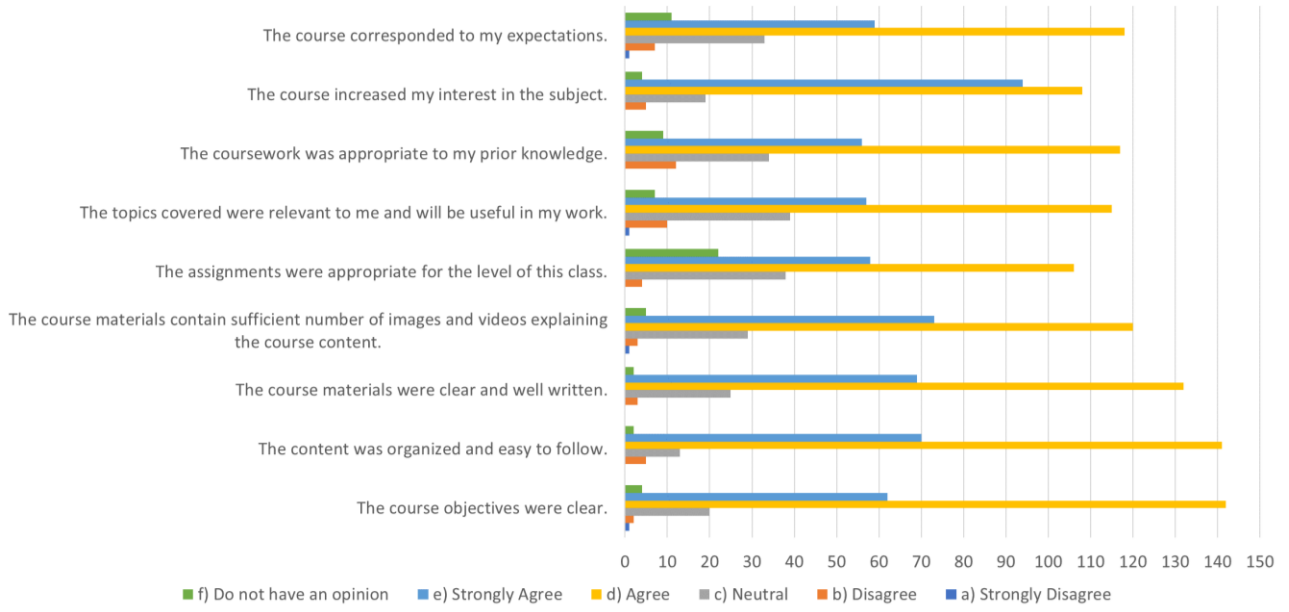

Figure 28 Post-training: Please indicate your level of agreement with the following statements

As evident from Figure 29, the trainers giving the lectures used interactive tools during training courses, encouraged feedback, were competent in the subject matter and were effective in communicating the content of the course.

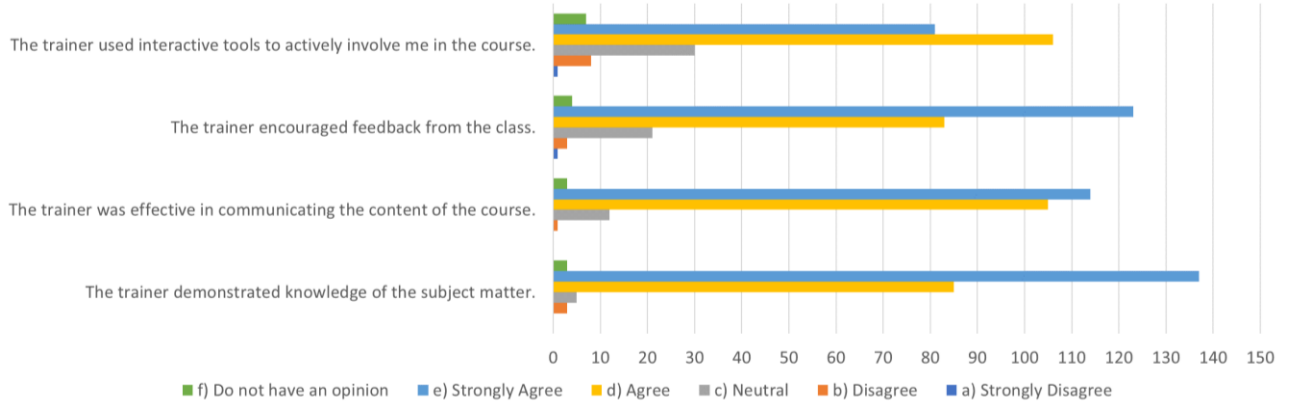

Figure 29 Post-training: Please indicate your level of agreement with the following statements

From Figure 30 it is evident that classroom course participants feel they gained new competences on BIM and energy efficiency but there are also areas which received a significant number of neutral responses. These neutral responses mean that Net-UBIEP training materials should be amended in these areas, i.e. BIM for handover and maintenance, supervision of construction works, quality management, procurement management etc.

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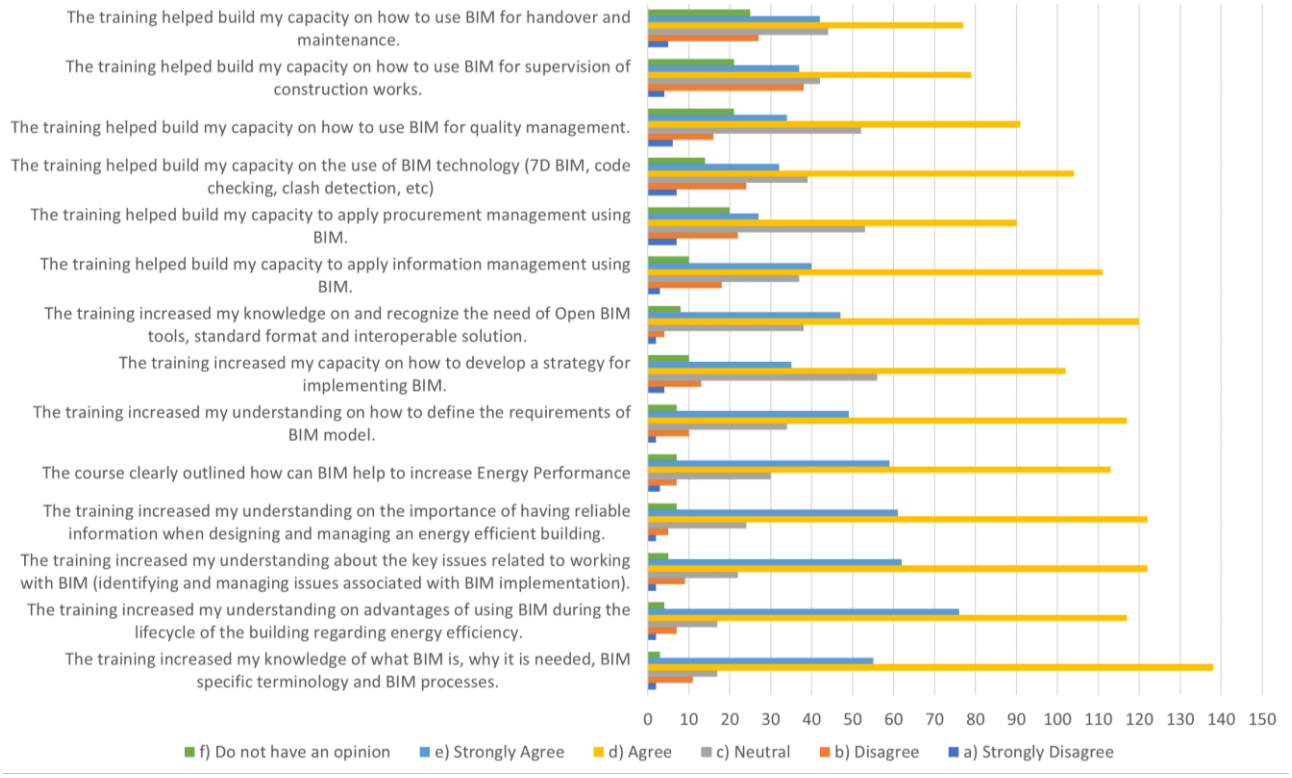

Figure 30 Post-training: Please indicate your level of agreement with the following statements

When getting more in depth and looking for their opinion on each of the training modules (Figure 31), participants feel that Introductory module is useful and requires no changes, while 5 modules developed are useful but significant number of course participants also feel that these modules should be amended with additional content to make it better. Additionally, there are a lot of training participants who have no opinion on training materials developed under the Net-UBIEP project which could indicate that developed training modules could be better communicated during classroom courses.

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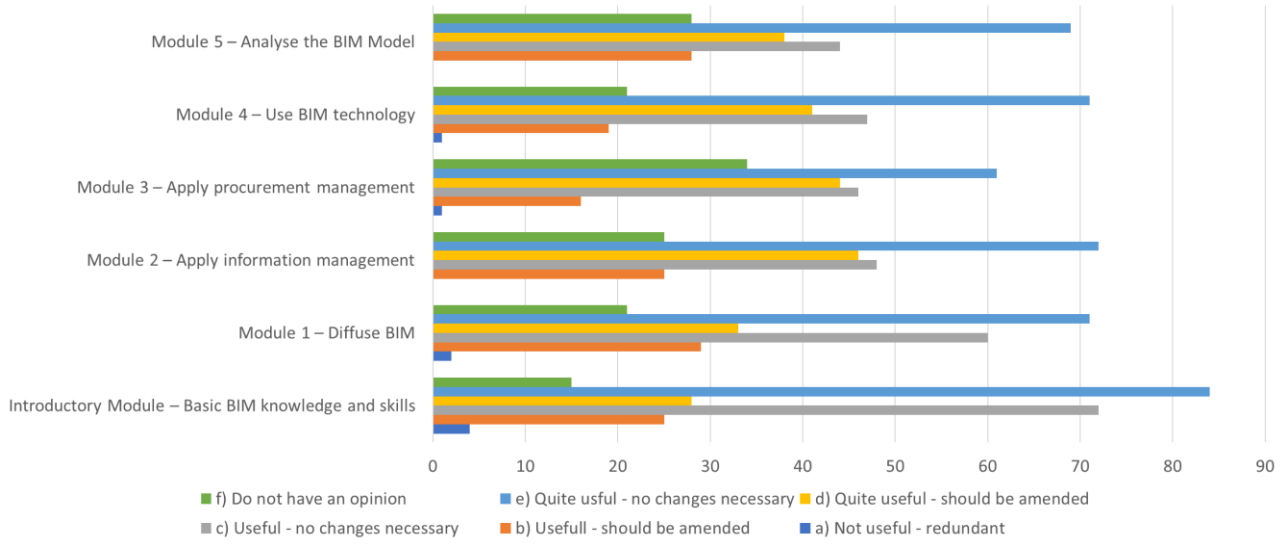

Figure 31 Post-training: Please rate the following BIM course modules based on how they are useful and interesting to you

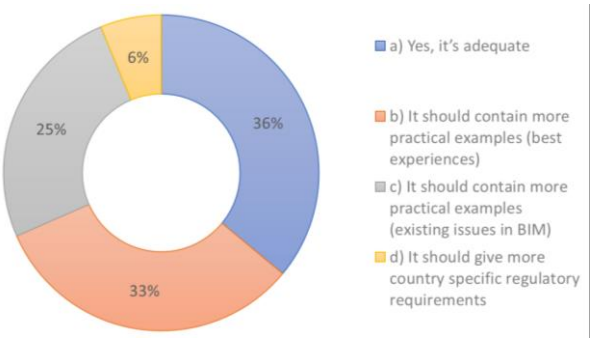

Figure 32 Post-training: What do You feel, is the training material comprehensive enough?

Specifically, approximately a third of course participants (36 %) feel the training material is adequate and comprehensive enough, while the almost all the rest think that training materials should contain more practical examples (best experiences and existing issues in BIM), 33 % and 25 % respectively which is a significant number and should be respected.

It has to be said here that in more BIM advanced countries higher number training participants demand more practical examples while on the other hand in training in less BIM developed countries the developed materials are deemed adequate.

Regarding the length of training, 70 % of training participants said that their respective training course duration was adequate (Figure 33), while 17 % think it should be longer and 13 % think the course should be shorter. This means that the training course providers had a good understanding on the type of the group on the course, since there were groups with 4 hours, 8 hours, 16 hours and 32 hour courses and that course duration was adapted according to groups pre-course competences while at the same time remaining course intensity and trainee's attention. It has to be enhanced that 81 % of course participants prefer to take this courses in the classroom while only 19 % of people would prefer to take it on-line.

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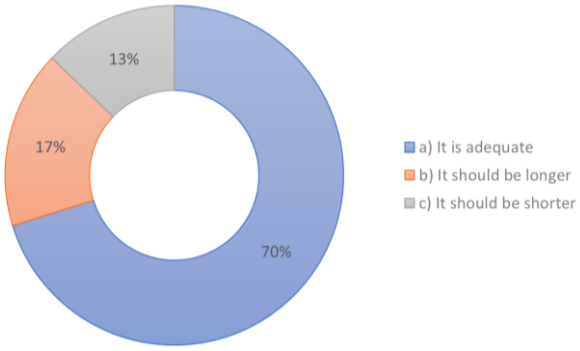

Figure 33 Post-training: What do You feel about the duration of the training?

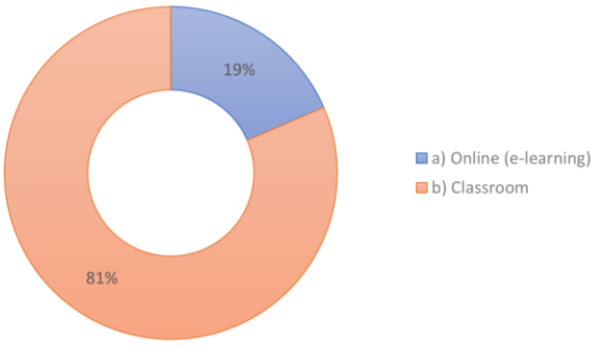

Figure 34 Post-training: Would you prefer to take this course online or in the classroom?

The quality of the course is best rated if training participants disseminated and recommend the course to their colleagues, friends and associates, and in the case of Net-UBIEP classroom courses, participants have declared that they would definitely (55 %) and probably (37 %) be willing to disseminate the BIM training courses among their contacts.

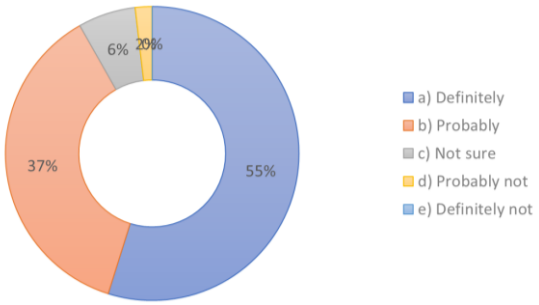

Figure 35 Post-training: Would You be willing to disseminate the BIM training courses among Your contacts and associates?

Training participants were asked to make a self-evaluation of their BIM competences (knowledge, skills, responsibility and autonomy) (Figure 36) and the results showed that actually BIM users have little competences and on the other hand they cannot not compare their competences to any reference point. After the course, training participants were asked to repeat the exercise and assess BIM competences they had before the course (Figure 37) where it was confirmed little competences of training participants (53 %). and this is understandable if compared with the number of participants who never used BIM (as shown in Figure 7). On the other hand, more important data is that very low percentage of training participants rate their competences as excellent and very good (1 % and 9 % respectively) and 31 % as good (Figure 37).

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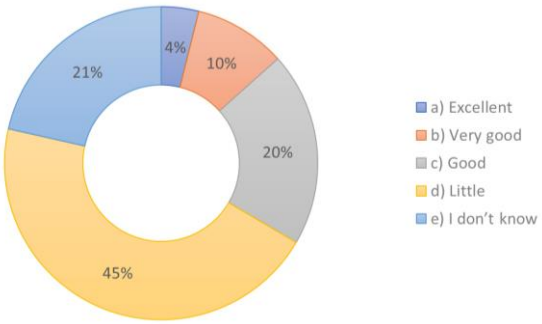

Figure 36 Pre-training: How do You rate Your competences in BIM?

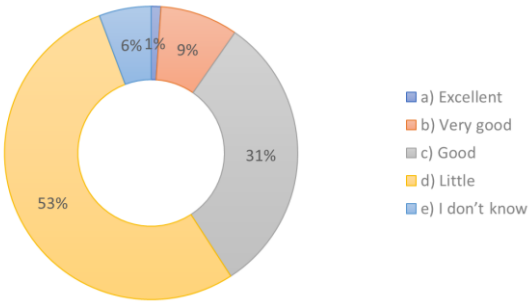

Figure 37 Post-training: In retrospective, how do You rate Your competences before this BIM course?

This data can be read as an indication that even experienced BIM users recognized areas (or modules) in the Net-UBIEP classroom courses or (Net-UBIEP training materials) which could be useful for them to learn. In other words, Net-UBIEP training materials and training courses developed in different partner countries seem to have sufficient complexity and could be also used by people with some BIM experience to advance their competences, and not only by the novice BIM users.

When asked about the quantity of new information they received during the Net-UBIEP training course, it was shown that majority of training participants received new information out of which 24 % received a lot of new information, 34 % received much, 31 % received some new information, while 9 % and 2 % received little and no new information, respectively (Figure 38).

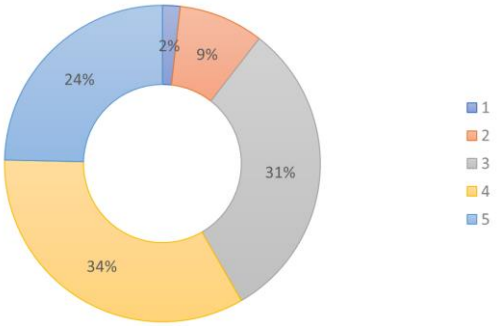

Figure 38 Post-training: How much new information did you receive in the training course?

C.5 Conclusions

The post training survey used for validation of the Net-UBIEP training courses was performed on 269 training participants. The survey results showed that trainees have positive opinion on developed training courses and training materials within the Net-UBIEP project and would be willing to recommend the course to their colleagues.

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The main suggestions which arose during the training courses from training participants and trainers are the following. The practical work is deemed both by the trainers and course participants as necessary for classroom courses where more practical lessons and tasks, more examples of good practice could be performed, analyzed and discussed.

The main goal to gather data for validation of classroom courses was achieved and the survey results have provided information for future activities and the experiences of training participants across partner countries. Therefore, this survey has set guidelines for the project deliverable *D4.8 Review of the three dimensional matrix*, as well as for the overall evaluation of the courses conducted within the Net-UBIEP project.

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D. Public Administration
(The questionnaire tailored for stakeholders)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

D. The questionnaire tailored for stakeholders (Public Administration)

D.1 Foreword to the survey

Dear Madam/Sir,
You are invited to participate in Survey about using BIM to increase energy performance of buildings.
The purpose of this survey is to assess the implementation of building information modelling (BIM) as a tool and a process for energy efficiency application among key stakeholders of the **Net-UBIEP project (Horizon 2020)** in order to understand the current use of BIM, benefits of using BIM, obstacles to using BIM as well as possible future use.
Net-UBIEP (Network for Using BIM to Increase the Energy Performance of Buildings) aims at increasing energy performance of buildings by wide spreading and strengthening the use of BIM, during the life cycle of the building. For more information about the project please visit www.net-ubiep.eu.

This survey will address all stakeholders of construction project: Public administration, Professionals (designers, constructors, supervising engineers), Technicians (installers/maintainers), Tenants/Owners, Building Administrator (facility managers, etc.) and other stakeholders involved in energy efficiency projects in general.

This questionnaire is tailored for **Public Administration**
The questionnaire for public administration is sent under the "Freedom of information act" (**Italy**: Decreto Legislative Recante Revisione e Semplificazione Delle Disposizioni in Materia di Prevenzione Della Corruzione Pubblicita' e Trasparenza Correttivo Della Legge 6 Novembre 2012, n. 190 e del Decreto Legislativo 14 marzo 2013, n. 33, ai Sensi Dell'articolo 7 Della Legge 7 Agosto 2015, n. 124, in Materia di Riorganizzazione Delle Amministrazioni Pubbliche; **Spain**; **The Netherlands**: Government Information (Public Access) Act (WOB), 1991 (Wet Openbaarheid van Bestuur); **Slovakia**: Act No. 211/2000 Coll. on Free Access to Information and on amendments of certain acts (Zákon o slobodnom prístupe k informáciám ao zmene niektorých zákonov); **Estonia**: "Parliament of Estonia, Public Information Act Passed 15 November 2000". Legaltext.ee. 2000-11-15. Archived from the original on 23 November 2009. Retrieved 2010-11-29.; **Lithuania**: "Lietuvos Respublikos teisės gauti informaciją iš valstybės ir savivaldybių institucijų ir įstaigų įstatymas", TAR 2016-10-17, i. k. 2016-25262; **Croatia**: *Zakon o pravu na pristup informacijama, NN 25/13, 85/15*) which gives the legal or private person the right to ask any public body for all the information they have on any subject he chooses.

If you have not had experience with BIM yet, feel free to answer the questions to the best of your ability or you can forward the link of this survey to another person in your company/organization who would be better able to answer questions about the current use of building information modelling (BIM) on energy efficiency projects.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if a registration is performed on the web page: http://www.net-ubiep.eu/registration/

Thank you for your participation!

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D.2 Interview with Public Administration stakeholders

Obligatory question	Question	Possible answers
Yes	1. Which of the following best describes Your company/organization's type? (Please mark one answer).	a) Ministry b) Province c) Municipality d) Other public bodies e) Other, please specify _____
Yes	2. What role do You perform within Your company? (Please mark one answer).	a) Department head b) Senior clerk c) Clerk d) Other, please specify _____
Yes	3. Projects You work on are?	a) Mainly Public b) Mainly Private c) Equally public and private
Yes	4. What type of construction projects does Your company/organization focus on? (Please select all that apply).	a) Residential b) Commercial c) Higher education d) Education e) Hospitality f) Healthcare g) Transportation h) Infrastructure i) Public Assembly j) Interior k) Research and Labs l) Government and Federal m) Other, please specify _____
Yes	5. What is the typical project value range Your company/ organization is involved in?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes	6. Are you aware of the Directive (2018/844/EU) amending the Energy Performance of Buildings Directive (EPBD)?	a) Yes b) No

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Yes	7. Are you aware that the European Public Procurement Directive includes encouragement for BIM in the procurement of public works? (Article 22 paragraph 4 of Directive 2014/24/UE on public procurement: *For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools or similar. …)*	a) Yes b) No
Yes	8. Does Your company/organization currently use BIM on any level, or is it intending to use BIM in the near future? * If your answer to Question 8 is NO, please complete Questions 9-10 ** If your answer to Question 8 is YES answer Questions 11-22	a) Yes b) No
Yes (If *)	9. * If you have not had experience with BIM, are you aware of the BIM approach?	a) Yes b) No
Yes (If *)	10. * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future? (Please mark one answer).	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely
Yes (If **)	11. ** What was project value for which you used BIM?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes (If **)	12. ** How many professionals with working knowledge of BIM are employed by your company/ organization?	
Yes (If **)	13. ** In your opinion, who derives benefits from using BIM on energy efficiency related projects? (Please select all that apply).	a) Public Authorities b) Owner c) Architect d) Engineer e) General contractor f) Construction manager g) Installer h) Facility manager i) Building manager j) Other (please specify) _____

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Yes (If **)	14. ** At which level does you company/organization utilize BIM? (Please mark one answer).	a) Create (author) building information models b) Use BIM tools to analyse models but do not create our own models c) Create (author) and analyse building information models d) Other (Please specify) _____
Yes (If **)	15. ** How many years has it been since your company/organization first implemented BIM?	
Yes (If **)	16. ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?	a) < 10 % b) 10 –30 % c) 30 – 50 % d) > 50 %
Yes (If **)	17. ** How were Your BIM projects related to increasing energy efficiency? (Please select all that apply).	a) Building energy refurbishment within minimum compliance b) Building energy refurbishment to NZEB c) New NZEBs d) New building within minimum compliance e) Industry facilities energy optimisation f) Building energy consumption control g) Other (Please specify) _____
Yes (If **)	18. ** Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No c) Do not have an opinion
Yes (If **)	19. ** Do you believe that implementation of BIM results in productivity gains?	a) Yes b) No c) Do not have an opinion
Yes (If **)	20. ** The general opinion is that widespread adoption of BIM will facilitate a reduction of costs and opportunity for error. Do You agree or disagree with this statement?	a) Agree b) Disagree c) Do not have an opinion
Yes (If **)	21. ** With the successful adoption of BIM, a new collaborative way of working and sharing of information is expected. From Your experience, or in Your opinion, will this be achieved?	a) Yes b) No c) Do not have an opinion

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Yes (If **)	22. ** As a client, what are Your requirements on BIM? (*** BIM Level 2 maturity model – we work together with other disciplines on the basis of models (4D and 5D information)) (Please mark one answer).	a) We ask for BIM Level 2*** which we share between experts as a contractual requirement on all our projects b) We ask for BIM Level 2*** as a contractual requirement on some of our projects c) We recommend the use of BIM Level 2*** but not as a contractual requirement d) We would like to ask for BIM Level 2*** as a contractual requirement but do not know how to implement e) We do not make BIM a requirement on our projects, although teams are free to use it

Yes

23. What do you consider as barriers for BIM implementation?

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

Yes	24. Do You forecast companies will be left behind and/or struggle to survive if they do not adopt BIM quickly enough?	a) Yes b) No c) Do not have an opinion
Yes	25. In Your opinion, how will the implementation of BIM affect the role You are having in Your company/ organization?	a) No effect b) Redefined c) Extinct d) Do not have an opinion

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Yes	26. In Your opinion, how likely is it that Your company/organization will require (be required) to apply BIM on energy efficiency related projects?	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely f) Do not have an opinion
Yes	27. In Your opinion, how important is it that specific departments and/or Ministries (those responsible for energy efficiency in buildings) mandate the use of BIM in order to encourage its implementation on energy efficiency related projects?	a) unimportant b) of little importance c) moderately important d) important e) very important f) Do not have an opinion
Yes	28. Would BIM certification, support or training, benefit your colleagues?	a) Absolutely b) Likely c) Possibly d) No
Yes	29. Are You ready to take a course in BIM or send Your employees on a course in BIM?	a) Yes b) Not at the moment, in one year c) Not at the moment, in 2 years or more
Yes	30. If there would be formal education for certain BIM profiles, about BIM, advantages of BIM and BIM processes (without using specific software), would You be willing to educate Yourself (Your employees) in such courses? (Please mark one answer).	a) Yes b) Yes, if needed to advance in BIM levels or recertification c) No, I believe that I can learn enough in my work environment d) No, I believe that training provided by BIM software vendors is sufficient e) It depends on the price and the duration of such training
Yes	31. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
Yes	32. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Yes, if I find them useful and of good quality b) No, probably not (after all, they are my competitors) c) I don't know
No	33. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

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E. Professionals
(The questionnaire tailored for stakeholders)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

E. The questionnaire tailored for stakeholders (Professionals)

E.1 Foreword to the survey

Dear Madam/Sir,
You are invited to participate in Survey about using BIM to increase energy performance of buildings. The purpose of this survey is to assess the implementation of building information modelling (BIM) as a tool and a process for energy efficiency application among key stakeholders of the **Net-UBIEP project (Horizon 2020)** in order to understand the current use of BIM, benefits of using BIM, obstacles to using BIM as well as possible future use.

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This survey will address all stakeholders of construction project: Public administration, Professionals (designers, constructors, supervising engineers), Technicians (installers/maintainers), Tenants/Owners, Building Administrator (facility managers, etc.) and other stakeholders involved in energy efficiency projects in general.

This questionnaire is tailored for **Professionals**

If you have not had experience with BIM yet, feel free to answer the questions to the best of your ability or you can forward the link of this survey to another person in your company/organization who would be better able to answer questions about the current use of building information modelling (BIM) on energy efficiency projects.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if an email is provided within the survey.

Thank you for your participation!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

E.2 Interview with Professionals

Obligatory question	Question	Possible answers
Yes	1. Which of the following best describes Your company/organization's type? (Please mark multiple answers if applicable).	a) Architecture b) Civil Engineering c) Mechanical Engineering d) Electrical Engineering e) Construction company f) Subcontractor g) Construction management h) Construction products manufacturer i) Association, please specify _____ j) Other, please specify _____
Yes	2. What role do You perform within Your company? (Please mark multiple answers if applicable).	a) Company owner b) Company director c) President d) Vice-president e) Designer f) Lead designer g) Project manager h) Project engineer i) Field engineer j) BIM specialist k) Other, please specify _____
Yes	3. Who do You work on behalf of?	a) Public clients b) Private clients c) Both public and private clients d) As a subcontractor e) I'm a developer f) Other, please specify _____
Yes	4. How many years have You been working as a professional in Your discipline?	a) < 5 years b) 5 – 10 years c) 10 – 20 years d) > 20 years
Yes	5. Projects You work on are?	a) Mainly Public b) Mainly Private c) Both public and private

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes	6. What type of construction projects does Your company/organization focus on? (Please select all that apply).	a) Residential b) Commercial c) Higher education d) Education e) Hospitality f) Healthcare g) Transportation h) Infrastructure i) Public Assembly j) Interior k) Research and Labs l) Government and Federal m) Other, please specify _____
Yes	7. What is the typical project value range Your company/ organization is involved in?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes	8. Are you aware of the Directive (2018/844/EU) amending the Energy Performance of Buildings Directive (EPBD)?	a) Yes b) No
Yes	9. Are you aware that the European Public Procurement Directive includes encouragement for BIM in the procurement of public works? (Article 22 paragraph 4 of Directive 2014/24/UE on public procurement: *For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools or similar. …)*	a) Yes b) No
Yes	10. Does Your company/organization currently use BIM on any level, or is it intending to use BIM in the near future? * If your answer to Question 10 is NO, please complete Questions 11-12 ** If your answer to Question 10 is YES answer Questions 13-23	a) Yes b) No
Yes (If *)	11.* If you have not had experience with BIM, are you aware of the BIM approach?	a) Yes b) No
Yes (If *)	12. * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future? (Please mark one answer).	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	13. ** What was project value for which you used BIM?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes (If **)	14. ** How many professionals with working knowledge of BIM are employed by your company/ organization?	
Yes (If **)	15. ** In your opinion, who derives benefits from using BIM on energy efficiency related projects? (Please select all that apply).	a) Public Authorities b) Owner c) Architect d) Engineer e) General contractor f) Construction manager g) Installer h) Facility manager i) Building manager j) Other (please specify)
Yes (If **)	16. ** At which level does you company/organization utilize BIM? (Please mark one answer).	a) Create (author) building information models b) Use BIM tools to analyse models but do not create our own models c) Create (author) and analyse building information models d) Other (Please specify)
Yes (If **)	17. ** How many years has it been since your company/organization first implemented BIM?	
Yes (If **)	18. ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?	a) < 10 % b) 10 –30 % c) 30 – 50 % d) > 50 %
Yes (If **)	19. ** How were Your BIM projects related to increasing energy efficiency? (Please select all that apply).	a) Building energy refurbishment within minimum compliance b) Building energy refurbishment to NZEB c) New NZEBs d) New building within minimum compliance e) Industry facilities energy optimisation f) Building energy consumption control g) Other (Please specify) _____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	20. ** What project delivery method was used on energy efficiency related projects that use BIM? (Please select all that apply).	a) Design-bid-build b) Design-build c) Construction management d) Integrated project delivery (IPD) e) Construction management at risk f) Build-operate-transfer (BOT) g) Design- Build-finance-operate (DBFO) h) ESCO model i) Other (Please specify) _____
Yes (If **)	21. ** Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No c) Do not have an opinion
Yes (If **)	22. ** Do you believe that implementation of BIM results in productivity gains?	a) Yes b) No c) Do not have an opinion
Yes (If **)	23. ** The general opinion is that <u>widespread adoption</u> of BIM will facilitate a reduction of costs and opportunity for error. Do You agree or disagree with this statement?	a) Agree b) Disagree c) Do not have an opinion
Yes	24. What do you consider as barriers for BIM implementation?	

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

Yes	25. With the successful adoption of BIM, a new collaborative way of working and sharing of information is expected. From Your experience, or in Your opinion, will this be achieved?	a) Yes b) No c) Do not have an opinion

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Yes	26. Do you forecast companies will be left behind and/or struggle to survive if they do not adopt BIM quickly enough?	a) Yes b) No c) Do not have an opinion
Yes	27. In Your opinion, how will the implementation of BIM affect the role You are having in Your company/ organization?	a) No affect b) Redefined c) Extinct d) Do not have an opinion
Yes	28. In your opinion, how likely is it that your company/organization will be required to apply BIM on energy efficiency related projects?	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely f) Do not have an opinion
Yes	29. In Your opinion, how important is it that specific departments and/or Ministries (those responsible for energy efficiency in buildings) mandate the use of BIM in order to encourage its implementation on energy efficiency related projects?	a) unimportant b) of little importance c) moderately important d) important e) very important f) Do not have an opinion
Yes	30. Would BIM certification, support or training, benefit your colleagues?	a) Absolutely b) Likely c) Possibly d) No
Yes	31. Are you ready to take a course in BIM or send Your employees on a course in BIM?	a) Yes b) Not at the moment, in one year c) Not at the moment, in 2 years or more
Yes	32. If there would be formal education for certain BIM profiles, about BIM, advantages of BIM and BIM processes (<u>without using specific software</u>), would You be willing to educate Yourself (Your employees) in such courses? (Please mark one answer)	a) Yes b) Yes, if needed to advance in BIM levels or recertification c) No, I believe that I can learn enough in my work environment d) No, I believe that training provided by BIM software vendors is sufficient e) It depends on the price and the duration of such training
Yes	33. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
Yes	34. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Yes, if I find them useful and of good quality b) No, probably not (after all, they are my competitors) c) I don't know

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Yes	35. What do You feel would be the most suitable duration of BIM certification course?	a) < 8 hours b) 8 – 16 hours c) 16 – 32 hours d) > 32 hours
Yes	36. When would You prefer to have the BIM training courses?	a) During working hours b) After working hours c) During weekends d) No preferences
No	37. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

F. Technicians
(The questionnaire tailored for stakeholders)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

F. The questionnaire tailored for stakeholders (Technicians)

F.1 Foreword to the survey

Dear Madam/Sir,
You are invited to participate in Survey about using BIM to increase energy performance of buildings. The purpose of this survey is to assess the implementation of building information modelling (BIM) as a tool and a process for energy efficiency application among key stakeholders of the **Net-UBIEP project (Horizon 2020)** in order to understand the current use of BIM, benefits of using BIM, obstacles to using BIM as well as possible future use.

Net-UBIEP (Network for Using BIM to Increase the Energy Performance of Buildings) aims at increasing energy performance of buildings by wide spreading and strengthening the use of BIM, during the life cycle of the building. For more information about the project please visit www.net-ubiep.eu.

This survey will address all stakeholders of construction project: Public administration, Professionals (designers, constructors, supervising engineers), Technicians (installers/maintainers), Tenants/Owners, Building Administrator (facility managers, etc.) and other stakeholders involved in energy efficiency projects in general.

This questionnaire is tailored for **Technicians**

If you have not had experience with BIM yet, feel free to answer the questions to the best of your ability or you can forward the link of this survey to another person in your company/organization who would be better able to answer questions about the current use of building information modelling (BIM) on energy efficiency projects.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if an email is provided within the survey.

Thank you for your participation!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

F.2 Interview with Technicians

Obligatory question	Question	Possible answers
Yes	1. Which of the following best describes your company/organization's type? (Please mark multiple answers if applicable).	a) Building envelope systems installer/maintainer (walls, roofs, windows, etc.) b) RES system installer/maintainer c) HVAC system installer/maintainer d) Electrical installer/maintainer e) Automation system installer/maintainer f) Association, please specify _____ g) Other, please specify _____
Yes	2. What role do you perform within your company? (Please mark multiple answers if applicable).	a) Company owner b) Company director c) Field engineer d) Installer (insulation, technical systems, automation, other) e) Other, please specify _____
Yes	3. Who do you work on behalf of?	a) Public clients b) Private clients c) Both public and private clients d) As a subcontractor e) Other, please specify _____
Yes	4. How many years have you been working as a professional in your discipline?	a) < 5 years b) 5 – 10 years c) 10 – 20 years d) > 20 years
Yes	5. Projects You work on are?	a) Mainly Public b) Mainly Private c) Both public and private

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Yes	6. What type of construction projects does your company/organization focus on? (Please select all that apply).	a) Residential b) Commercial c) Higher education d) Education e) Hospitality f) Healthcare g) Transportation h) Infrastructure i) Public Assembly j) Interior k) Research and Labs l) Government and Federal m) Other, please specify _____
Yes	7. What is the typical project value range your company/ organization is involved in?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes	8. Are you aware of the Directive (2018/844/EU) amending the Energy Performance of Buildings Directive (EPBD)?	a) Yes b) No
Yes	9. Are you aware that the European Public Procurement Directive includes encouragement for BIM in the procurement of public works? (Article 22 paragraph 4 of Directive 2014/24/UE on public procurement: *For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools or similar. …)*	a) Yes b) No
Yes	10. Does Your company/organization currently use BIM on any level, or is it intending to use BIM in the near future? * If your answer to Question 10 is NO, please complete Questions 11-12 ** If your answer to Question 10 is YES answer Questions 13-23	a) Yes b) No
Yes (If *)	11.* If you have not had experience with BIM, are you aware of the BIM?	a) Yes b) No
Yes (If *)	12. * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future? (Please mark one answer).	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	13. ** What was project value for which you used BIM?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes (If **)	14. ** How many professionals with working knowledge of BIM are employed by your company/ organization?	
Yes (If **)	15. ** In your opinion, who derives benefits from using BIM on energy efficiency related projects? (Please select all that apply).	a) Public Authorities b) Owner c) Architect d) Engineer e) General contractor f) Construction manager g) Installer h) Facility manager i) Building manager j) Other (please specify)
Yes (If **)	16. ** At which level does you company/organization utilize BIM? (Please mark one answer).	a) Create (author) building information models b) Use BIM tools to analyse models but do not create our own models c) Create (author) and analyse building information models d) Other (Please specify)
Yes (If **)	17. ** How many years has it been since your company/organization first implemented BIM?	
Yes (If **)	18. ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?	a) < 10 % b) 10 –30 % c) 30 – 50 % d) > 50 %
Yes (If **)	19. ** How were Your BIM projects related to increasing energy efficiency? (Please select all that apply).	a) Building energy refurbishment within minimum compliance b) Building energy refurbishment to NZEB c) New NZEBs d) New building within minimum compliance e) Industry facilities energy optimisation f) Building energy consumption control g) Other (Please specify) _____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	20. ** Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No c) Do not have an opinion
Yes (If **)	21. ** Do you believe that implementation of BIM results in productivity gains?	a) Yes b) No c) Do not have an opinion
Yes (If **)	22. ** The general opinion is that widespread adoption of BIM will facilitate a reduction of costs and opportunity for error. Do You agree or disagree with this statement?	a) Agree b) Disagree c) Do not have an opinion
Yes (If **)	23. ** With the successful adoption of BIM, a new collaborative way of working and sharing of information is expected. From Your experience, or in Your opinion, will this be achieved?	a) Yes b) No c) Do not have an opinion
Yes	24. What do you consider as barriers for BIM implementation?	

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

Yes	25. Do you forecast companies will be left behind and/or struggle to survive if they do not adopt BIM quickly enough?	a) Yes b) No c) Do not have an opinion
Yes	26. In Your opinion, how will the implementation of BIM affect the role You are having in Your company/ organization?	a) No effect b) Redefined c) Extinct d) Do not have an opinion

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Yes	27. In your opinion, how likely is it that your company/organization will be required to apply BIM on energy efficiency related projects?	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely f) Do not have an opinion
Yes	28. Would BIM certification, support or training, benefit your colleagues?	a) Absolutely b) Likely c) Possibly d) No
Yes	29. Are you ready to take a course in BIM or send Your employees on a course in BIM?	a) Yes b) Not at the moment, in one year c) Not at the moment, in 2 years or more
Yes	30. If there would be formal education for certain BIM profiles, about BIM, advantages of BIM and BIM processes (without using specific software), would You be willing to educate Yourself (Your employees) in such courses? (Please mark one answer)	a) Yes b) Yes, if needed to advance in BIM levels or recertification c) No, I believe that I can learn enough in my work environment d) No, I believe that training provided by BIM software vendors is sufficient e) It depends on the price and the duration of such training
Yes	31. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
Yes	32. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Yes, if I find them useful and of good quality b) No, probably not (after all, they are my competitors) c) I don't know
Yes	33. What do You feel would be the most suitable duration of BIM certification course?	a) < 8 hours b) 8 – 16 hours c) 16 – 32 hours d) > 32 hours
Yes	34. When would You prefer to have the BIM training courses?	a) During working hours b) After working hours c) During weekends d) No preferences
No	35. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

G. Tenants/Owners/Building Administrators (The questionnaire tailored for stakeholders)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

G. The questionnaire tailored for stakeholders (Tenants/Owners/Building Administrators)

G.1 Foreword to the survey

Dear Madam/Sir,
You are invited to participate in Survey about using BIM to increase energy performance of buildings. The purpose of this survey is to assess the implementation of building information modelling (BIM) as a tool and a process for energy efficiency application among key stakeholders of the **Net-UBIEP project (Horizon 2020)** in order to understand the current use of BIM, benefits of using BIM, obstacles to using BIM as well as possible future use.

Net-UBIEP (Network for Using BIM to Increase the Energy Performance of Buildings) aims at increasing energy performance of buildings by wide spreading and strengthening the use of BIM, during the life cycle of the building. For more information about the project please visit www.net-ubiep.eu.

This survey will address all stakeholders of construction project: Public administration, Professionals (designers, constructors, supervising engineers), Technicians (installers/maintainers), Tenants/Owners, Building Administrator (facility managers, etc.) and other stakeholders involved in energy efficiency projects in general.

This questionnaire is tailored for **Tenants/Owners/Building Administrators**

If you have not had experience with BIM yet, feel free to answer the questions to the best of your ability or you can forward the link of this survey to another person in your company/organization who would be better able to answer questions about the current use of building information modelling (BIM) on energy efficiency projects.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if an email is provided within the survey.

Thank you for your participation!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

G.2 Interview with Tenants/Owners/Building Administrators

Obligatory question	Question	Possible answers
Yes	1. Which of the following best describes You/Your company/organization's type? (Please mark multiple answers if applicable).	a) Tenant b) Owner c) Building administrator d) Facility manager e) Public body (government departments, local government, schools, universities, etc.) f) Publicly owned company g) Private company h) Association i) Other, please specify _____
Yes	2. What role do You perform within Your company? (Please mark multiple answers if applicable).	a) Company owner b) Company director c) Department head d) Engineer e) Building (part of building) owner f) Superintendent g) Building manager h) BIM specialist i) Other, please specify _____
Yes (except for tenants)	3. How many years have you been working as a professional in Your discipline?	a) < 5 years b) 5 – 10 years c) 10 – 20 years d) > 20 years
Yes (except for tenants)	4. Buildings You work on are?	a) Mainly Public b) Mainly Private c) Both public and private
Yes (except for tenants)	5. What type of construction projects does Your company/organization focus on? (Please select all that apply).	a) Residential b) Commercial (offices, etc.) c) Higher education, Education d) Hospitality (hotels, etc.) e) Healthcare f) Transportation g) Infrastructure h) Interior i) Research and Labs j) Other, please specify _____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (except for tenants)	6. What is the typical project value range Your company/ organization is involved in?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes	7. Are you aware of the Directive (2018/844/EU) amending the Energy Performance of Buildings Directive (EPBD)?	a) Yes b) No
Yes	8. Are you aware that the European Public Procurement Directive includes encouragement for BIM in the procurement of public works? (Article 22 paragraph 4 of Directive 2014/24/UE on public procurement: *For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of building information electronic modelling tools or similar. …)*	a) Yes b) No
Yes	9. How accurate is Your current data about buildings (parts of buildings) You own/manage/use?	a) Very accurate. b) Moderately accurate. c) Very inaccurate d) Do not know
Yes	10. Does your current organization have a dedicated individual within either the operation or management groups update and maintain this archived data?	a) Yes b) No c) Do not know
Yes	11. Do you currently use BIM for tracking data?	a) Currently do not use. b) Currently use. c) Plan to use. d) Think it is a good idea to pursue further.
Yes	12. Have you heard about COBie (Construction Operations Building information exchange)?	a) Yes b) No
Yes	13. Do You or Your company/organization currently use BIM (other applications than tracking data), or is it intending to use BIM in the near future? *If your answer to Question 13 is NO, please complete Questions 14-15 ** If your answer to Question 12 is YES answer Questions 16-28	a) Yes b) No
Yes (If *)	14. * If you have not had experience with BIM, are you aware of the BIM approach?	a) Yes b) No
Yes (If *)	15. * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future? (Please mark one answer).	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	16. ** What was project value for which you used BIM?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes (If **)	17. ** How many professionals with working knowledge of BIM are employed by your company/ organization?	
Yes (If **)	18. ** In your opinion, who derives benefits from using BIM on energy efficiency related projects? (Please select all that apply).	a) Public Authorities b) Owner c) Architect d) Engineer e) General contractor f) Construction manager g) Installer h) Facility manager i) Building manager j) Other (please specify) _____
Yes (If **)	19. ** At which level does you company/organization utilize BIM? (Please mark one answer).	a) Create (author) BIM models b) Use BIM tools to analyse models but do not create our own models c) Create (author) and analyse building information models d) Other (Please specify) _____
Yes (If **)	20. ** How many years has it been since your company/organization first implemented BIM?	
Yes (If **)	21. ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?	a) < 10 % b) 10 –30 % c) 30 – 50 % d) > 50 %
Yes (If **)	22. ** How were Your BIM projects related to increasing energy efficiency? (Please select all that apply).	a) Building energy refurbishment within minimum compliance b) Building energy refurbishment to NZEB c) New NZEBs d) New building within minimum compliance e) Industry facilities energy optimisation f) Building energy consumption control g) Other (Please specify) _____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.754016

Yes (If **)	23. ** What project delivery method was used on energy efficiency related projects that use BIM? (Please select all that apply).	a) Design-bid-build b) Design-build c) Construction management d) Integrated project delivery (IPD) e) Construction management at risk f) Build-operate-transfer (BOT) g) Design- Build-finance-operate (DBFO) h) ESCO model i) Other (Please specify) _____
Yes (If **)	24. ** Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No c) Do not have an opinion
Yes (If **)	25. ** Do you think believe that implementation of BIM results in productivity gains?	a) Yes b) No c) Do not have an opinion
Yes (If **)	26. ** The general opinion is that widespread adoption of BIM will facilitate a reduction of costs and opportunity for error. Do You agree or disagree with this statement?	a) Agree b) Disagree c) Do not have an opinion
Yes (If **)	27. ** With the successful adoption of BIM, a new collaborative way of working and sharing of information is expected. From Your experience, or in Your opinion, will this be achieved?	a) Yes b) No c) Do not have an opinion
Yes (If **)	28. ** As a client, what are Your requirements on BIM? (*** BIM Level 2 maturity model – we work together with other disciplines on the basis of models (4D and 5D information)) (Please mark one answer)	a) We ask for BIM Level 2*** which we share between experts as a contractual requirement on all our projects b) We ask for BIM Level 2*** as a contractual requirement on some of our projects c) We recommend the use of BIM Level 2*** but not as a contractual requirement d) We would like to ask for BIM Level 2*** as a contractual requirement but do not know how to implement e) We do not make BIM a requirement on our projects, although teams are free to use it

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Yes

29. What do you consider as barriers for BIM implementation?

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

Yes

30. Do you forecast companies/organizations will be left behind and/or struggle to survive if they do not adopt BIM quickly enough?
    a) Yes
    b) No
    c) Do not have an opinion

Yes

31. In Your opinion, how will the implementation of BIM affect the role You are having in Your company/ organization?
    a) No effect
    b) Redefined
    c) Extinct
    d) Do not have an opinion

Yes

32. In your opinion, how likely is it that your company/organization will be required to apply BIM on energy efficiency related projects?
    a) Not likely at all
    b) Somewhat likely
    c) Moderately likely
    d) Very likely
    e) Extremely likely
    f) Do not have an opinion

Yes

33. In Your opinion, how important is it that specific departments and/or Ministries (those responsible for energy efficiency in buildings) mandate the use of BIM in order to encourage its implementation on energy efficiency related projects?
    a) unimportant
    b) of little importance
    c) moderately important
    d) important
    e) very important
    f) Do not have an opinion

Yes

34. Would BIM certification, support or training, benefit Your colleagues?
    a) Absolutely
    b) Likely
    c) Possibly
    d) No

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Yes	35. Are you ready to take a course in BIM or send Your employees on a course in BIM?	a) Yes b) Not at the moment, in one year c) Not at the moment, in 2 years or more
Yes	36. If there would be formal education for certain BIM profiles, about BIM, advantages of BIM and BIM processes (without using specific software), would You be willing to educate Yourself (Your employees) in such courses?	a) Yes b) Yes, if needed to advance in BIM levels or recertification c) No, I believe that I can learn enough in my work environment d) No, I believe that training provided by BIM software vendors is sufficient e) It depends on the price and the duration of such training
Yes	37. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
Yes	38. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Yes, if I find them useful and of good quality b) No, probably not (after all, they are my competitors) c) I don't know
Yes	39. What do You feel would be the most suitable duration of BIM certification course?	a) < 8 hours b) 8 – 16 hours c) 16 – 32 hours d) > 32 hours
Yes	40. When would You prefer to have the BIM training courses?	a) During working hours b) After working hours c) During weekends d) No preferences
No	41. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

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H. Pre training questionnaire
The questionnaire tailored for training participants

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

H. The questionnaire tailored for training participants

H.1 Foreword to the survey

Dear Madam/Sir,
You are invited to participate in Survey about using BIM to increase energy performance of buildings. The purpose of this survey is to assess the implementation of building information modelling (BIM) as a tool and a process for energy efficiency application among key stakeholders of the **Net-UBIEP project (Horizon 2020)** in order to understand the current use of BIM, benefits of using BIM, obstacles to using BIM as well as possible future use.

Net-UBIEP (Network for Using BIM to Increase the Energy Performance of Buildings) aims at increasing energy performance of buildings by wide spreading and strengthening the use of BIM, during the life cycle of the building. For more information about the project please visit www.net-ubiep.eu.

This survey will address all stakeholders of construction project: Public administration, Professionals (designers, constructors, supervising engineers), Technicians (installers/maintainers), Tenants/Owners, Building Administrator (facility managers, etc.) and other stakeholders involved in energy efficiency projects in general.

This questionnaire is tailored for **Training participants** as a **Pre training questionnaire**.

If you have not had experience with BIM yet, feel free to answer the questions to the best of your ability or you can forward the link of this survey to another person in your company/organization who would be better able to answer questions about the current use of building information modelling (BIM) on energy efficiency projects.
We will ask you to complete the questionnaire again at the end of the workshop so that we can assess what you have learned and how the trainers have done at conveying the main points.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if an email is provided within the survey.

Thank you for your participation!

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H.2 Interview with Training participants

Obligatory question	Question	Possible answers
Yes	1. Which of the following best describes your company/organization's type? (Please mark one answer).	a) Owner b) Architecture c) Engineering d) Construction company e) Subcontractor f) Facility management g) Construction management h) Public authority i) Other, please specify
Yes	2. What role do you perform within your company?	a) Company owner b) Company director c) President d) Vice-president e) Designer f) Lead designer g) Project manager h) Project engineer i) Public authority (department head, senior clerk, clerk) j) Field engineer k) Installer (insulation, technical systems, automation, other) l) Building (part of building) owner m) Superintendent n) Building manager o) BIM specialist p) Other, please specify _____
Yes (except for tenants)	3. How many years have you been working as a professional in your discipline?	a) < 5 years b) 5 – 10 years c) 10 – 20 years d) > 20 years
Yes (except for tenants)	4. What type of construction projects does your company/organization focus on? (Please select all that apply).	a) Residential b) Commercial c) Higher education d) Education e) Hospitality f) Healthcare g) Transportation h) Infrastructure i) Interior

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		j) Research and Labs k) Government and Federal l) Other, please specify _____
Yes (except for tenants)	5. What is the typical project value range your company/ organization is involved in?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes	6. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future? * If your answer to Question 6 is NO, please complete Questions 7-8. ** If your answer to Question 6 is YES answer Questions 9-21	a) Yes b) No
Yes (If *)	7. * If you have not had experience with BIM, are you aware of the BIM approach?	a) Yes b) No
Yes (If *)	8. * If your company/organization does not currently use BIM, how likely your company/organization will use BIM in future? (Please mark one answer).	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely
Yes (If **)	9. ** What was project value for which you used BIM?	a) < 50,000 EUR b) 50,000 – 250,000 EUR c) 250,000 – 500,000 EUR d) 500,000 – 1,000,000 EUR e) 1,000,000 – 5,000,000 EUR f) 5,000,000 – 10,000,000 EUR g) > 10,000,000 EUR
Yes (If **)	10. ** How many professionals with working knowledge of BIM are employed by your company/ organization?	
Yes (If **)	11. ** In your opinion, who derives benefits from using BIM on energy efficiency related projects? (Please select all that apply).	a) Public Authorities b) Owner c) Architect d) Engineer e) General contractor f) Construction manager g) Installer h) Facility manager i) Building manager j) Other (please specify)
Yes	12. ** At which level does you	a) Create (author) building

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(If **)	company/organization utilize BIM? (Please mark one answer).	information models b) Use BIM tools to analyse models but do not create our own models c) Create (author) and analyse building information models d) Other (Please specify)
Yes (If **)	13. ** How many years has it been since your company/organization first implemented BIM?	a) < 1 year b) 2 –3 years c) 4 – 5 years d) 6 – 10 years e) > 10 years
Yes (If **)	14. ** Indicate in years your experience in BIM?	a) < 1 year b) 2 –3 years c) 4 – 5 years d) 6 – 10 years e) > 10 years
Yes (If **)	15. ** What percentage of the projects that your company/organization executed has utilized BIM within the past 5 years?	a) < 10 % b) 10 –30 % c) 30 – 50 % d) > 50 %
Yes (If **)	16. ** How were Your BIM projects related to increasing energy efficiency? (Please select all that apply).	a) Building energy refurbishment within minimum compliance b) Building energy refurbishment to NZEB c) New NZEBs d) New building within minimum compliance e) Industry facilities energy optimisation f) Building energy consumption control g) Other (Please specify) _____
Yes (If **)	17. ** What project delivery method was used on energy efficiency related projects that use BIM? (Please select all that apply).	a) Design-bid-build b) Design-build c) Construction management d) Integrated project delivery (IPD) e) Construction management at risk f) Build-operate-transfer (BOT) g) Design- Build-finance-operate (DBFO) h) ESCO model i) Other (Please specify) _____

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Yes (If **)	18. ** Do You believe that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No c) Do not have an opinion
Yes (If **)	19. ** Do you believe that implementation of BIM results in productivity gains?	a) Yes b) No c) Do not have an opinion
Yes (If **)	20. ** The general opinion is that widespread adoption of BIM will facilitate a reduction of costs and opportunity for error. Do You agree or disagree with this statement?	a) Agree b) Disagree c) Do not have an opinion
Yes (If **)	21. ** With the successful adoption of BIM, a new collaborative way of working and sharing of information is expected. From Your experience, or in Your opinion, will this be achieved?	a) Yes b) No c) Do not have an opinion
Yes	22. How do You rate Your competences (knowledge, skills, responsibility and autonomy) in BIM?	a) Excellent b) Very good c) Good d) Little e) I don't know
Yes	23. From Your understanding of BIM, how strongly do You agree or disagree with the following statements?	

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The industry is yet not clear enough on what BIM really is.						
BIM is all about real time collaboration.						
BIM is all about software.						
BIM is only for new build, not renovation.						
BIM doesn't facilitate modified design or construction method.						
BIM is just a synonym for 3D CAD drawings.						
BIM's just for the 'big' - big companies, big buildings, big (government) projects.						
BIM only benefits those involved in design and construction.						
Clients don't know what to do with BIM data						

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24. What do you consider as barriers for BIM implementation?

Yes

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

25. In Your opinion, how important would it be to use BIM in different phases of future energy efficiency related projects?

Yes

	unimportant	of little importance	moderately important	important	very important	do not have opinion
Predesign or program phase						
Schematic design phase						
Design development phase						
Construction documents phase						
Pre-construction phase						
Construction administration phase						
Post-construction operation phase						

Yes

26. In your opinion, how likely is it that your company/organization will require (be required) to apply BIM on energy efficiency related projects?

a) Not likely at all
b) Somewhat likely
c) Moderately likely
d) Very likely
e) Extremely likely
f) Do not have an opinion

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Yes	27. In your opinion, how important is it that specific departments and/or Ministries (those responsible for energy efficiency in buildings) mandate the use of BIM in order to encourage its implementation on energy efficiency related projects?	a) unimportant b) of little importance c) moderately important d) important e) very important f) Do not have an opinion
Yes	28. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
No	29. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

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I. Post training questionnaire
The questionnaire tailored for training participants

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement *No.754016*

I. The questionnaire tailored for training participants

I.1 Foreword to the survey

Thank you for attending **Net-UBIEP** training course.

Net-UBIEP (Network for Using BIM to Increase the Energy Performance of Buildings) aims at increasing energy performance of buildings by wide spreading and strengthening the use of BIM, during the life cycle of the building. For more information about the project please visit www.net-ubiep.eu.

Your experience at the training is very important to us as we continue to look for ways to improve our capacity-building activities.
The **purpose of this survey** is to help us determine the extent to which the training met its goals and to identify ways to improve future training events.

This questionnaire is tailored for **Training participants** as a **Post training questionnaire**.

We invite you take a few minutes to complete this short survey and provide your feedback. The survey should take **less than 15 minutes**.

Your **participation is voluntary, anonymous and confidential**, we will use the findings only to improve future trainings.

All of the information collected will remain confidential. Anonymous answers will be used for research purposes only. Results will be shared with those who participate, if an email is provided within the survey.

Thank you for your participation!

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I.2 Interview with Training participants

Obligatory question	Question	Possible answers
Yes	1. Do You or Your company/organization currently use BIM, or is it intending to use BIM in the near future?	a) Yes b) No

Yes

2. What do you consider as barriers for BIM implementation?

	not likely at all	somewhat likely	moderately likely	very likely	extremely likely	do not have opinion
Knowledge gaps in the fundamental understanding of BIM's advantages						
Cost of implementation (software and hardware upgrades, education of BIM professionals)						
Lack of BIM-knowledgeable design professionals on the project (my associates do not use BIM)						
No time to learn (tight project schedules)						
Reluctance to change BAU (business as usual) methods						
Owners and/or other firms on projects do not demand use of BIM, it is not required in construction process						
No perceived value of BIM by clients						
Project budget and complexity						
Problems with intellectual rights (ownership of BIM model)						
Lack of interoperability between BIM software used by team members						
Other, please specify						

Yes	3. In Your opinion, will You need to utilise BIM in order to design/ check compliance/ construct/ use/manage nZEBs in future? (Please select all that apply).	a) Yes b) Yes, for large buildings c) Yes, it will be mandatory d) No, business as usual methods are sufficient e) I don't know
Yes	4. Do You think that implementation costs associated with BIM (e.g. hardware, software and staff training) outweigh benefits from BIM?	a) Yes b) No
Yes	5. Do you forecast companies/organizations will be left behind and/or struggle to survive if they do not adopt BIM quickly enough?	a) Yes b) No

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Yes

6. In Your opinion, how will the implementation of BIM affect the role You are having in Your company/ organization?

a) No affect
b) Redefined
c) Extinct

Yes

7. What do You think are key tasks related to energy efficiency which will be the most affected by implementation of BIM?

(Please select 5 key tasks that will be most affected).

a) Establishing client requirement and feasibility studies
b) Preparation of tender and contract documents
c) Cost analysis and lifecycle costing
d) Identifying, analysing and developing responses to risks
e) Analysing proposed outcomes
f) Energy performance modelling
g) Valuing completed work and compliance checking
h) Construction quality control
i) Identifying as built situation
j) Energy performance certificate
k) Facility management
l) Storage of documentation and information about the building
m) Managing energy consumption
n) Construction delivery models

Yes

8. Rate the business benefits that Your company/organization could have due to the use of BIM on energy efficiency related projects.

	not beneficial at all	slightly beneficial	moderately beneficial	very beneficial	extremely beneficial	do not have opinion
Decreased project cost and duration						
Increased productivity/efficiency						
Better quality of project						
Increased return on investment (ROI) and project profitability						
Increased accuracy of the cost estimate						
Extended building life						
Maintaining business with past clients						
Faster regulatory approval						

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Yes

9. Rate the project benefits specific to energy efficiency that Your company/organization could achieve as a result of using BIM.

	not beneficial at all	slightly beneficial	moderately beneficial	very beneficial	extremely beneficial	do not have opinion
Better-designed and performing building						
Improved collective understanding of design intent						
Lower risk and better predictability of outcomes (more accurate project documentation, less field coordination problems						
Greater professional satisfaction with project outcomes, reduced claims, disputes and conflicts						
Individual participant productivity						
Lower construction costs, faster project delivery and higher profitability of participating companies						
Enhanced operations, maintenance and facility management						
Improved review and approval cycles						

Yes

10. In Your opinion, how important would it be to use BIM in different phases of future energy efficiency related projects?

	unimportant	of little importance	moderately important	important	very important	do not have opinion
Predesign or program phase						
Schematic design phase						
Design development phase						
Construction documents phase						
Pre-construction phase						
Construction administration phase						
Post-construction operation phase						

Yes

11. Please assess, how much can You increase your productivity by using BIM, after this training course?

a) 0 – 5 %
b) 5 – 10 %
c) > 10 %
d) I don't know

Yes

12. Please assess, how much energy do You expect to save by applying knowledge gained during this BIM training

How much would Your design/execution/compliance check/building use be improved compared to the standard practice?

a) 0 – 5 %
b) 5 – 10 %
c) > 10 %
d) I don't know

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Yes	13. In your opinion, how likely is it that your company/organization will require (be required) to apply BIM on energy efficiency related projects?	a) Not likely at all b) Somewhat likely c) Moderately likely d) Very likely e) Extremely likely f) Do not have an opinion
Yes	14. In your opinion, how important is it that specific departments and/or Ministries (those responsible for energy efficiency in buildings) mandate the use of BIM in order to encourage its implementation on energy efficiency related projects?	a) unimportant b) of little importance c) moderately important d) important e) very important f) Do not have an opinion
Yes	15. Would BIM certification, support or training, benefit Your colleagues?	a) Absolutely b) Likely c) Possibly d) No
Yes	16. What do You think about formal education about BIM, advantages of BIM and BIM processes (without using specific software)? (Please mark one answer)	a) Quite useful b) Quite useful, I can learn specific BIM software on my own c) Useful but I need more training on specific BIM software d) Not useful at all e) It depends on the price and the duration of such training
Yes	17. Do You believe "BIM" is currently a requirement in Your country?	a) Yes b) No c) I don't know
Yes	18. In retrospective, how do You rate Your competences (knowledge, skills, responsibility and autonomy) before this BIM course?	a) Excellent b) Very good c) Good d) Little e) I don't know
Yes	19. What overall rating would You give the course?	a) Excellent b) Very good c) Good d) Fair e) Poor

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Yes

20. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The course objectives were clear.						
The content was organized and easy to follow.						
The course materials were clear and well written.						
The course materials contain sufficient number of images and videos explaining the course content.						
The assignments were appropriate for the level of this class.						
The topics covered were relevant to me and will be useful in my work.						
The coursework was appropriate to my prior knowledge.						
The course increased my interest in the subject.						
The course corresponded to my expectations.						

Yes

21. What overall rating would you give the trainer(s)?

a) Excellent
b) Very good
c) Good
d) Fair
e) Poor

Yes

22. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The trainer demonstrated knowledge of the subject matter.						
The trainer was effective in communicating the content of the course.						
The trainer encouraged feedback from the class.						
The trainer used interactive tools to actively involve me in the course.						

Yes

23. 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)

a) 1
b) 2
c) 3
d) 4
e) 5

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Yes

24. Please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	do not have opinion
The training increased my knowledge of what BIM is, why it is needed, BIM specific terminology and BIM processes.						
The training increased my understanding on advantages of using BIM during the lifecycle of the building regarding energy efficiency.						
The training increased my understanding about the key issues related to working with BIM (identifying and managing issues associated with BIM implementation).						
The training increased my understanding on the importance of having reliable information when designing and managing an energy efficient building.						
The course clearly outlined how can BIM help to increase Energy Performance						
The training increased my understanding on how to define the requirements of BIM model.						
The training increased my capacity on how to develop a strategy for implementing BIM.						
The training increased my knowledge on and recognize the need of Open BIM tools, standard format and interoperable solution.						
The training helped build my capacity to apply information management using BIM.						
The training helped build my capacity to apply procurement management using BIM.						
The training helped build my capacity on the use of BIM technology (7D BIM, code checking, clash detection, etc)						
The training helped build my capacity on how to use BIM for quality management.						
The training helped build my capacity on how to use BIM for supervision of construction works.						
The training helped build my capacity on how to use BIM for handover and maintenance.						

Yes

25. Please rate the following BIM course modules based on how they are useful and interesting to You.

	Not useful - redundant	Useful – should be amended	Useful – no changes necessary	Quite useful – should be amended	Quite useful – no changes necessary	Do not have opinion
Introductory Module – Basic BIM knowledge and skills						
Module 1 – Diffuse BIM						
Module 2 – Apply information management						
Module 3 – Apply procurement management						
Module 4 – Use BIM technology						
Module 5 – Analyse the BIM Model						

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Yes	26. What do You feel, is the training material comprehensive enough? (Please mark all that apply)	a) Yes, it's adequate b) It should contain more practical examples (best experiences) c) It should contain more practical examples (existing issues in BIM) d) It should give more country specific regulatory requirements
Yes	27. What do You feel about the duration of the training?	a) It is adequate b) It should be longer c) It should be shorter
Yes	28. Would You be willing to disseminate the BIM training courses among Your contacts and associates? Without any obligation to do so!	a) Definitely b) Probably c) Not sure d) Probably not e) Definitely not
Yes	29. Would you prefer to take this course online or in the classroom?	a) Online (e-learning) b) Classroom
No	30. Please provide any comments or suggestions that might help improve this course in the future.	
No	31. The survey results will be shared with You if a registration is performed on the web page:	Please register: http://www.net-ubiep.eu/registration/

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This deliverable reflects only the author's view. The Agency is not responsible for any use that may be made of the information it contains.

The present deliverable will be update during the project in order to align the outcome to the market needs as well as to other BIM related projects realized within Horizon 2020 program.

The updated version of the deliverable will be only available in the website of the project www.net-ubiep.eu.

Some deliverables could also be translated in partners national languages and could be find in the respective national web pages. Click on the flags to open the correspondence pages:

International web page

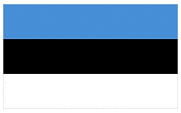
Italian web page

Croatian web page

Slovak web page

Spanish web page

Dutch web page



Estonian web page

Lithuanian web page

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