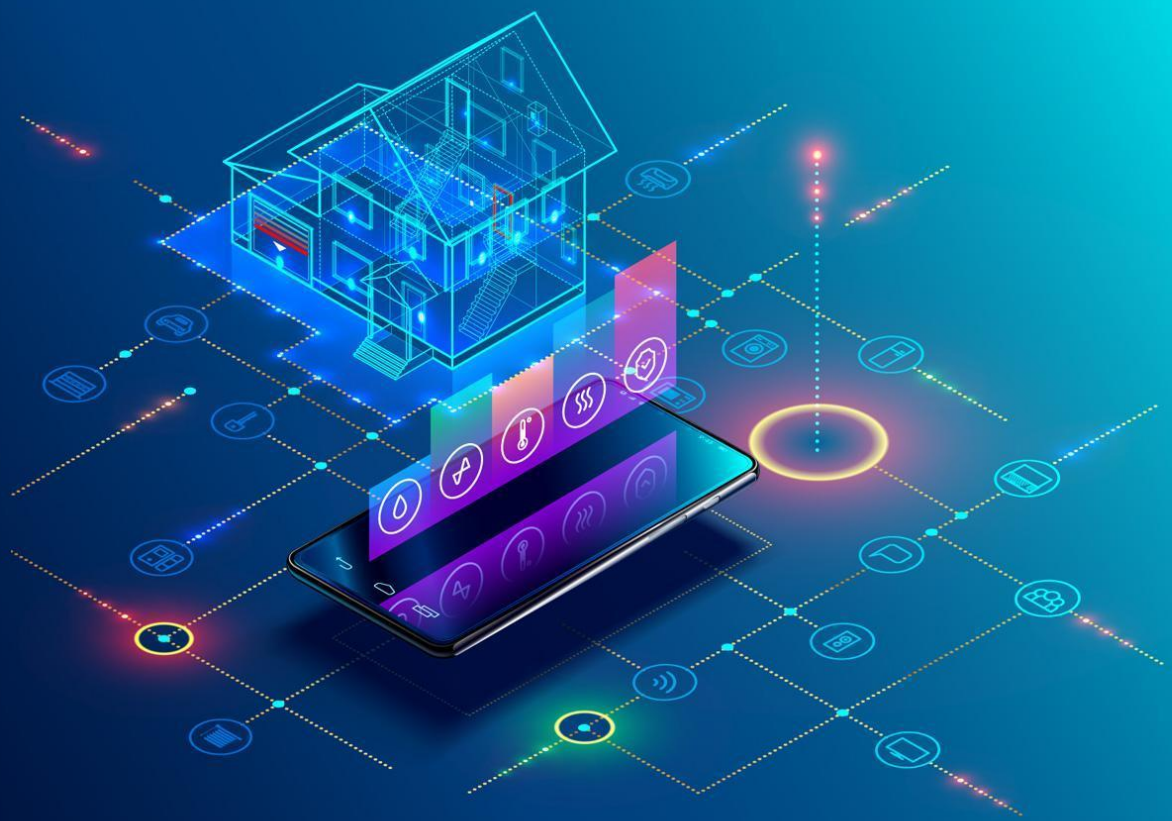


D9.3 Professional Training Plan of BIM for renovation

Deliverable Report D9.3



Deliverable Report: D9.3, version 3, issue date on 28/10/2021

BIM-SPEED
Harmonised Building Information Speedway for Energy-Efficient Renovation

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D9.3 Professional Training Plan of BIM for renovation

Issue Date 28/10/2021
Produced by Architects' Council of Europe (ACE)
Main author Dr. Veronika Schröpfer (ACE)
Co-authors Larissa De Rosso (ACE), Fernando Sigchos (EBC), Fernando Vespa (EBC), Spyridon Pantelis (REHVA), Roberta Stankeviciute (FIEC)
Version: V3
Reviewed by João Gonçalves (ERA), Ane Ferreiro (CYPE)
Approved by Timo Hartmann (TUB), Samaneh Rezvani (DEMO)
Dissemination Public

Colophon

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Publishable executive summary

This **training plan** aimed at all main stakeholders in the renovation market, i.e. real estate clients, public authorities, and professionals from all disciplines (architects, structural and HVAC engineers, construction firms –involving both white- and blue-collar workers). It represented a holistic approach to use project results effectively beyond the project life, consisting of the developed training materials, the running of one ‘train-the-trainers’ session, and the organisation of training and dissemination workshops focused on members of the four involved EU umbrella organisations (ACE, REHVA, FIEC, EBC) and companies participating in the demonstration sites.

The comprehensive **training materials** (<https://www.bim-speed.eu/en/training-materials>) reflecting the teachable aspects of the project were developed with the participation of all partners to fit for different media formats. The contributions were especially relevant from the partners responsible for the teachable outputs on this task. The materials were developed in English and translations are available in BIM-SPEED YouTube Channel

(<https://www.youtube.com/channel/UCA1lPcqkZpHyalzHUw9F40w/featured>). Webinars were held and recorded, and are openly accessible via the project’s YouTube channel, and the EU Build Up Portal (<https://www.buildup.eu/en/news/bim-speed-training-videos>), and the project website (<https://www.bim-speed.eu/en/training-materials>). The training material was made available to the wider public through the EU PROF/TRAC (<http://profrac.eu/training-material/search-training-material.html>) open access online training material repository (ACE and REHVA were in the project consortium) and offered for adaptation to the member associations of the four involved EU umbrella organisations (ACE, REHVA, FIEC, EBC), who are acknowledged national level training providers. The training content is available at ACE (<https://www.ace-cae.eu/access-to-the-profession/continuing-professional-development/eu-funded-projects-training-area/>) and REHVA website (<https://www.rehva.eu/news/article/building-information-modelling-training-material-of-13-bim-related-tools>).

The three online **train-the-trainers’ sessions** were hosted by VISESA, organised by ACE and were taught by the core team for training activities, responsible for the main output of the project. Twenty trainers (16 men and 4 women) from different European countries participated in these events, ten trainers more than initially planned. The primary objective of this activity was to ‘spread the news’ about the BIM-SPEED solutions in appropriate academic/educational institutions and training organisations in the EE (energy efficiency) domain in construction. Additionally, these events also were used to obtain feedback for the improvement of the training materials for the training and dissemination workshops.

The **two national training and dissemination workshops** were organised by ACE and the other three involved EU umbrella organisations (REHVA, FIEC, EBC) on the 20th October 2021. The workshops were held online and included all practical aspects of training targeting the French speaking countries and Greece with the support of the WP leader and participation of all partners involved in this task.



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1. Introduction

1.1. Objectives

The main aim of the BIM-Speed training plan is to showcase the project progress and create content material of the results and achievements of the project. In this sense, the training in WP9 (Communicating, disseminating, exploiting innovations) is one of the key pillars for dissemination. This task is divided into four parts, which progressively build upon each other. This training plan reports on the activities delivered and how the training materials can be accessed and used in the future to guarantee their sustainability after the end of the project. It is supplemented by the training materials and the actual training courses, first a train-the-trainers event and then two national dissemination and training events. Vital within this task is, on the one hand, the contribution and cooperation between all four EU umbrella organisations partnering in the project (ACE, EBC, FIEC, REHVA), as well as the link to the demonstration building. Unfortunately, due to the pandemic, the train-the-trainers and the two national workshops were done online and not in person at the demonstration site. The online format allowed us to reach more experts and professionals in the industry.

1.2. Connections with other deliverables and Work Packages

This task is linked to work packages 1-8, as the comprehensive **training materials** were developed with the participation of all partners regarding the teachable aspects of the project. The training materials in the format of video tutorials were developed in English and made available on BIM-Speed YouTube Channel (<https://www.youtube.com/channel/UCA1lPcqkZpHyalzHUw9F40w/videos>). The translations into all project partners language are provided by the auto-translation feature on YouTube. This task is connected in particular with the T8.3 BIM-SPEED EU competition for BIM-based renovation plans. The training material provides the competition participants with the guidance on how to use the BIM-Speed tools and the methodologies in their competition entries. This is relevant because the use of at least one of the BIM-Speed tools is mandatory for the participation in the competition.



1.3. Training plan activities and timeline

The training plan was broken down into three main activities; Development of the Training Plan, Train-the-trainers workshop, and National workshops. For each activity, a set of sub-activities were created, responsible partners, and deadlines assigned. The training plan breakdown and deadlines can be found in Table 1 below.

Table 1 Training plan activities and timeline

		M24	M25	M29	M30	M31	M32	M36
Activity breakdown	Partners responsible	Oct 20	Nov 20	Mar 21	Apr 21	May 21	Jul 21	Oct 21
Development of the training Plan	ACE							
Selection of the most relevant outcomes for the development of the training materials	ACE							
Contacting partners responsible for the tools and methodology to develop the training	ACE							
Training Material	by partners							
Train the trainers	ACE							
Train-the-trainers webinars (planned invitation - 10 trainers from different EU countries)	Organised by the demo partners							
Training material to be revised (after comments from the trainers)	All partners							
Training material to be translated to 8 partners language (German, Dutch, French, Spanish, Italian, Romanian, Bulgaria, Polish)	All partners							
National workshops	ACE							
French National workshop	EBC, REHVA							
Greed National workshop	FIEC, ACE							



2. Training Materials

2.1. Project Outcomes

The project outcomes were the starting point for the selection of the content for the training material. The list of the deliverables from work packages 1-8 (Figure 1, Figure 2, Figure 3, and Figure 4) provide the overall picture of the potential training material content related to the tool and methodology and the responsible partners to be contact to produce the training material.

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D1.1	Methods for architectural, structural, thermal 3D data acquisition of existing buildings	WP1	5 - HTV	Report	Public	24
D1.2	Methods for surveying and diagnostics of HVAC systems in the existing buildings	WP1	10 - ARC	Report	Public	24
D1.3	IT solutions to couple dynamic data of the existing buildings to BIM	WP1	4 - CARTIF	Other	Confidential, only for members of the consortium (including the Commission Services)	24
D1.4	IT solutions to couple environmental, surroundings and weather data to BIM	WP1	1 - TUB	Other	Public	24
D1.5	Applications for crowdsourcing of inhabitants input	WP1	2 - DMO	Other	Public	24
D2.1	Method and online tool for defining the feasibility and scope of BIM implementation for renovation projects	WP2	7 - PB40	Other	Public	12
D2.2	BIM Family ontologies for materials, components, HVAC equipment in renovation projects	WP2	1 - TUB	Report	Public	24
D2.3	BIM Object Library and Product LCA for renovation projects	WP2	9 - STRESS	Other	Public	36
D2.4	Guidelines for as-built BIM modelling of existing buildings	WP2	10 - ARC	Report	Public	24
D2.5	A set of BIM Passports of the existing building stock	WP2	10 - ARC	Other	Public	48
D3.1	Analysis of BIM-to-BEM critical parameters and recommendations	WP3	9 - STRESS	Report	Public	12

Figure 1 Deliverables expected from BIM-Speed project - Part1.



Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
	to solve the current bottlenecks					
D3.2	A set of support tools and standardised procedures for BEM creation	WP3	6 - CYPE	Other	Public	24
D3.3	Methods for integration of environmental and GIS data to BEM	WP3	1 - TUB	Report	Public	24
D3.4	A set of calibrated BEM for real demonstration cases and proposed standardisation	WP3	8 - UNIVPM	Other	Public	36
D4.1	Baseline and Use Cases for BIM-based renovation projects and KPIs for EEB renovation	WP4	8 - UNIVPM	Report	Public	12
D4.2	Real demonstration results of BEM performance simulation using BIM-SPEED Toolset	WP4	9 - STRESS	Other	Public	48
D4.3	Practical framework for BIM-based acoustic, thermal comfort, and indoor air quality assessment in renovation projects	WP4	8 - UNIVPM	Report	Public	36
D4.4	Practical framework for BIM-based lighting and visual comfort assessment in renovation projects	WP4	12 - UNS	Report	Public	36
D4.5	BIM-based procedures and tool for holistic performance assessment of renovation design options	WP4	22 - MTB	Other	Public	48
D5.1	Report on cooperation activities with standardisation bodies and recommendations on BIM for renovation	WP5	3 - CSTB	Report	Public	48
D5.2	BIM Connectors for interoperability between different BIM	WP5	4 - CARTIF	Other	Public	24

Figure 2 Deliverables expected from BIM-Speed project - Part 2



Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
	tools and with the BIM-SPEED Platform					
D5.3	Methods and tools for rule-based model checking and data validation	WP5	5 - HTV	Other	Public	36
D5.4	Guidelines for BIM-based procurement, collaboration protocols and IPD for renovation projects	WP5	7 - PB40	Report	Public	36
D6.1	Launch version of the BIM-SPEED cloud platform, services and interfaces	WP6	3 - CSTB	Other	Public	6
D6.2	Full version of the BIM-SPEED cloud platform, services and interfaces	WP6	3 - CSTB	Other	Public	48
D6.3	Strategies for user acceptance, collaboration support, and BIM data maintenance	WP6	3 - CSTB	Report	Public	24
D6.4	Evaluation and recommendations of BIM data security, privacy, social and ethical aspects	WP6	16 - ERA	Report	Public	48
D7.1	Multi-criteria decision making method and tool for housing renovation projects	WP7	1 - TUB	Other	Public	24
D7.2	Machine-learning for As-Built diagnostics and enrichment of design rules for deep renovation	WP7	4 - CARTIF	Report	Public	24
D7.3	Semantic design rules and tool for deep renovation design	WP7	15 - LKS	Other	Public	36
D7.4	Life-Cycle Cost and asset management tool	WP7	2 - DMO	Other	Public	36
D7.5	VR/AR demonstrators of deep renovation scenarios	WP7	11 - ASP	Demonstrator	Public	48

Figure 3 Deliverables expected from BIM-Speed project - Part 3



Deliverable Number¹⁴	Deliverable Title	WP number⁹	Lead beneficiary	Type¹⁵	Dissemination level¹⁶	Due Date (in months)¹⁷
D7.6	BIM Execution Plan for residential deep renovation	WP7	14 - MOW	Report	Public	48
D8.1	Synthesis report on demonstration cases of BIM for renovation projects	WP8	13 - FAS	Report	Public	48
D8.2	Establishment and management of Community of Practice and Advisory Board	WP8	2 - DMO	Websites, patents filling, etc.	Public	12
D8.3	Synthesis multimedia presentation of the EU BIM for Renovation Competition	WP8	19 - REHVA	Websites, patents filling, etc.	Public	48
D8.4	EU BIM guidelines, best practices and market uptake roadmap for renovation of residential buildings	WP8	20 - FIEC	Report	Public	48

Figure 4 Deliverables expected from BIM-Speed project - Part 4



2.2. Contributing Partners

The following consortium partner are work package (WP) leaders coordinating the work, that can potentially be develop into training material:

WP1: Collecting and understanding BIM data from existing buildings - Leader: HTV

WP2: Creating As-Built BIM, BIM Passport, Family & Library - Leader: PB40

WP3: Creating and calibrating Building Energy & related analytical models - Leader: STRESS

WP4: Conducting performance simulations of renovation scenarios - Leader: UNIVPM

WP5: Developing open-interoperability solutions and standardisation - Leader: CARTIF

WP6: Implementing BIM cloud platform and data management - Leader: CSTB

WP7: Generating EEB renovation solutions and implementation strategies - Leader: MOW

WP8: Demonstrating best practices of BIM for renovation - Leader: FAS

2.3. Chosen Training Content

The content selection for the training material was done following the criteria below.

- 1) Relevance: The content must be relevant for the main stakeholders in the renovation market.
- 2) No Confidentiality: The content material must be a public deliverable and freely accessible.
- 3) Availability: The content material and the tool must be available for the Train-the-trainers workshop by April 2021.

In collaboration with WP8 leader (Fasada) and the project coordinators (TU Berlin and DEMO), fourteen tools and seven methodologies were identified (Table 2 Tools and methodologies available by April 2021. Table 2) as potential content for the training material and available by April 2021. The responsible partners were contacted and it was agreed that ten tools and four methodologies would become available as training materials. The other tools and methodologies were either not available at the moment (April 2021) of the training material development or they were confidential and could not be shared outside of the project consortium.

Table 2 Tools and methodologies available by April 2021.

Tools	Partners	Status	
1	Tools for collecting environmental, climate and surrounding data	TUB	accepted
2	BIMspeed Platform	CSTB	accepted
3	File name convention tool	CSTB	accepted
4	Open BIM Analytical model	CYPE	accepted
5	Open BIM Construction Systems	CYPE	accepted
6	CYPETherm EPlus	CYPE	accepted



7	CYPETHERM Improvements	CYPE	accepted
8	Arquimedes	CYPE	Not available
9	Metabuild	metabuild	Not available
10	BIMtoBEPS	CARTIF	Not available
11	ECOtool	CARTIF	Not available
12	3DASH Tool (Scan2BIM) ok	CARTIF	accepted
13	BACN2BIM (IoT platform) ok	CARTIF	accepted
14	Inhabitants Crowd-Sourcing App	DEMO	accepted
Methodologies			
1	D1.1 Methods for architectural, Structural, Thermal 3D data acquisition of existing Buildings.	HTV	accepted
2	D1.2 Methods for surveying and diagnostic of HVAC systems in existing buildings - describes how to collect data. In this, there may be some items that can require training (the scripts developed).	ARC	accepted
3	D2.1 Method and online tool for defining the feasibility and scope of BIM implementation for renovation projects	PB40	accepted
4	D2.4 Guidelines for as-built BIM modelling of existing buildings - describes what users need to consider when creating a BIM 3D model of a renovation project.	ARC	Not available
5	D5.2 BIM Connectors for interoperability between different BIM tools and with the BIM-Speed platform.	CARTIF	confidential
6	D7.1 Multi-criteria decision-making method and tool for housing renovation projects	TUB	accepted
7	D7.2 Machine learning for As-Built diagnostic and enrichment of design rule for deep renovation	CARTIF	confidential

2.4. Training material format

Video tutorial format was considered as the most learning friendly format compared to a written manual. Currently, Videos are also the most common format for tutorial content.

In order to have the same visual appearance and topics for all videos, a PowerPoint template (Figure 5) was created by the partner Erasmus University, the dissemination leader. All content creator partners were asked to use the template and record an approximately 15 minutes video tutorial presentation following the topics provided: short description of the tool or methodology, use cases in which it is applied, who can use the tool, and finally the tutorial itself.



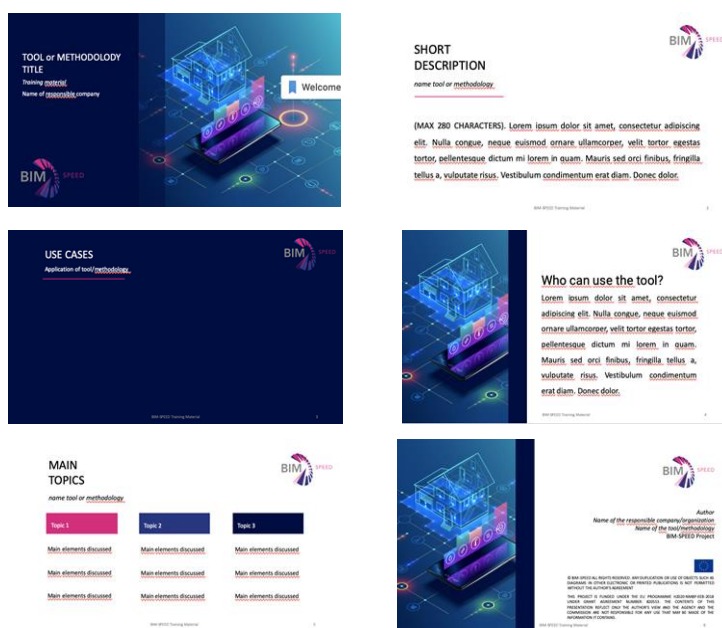


Figure 5 PowerPoint template for Training videos

In March 2021, the content creator partners provided the 14 videos tutorial as planned. The videos links can be found in the Table 3 below.

Table 3 Training videos available in March 2021

Number	Title	Link
1	BIM-SPEED Multi Criteria Decision Support Tool	https://youtu.be/jzJmGAufdlg
2	BIM-Speed Platform	https://youtu.be/lx_ZLlxZo0k
3	BIM-Speed File Name Convention Tool	https://youtu.be/0jrYYuoA0lg
4	BIM Maturity Tool	https://youtu.be/g7tgYFPfX9Y
5	Tools for collecting environmental, climate and surrounding data	https://youtu.be/ZXcTZzaTKZo
6	BIM-Speed methodology toolkit	https://youtu.be/m2N_yQ00SXc
7	Open BIM construction System	https://youtu.be/157YbnVslI0
8	Methods for surveying and diagnostic of HVAC systems in existing buildings	https://youtu.be/o_asFfKDEw
9	Open BIM Analytical Model	https://youtu.be/91MzX4GC5d8
10	Improvements Plus	https://youtu.be/yac5T1nmKus
11	Cypetherm EPlus	https://youtu.be/wZy1YSgyhEo
12	BIM-Speed Inhabitants Crowd-Sourcing App	https://youtu.be/_eJnRpQWUZM
13	3DASH Tool	https://youtu.be/pJB1pGj1I34
14	BACN2BIM	https://youtu.be/2k9kvkPzNU4

All videos were uploaded in the BIM-Speed YouTube channel (Figure 6) and at BIM-Speed Training Material area (Figure 8) in the website (<https://www.bim-speed.eu/en/training-materials>)



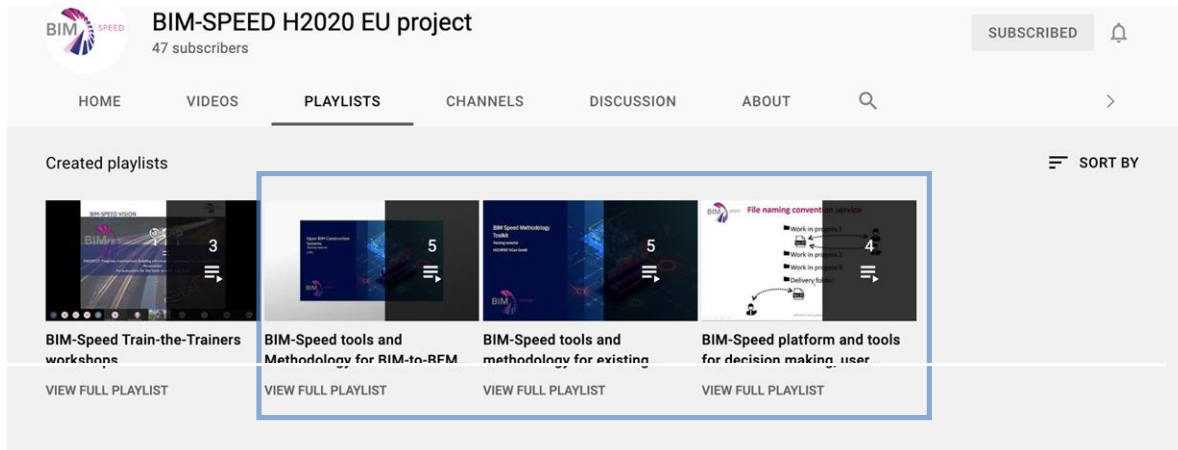


Figure 6 BIM-Speed YouTube channel and the playlists for the training material

In August 2021, three new training tutorial videos about tools recently developed were added to the YouTube channel. The videos links can be found in the Table 4 below.

Table 4 New training videos available in August 2021

Number	Title	Link
1	Volumetrization Techniques Tutorial:Creation of a thermal 3D model from 2D thermal scans	https://youtu.be/Ka8rzxaAAr8
2	VT set, thermal photogrammetry training video	https://youtu.be/D5FkViPBIFY
3	XTR set, augmented reality – microsoft hololens 2	https://youtu.be/09S8zgj9Fec

In October 2021, the 17 videos were viewed 1.647 times on YouTube. A breakdown of the views per video can be found on table 5 in Section 4.4 in this report.



2.5. Training material translation

The translations of the training material to all partner languages in the project can be done by using the Auto-translate feature from YouTube. The six steps to activate the feature can be found below (Figure 7). This way it is ensured that all EU languages are enabled and hence the impact to reach the audience is enlarged.

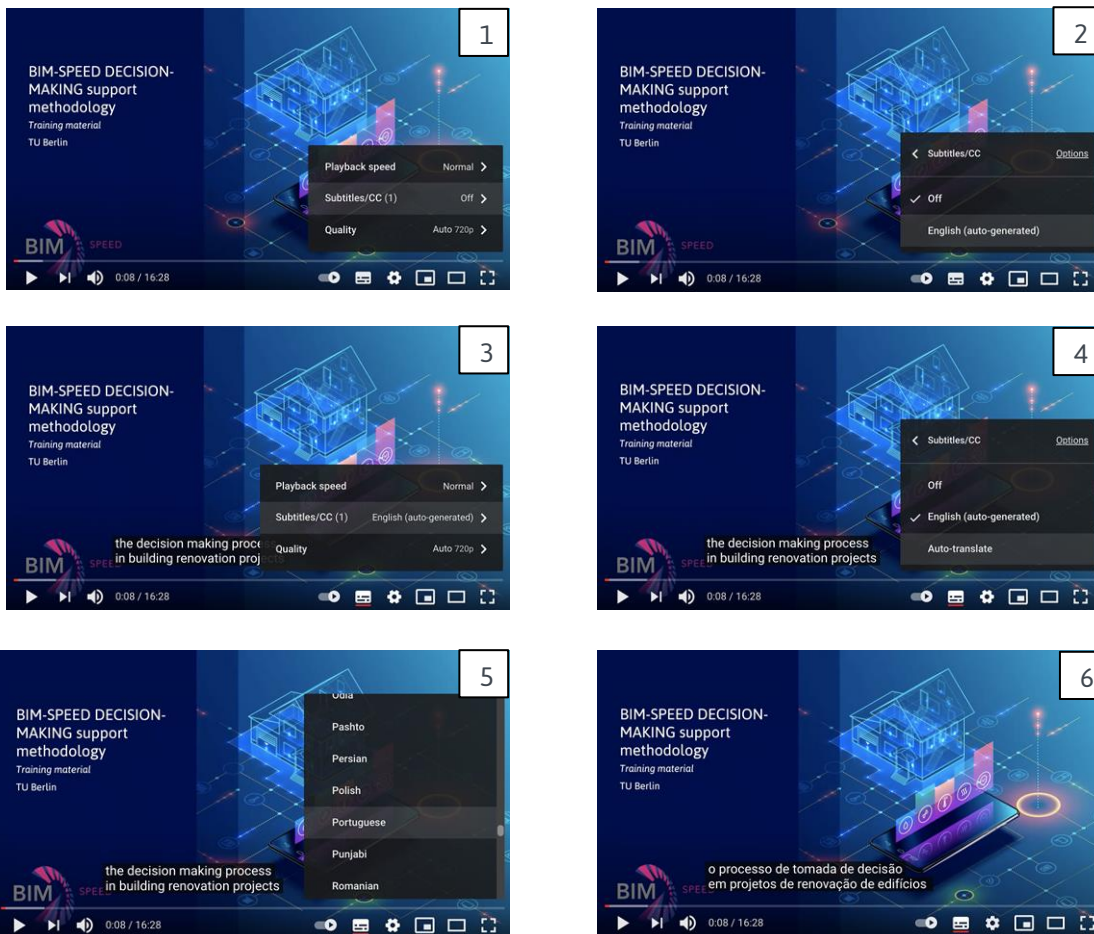


Figure 7 Auto translate feature on YouTube



2.6. Training material website

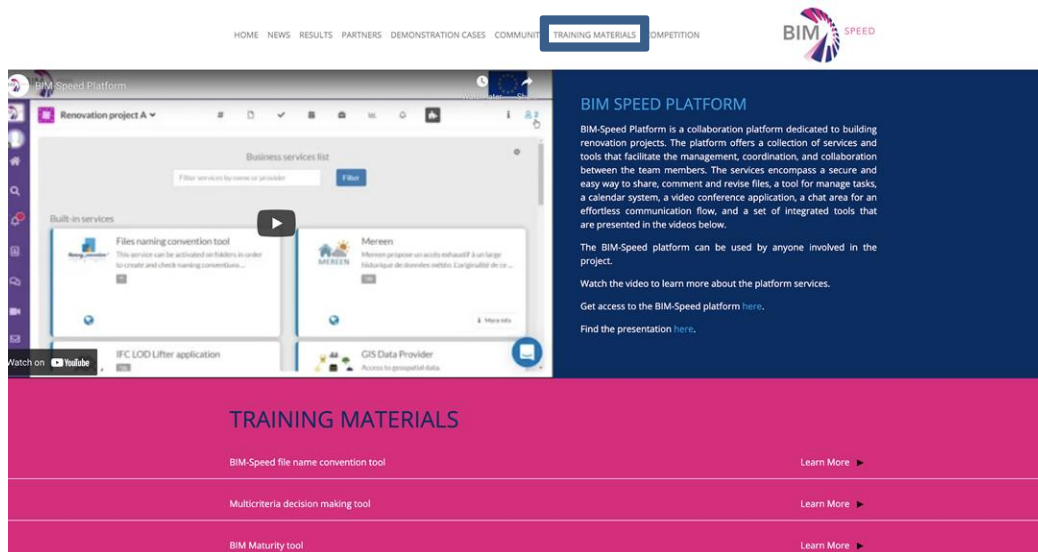


Figure 8 Training material webpage inside BIM-Speed website

The training material area (Figure 8) was created in the BIM-Speed website to contain all information and videos produced for training purposes. For each of the training content created, a brief description was provided, the target user and links to the tools and/or to the presentation. The training material website was ready and available before the train-the-trainer workshop sessions in April 2021.

New training material were added to the webpage in August 2021. The tools were presented in the online National Workshop in Greece in October 2021.



3. Training Events

3.1. Train-the-Trainers workshop

The train-the-trainers workshop was organized by ACE in month 30, April 2021. The workshop was hosted by the Visesa, the partner responsible for the Spanish demonstration site partner. The Spanish demonstration site was chosen as it was the most advanced demonstration site regarding the tools' application at the time of the workshop. This allowed some partners to present the tools applied to this specific demonstration case.


The Spanish demonstration buildings are located at Vitoria-Gasteiz, in the north of Spain. The two residential buildings have together 20 flats and both were built in 1958. Both buildings are not insulated and have poor energy performance with condensation and humidity problems. During the BIM-SPEED project new tools and solutions supporting as-built data acquisition, designing, energy simulation and construction works were implemented in the demonstration site.

The train the trainers' workshop reached twenty experts (16 men and 4 women), the maximum number foreseen during the activities planning. Each task partner invited at least two experts covering the following countries: Italy, Spain, The Netherlands, Norway, North Macedonia, France, Portugal, Romania, Hungary, Ireland, and the United Kingdom.

As the training material content was extensive, the task partners decided to organise a series of three Train-the-Trainers workshop sessions of approximately one hour and thirty minutes each. For this purpose, the training material was divided into three topics: Multicriteria Decision Making and BIM Maturity tool; Information gathering from existing buildings; and BIM-to-BEM and energy Simulations. The agendas of the three workshops are displayed in Figure 9.

The workshops were recorded and made available on the BIM-Speed YouTube channel (<https://www.youtube.com/channel/UCA1lPcckZpHyalzHUw9F40w/videos>) and in the Training Material area of the BIM-Speed website (<https://www.bim-speed.eu/en/training-materials>).





AGENDA
Session 1: BIM-Speed platform, tools and Methodology for decision making, user involvement and BIM maturity
 Train-the-Trainer session
 21/04/2021 - 11:00 (1h30min session)

- 5min **Welcome**
David Grisaleña - Visesa
- 10min **BIM-Speed project introduction**
Andre van Delft - DEMO
- 15min **BIM-Speed platform**
Nicolas Pastorelly – CSTB
- 5min **Q&A session**
- 15min **Multicriteria decision making**
Jerson Alexis Pinzon Amorocho – TU Berlin
- 5min **Q&A session**
- 15min **Inhabitants tool**
Jos Noordzij – DEMO
- 5min **Q&A session and Closing remarks**



AGENDA
Session 2: BIM-Speed tools and methodology for existing Buildings
 Train-the-Trainer session
 27/04/2021 – 10:00 (1h30min session)

- 5min **Welcome**
David Grisaleña - Visesa
- 10min **Spanish demonstration case presentation**
David Grisaleña – Visesa
- 10min **BIM Maturity tool**
Josephine Cooke - PB40
- 10min **BIM-Speed methodology toolkit**
Jan-Derrick Braun - HTV
- 10min **Methods for surveying and diagnostic of HVAC systems in existing buildings**
Bogdan Tofan – ARC
- 5min **Q&A session**
- 15min **3DASH Tool**
Javier Román Cartif
- 15min **BACN2BIM Tool**
Roberto Sanz – Cartif
- 5min **Q&A session**
- 5min **Closing remarks**



AGENDA
Session 3: BIM-Speed tools and Methodology for BIM-to-BEM and energy simulations
 Train-the-Trainer session
 29/04/2021 10:00 (1h 20min session)

- 5min **Welcome**
David Grisaleña - Visesa
- 10min **Spanish demonstration case presentation**
David Grisaleña - Visesa
- 15min **Tools for collecting environmental climate and surrounding data**
Maryam Daneshfar – TU Berlin
- 5min **Q&A session**
- 30min **BIM to BEM and energy simulations**
Antonio Gonzalez Viega - CYPE
- 10min **Q&A session**
- 5min **Closure remarks**

Figure 9 Train the trainers' workshop agendas

3.2. Two dissemination and training events

The BIM-Speed project has planned two online national workshops in Greece and French speaking countries. These workshops aim to generate an overview of the BIM-Speed project processes: from planning to construction, and encourage identified target groups (promoters, construction companies, engineers, project managers and architects) to use and put in practice the concept and the different tools provided by the project. Participants were companies involved in the renovation process, as well as members from the four EU umbrella organisations. The workshops were held on line and promoted in the umbrella's association network (Figure 10). The recordings of the two training/dissemination events are available online (<https://youtu.be/ra6s8PfgiX8>, <https://youtu.be/W6bfffNqOqY>).



Figure 10 National workshop banners



3.2.1. Greek national workshop

- **Introduction**

The national workshop in Greece was held in the month 36, October 2021. The event was organised by FIEC and ACE with the assistance of other two umbrella organisations (EBC, REHVA). Greece was chosen as a hosting country to promote project’s tools and reinforce the knowledge of BIM-Speed tools among targeted audience.

In order to attract a wider audience at national level and provide the opportunity to attend to non-English speaking audience, a simultaneous interpretation English-Greek and Greek-English was provided. For this matter, quotations were asked from four companies that offer interpretation services online. The selected provider of services was chosen based on the best quality-cost ratio offer and previous experience in the field for both Greek and French speaking countries.

Invitations to participate in the workshop were sent to the members in Greece of all four umbrella organisations (except REHVA that do not have a Greek member). Reminders were sent a couple of days before the event took place.

The duration of the workshop was 1h30min.

- **Agenda**

Agenda was discussed and concluded by FIEC and ACE considering targeted audience, availabilities of the organising partners, the speakers and tools available at the moment. The screenshot of agenda is displayed below (Figure 11).

- **Target audience**

The workshop intended to target professionals working in architecture and engineering in Greece for whom BIM-Speed tools would be useful in their daily practise. Participants were able to register to the event using Google registration form prior one day before the event. In total 42 registrations were received.

- **Main outputs**

Organising partners have selected three tools to be presented:

1. BIM-SPEED methodology toolkit.
2. Extended Reality Tools.
3. CYPE tools.



AGENDA	
BIM-SPEED Greek National workshop	
20/10/2021 - 10:00 – 11:35 (CET)	
Platform – Zoom	
English/Greek interpretation	
10:00 – 10:05	Welcome presentation FIEC and PEDMEDE
10:05 – 10:15	BIM-SPEED Project presentation (DEMO, the Netherlands)
10:15 – 10:25	BIM-SPEED platform Nicolas Pastorely (CSTB, France)
10:25 – 10:35	BIM-SPEED methodology toolkit Jan-Derrick Braun (HTV, Germany)
10:35 – 10:45	Extended Reality Tools Nadya Stamatova (Architectural Spies, Bulgaria)
10:45 – 10:55	CYPE tools Pablo Gilabert (CYPE, Spain)
10:55 – 11:10	Questions and Answers session
11:10 – 11:20	Presentation of the BIM-SPEED "EU BIM for building renovation" competition Spyridon Pantelis (REHVA, Belgium)
11:20 – 11:30	Questions and Answers session
11:30 – 11:35	Closing remarks FIEC moderator

Figure 11 Agenda of national workshop in Greece



In addition, to inform participants who are not aware about the BIM-Speed it was decided to give at the beginning of the workshop a general brief presentation about the project, its goals, and main objectives and as well to present BIM-Speed platform.

Finally, in order to promote, disseminate and reach higher number of participants in the “EU BIM for building renovation” competition a short presentation was given to the audience. Following the event, one more team was registered in the Competition.

3.2.2. French speaking countries national workshop

- **Introduction**

Upon prior agreement between the four umbrella organisations organising the national workshops, EBC and REHVA were made responsible of organising the second national workshop. Initially planned for France only, the organisers quickly extended this national workshop to all European French-speaking countries given their manifested interest and the logistical possibilities offered by online tools. The online event was held in Month 36, October 2021.

The organizers initially selected France due the close links between the BIM-SPEED platform and the Kroqi platform, already exploited by French construction stakeholders; with the extension of scope to other French-speaking countries. The intentions of the organisers were to fully exploit the resources available and inform as many French-speaking professionals as possible. The built environment communities in France, Belgium, Switzerland and Luxembourg were thus considered as relevant audiences for the BIM-SPEED partnership to promote the project’s tools and ideas.

Considering that the majority of the targeted stakeholders operate at the local level, with no guarantee on their knowledge of the English language, the organisers decided to provide simultaneous interpretation English-French to attract a wider audience and give an opportunity to all kind of stakeholders, especially construction micro and small companies and HVAC engineers. Invitations to participate in the workshop were sent to the members in France, Belgium, Switzerland and Luxembourg of all four umbrella organisations. Reminders were sent a couple of days before the event took place. The duration of the workshop was 1h30min.

- **Agenda**

The agenda was discussed and concluded by EBC and REHVA considering the targeted audience, as well as availabilities of the identified BIM-SPEED partners, speakers and tools. The agenda is displayed below (Figure 12).





AGENDA	
14:00 – 14:05	Mots de bienvenue
14:05 – 14:15	Présentation du projet BIM-Speed André van Delft, DEMO Consultants (NL)
14:15 – 14:25	Plateforme BIM-Speed Nicolas Pastorelly, CSTB (FR)
14:25 – 14:35	Boîte à outils méthodologique BIM-SPEED Jan-Derrick Braun, HTV (DE)
14:35 – 14:45	Outil de maturité BIM Essam Fadel, Planen Bauen 4.0 (DE)
14:45 – 14:55	Outils CYPE: CYPERTHERM Eplus & CYPERTHERM Improvement Plus Benjamin Gonzalez, CYPE (ES)
14:55 – 15:10	Questions/Réponses
15:10 – 15:20	Présentation de la compétition BIM-SPEED Spyridon Pantelis, REHVA (UE)
15:20 – 15:25	Questions/Réponses
15:25 – 15:30	Observations finales

Modérateur:
Fernando Sigchos Jiménez, EBC (UE)

Atelier BIM-SPEED pour pays francophones, 20 octobre 2021

Figure 12 Agenda of national workshop in French speaking countries.

The online workshop was structured following the rationale of presenting first the main concepts behind the BIM-SPEED project, then presentations of the BIM-SPEED platform and methodology toolkit, thirdly demonstrations of a set of BIM-SPEED tools, and finally an invitation to participate to the BIM-SPEED competition.

- **Target audience**

The workshop intended to target professionals working in construction companies and engineering in French-speaking countries for whom BIM-Speed tools are or would be useful in their daily practice. Participants were able to register to the event using a Google registration form prior one day before the event. In total 19 registrations were received (not including BIM-SPEED partners).

- **Main outputs**

To set the scene and make aware participants about the BIM-Speed project, a brief general presentation of the project, its goals, and main objectives was shared with the audience.

Given its central importance as a one-stop shop for most of the project’s innovations, the BIM-SPEED platform was also presented and demonstrated.

The BIM-SPEED tools were selected as particularly appealing for the members of EBC and REHVA. In addition to a presentation of the BIM-SPEED methodology toolkit developed by Hochtief, EBC selected the BIM Maturity Tool developed by Planen Bauen 4.0 and REHVA the CYPERTHERM series developed by CYPE (<https://www.bim-speed.eu/en/training-materials>).

Finally, in order to promote, disseminate and reach a higher number of participants in the “EU BIM for building renovation” competition organised by the BIM-SPEED partnership, a short presentation was given to the audience by REHVA.



4. Results

4.1. Feedback from the experts about the Train the Trainers workshops and training material

The participants of the workshops received a feedback survey after each workshop session for the assessment of the training material and the workshops. In the survey they had the opportunity to make a general assessment about the tools and methodologies presented by replying to a Likert scale questionnaire and also provide specific feedback for each topic presented by answering open questions. Ten participants provided the feedback. The results are shown below (Figure 13, Figure 14, and Figure 15).

4.1.1. Feedback results from session 1: BIM-Speed platform, tools and Methodology for decision making, user involvement and BIM maturity

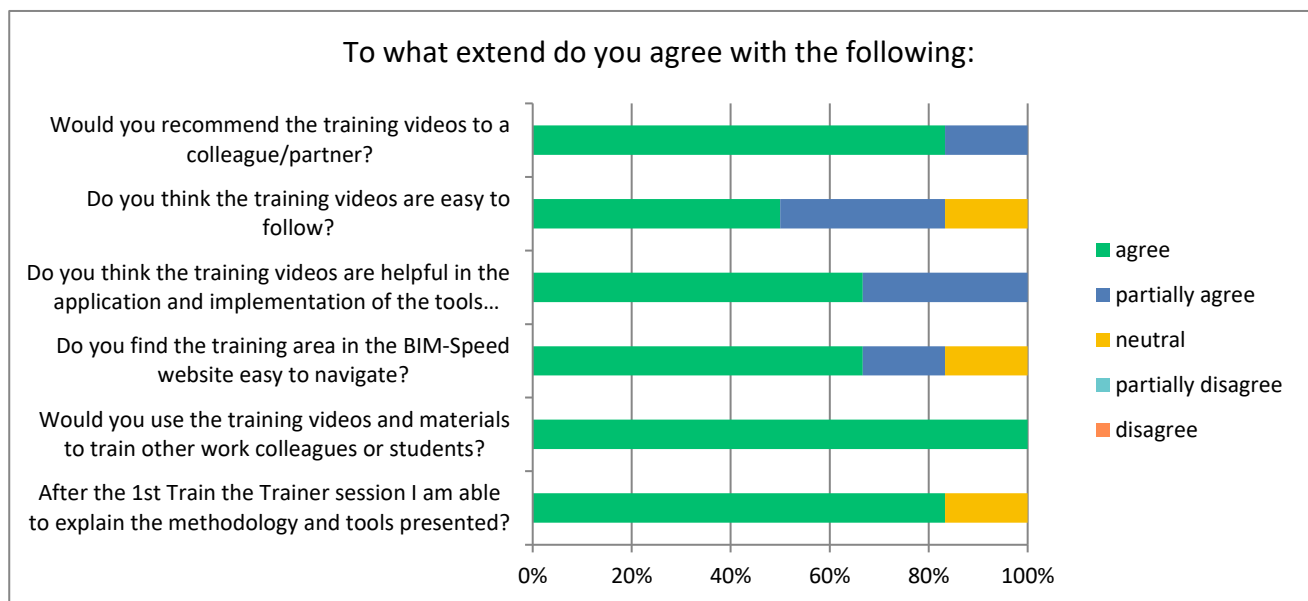


Figure 13 Feedback results from the First Train the Trainers meeting

The feedback for the first session was overall positive. All the six respondents agree that they would use the training materials to train other work colleagues or students. The majority of the respondents considered themselves able to explain the content presented, they would recommend the training videos to a colleague, they find the training videos helpful for the implementation of the tools and methodologies and they think that the website for the training material is easy to navigate. Half of the respondents think the videos are easy to follow.

The BIM-Speed platform, Name convention file and the Multicriteria decision making tool received specific feedback about their videos which can be found below.



BIM-Speed Platform

- “Add a short BIM SPEED project overview”
- “Please use BIM-Speed template”
- “Perhaps to link the MCA tools with BIM model”

BIM-SPEED File Name Convention Tool

- “Try to reduce to 4”
- “Please use BIM-Speed template”
- “Perhaps to support with other training materials - presentations etc.”

Multicriteria decision-making tool

- “Too long (20'), try to keep the length as per other videos (6'-12')”
- “Perhaps to translate to other languages”

The multicriteria decision-making video was modified accordingly. A new adapted version of the Multicriteria decision-making tool video tutorial was provided in June 2021 and replaced the other one on YouTube and the training material website.

4.1.2. Feedback results from session two BIM-Speed tools and methodology for existing Buildings

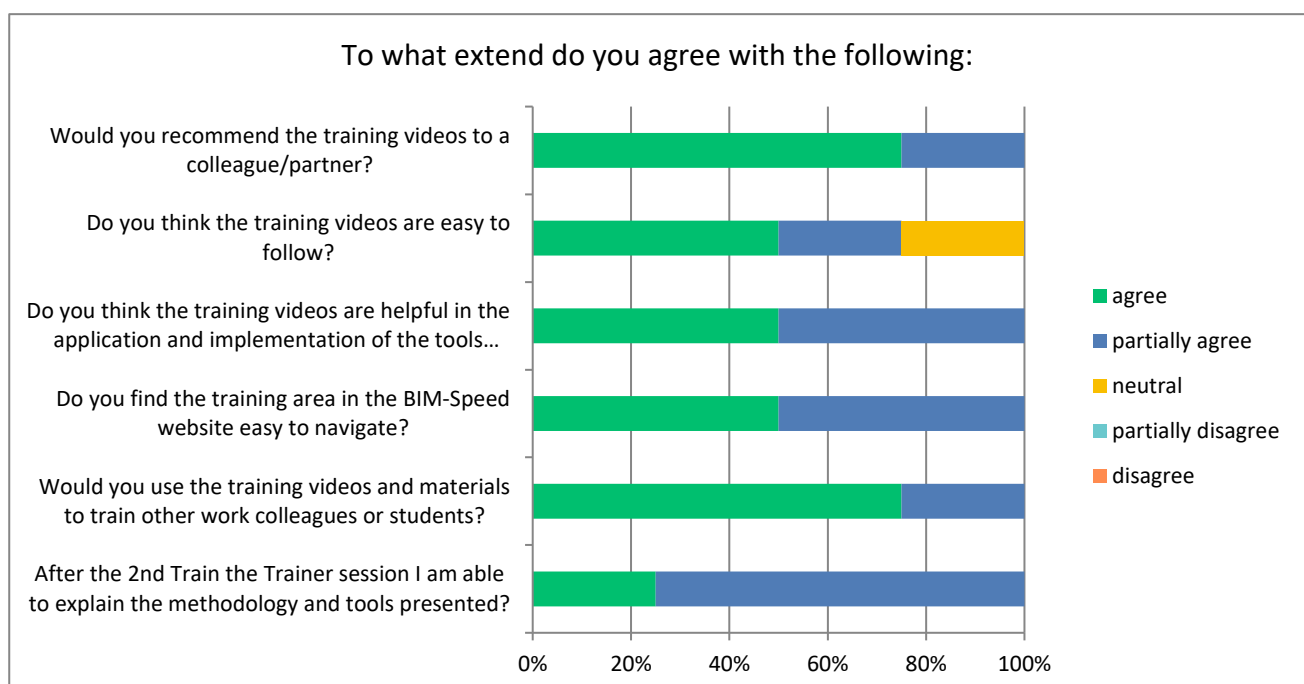


Figure 14 Feedback results from the Second Train the Trainers meeting

In the second session, the majority of the four respondents would recommend the training videos to a colleague and would use the material to train other work colleagues or students. Half of the respondents think the videos are easy to follow, the training videos are helpful in the implementation of the methodologies and the website is easy to navigate. Finally, only 25% of the respondents think they would be able to explain the tools and methodologies presented.

The BIM Maturity tool and the 3DASH tool received the specific feedback that can be found below.



BIM Maturity tool

- "In my opinion, it is one of the best videos in terms of content, length and audio."
- "Specify the stage of the process in which the tool is useful"
- "clear to follow"

3DASH Tool

- "I don't like computer audio, I believe that a good quality human speaking is more captivating in video tutorials."
- "Would be nice to share the example files shown in the video in order to allow people to repeat the exercises at home."
- "I think it can become even faster thanks to the new functionalities of Revit 2022 with the fast creation of floors and roofs. If updated it would boost the model creation even more"
- "I liked it"

The 3DASH tool content developers replied to the comments above. They prefer to keep the computer voice as it is cleared than a non-native speaker voice over. Unfortunately, the example files shown in the tutorial can't be made available by the demonstration site partner. They also appreciate the suggestions made for future development of the tool in Revit 2022. They clarified the tool runs in Revit 2019 and it isn't intended yet for floors and roofs.



4.1.3. Feedback results session 3: BIM-Speed tools and Methodology for BIM-to-BEM and energy simulations

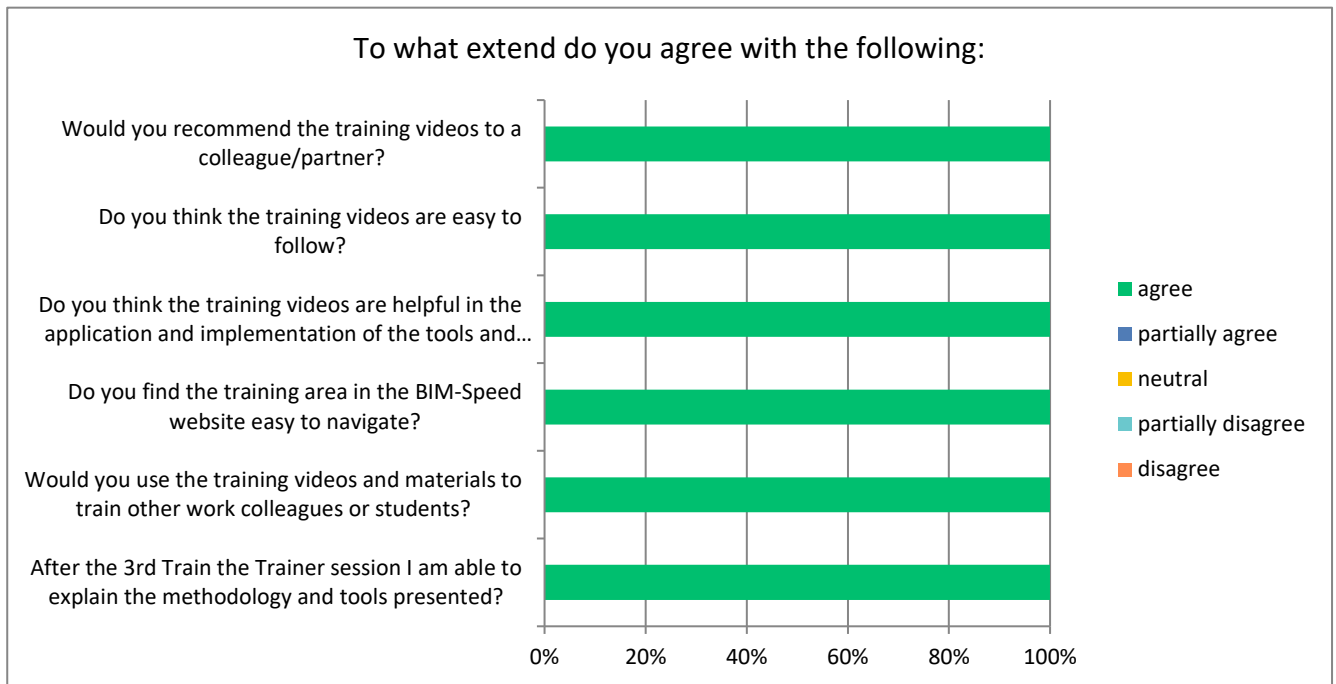


Figure 15 Feedback results from the Third Train the Trainers meeting

The last session has received very positive feedback from only one participant.

The participants also wrote feedback for the overall training workshop that can be found below.

“Share a "Training Roadmap" in order to guide the user on the proper learning path, it could be a new video or a brief pdf. Currently videos are presented as a simple list, and it could be confusing. Material should be categorized in project phases, e.g.: survey, BIM modelling, environmental modelling, BEM, analysis, outcome. In this way it would be possible to filter content as well. _Usually audio is a bit poor and, in some videos, ("Inhabitants crowd-sourcing app" and "3DASH tool") there is a robotic voice instead of a human speaker. They both sound "distant" and difficult to follow after the first minute (due to the slow speaking). In my opinion the best solution is a high-quality human voice recording (as per BIM Maturity tool video) _Allow to download the presentations shown in the videos _Add YouTube subtitles in different languages (at least: French, Spanish, German and Italian) _Create a "primer document" where training material is presented as text and make it available for on-line consultation or in pdf (translated in several languages)”

“The first training was a success!”



“Uniform audio quality of the videos _ Create a "summary" video where a demo-case of the whole process is shown, in order to give an overview of all the tools and understand their relationship”

“Excellent project, specific by taking the buildings' users in consideration”

The response by the organiser can be found below.

The materials were categorised by project phases and this information was made available on the Training material webpage (Figure 16). Therefore, the user can better understand when to use each tool and training material during the renovation process. The computer voice is understood clearer and without accents by the partners. The video's subtitles are shown in different languages by using the auto-translate feature in the BIM-Speed YouTube channel, as explained in section 2.5 in this report.

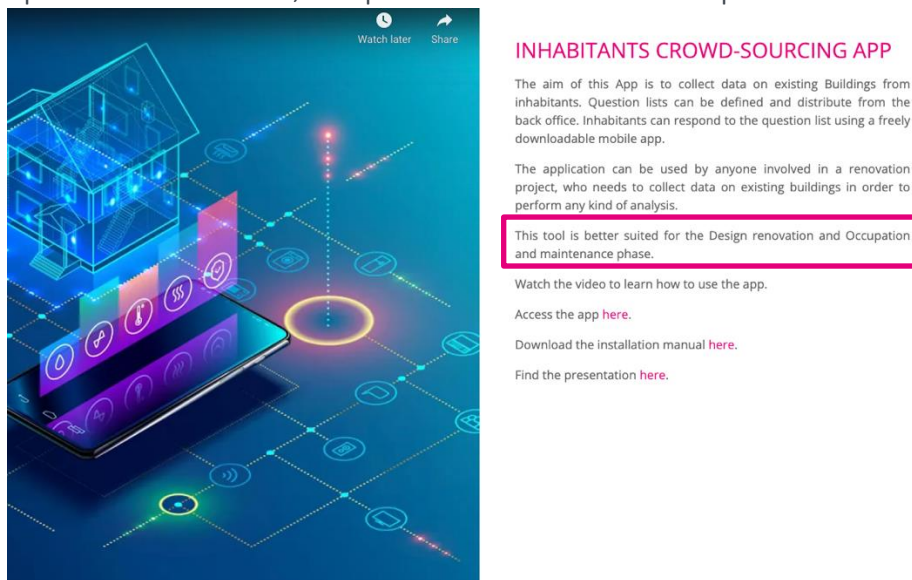


Figure 16 Project phase information add to the training material website.

4.2. Train the trainers workshop

The three Train-the-Trainers workshops gather in total twenty experts. It was observed a total of sixteen men and four women. Four experts participated in all three workshops. Four participated in two workshops and twelve participated in only one workshop. The first workshop attended fourteen experts. The second workshop attended eleven experts. And finally, the third workshop seven experts participated. The experts were from Spain, Ireland, Italy, Romania, Greece, Portugal, The Netherlands, Norway, France, and North Macedonia. A total of ten European countries and United Kingdom. From the twenty experts, seven were architects, seven engineers, two BIM experts, one expert in energy simulation, one project coordinator, one senior teacher in technical school, and one researcher. The workshops recordings were made available at the BIM-Speed YouTube channel (Figure 17) (https://www.youtube.com/watch?v=Y-9Fqyrx4PI&list=PL-LSKZJhMrFJWXL0IYCqnhZmd9_FBsGQG) and they were seen by 144 people from April to October 2021 when this report was written.



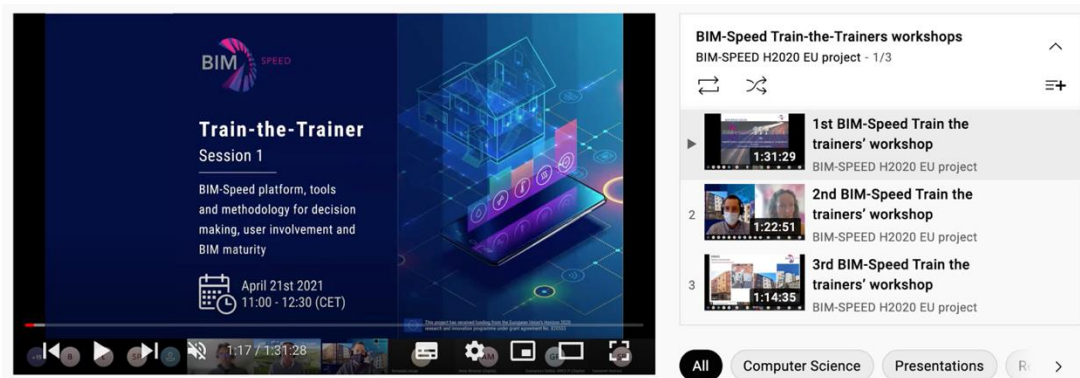


Figure 17 Train-the-trainer workshops available at BIM-Speed YouTube channel

4.3. Two National Workshops

The BIM-Speed project has planned two national workshops hosted online for specific countries, Greece and French speaking countries, where stakeholders involved in renovation processes have shown a particular interest in BIM-SPEED tools. These workshops aimed to generate an overview of the BIM-Speed project processes: from planning to construction, and to further encourage persons of interest (promoters, construction companies, engineers, project managers and architects, etc.) to use and put in practice the concept and the different tools provided by the project.

4.3.1. National workshop in Greece

- **Target audience reached**

The event was attended by 51 participants including representatives of the four umbrella organisations, interpreters, speakers, and registered attendees (19 of them), e.g., employees and students at the Technical University of Athens, civil engineers, representatives of Panhellenic Association of Engineers Contractors of Public Works, architects, electrical engineers from various private companies in the country (Figure 18).

- **Main outputs**

In total there were 6 presentations:

1. BIM-SPEED Project presentation – presented by André van Delft (DEMO Consultants, the Netherlands).
2. BIM-SPEED platform – presented by Nicolas Pastorelly (CSTB, France).
3. BIM-SPEED methodology toolkit – presented by Jan-Derrick Braun (HTV, Germany).
4. Extended Reality Tools – presented Nadya Stamatova (Architectural Spies, Bulgaria).



Figure 18 BIM-Speed online National workshop in Greece



5. CYPE tools – presented by Benjamin Benjamín González (CYPE, Spain).
6. BIM-SPEED “EU BIM for building renovation” competition – presented by Spyridon Pantelis (REHVA, Belgium).

Below some screenshots of the events are displayed (Figure 19, Figure 20, and Figure 21):

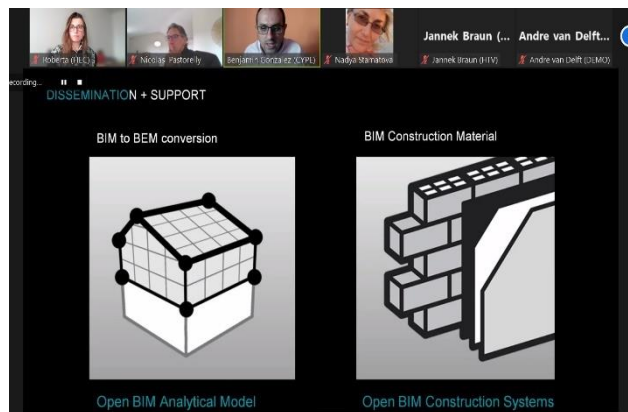


Figure 19 CYPE tools presentation at the Greek Workshop



Figure 20 BIM-Speed toolkit presentation at the Greek workshop



Figure 21 BIM-Speed Platform presentation at the Greek Workshop

• Sli.do results and questions from the floor / comments in the chat

Two Questions and Answers sessions were held (10 min each) during the event. Participants were given a chance to ask any questions to the speakers to get any additional information about the tools or the project. Additionally, the participants of the workshop were asked to answer 7 questions using Sli.do. This helped organizers to collect general feedback of the tools presented and to keep audience engaged during the event. The results of all questions are shown below (Figure 22 and Figure 23).

There were 32 active users taking part into questions, engagement per user reached is 3.2. Each question received 14 answer on average. Participants did not raise any questions neither on the chatbox nor in live form.



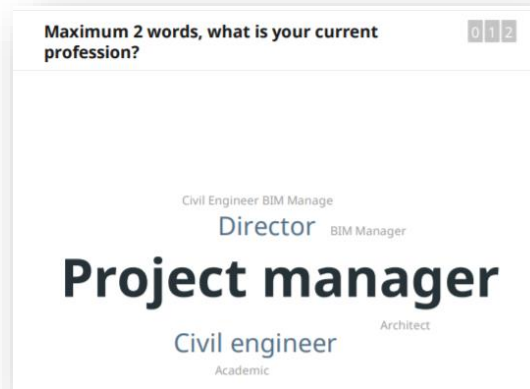


Figure 23 Questions to the Audience Greek workshop - Feedback

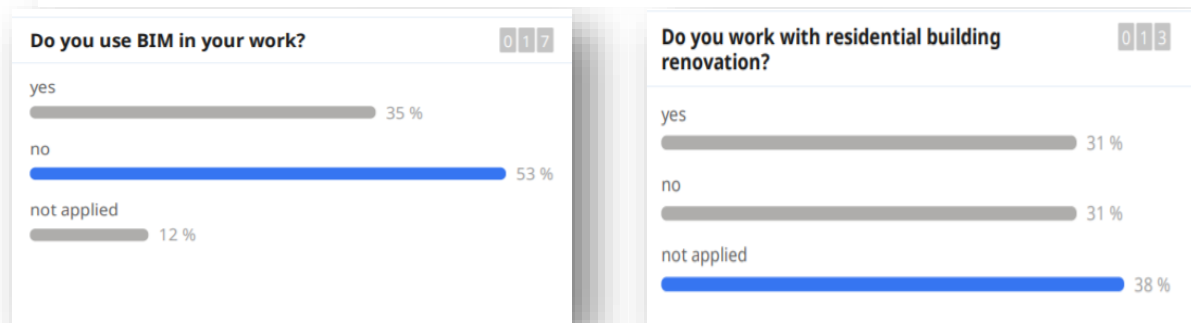
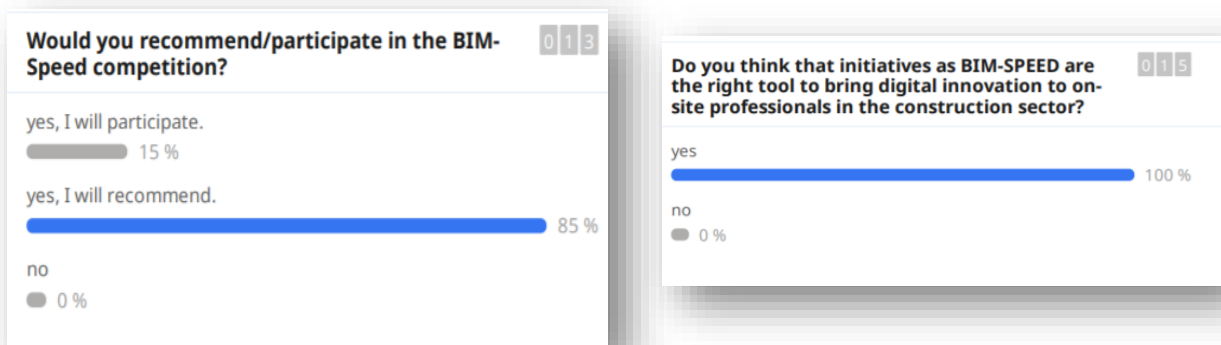
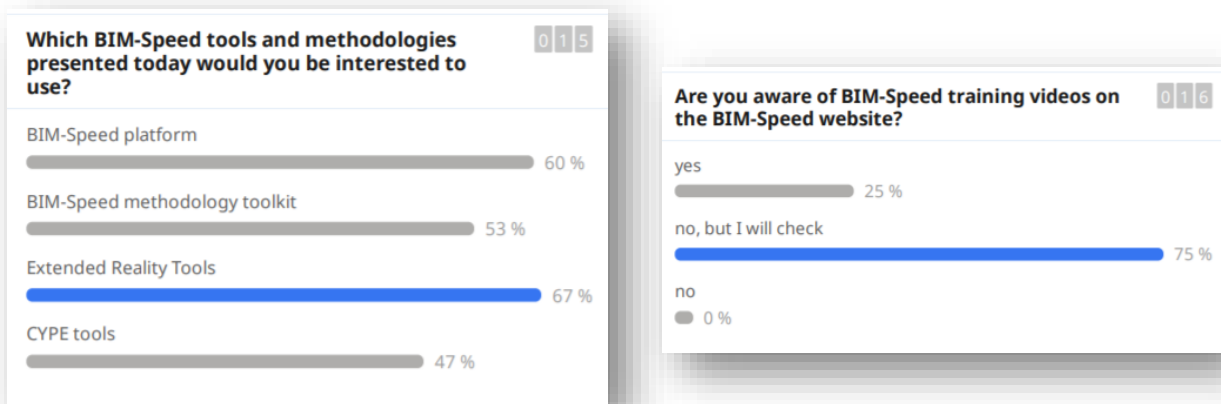


Figure 22 Questions to the Audience Greek workshop- Getting to know the participants.



4.3.2. National workshop in French speaking countries

- **Target audience “Reached”**

The event was attended by 26 participants, including representatives of the four umbrella organisations, interpreters, speakers, and registered attendees (7 of them), e.g., representatives of the French “Confédération de l’artisanat et des petites entreprises du bâtiment (CAPEB)” and “Syndicat national du Second Oeuvre (SNSO)”, of the Belgian “Unie van het KMO-bedrijven” (BOUWUNIE), Association des Ingénieurs et techniciens en Climatique, Ventilation et Froid (AICVF) the Polish “Związek Rzemiostła Polskiego (ZRP)”.

- **Main outputs**

In total there were 6 presentations:

1. BIM-SPEED Project presentation – presented by André van Delft (DEMO Consultants, the Netherlands).
2. BIM-SPEED platform – presented by Nicolas Pastorelly (CSTB, France).
3. BIM-SPEED methodology toolkit – presented by Jan-Derrick Braun (Hochtief TV, Germany).
4. BIM Maturity Tool – presented by Essam Fadel (Planen Bauen 4.0, Germany).
5. CYPE tools – presented by Benjamín González (CYPE, Spain).
6. BIM-SPEED “EU BIM for building renovation” competition – presented by Spyridon Pantelis (REHVA, EU).

Below some screenshots of the events are displayed (Figure 24 and Figure 25)



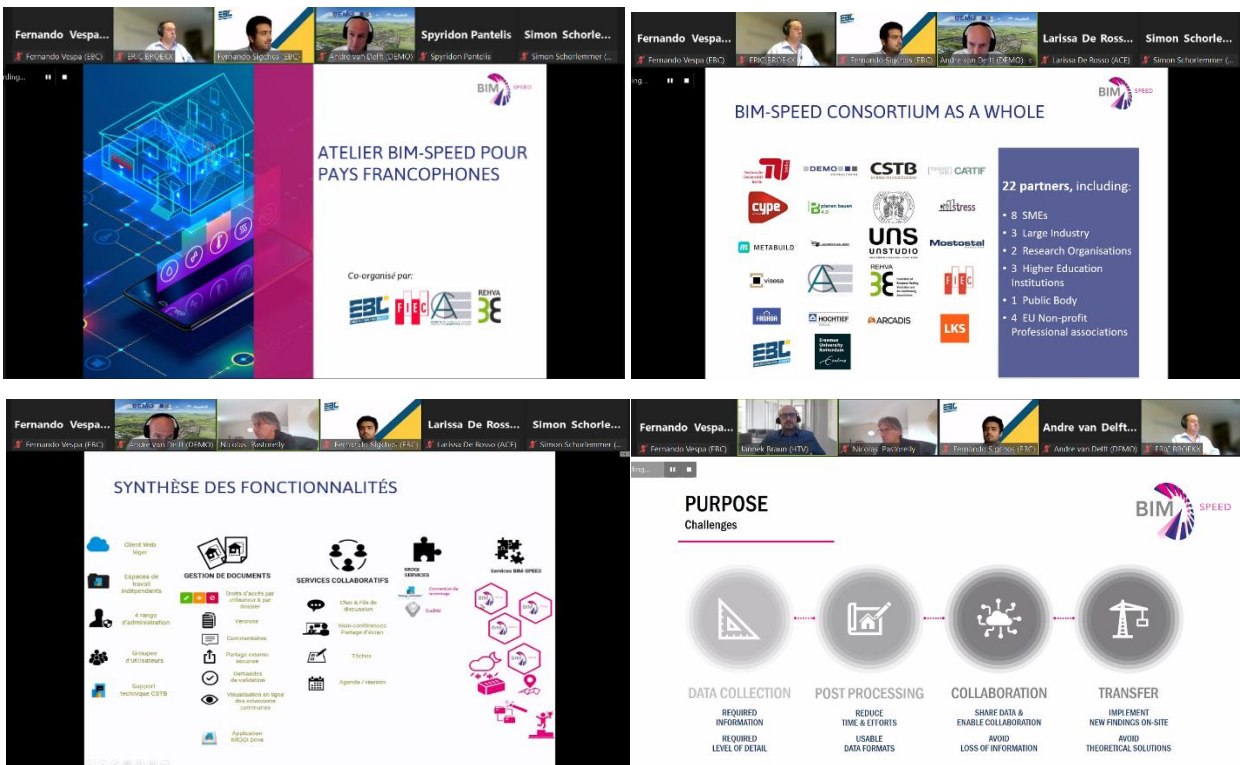


Figure 24 BIM-Speed workshop in French speaking countries

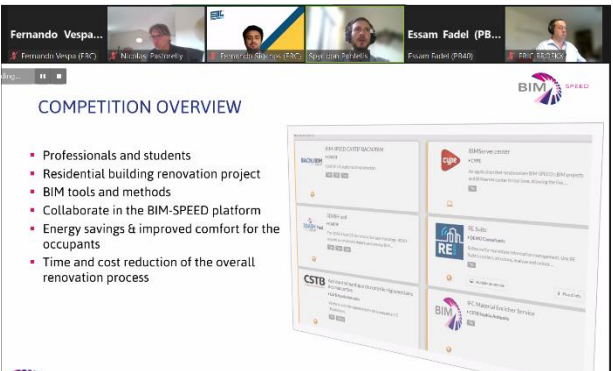
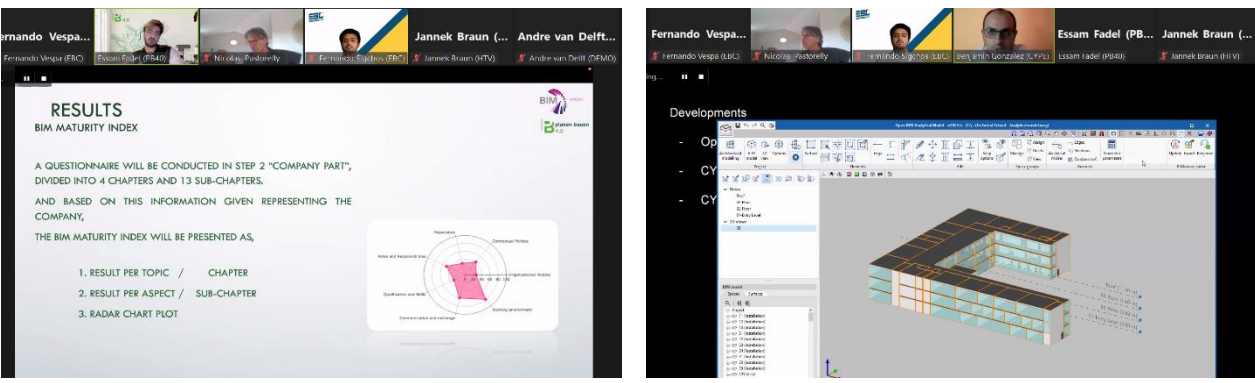


Figure 25 BIM-Speed workshop in French speaking countries



- **Sli.do results & questions from the floor / comments in the chat**

Initially two Questions and Answers sessions were planned, but only one was held (10 min) during the event to avoid delays. Participants were given a chance to ask any questions to the speakers to get any additional information about the tools or the project.

Additionally, the participants of the workshop were asked to answer 7 questions using the interactive online service Sli.do. The questions were split in two parts, the first three Sli.do questions were about the profile of the attendees and thus were presented during the welcoming words; the last four Sli.do questions were about feedback on the tools and the competition and thus were presented closer to the end of the event. Globally, using the Sli.do service helped the organizers to collect general feedback and keep audience engaged during the event. The results of all questions are shown below (Figure 26 and Figure 27).

There were up to 16 active users taking part into questions, engagement per user reached is 3.2. Each question received 13 answers on average. Participants did not raise any questions neither on the chatbox nor in live form.

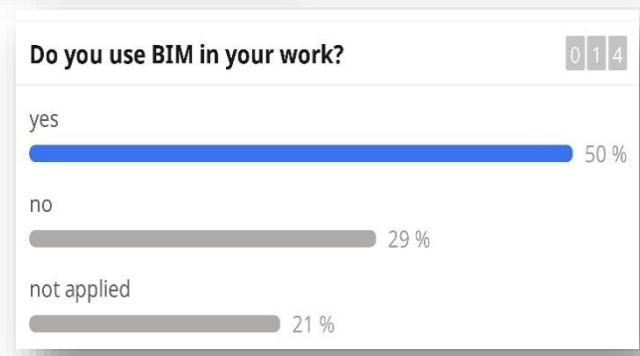
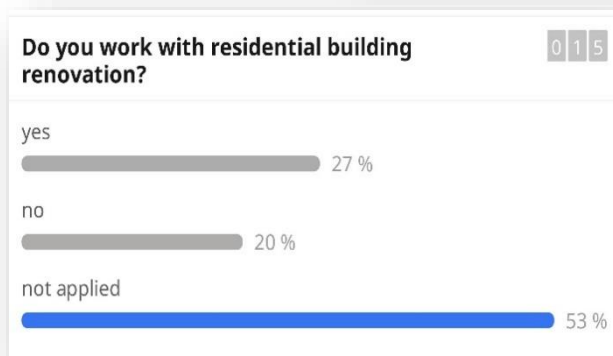
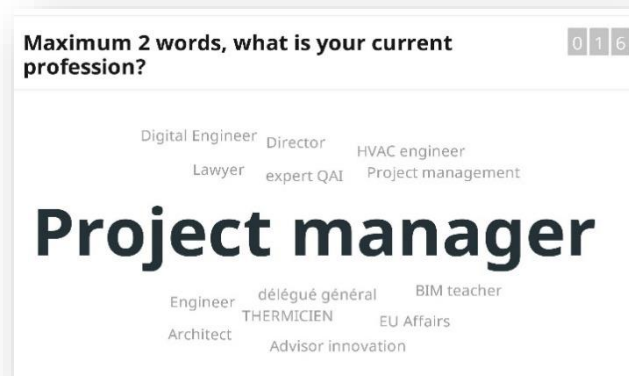


Figure 26 Questions to the Audience French speaking countries workshop- Getting to know the participants.



4.4. Website and YouTube channel

The impact of the training videos tutorials available on the YouTube platform can be measured by the number of views the video achieved. In the same way, the training website access can also be measured by the number of views. The Table 5 below presents the website and training tutorial video numbers, such as the number of views/visits, the amount of time it is available and the duration of each video.

The most viewed video is the BIM-Speed platform with 266 views, followed by BIM Maturity tool with 197 views, and the Open BIM Construction system with 169 views. The numbers suggest that there is no correlation between the video duration and the views. In other words, shorter videos don't have more views. The training material videos were viewed 1.647 times. The training related material videos, including the workshops, were viewed 1.791. The data was collected on the 22nd October 2021.

Table 5 Training videos impact. Data collected on the 22nd October 2021

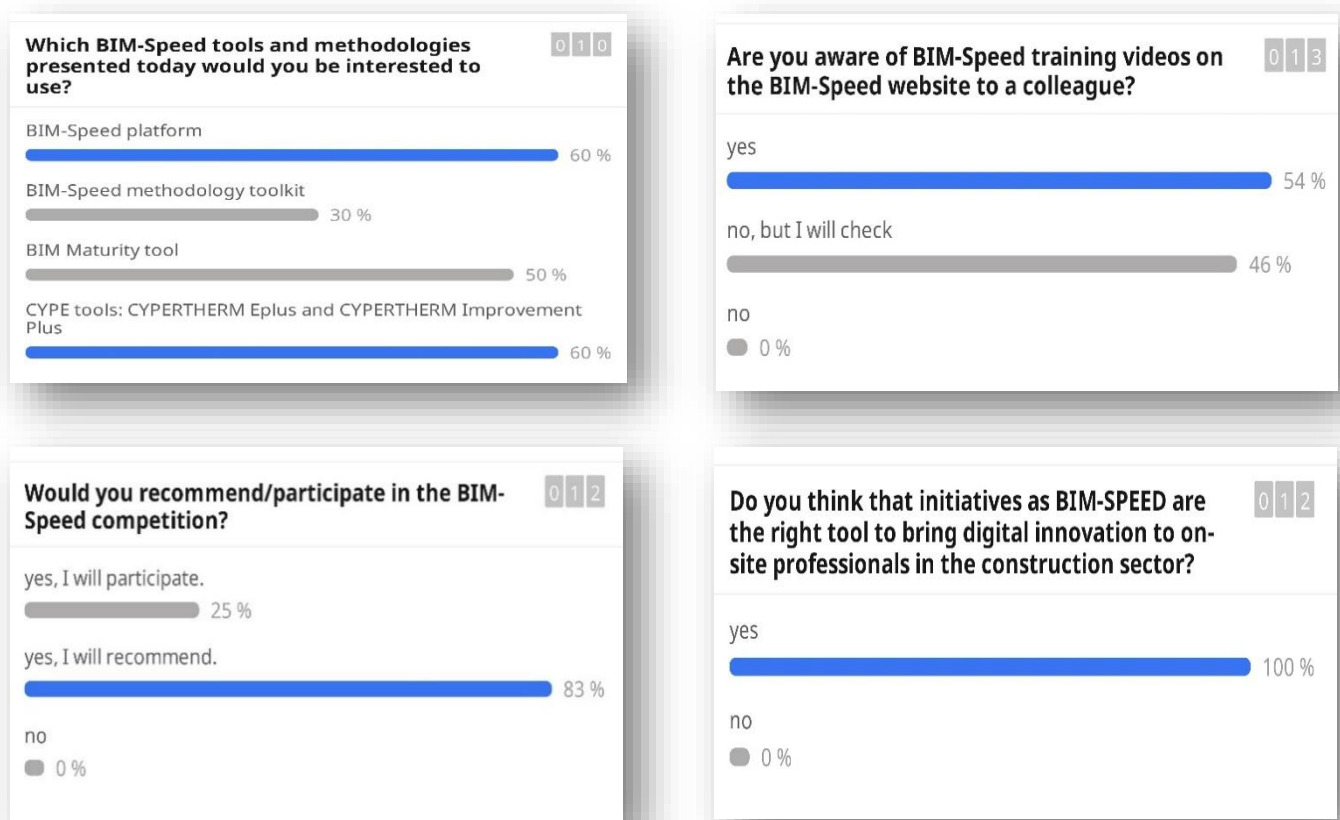


Figure 27 Questions to the Audience French speaking countries workshop - Feedback

Image	Title	How long it is available online.	Number of visits or views.	Video Duration (hour,	Link



				minutes, seconds)	
	BIM-Speed website: Training Materials	6 months		N/A	https://www.bim-speed.eu/en/training-materials
	BIM-SPEED Multi Criteria Decision Support Tool	2 nd edition – 3 months	2 nd edition – 50 views	16m29s	https://youtu.be/jzJmGAufdlg
	BIM-Speed Platform	6 months	266 views	6m01s	https://youtu.be/lx_ZLlxZo0k
	BIM-Speed File Name Convention Tool	6 months	92 views	5m53s	https://youtu.be/0jrYUyoA0lg
	BIM Maturity Tool	6 months	197 views	6m02s	https://youtu.be/g7tgYFPfX9Y
	Tools for collecting environmental, climate and surrounding data	6 months	93 views	13m42s	https://youtu.be/ZXcTZzaTKZo
	BIM-Speed methodology toolkit	5 months	81 views	12m31s	https://youtu.be/m2N_yQ0Q5Xc
	Open BIM construction System	5 months	169 views	5m28s	https://youtu.be/157YbnVslI0
	Methods for surveying and diagnostic of HVAC systems in existing buildings	5 months	53 views	7m24s	https://youtu.be/o_asFffkDEw
	Open BIM Analytical Model	5 months	111 views	7m21s	https://youtu.be/91MzX4GC5d8
	Improvements Plus	5 months	33 views	6m49s	https://youtu.be/yac5T1nmKus
	Cypetherm EPlus	5 months	87 views	11m35s	https://youtu.be/wZy1YSgyhEo



	BIM-Speed Inhabitants Crowd-Sourcing App	5 months	84 views	21m38s	https://youtu.be/_eJnRpQWUZM
	3DASH Tool	4 months	65 views	10m55s	https://youtu.be/pJB1pGj1134
	BACN2BIM	4 months	45 views	9m10s	https://youtu.be/2k9kykPzNU4
	Volumetrization Techniques Tutorial:Creation of a thermal 3D model from 2D thermal scans	4 months	69 views	10m00s	https://youtu.be/Ka8r zxaAAr8
	VT set, thermal photogrammetry training video	4 months	41 views	2m42s	https://youtu.be/D5FkViPBIFY
	XTR set, augmented reality – microsoft hololens 2	4 months	111 views	9m32s	https://youtu.be/09S8zgj9Fec
	1 st BIM-Speed Train the trainers' workshop	4 months	62 views	1h31m29s	https://youtu.be/Y-9Fqyrx4PI
	2 nd BIM-Speed Train the trainers' workshop	4 months	49 views	1h22m51s	https://youtu.be/jkED2Kxk1JQ
	3 rd BIM-Speed Train the trainers' workshop	4 months	33 views	1h14m35s	https://youtu.be/7oDtlfpZDdc



5. Conclusion

This task and thus the training plan is divided in four parts, which progressively build upon each other. This training plan sets out the strategy in the beginning, outlines the overall picture and reports back on undertaken training activities. It is supplemented by the online training materials, first a train-the-trainers event and then two national dissemination and training events.

The 17-training video material were viewed 1.647 times on YouTube. The most viewed video is the BIM-Speed platform with 266 views, followed by BIM Maturity tool with 197 views, and the Open BIM Construction system with 169 views. The overall views on all related training material, including the workshops, is 1.791.

The three train-the-trainers workshops hosted by VISESA, organised by ACE gathered twenty trainers (16 men and 4 women) from different European countries, ten trainers more than initially planned. Each task partner invited at least two experts covering the following countries: Italy, Spain, The Netherlands, Norway, North Macedonia, France, Portugal, Romania, Hungary, Ireland, and the United Kingdom. The recordings of the three online workshops are available on YouTube Channel and they were seen by 109 people from April to October 2021 when this report was written.

Two national workshops focused on Greece and French speaking countries and attracted in total 77 number of participants. Aimed at promoting developed BIM-Speed tools, workshops attracted a wide audience of professionals in different fields, for instance, civil engineers, construction companies, HVAC engineers, architects, etc. Both events were a good opportunity to achieve the main objectives of the project task.

Looking at the results of the questions on Sli.do, it could be noted even though not all participants work in building renovation and use BIM, they all agree that initiatives like BIM-Speed are the right tool to bring digital innovation to onsite professionals in the construction sector. Besides, most participants showed interested in checking BIM-Speed training videos on the project's website and either participating or recommending BIM-Speed competition.

This task was an effort of the whole consortium, as almost all partners were involved in creating results, which turned into interesting training material and thus ensure the sustainability of the project results way beyond the project's life span. The training material development will continue and will follow the tool development conclusion. Tutorial videos about the tools that will be finished after the conclusion of this report are expected to be provided and made available in the training area in the BIM-Speed website.



