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## DELIVERABLE D10.3 BIMERR DISSEMINATION AND COMMUNICATION PLAN AND ASSOCIATED MATERIAL 2

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## **EXECUTIVE SUMMARY**

The main aim of this report is to update the dissemination and communication plan with all changes since month 6 of the project and deliverable 10.2 “BIMERR Dissemination and Communication Plan and Associated Material 1” and to describe the dissemination and communication activities that took place during the first 18 months of the project.

In parallel, this report aims to specify the updated quantified targets and Key Performance Indicators (KPIs), which will constitute the means of evaluation and assessment for the performed activities. Then, the in this report presented activities are evaluated towards those specified targets and assessed under the framework of a risk analysis, providing recommended future actions and activities to improve the dissemination and communication of the project and its results.

# 1. INTRODUCTION

## 1.1 PURPOSE, CONTEXT AND SCOPE OF THIS DELIVERABLE

The main purpose of this deliverable is to:

- Steer the dissemination and communication (D&C) activities during the project's lifetime
- Specify the methodological approach for defining the appropriate information and key message for achieving stakeholders' engagement throughout the entire project implementation
- Describe all the activities that took place in the framework of the project during the first 18 months of the project
- Evaluate the executed activities towards the specified quantified targets and Key Performance Indicators
- Create a plan for the future dissemination and communication activities that should be done in the next months of the project.

In this context, the main scope of this deliverable is to clearly define:

- the communication and dissemination objectives in relation to project's objectives
- the interdependencies between project WPs, outcomes, dissemination & communication activities
- the estimated time plan for every communication and dissemination action
- the concrete segment of communication and dissemination target groups and partners involved (enablers) in each activity
- the content and message that need to be produced, finalized, and communicated at each step and activity, according to the project's deployment phase
- the selected dissemination and communication means (online and offline) and the "roadmap" for multiplying the expected effect to the predefined audiences during and after the end of BIMERR
- the responsible partner (or internal teams) for implementing each communication and dissemination activity

## **1.2 STRUCTURE AND CONTENT OF THIS DELIVERABLE**

In the first part of this deliverable, the general definitions of dissemination and communication as concepts are given and the dissemination and communication strategy is presented. More in detail, in this part, after the definitions and concept, a short presentation of the BIMERR concept is given, of the methodological approach, the vision, and the goals & objectives. More specifically, it begins with the BIMERR abstract and conceptual approach, then the BIMERR implementation methodology and concrete project's phases are stated, followed by the project's milestones, expected tangible and intangible results and overall quantified impact. Moreover, the communication and dissemination objectives and expected impact are discussed. In more detail, firstly, the communication plan and objectives are presented. Secondly, the dissemination plan and objectives are discussed. Thirdly, the target groups identification and classification are mentioned.

In the next section, the dissemination and communication methodology is analyzed. In more detail, the SMART communication methodology is thoroughly discussed, followed by the BIMERR selected dissemination and communication methodological approach. Then, the deployment approach and specifications of the communication and dissemination tangible and intangible tools and materials are defined. The BIMERR internal management and communication tool is discussed, followed by a presentation of the BIMERR website, the social media platforms, and the living lab activities. In addition, the scientific publications and presentations, and the participation in fora and thematic events are presented. Then, the cooperation with other projects in the domain of energy efficiency buildings and BIM is outlined along with the liaison with professional communities and networks and the promotional and dissemination material.

After presenting D&C tools and mechanisms, the updated dissemination and communication action plan is presented. In this chapter the detailed communication plan and the detailed dissemination plan are presented, as updated after the month 6 of the project, and the plan described in deliverable 10.2.

Following that, a detailed description of the activities carried out during the first 18 months of the project is discussed. In more detail, firstly the activities of the first six months are presented, as described in deliverable 10.2, and then the updates for the activities from month 7 to month

18 are presented thoroughly. Also, in this section, the partner roles and the anticipated actions for the next period are analyzed.

In the next chapter, the monitoring of the activities and the analysis of metrics is presented, towards the specified quantified targets and KPIs. In addition, a risk assessment describes and analyzes the risk register and the risk mitigation procedure, as updated since month 6 of the project and deliverable 10.2. Finally, the conclusions are examined in detail and the dissemination material is presented in the annexes.

## 2. DISSEMINATION AND COMMUNICATION DEFINITIONS AND METHODOLOGY

It should be noted that parts of this section are provided for coherency reasons and they include information already presented in paragraph "2. Dissemination and communication plan", of deliverable D10.2.

### 2.1 DEFINITIONS

**Communication** refers to the act of informing audience beyond the project community about the action and its results. It is a process that starts at the outset of the action and continues throughout its entire lifetime. Strategic and targeted measures are vital in order to communicate the action and its results to a multitude of audiences, including the media and the public and possibly engaging in a two-way exchange, according to the EC Research & Innovation Participant Portal Glossary/Reference Terms. The purpose of Communication of the project is to show the impact and benefits of EU-funded R&I activities. Communication should focus on promoting the project and its results.

**Dissemination** focuses on the communication of the results produced during the project. It refers to the public disclosure of the results by any appropriate means (other than resulting from protecting or exploiting the results), including scientific publications in any medium, according to the EC Research & Innovation Participant Portal Glossary/Reference Terms. The objective of dissemination is to 'transfer knowledge and results' to enable others to use the results, leading to a maximization of the impact of the EU funded research. Dissemination is focused on the results which shall become available to other stakeholders for use through this process. The target audiences of dissemination are groups that take an interest in the potential use of the results of the projects, such as the scientific community, industrial partners, and policy makers.

This deliverable is based on the above-mentioned definitions and its structure follows this clear distinction between communication and dissemination.

To maximize the impact and the effectiveness of the dissemination activities, specified messages will be produced with different approach for each target group. The dissemination messages will be accurate, in a scientific and formal language.



Communication, on the other hand, aims at promoting the project to the general public. The target of communication is to increase the public visibility of the project; therefore, the language that is used to achieve the target, is rather more accessible.

## 2.2 SHORT PRESENTATION OF BIMERR

### 2.2.1 BIMERR ABSTRACT AND CONCEPTUAL APPROACH

Building Information Modelling is a critical element in the digitalization of the construction industry, which is necessary to unleash huge efficiency and productivity improvements.

BIMERR will design and develop a renovation 4.0 toolkit which will comprise tools to support renovation stakeholders throughout the renovation process of existing buildings, from project conception to delivery.

It comprises tools for the automated creation of enhanced building information models, a renovation

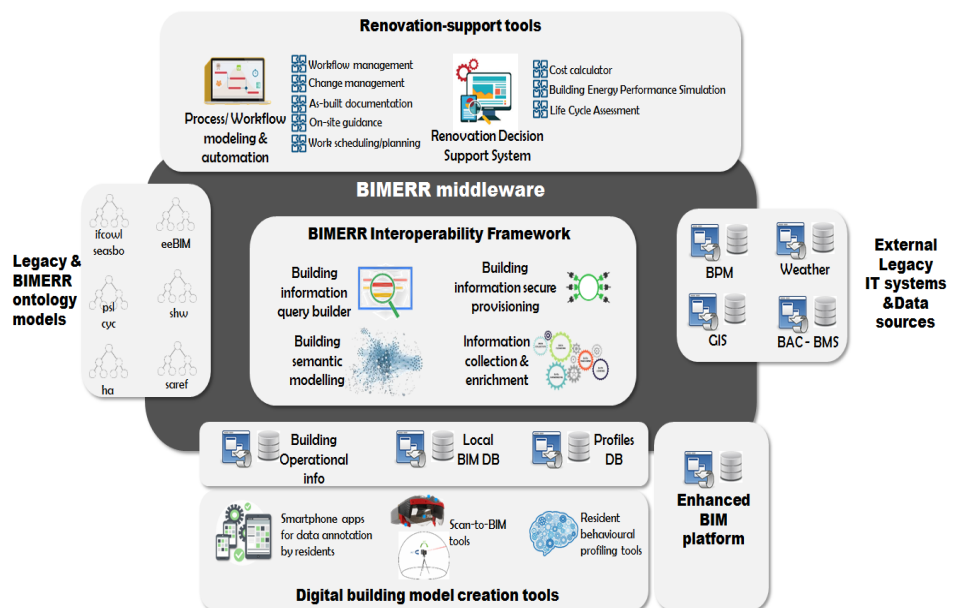


Figure 1: BIMERR Interoperability Framework

decision support system to aid the designer in exploring available renovation options and provide an accurate estimation of renovation impact on building performance, as well as a process management tool that will optimize the design and on-site construction process toward optimal coordination and minimization of renovation time and cost.

At the heart of the BIMERR toolkit lies an interoperability framework, which will enforce semantic interoperability among BIMERR tools as well as with third-party legacy ICT tools to enable seamless BIM creation and information exchange among AEC stakeholders in an effort to enhance the rapid adoption of BIM in renovation of the existing EU building stock.

The BIMERR toolkit will be validated and demonstrated in 4 buildings in 3 European Member States. Two buildings will be used for pre-validation and implementation refinement and the refined BIMERR toolkit will support the actual renovation design and works in one residential building in Poland and a second one in Spain.

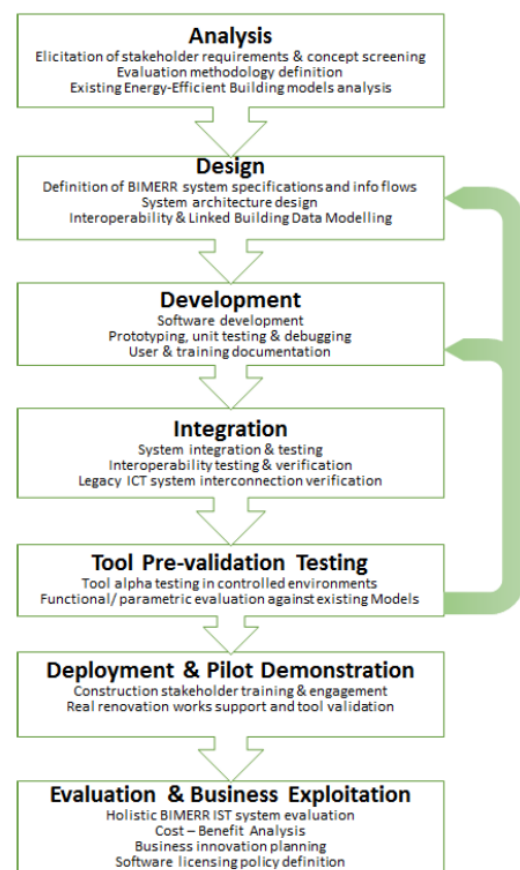
The assessment and evaluation of the BIMERR toolkit after these real-life activities will feed material into two supporting horizontal project activities: i) dissemination and exploitation of project outcomes through the creation of best practice examples of BIMERR use, that will guide further replication effort, and ii) promotion of BIMERR outcomes to the most relevant standardization bodies.

### 2.2.2 BIMERR IMPLEMENTATION METHODOLOGY AND DISCRETE PROJECT'S PHASES

In order to reach the above-mentioned objectives, the BIMERR consortium has planned to follow an implementation methodology that comprises several steps as shown in Figure 2.

First, an analysis will be conducted including a study in the requirements of the end users to be used as core feedback for the tool's development.

Moreover, an evaluation methodology will be developed to showcase the impact of these tools along with an analysis in the existing energy efficiency of the building. Software development begins after this analysis. It consists of three phases: the design phase, the development phase, and the integration phase. Software development will follow agile methodologies and continuous integration principles, always anchored to the BIMERR data models



**Figure 2: BIMERR Implementation Methodology**

designed up-front. The aim of this is to catch potential incompatibilities or bugs early in the development process.

Moreover, this development and integration approach will also enable a key feedback loop from the pre-validation phase, foreseen in the project methodology, that aims to eliminate user acceptance issues during the pilot demonstrations. This testing and pre-validation phase is foreseen to take place in real buildings which will not undergo any renovation interventions and will serve as a dry run for the actual demonstration activities. After the pre-validation, the final technical phase is the validation on real renovation sites, where the entire BIMERR tools value chain will be demonstrated in two real-life renovation projects in order to quantify and validate their impact throughout the renovation process: from design and planning to the actual construction works. Finally, in parallel with the technical activities of the project, an evaluation and business exploitation plan will be developed to evaluate the project results and prepare for the commercialization phase following the project.

### **2.2.3 PROJECT MILESTONES**

In the following table a list of the BIMERR project milestones is presented. From those milestones relevant to the activities of dissemination and communication are:

- Milestone 7 “Public Awareness, Dissemination and Engagement Planning” which is estimated for M06 and verifies the detailed report on the dissemination and communication plan and the smooth operation of the living labs
- Milestone 8 “Standardization Punch-list” which is predicted for M30 and verifies the timely preparation of the standardization punch-list and plan for promotion to relevant bodies and finally
- Milestone 11 “Project Website Launch” which is estimated for M03 and verifies the launch of project website and its availability to public access.

**Table 1 The BIMERR Milestones**

Milestone number	Milestone name	Related WPs	Estimated date	Means of verification
MS1	End-user requirements elicitation & documentation	WP2	M6	Timely delivery of D1.1.
MS2	BIMERR system architecture definition	WP2	M12	All the deliverables related to architecture design and specifications are delivered prior development task starts
MS3	Delivery of first version of BIMERR system for pre-validation	WP7	M24	Availability of the integrated BIMERR framework for deployment and testing at the pre-validation pilot sites.
MS4	Selection of real renovation projects for demonstration activities	WP8	M24	Detailed information about the target buildings, written commitment from the owner/manager to participate in validation activities
MS5	Delivery of refined BIMERR system after pre-validation	WP7	M30	Availability of the second version of the integrated BIMERR framework for deployment and use at the real renovation pilot sites.
MS6	BIMERR validation and evaluation	WP8	M42	BIMERR validation completed and relevant recommendations extracted and delivered to WP9 for best practice documentation.
MS7	Public Awareness, Dissemination and Engagement Planning	WP9	M6	Detailed report on the dissemination and communication plan. Smooth operation of the living labs.
MS8	Standardization Punch-list	WP9	M30	Timely preparation of the standardization punch-list and plan for promotion to relevant bodies
MS9	Business Innovation plan	WP8	M42	BIMERR business innovation plan release
MS10	Quality Assurance Plan	WP1	M3	Quality assurance circulation and agreement among partners
MS11	Project website launch	WP9	M3	Public access to project website available

## 2.2.4 PROJECT EXPECTED TANGIBLE AND INTANGIBLE RESULTS AND OVERALL QUANTIFIED IMPACT

### 2.2.4.1.1 BIMERR expected tangible and intangible results

According to the Grant Agreement and the Description of Action (DoA) of the BIMERR project, the following table summarizes the main exploitable results expected to be generated by the BIMERR project, as well as the main exploitation routes and options that the consortium is foreseeing for each of them.

**Table 2 BIMERR exploitable results**

Exploitable results	Target exploitation route	Responsible partner	Offering type	Monetization model	Target users/clients
<b>BIMERR Solution</b>	Commercial	BIMERR Joint Venture	Software Product	Royalties	AEC Industry
<b>BIMERR Semantic Interoperability Framework</b>	Commercial	Suite5, UBITECH	Software Service	License Fees, Implementation Fees	AEC Industry, Urban Planners, Utilities, Software Providers
<b>Scan-to BIM tool</b>	Commercial R&D	HWU	Software Product	Consulting Fees	AEC Industry, Software Providers
<b>Augmented Reality Apps for BIM Enrichment</b>	Commercial	CERTH, GU	Product	Direct Sales	AEC Industry, Building Occupants, Facility Managers
<b>Renovation Workflow Management and Automation Module</b>	Commercial	BOC, NT	Software Product	License Fees, Consulting Fees	AEC Industry, Software Providers
<b>Augmented Reality App for On-site work support</b>	Commercial	NT	Software Product	Direct Sales	AEC Industry, Software Providers
<b>Renovation Components (modelling constructs) Repository</b>	Commercial	EXE	Add-on to existing product	Direct Sales	AEC Industry, Software Providers
<b>Renovation Performance Simulation Modules and DSS</b>	Commercial	Xylem	Add-on to existing product	Direct Sales	AEC Industry, Urban Planners
<b>Resident Behaviour Profiling module</b>	Commercial R&D	Hypertech	Add-on to existing product	License fees	AEC Industry, Energy Utilities, Smart Home Equipment Providers

### 2.2.4.2 Expected BIMERR overall impact

The expected overall impact of BIMERR is:

- A reduction of the renovation working time of at least 15-20% compared to current practices with the baseline defined in the proposal
- Acceleration of the market uptake across Europe, by speeding-up industrial exploitation, in particular amongst constructing/ renovations companies with a target of 50% of their renovation business based on BIM;
- Creation of best practice examples for the construction retrofitting sector with benefits for the operators and associated stakeholders (architects, designers, planners, etc.).

The estimated quantified impacts of BIMERR are described in the following table:

**Table 3 BIMERR Impact Achieved During the Project**

<b>BIMERR Impact Achieved During the Project</b>	
Impact Category	Target
Renovation Cost Savings	80%
Renovation Time Reduction	30-35%
User acceptance rate during BIMERR pilot activities	>95%
<b>Contribution to Additional Impacts following the wide deployment of BIMERR solutions and technologies</b>	
Energy Savings in Buildings	35%
Annual Energy Savings in GWh	17,800
Annual Energy Cost Savings for the renovated building stock	€ 2 billion
Annual Energy Cost Savings per household	€ 315
GHG Emissions Reduction	122 million tons CO2
Increase of Rental Rates of the EU Building Stock	2-17%
Increase of Resale Rates for Renovated Buildings	6-35%
Annual EU Building Stock Market Value Increase	€ 126 million
New Jobs Created on an Annual Basis	3,000-10,000

The communication and dissemination content that will be produced during the lifecycle of BIMERR will also be based on the above-mentioned project's impact in accordance to the needs of each target group and according to each project's phase.

## **2.3 COMMUNICATION AND DISSEMINATION OBJECTIVES AND EXPECTED IMPACT**

### **2.3.1 INTRODUCTION**

Based on the concept, goals, and objectives of BIMERR and to achieve the best possible results for the project, specific communication and dissemination objectives are defined since the start of the project. The below mentioned objectives are in accordance with the overall impact of BIMERR and act as enablers to maximize this impact, both during and after the end of BIMERR. The 4 phases of the communication and dissemination plan are in parallel with the 4 phases of the expected BIMERR software implementation progress in order to facilitate the timely communication of the project outcomes. These objectives are described in the following paragraphs.

### **2.3.2 COMMUNICATION PLAN & OBJECTIVES**

To achieve an effective communication strategy, it is crucial to define clear communication objectives. In BIMERR project, the communication plan is driven by the following communication objectives:

- **Communication Objective 1:** Increase the **visibility of BIMERR** by providing universally comprehensible information to the public about the project goals and results.
- **Communication Objective 2:** Create a **user community that will provide insights and detailed feedback** during the development of the project.
- **Communication Objective 3:** Communicate **tangible results and success stories** coming from the project's validation activities.
- **Communication Objective 4:** Increase **awareness and enhance societal perception** on how Research and Innovation can tackle emerging challenges and positively impact the society, while increasing visibility and information flow on the vital role of HORIZON 2020 and EU funded research.
- **Communication Objective 5:** Promoting and demonstrating the **societal and economic benefits** generated by the BIMERR project to a wide range of audiences outside the core project target groups.
- **Communication Objective 6:** **Complement the dissemination activities** of the BIMERR project.

An integrated Dissemination and communication methodology is designed and launched by the BIMERR Consortium utilizing a vast variety of instruments and relations to communicate the project's success stories along with the overall project's framework.

The BIMERR communication instruments will include at minimum the following:

- Project's website
- Social media (Twitter, Facebook, LinkedIn)
- Press releases, newsletters, videos in popular media channels with diverse inclusive audiences
- Participation and presentation of the project in other networks and groups
- In-house presentations to existing clients / collaborators and brainstorming for further extending the BIMERR solutions to other applications and markets
- Appropriate material (e.g. brochure, roll-up, poster, factsheet, leaflet, press release, newsletter) accompanied by promotional video presenting results and achievements of BIMERR

All these communication means and instruments will support the BIMERR consortium to achieve all the above-mentioned communication objectives. By using the appropriate material, the non-specialist general public will be targeted. In addition, media relations will be established through social media to attract journalists and bloggers to the BIMERR's social media posts and updates.

Through the following table, an initial crosstabulation between communication objectives, project period and selected means and actions are described:

**Table 4: BIMERR Communication Plan**

Periodicity Tools for Communication	Period I: M01 – M06	Period II: M06-M12	Period III: M12-M18	Period IV: M18-M43	Post Project Communication
<b>BIMERR Website</b>	Design and development of the BIMERR website	Regular update of the website content	Continuous update of website with targeted content	Regular update of website content with presentation of results and demo	
<b>Social Media</b>	Establishment of social media presence	Regular actions on social media	Promote results and events; Interact with social media users	Post updates about project results; Interact with users;	



				Spread relevant material.	
<b>Communication Material</b>	Design logo and project's graphic identity, brochure, roll-up	Poster, factsheet, press releases newsletters	Promotional video, leaflet with results, press releases, newsletters	Promotional video, leaflet with achievements, press releases, newsletters	

### 2.3.3 DISSEMINATION PLAN & OBJECTIVES

The major focus of the dissemination strategy of BIMERR is to ensure that project's outcomes (concepts, scientific results, tools, methodologies etc.) are widely disseminated to the appropriate target communities at appropriate times via appropriate methods. To that end, in order to have a successful dissemination strategy, the BIMERR consortium has set the following dissemination objectives:

- **Dissemination Objective 1:** Raise **awareness and social engagement** for the BIMERR project goals and activities in target communities via appropriate methods.
- **Dissemination Objective 2:** Encourage the **involvement of end-users and stakeholders**, through the utilization of Living Lab, in all phases of the project implementation by using a "User-Centric Design Approach" of dissemination. In this objective is very important to establish and maintain an adequate communication channel with all types of participants involved.
- **Dissemination Objective 3:** Ensure **the diffusion of all the scientific and technological results** generated in the BIMERR project within and beyond the project's consortium.
- **Dissemination Objective 4:** Effective BIMERR dissemination activities implicitly and explicitly contribute to the timely support of the **exploitation strategy** of the BIMERR project.
- **Dissemination Objective 5:** **Cooperation with other projects** in the domain of Energy Efficiency Buildings and Building Information Modelling.

To ensure the achievement of the dissemination objectives, the BIMERR Consortium has designed specific dissemination activities and means. Dissemination activities are characterized by active and a priori awareness and acceptance of the targeted audience.

The BIMERR dissemination instruments will include the following activities and means:

- Living Lab to raise awareness and achieve wide engagement of demo stakeholders
- Project website and social media presence
- Scientific publications and presentations
- Participation in fora & thematic events
- Contributions to standards
- Active cooperation with other projects in relevant fields
- Liaison with professional communities and networks
- Promotional content and dissemination material

All the above-mentioned instruments and means will contribute to the successful dissemination of the BIMERR project. BIMERR will also produce and disseminate promotional videos, newsletters, press releases, brochures, posters, slides, and leaflets presenting the project concept and achievements.

Through the following table, an initial crosstabulation between dissemination objectives, project period and selected means and actions are described:

**Table 5: BIMERR Dissemination Plan**

periodicity Tools for Dissemination	Period I: M01 – M06	Period II: M06-M12	Period III: M12-M18	Period IV: M18-M43	Post Project Communication
<b>Implementation of Living Labs Methodology throughout the project</b>	Specification of Living Lab Activities; Identify key target groups;	Implementation of Dissemination activities through Living Lab Methodology; Follow up activities	Implementation of Dissemination activities through Living Lab Methodology; Follow up activities,	Implementation of Dissemination activities Living Lab; Continuous feedback; Pilot activities feedback and results	
<b>Participation in Conferences</b>	Participation in relevant events and presentation of BIMERR	Presentation of project's results to events	Presentation of project's results and BIMERR solution to events	Presentation of BIIMERR results, achievements and solutions to events	
<b>Scientific Publication &amp; Presentations</b>	Preparation for publication of position papers	Publication of position papers and methodology	Publication of position papers and methodology; Presentation of project results	Publication of position papers and methodology; Publications on project results and findings	
<b>Standardization Activities</b>	-	Identification and Information on Standardization bodies	Identification and Information on Standardization bodies	Consultation, Engagement and Involvement of Standardization Bodies through the Promotion of BIMERR Results	
<b>Cooperation with other projects</b>	Mapping of possible synergies	Participation in events in order to establish synergies	Synergies & links for smooth knowledge transfer; common dissemination actions	Common dissemination actions with other projects	

### 2.3.4 TARGET GROUPS IDENTIFICATION & CLASSIFICATION

The goal of this paragraph is to provide a clear definition of the dissemination and communication target groups. The accurate identification of the target groups is essential for the success of the BIMERR project. The definition of the groups is based on the Dissemination and Communication Objectives as described in previous sections.

The dissemination and exploitation strategy of BIMERR, as defined in the Grant Agreement and the DoA, focuses on the following target groups:

- **Architects, Engineers and Construction Industry (AEC Industry)**
- **Building Residents / Energy Consumers**
- **Technological Platforms and Professional Association and Initiatives**
- **Scientific Community**

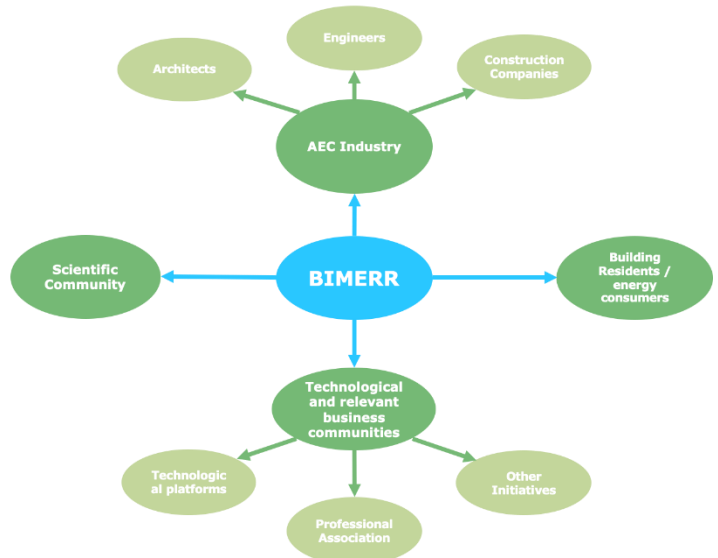


Figure 4: Communication and Dissemination Target Groups

The first target group, namely the **AEC industry**, entails key stakeholders involved in the design, planning and implementation of building renovation projects and subsequently the primary end-users of the BIMERR result. In the target group of AEC industry the BIMERR partners entail architects, engineers, construction companies, project managers and workers. Moreover, AEC companies are the essential participants and receivers of the Living Lab awareness, engagement, training, and other dissemination activities. The active involvement of this target group is crucial for the success of the project, since they will be invited to co-design, co-create, and demonstrate/ validate the BIMERR BIM-based innovations. Particular attention is given to the segment of **BIM software providers**, which comprises the main exploitation target group for the integrated solution delivered by BIMERR.

In the Deliverable 3.1 presented in M06, the BIMERR Consortium defined 17 user groups in the use cases and are grouped to 7 main user groups according to their role in the use cases and the BIMERR component (tool) they will use. The following table provides a brief general description of the 17 user groups/roles identified in the use cases and are involved in the renovation process.

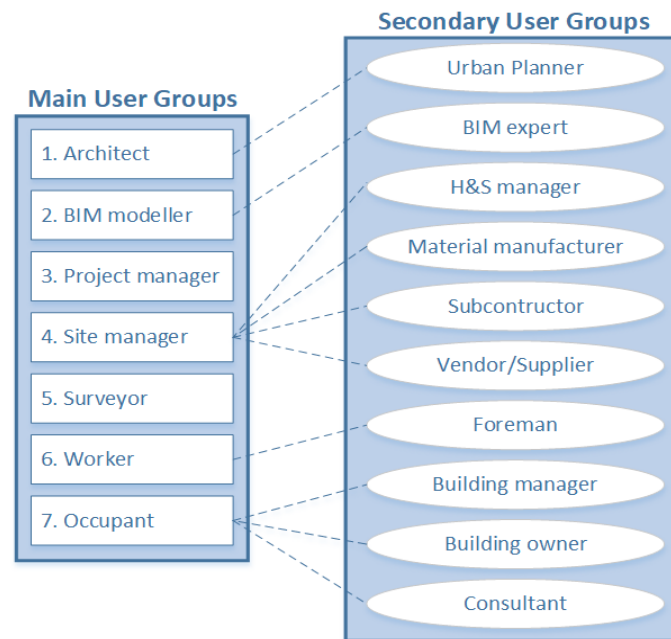
**Table 6: Target Groups from AEC community**

No	BIMERR user	Description
1	BIM modeler	A BIM Modeler is engaged in the process of generating digital models of the construction/renovation place. He develops the construction drawings and imports data to a BIM platform.
2	Building surveyor	The Building surveyor is responsible for making sure that buildings are safe, energy efficient and livable. He interacts with other professionals such as engineers, architects, and builders to ensure that buildings are designed and constructed to comply with building regulations.
3	Architect-Designer/Engineer	An architect/engineer prepares construction drawings and specifications. He could lodge the planning application and building warrants. He leads the design team to meet the client's design requirements and hence, defines the client requirements, arranges site investigations, establishes the preferred solution, develops the design, prepares room data sheets, offers advice on material selection, etc. An architect/engineer also monitors the construction of the project to ensure it is done according to the plans and specifications.
4	BIM expert	He is engaged with the process of generating and managing digital building information models. He is a member of the BIM team; however, different terminology is used in the AEC Industry to define the roles in a BIM team. A BIM Manager is usually someone who manages the team. A BIM Modeler builds the BIM virtually and ensures that the model aligns with the goals set by the BIM Manager. A BIM Technician is someone who develops the construction drawings and extracts data on a BIM platform.
5	Urban Planner	Urban planning deals with the development and design of land use and the built environment, including air, water, and infrastructure such as transportation, communications, and distribution networks. It deals with the physical layout of human settlements. The primary concern is public safety,

		including efficiency, sanitation, protection and use of the environment issues. It is interdisciplinary and includes social, engineering and design sciences.
6	Building manager	He is mainly involved in the development of master plans for properties as well as budget estimation for proposed projects. He could serve as lease manager for the owner's rental properties and be the contact with the tenants. He may be responsible for space planning, and space inventory and allocations. Also, he might oversee minor projects such as contracted work and services.
7	Building occupant	The occupant is the final customer. Since one of the objectives of the BIMERR project is to establish an energy efficient environment fully preserving end users' needs and preferences, tools and applications will be available to address the high-level need for establishing a sustainable environment.
8	Building owner	The person who owns the building and has full authority to control the renovation project. Generally, he is mainly involved in the financial issues of the construction project and makes sure that the necessary financial resources are available timely. He has to work together with the architect and other consultants to achieve the goals set for the construction project.
9	Consultant	Construction consultants help clients prepare for their projects and ensure that contractors complete the project on cost. They provide cost estimates and budgets, select contractors, administer construction contracts, and resolve differences between contractors and project owners.
10	Health & Safety Manager	His roles and responsibilities include monitoring health and safety risks at the workplace and advising employees how to avoid them. He ensures compliance with all health and safety legislation. He works with and trains employees to improve the health and safety standards in the workplace. He assists with the creation and management of health and safety monitoring systems and policies in the workplace, as well as manages emergency procedures (such as fire alarm drills).
11	Material manufacturer	Building materials manufacturers produce a variety of materials used for construction. This is an established industry and the use of the materials is typically segmented into specific specialty trades, such as carpentry, insulation, plumbing, roofing work, etc.

12	Project manager	He monitors and controls all the aspects of a project and makes sure that the people involved achieve the objectives on time and to cost, performance and quality. He also directs the Design Team and ensures that appropriate information and understanding exists to effectively execute the project.
13	Subcontractor	He is hired by a general contractor to perform a specific job within a construction project. As such, plumbers, painters, electricians, and other specialists may be considered construction subcontractors.
14	Vendor/Supplier	Nowadays a supplier is not only an organization contracted to provide physical supplies such as goods, materials, plant, etc. but also any provider of services and goods, either directly to the employer or to another supplier in a supply chain.
15	Foreman	He is usually a senior worker in charge of a construction crew.
16	Site Manager	A site manager or sometimes construction manager, oversees site operations on a day-to-day basis, and ensures that work is done safely, on time, within budget and to the right quality standards.
17	Worker	A <i>construction worker</i> is a tradesperson, labourer, or professional employed in the physical <i>construction</i> of the built environment and its infrastructure.

In Figure 5, a main and secondary classification of targeted user groups is provided:



**Figure 5: Targeted user groups and categorization to main and secondary groups**

The second main target group entails the **building residents (energy consumers)**. Building residents are directly involved in project activities because they are the actual energy consumers in buildings. Their participation in the Living Lab Activities is crucial, as they will be invited to learn more about the BIMERR solution and any possible concerns about their privacy violations and personal data collection will be mitigated. Together with the AEC Industry, they are placed as key target group for the effective dissemination and communication of the BIMERR project.

The third target group is the **technological and relevant business communities**. This target group entails technological platforms, professional associations, and various related initiatives. BIMERR will establish clear alignment and coordination with relevant technology platforms and industrial associations, to establish standardized BIM-based practices and solutions.

Synergies with many technological and business communities will be explored during the development of the BIMERR project. Therefore, possible synergies will be continuously updated in the forthcoming versions of this document. Possible synergies will be established with the following communities, among others:

- eeSemantics Wiki
- Open Reference Models Initiative



- European Construction Technology Platform/ ECTP
- buildingSmart Alliance and its Linked Data Working Group
- ETSI Working Group for Standardization of the SAREF for Building Ontology
- W3C and its linked Building Data Community Group
- Euro VR Association
- European Platforms Initiative on IoT
- International Association for Automation and Robotics in Construction/IAARC
- International Committee of Architectural Photogrammetry/CIPA

The fourth target group is the **scientific community**, that corresponds to research and academic organizations, scientific journals, committees, internal fora, and other working groups in research fields related to the field of the BIMERR project.

**Figure 6: SMART Methodology**

In some cases, there is a need for the BIMERR project to be presented to a wide range of audiences outside the core project target groups. For the communication objectives of the project that reflect the demonstration of societal and economic benefits of the project in the society and the increase of the awareness on Horizon 2020 projects and EU funded Research, the target group is defined as “general public”.

## 2.4 DISSEMINATION AND COMMUNICATION METHODOLOGY

### 2.4.1 SMART COMMUNICATION METHODOLOGY

SMART methodology is a conceptual approach to design a consistent and robust communication plan before starting to communicate and disseminate project results. In this approach the main key is consistency. More into detail, SMART methodology considers the following aspects:



- **Specific:** Identify all the specific communication goals by answering key targeted questions (Who? What? Where? How? When? Why?). Set up specific communication targets in order to establish tactics and vehicles, goals and messages, benefits / stakeholders and the time frame of the project.

- **Measurable:** Establish criteria to measure the communication progress of the project. Metrics are very important for the development of plan (e.g. online analytics, surveys and polls, feedback analysis).
- **Achievable/Attainable:** Establish communication goals that are realistic and measure the balance between quality and quantity.
- **Realistic & Results Oriented:** Establish criteria to measure that the project's objectives and tactics are meeting the projected goals. Analyze the quality of the communication based on response. Identify possible measures for improvement in case the results are not as expected at the beginning of the project.
- **Time Conscious:** The absolute respect to the timeline and the deadlines, is a prerequisite for a successful communication plan.

For the BIMERR project, the **SMART approach** is chosen as **common framework** for performing the BIMERR Dissemination and Communication plan. Based on the above-mentioned methodological principles, the dissemination and communication activities and the relevant informative content / material will be **specific and direct, reliable, measurable, attainable, results oriented and time conscious**. In the following paragraph, based on these mentioned principles, a specific methodology has been chosen in order to conclude to a **detailed roadmap** for communicating the key messages and results of BIMERR to the relevant target groups.

#### **2.4.2 BIMERR SELECTED DISSEMINATION & COMMUNICATION METHODOLOGICAL APPROACH**

The BIMERR selected dissemination and communication methodological approach describes all the actions that will be performed during the dissemination process of the BIMERR project. In addition, the methodology defines the planning, the execution and the reporting/improving of the dissemination activities, as well as the responsibilities allocation among the BIMERR consortium partners. It is crucial to communicate and disseminate properly all the results of the BIMERR project, in order to achieve the maximum impact and successful communication towards the specific target groups.

During the implementation of this methodological approach, special attention has been given to stakeholders' engagement. According to the EU handbook (Durham E., 2014) "stakeholders' engagement" is crucial for the success of the communication and dissemination objectives and the absence of a clear understanding of their needs at each phase may lead to lost

opportunities for each part in terms of information, involvement and final engagement (if applicable). Early engagement is likely to make the engagement process more credible and relevant; finding the right mix of participants and ensuring no groups have been excluded will enhance legitimacy and credibility.

Consequently, since the first months of the project, a pre-defined horizontal methodology will be applied and will be based on the following principles:

- Who are BIMERR stakeholders?
- What to communicate?  
Assessment, analysis, and prioritization of BIMERR stakeholders and their needs
- Why communicate?  
Understanding of BIMERR stakeholders in terms of their expected input or interaction (information, consultation, involvement, engagement)
- When and where to communicate?
- How to communicate?

The whole engagement process will be undertaken while taking into consideration the following key success factors (CASH D. C., 2002), (CASH D. C., 2003), (YOUNG, 2013b):

- **Credibility** (the perceived quality and validity of the stakeholder engagement process and the people involved with the engagement)
- **Relevance** (the usefulness of the engagement process and its outcomes – how closely it relates to stakeholders and their needs, and how responsive the process is to changing needs)
- **Legitimacy** (the perceived fairness and balance of the stakeholder engagement process, and is particularly important in cases where conflict may occur)

Consequently, the BIMERR dissemination and communication methodology comprises of 3 distinct phases:

### 1. Planning phase

The design will be based on the abovementioned principles.

#### Scope

- The scope of the BIMERR project is clearly defined and the activities presented in this plan will be evaluated in due time.

### 2. Execution phase

Every partner will use the material and the agreed communication and dissemination methods.

#### Objectives

- Clear, achievable and measurable communication objectives are set for the BIMERR project.

### 3. Reporting / Improving phase

This phase will be guided by the active participation and contributions of each partner to plan on time corrective measures, if the goals are not achieved.

#### Planning

- Definition and understanding of the BIMERR objectives, the target audience and the planning is done before the implementation of the communication activity.

#### Metrics

- During the communication activity it is crucial to collect analytical metrics. A metrics system (indicators) is set in place in order to achieve better monitoring and improvement of the communication objectives.

**Figure 7: The BIMERR Communication Methodology**

The continuous and unceasing continuation of these 3 phases is crucial, in order to ensure coherent information flow of all BIMERR tangible and intangible results in all aspects of communication and dissemination activities.

In every phase of the project, all the project partners will actively provide material for internal and external communication and dissemination activities to reach the BIMERR communication goals and objectives. All the project results will be conceptualized and categorized in a timeframe, in order to communicate them with the appropriate target groups or stakeholders with a consistent message.

On the one side, the communication and dissemination of the BIMERR project will be focused on the results and the target groups that will be communicated during the development of the project. On the other side, a coherent and effective message with overall impact will be established in order to reach out society as a whole.

In the following chapters, a detailed and specific list with tangible and intangible results as well as the appropriate target groups and stakeholders for each result will be thoroughly analyzed.

## 2.5 LIVING LABS METHODOLOGY

The Living Labs Methodology is one of the main frameworks which support horizontally the Communication and Dissemination Methodology of the BIMERR project. The Living Lab approach adopted by BIMERR, engages end-users from the early stages of any new idea cultivating motivation to share and discuss experiences as well as requirements. In this context, one of the main novelties of BIMERR, is the involvement of end-users and stakeholders in the co-creation of the BIMERR framework (user-driven approach). For this reason, the aim of the Living Lab Methodology is to establish an open innovation 2.0 and value co-creation framework, involving different end-users and stakeholders either directly participating in or offered by the project and ranging from the project consortium partners to relevant end-users and stakeholders (AEC professionals), along with scientific, technological and relevant business communities.

The main activities under the living lab methodology are planned to be executed in three phases.

Thus, during the first phase, namely the **design phase**, the main scope of the activities will be to gather the stakeholder specifications and requirements which will be used during the design of BIMERR tools. To reach this target several workshops are going to be organized during this phase, in cooperation with Task 3.1, while different questionnaires for different stakeholder groups are going to be developed for the elicitation of the end user requirements. Those requirements will be then used as a core for the open-innovation design methodology of BIMERR tools and the main target will be to meet those requirements by the end of the project giving the opportunity to accelerate collaborative knowledge generation and technology integration against real market and user needs.

Following that, during the second phase, namely the **Implementation phase**, the Living Labs will be the live feedback loop between the stakeholders and the technology providers. More in detail, the stakeholders in that phase will provide feedback for the features of BIMERR tools during their development in order to establish the co-creation framework and maximize their effect on the characteristics of BIMERR tools. To achieve that, various interaction and collaboration mechanisms will be used during that phase, including workshops that might contain demonstration of beta versions of tools, or direct demonstration of features by the technology providers to specified user groups, or online demonstration of BIMERR tools to

specific user groups with the scope to receive their feedback and implement their needs in the BIMERR tools.

Finally, during the third phase, namely the **Validation phase**, the evaluation of BIMERR tools will be performed in accordance with the successful meeting of the end user requirements. Moreover, the stakeholders will be actively participating in the end-product definition and go-to-market strategy creation, during that phase by involving them through the final workshops in the pilot sites, but also by involving the participants in the training activities and other dissemination activities of the project. These activities aim to establish an iteration and open collaboration process that will accelerate collaborative knowledge generation and integration, technology customization and validation against real market and user needs, as well as end-product definition and go-to-market strategy creation.

The attraction of end-users and of the stakeholders will be from the networks of the BIMERR Consortium partners. All partners are responsible to provide contact details and signed consent forms from end-users and stakeholders that are participating in the project. More into detail, a Living Lab Database is under design in Confluence and the aim is to include several end-users and stakeholders Contact details and their function. The participants are categorized in target groups according to their function (e.g. Architects, Engineers, BIM-modelers etc.). The Living Lab Database will be used as the pool for future dissemination activities and will be continuously updated through the development of the project.

The Living Lab Methodology for co-creation follows an approach in order to involve different perspectives and collaboratively design tools, materials, processes, tools and activities. Another essential part of the Living Lab methodology is engagement of the users. One important factor of the engagement is that all possible types of user's engagement require continuous information of the users about the project and various information tools and activities. Thus, all types of engagement require some tools and activities.

The following table is a useful mechanism to structure the types of engagement in Living Lab activities with the goals for the users, key messages and relevant dissemination and communication tools. More in detail:

**Table 7: Type of engagement in Living Labs**

Type of engagement	Living Lab goal for participation	Dissemination and Communication Tools
CONTINUOUS INFORMATION	<ul style="list-style-type: none"> <li>Inform the end-users and the stockholders about the goals and objectives of the BIMERR project.</li> <li>How their participation will contribute to the success of the project.</li> <li>Their input and feedback are needed</li> </ul> <p>Key message: Inform the Participants in every stage.</p>	<ul style="list-style-type: none"> <li>Website</li> <li>Social Media</li> <li>Brochure</li> <li>Fact Sheet</li> <li>Workshop</li> <li>Questionnaires</li> <li>Newsletter</li> <li>Press Releases</li> <li>Articles</li> </ul>
CONSULTATION	<ul style="list-style-type: none"> <li>Gather information and feedback from end users through the project</li> </ul> <p>Key message: Their feedback is valuable for the project and they will be informed about how their input influenced BIMERR.</p>	<ul style="list-style-type: none"> <li>Living Lab Workshops</li> <li>Questionnaires</li> <li>Templates</li> <li>Interactive Techniques</li> <li>Internet</li> </ul>
COLLABORATION	<ul style="list-style-type: none"> <li>The creation of a collaborative relation with the users is very important. The identification of problems and the recommendations of possible solutions will be included in BIMERR</li> </ul> <p>Key Message: The collaboration with the users and stakeholders will ensure that their concerns will be solved in the final outcome with solutions and recommendations that they proposed.</p>	<ul style="list-style-type: none"> <li>Living Lab Workshops</li> <li>Interaction with participants</li> <li>Open questions in Questionnaires</li> <li>Internet</li> </ul>

## 2.6 DEPLOYMENT APPROACH AND SPECIFICATIONS OF THE COMMUNICATION AND DISSEMINATION TANGIBLE & INTANGIBLE TOOLS & MATERIALS

### 2.6.1 BIMERR INTERNAL MANAGEMENT AND COMMUNICATION TOOL

The communications and the data generated in BIMERR project, are stored in a protected internal repository called BSCW. The platform is managed by the project coordinator and is protected with username and password. This platform is used by project partners to store and share working documents and deliverables.



In addition to this tool, the consortium partners use the platform Confluence, offered by the Project Coordinator Fraunhofer, to facilitate the communication and the review procedure in the consortium of BIMERR project.

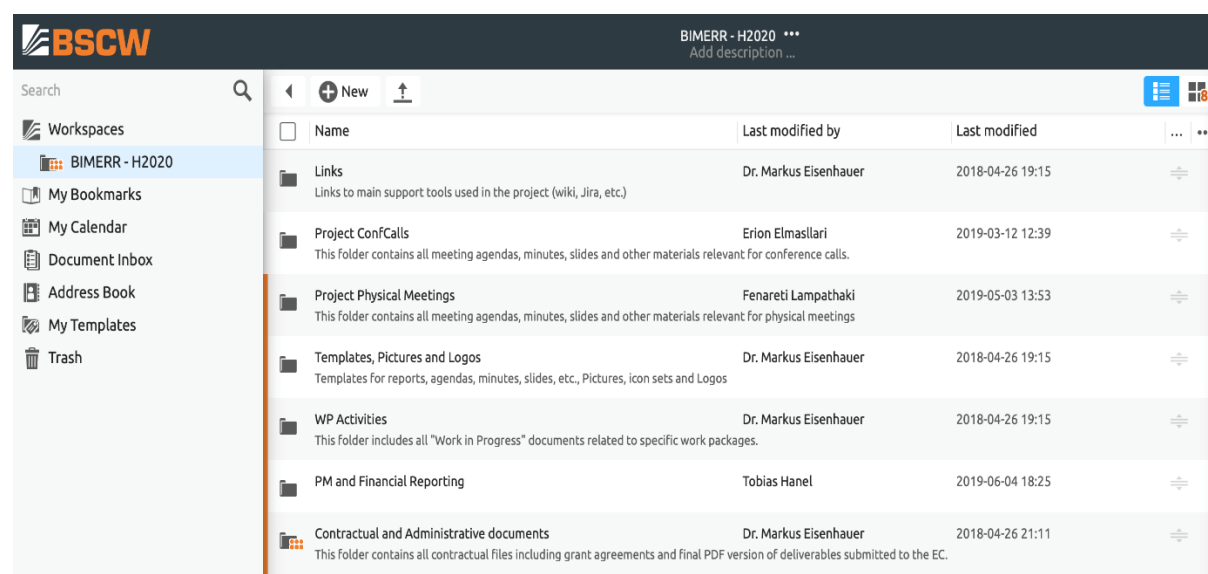


Figure 8: The BSCW internal repository

### 2.6.2 BIMERR WEBSITE

#### 2.6.2.1.1 Set up of the website

The BIMERR website – [www.bimerr.eu](http://www.bimerr.eu) (Delivered in M03) is the starting point for anyone that is seeking to learn more about the project. The website will stimulate a crucial resource on the presentation and promotion of the BIMERR objectives, tools, and consortium partners. Throughout the project, a variety of stakeholders will be invited to stay informed about the



development of BIMERR and to contribute to important aspects of the project. It has been designed as a vibrant online tool, visually attractive and informative about the project.

The website is the primary tool that will be used to successfully implement the Dissemination and Communication strategy of BIMERR project.

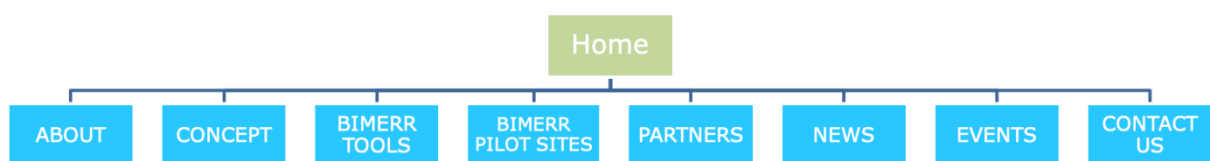
### 2.6.2.2 Website Update

To sustain a holistic online presence for BIMERR, the project's website is regularly updated, including project's results and specific news / events related to the BIMERR project.

Due to the evolving nature of the BIMERR project, the structure of the website is clear, and the information is constantly updated following the developments of the project.

The BIMERR webpage is designed, and the content is written and adapted, used a series of different tools. The update of the content is performed, using a What You See Is What You Get (WYSIWYG) application. For this reason, the creation and development of a webpage is faster because only a limited knowledge of HTML is needed, as it is automatically generated. However, the code can still be edited manually.

In the following figure, a detailed analysis of all the structure of the website is presented:



**Figure 9: BIMERR Website - Site Map**

Based on the structure of the above diagram, the developed site map is informative and concise, in order to facilitate the navigation of any type of website visitor. The webpage integrates all the different aspects of the BIMERR project.

The structure of the BIMERR website is based on this sitemap to provide a clear and detailed image of the project to the visitor.

## 2.6.3 SOCIAL MEDIA PLATFORMS

### 2.6.3.1.1 Twitter

As the nature of Twitter is to enable the sharing of short posts, the primary content will consist of short textual updates and links to BIMERR-related events or topics.

The Twitter account of @EUBIMERR will be used as preeminent communication media, given its efficiency in terms of visibility and engagement of users. It enables instantaneously reaching out to a large audience by creating primary posts or retweeting relevant content. One of the greatest advantages of Twitter is its ability to interconnect other users through tags and mentions (e.g #BIM). This approach will guarantee the ample reachability of the project.

The account will be mainly dedicated to non-visual content, to swiftly spread the message and the news of the BIMERR project. The Twitter account is used as a channel for constant update on every project development and result but also as a reminder for all the project-related activities and events.

The purpose of the Twitter account is to make the BIMERR project hashtag go viral and be "mentioned" and "re-tweeted" by a substantial number of targeted followers.

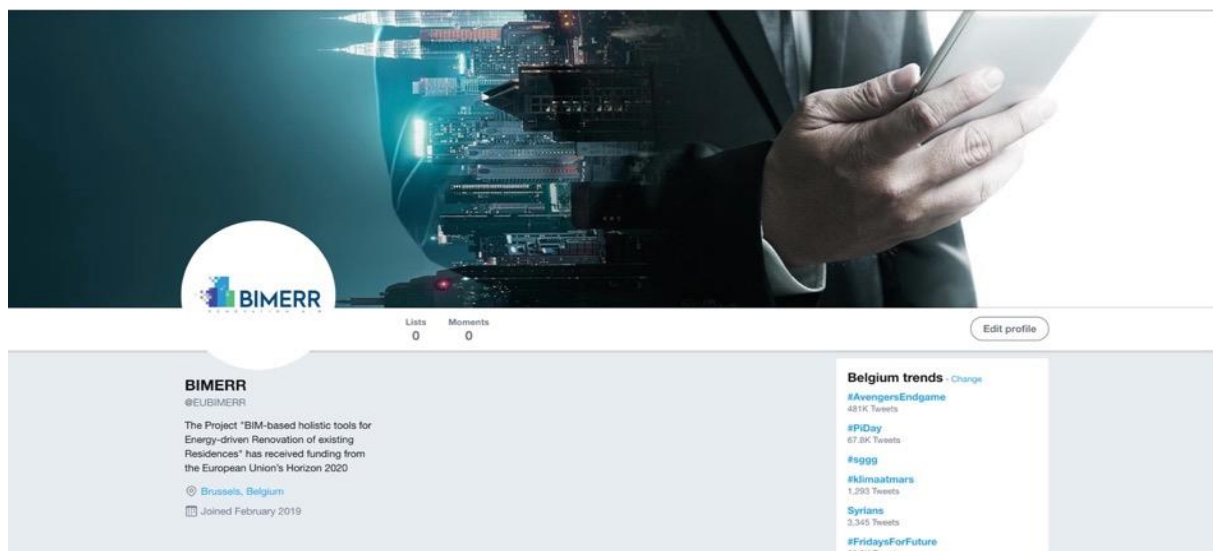


Figure 10: BIMERR Twitter page

### 2.6.3.2 LinkedIn

The second social media channel that is chosen for BIMERR project is LinkedIn with name @EUBIMERR. It might be less popular than other social media platforms, however, it is considered the best platform for professional use and networking.

As a networking site for professionals, it can be used for reaching other groups or professionals that might be interested in posting information about the project's vision, culture, objectives, and achievements.

For the purpose of BIMERR, our goal is to establish networks on specific topics, share content that will engage professionals and companies and connect with already established groups. LinkedIn can be a very effective tool for the project's exploitation strategy, that can promote BIMERR as a disruptive idea on the market, triggering potentially interested companies and end-users.

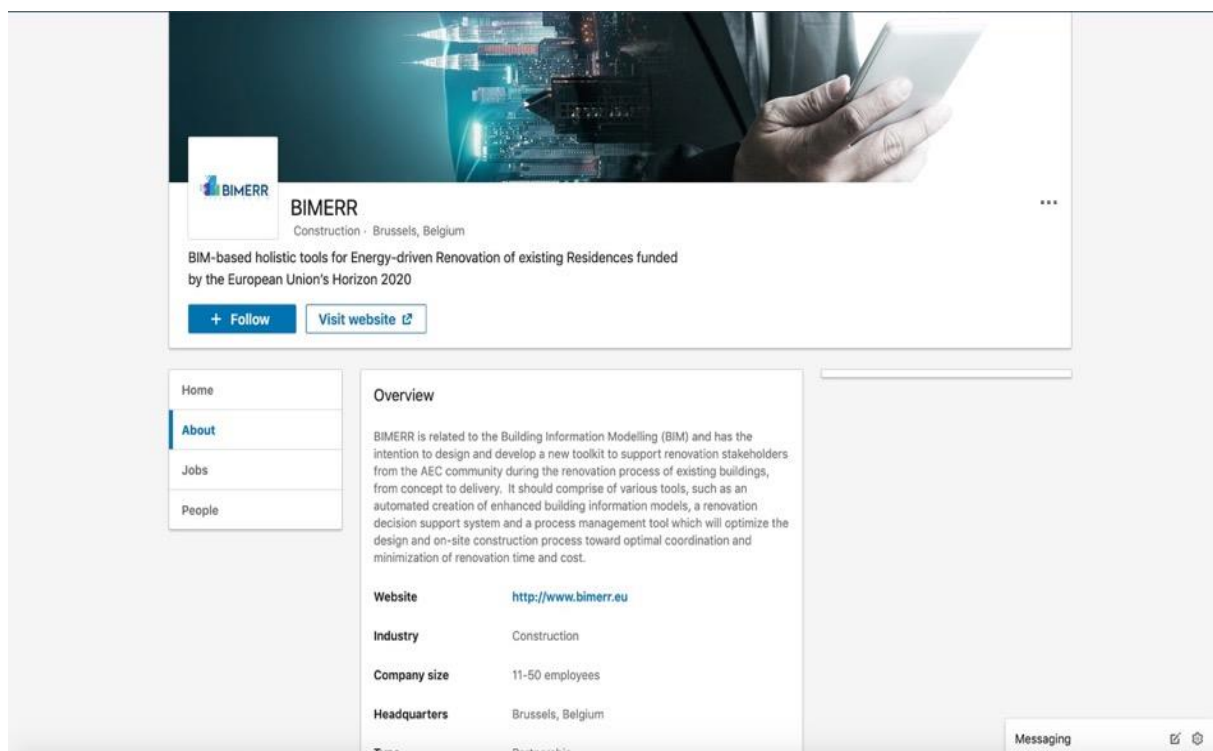
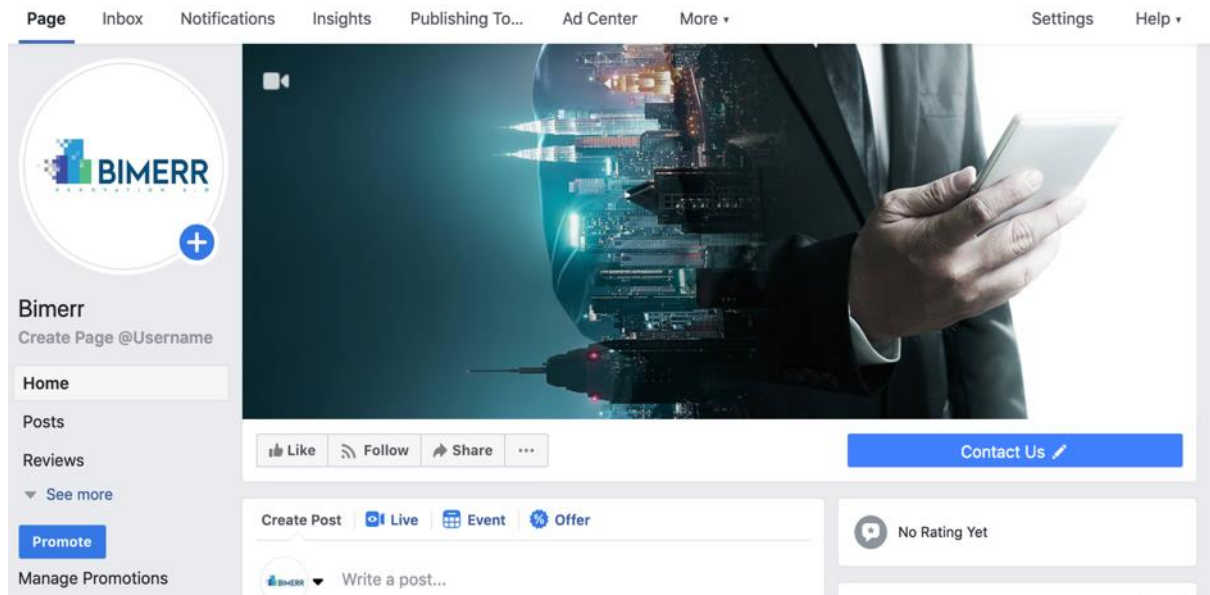


Figure 11: BIMERR LinkedIn page

### 2.6.3.3 Facebook



**Figure 12: BIMERR Facebook page**

The third social media channel that is chosen for BIMERR is Facebook named EUBIMERR. Facebook is the most common and popular social network. As a consequence, it can reach a wide audience of different types, maximizing the dissemination of BIMERR project-related news, events and results. Thus, a Facebook page for BIMERR is already created, to increase the project's outreach. The Facebook Analytics tool, namely Facebook Insights, will produce valuable statistics, e.g. the number of reached people, providing a useful instrument to measure "dissemination performance".

## 2.6.4 SCIENTIFIC PUBLICATIONS AND PRESENTATIONS

The main aim of scientific publications is to disseminate the latest project outcomes and scientific project advances.

Publications in specialized magazines and papers sent to related events will attract the attention of professionals from the AEC community and other relevant stakeholders, as well as providing the opportunity of collaboration within the purposes of the BIMERR project. To support this activity, whenever possible, project publications will be archived in the dedicated platform or linked to the BIMERR website.

It is foreseen that BIMERR consortium partners will individually, as well as in collaboration, publish and present project-related advances in technical papers, journals (peer reviewed or not) and magazines.

The following journals and magazines are especially relevant to the communication strategy of the BIMERR project:

**Table 8: Journals and Magazines relevant to the BIMERR project**

Title	Category	Publisher	Periodicity	Location
<b>Applied Energy</b>	Energy Efficiency	Elsevier B.V.	Twice a month (every 15 days)	Amsterdam
<b>Energy Efficiency</b>	Energy Efficiency	Springer	Monthly	Netherlands
<b>Energy and Building</b>	Energy efficiency in buildings	Elsevier B.V.	Monthly	Amsterdam
<b>Construction Innovation Information</b>	Information, Process, Management	Emerald Publishing Limited	Quarterly	United Kingdom
<b>Journal of Building Construction and Planning Research</b>	Building, construction, and planning	SCIRP – Scientific Research Publishing	Quarterly	
<b>Journal of Building Engineering</b>	Construction, operation, performance, maintenance, and deterioration / life cycle of the built environment	Elsevier B.V.	Every two months	Amsterdam
<b>Journal of Building Information Modelling</b>	Business, standards, and technical issues related to BIM	Matrix Group Publishing	Twice a year (fall and spring)	United States
<b>Journal of Building Performance Simulation</b>	Modelling and simulating the performance of buildings	Taylor & Francis Group	6 issues per year	United Kingdom
<b>Journal of Civil Engineering and Architecture</b>	Theory and practice of civil engineering science and technology, innovation, engineering, and management	David Publishing Company	monthly	United States
<b>Journal of Construction Engineering and Management</b>	Construction Management	ASCE Library	monthly	United States

Title	Category	Publisher	Periodicity	Location
<b>Virtual and Physical Prototyping</b>	Activities related to the multi-disciplinary area of virtual and rapid prototyping	Taylor & Francis Group	Quarterly	United Kingdom
<b>Automation in Construction</b>	Information technologies in buildings construction life cycle	Elsevier B.V.	Monthly	Amsterdam
<b>Buildings — Open Access Journal</b>	Building science, building engineering and architecture	Multidisciplinary Digital Publishing Institute	Monthly	Basel, Switzerland

### 2.6.5 PARTICIPATION IN FORA AND THEMATIC EVENTS

The BIMERR project aims at increasing the productivity of the building construction activities, such as renovation, refurbishment, and completely new development, through the digitalization revolution of the last decade. The BIMERR tool is a concept that can find many applications in the AEC sector and hence its commercialization is promising. Towards this, it is important to participate in events, meetings, consortiums etc. where the BIMERR can be demonstrated and the results/outcomes can be presented with the view of being ultimately adopted in the market. Thus, a full-scale dissemination has to follow, to exhibit the advantages of this concept to as many relevant market players and to effectively attract end-users.

### 2.6.6 COOPERATION WITH OTHER PROJECTS IN THE DOMAIN OF ENERGY EFFICIENCY BUILDINGS AND BUILDING INFORMATION MODELLING

The H2020 initiative encompasses a plethora of European funded projects around key domains and highlights the importance of exchanging ideas, building close collaborations and being inclusive. Therefore, creating bonds and communication roads with other projects in the same field of interest boosts dissemination of results and energizes consortia to cooperate and achieve their shared goal.

Since BIMERR is not a stand-alone project within the field of Building Innovation Modelling, opening communication channels with other projects could be beneficial for spreading its innovative concept across the partners of other consortia, consisting of members from many different countries. In addition, dispersion of scientific findings between projects could encourage problem-solving procedures and risk mitigation through sharing experiences and corrective actions in similar situations. The most important element of established project-wise

channels is the stacking of novel technologies and knowledge that will definitely prompt EU to achieve the H2020 goals and ultimately to make a crucial step towards energy efficiency and sustainability.

The BIMERR consortium strongly promotes its open-minded profile and looks forward to collaborating with other projects within the field of energy efficiency and Building Information Modelling. The similar projects are classified in completed (or almost finalized) and ongoing projects. The ongoing and completed projects that BIMERR will exchange knowledge in various fields and will cooperate are:

### **MOEEBIUS – November 2015**

The project focuses on reducing the gap between the predicted and actual energy performances at the level of buildings and blocks of buildings. In other words, MOEEBIUS is an attempt to mitigate the risk of building's energy underperformance. The solution to be developed will enable to predict the realistic energy use of buildings, increasing the confidence of customers in the EPC effectiveness and the associated savings the new energy technologies bring forward

Read more in this link: <https://www.moeebius.eu/about-the-project>

### **HEAT4COOL – October 2016**

The project focuses on developing, integrating, and demonstrating easy to install and highly energy efficient solutions for building retrofitting. Ultimate objective is to successfully implement a drop in the energy consumption by 20% in such a way to allow returns on investments in less than 10 years. Simultaneous achievements are expected to be the development of an integrated heating and cooling solution as well as a wastewater heat recovery system. Read more in this link: <https://www.moeebius.eu/about-the-project>

### **OptEEmal – September 2015 (Completed)**

The project aims to develop a holistic and robust design platform for renovation at district level. Through an integrated IPD building approach, it is expected to reduce time required for the district retrofitting projects and improve solutions as compared to existing but not fully-business practices. Read more in this link: <https://www.opteemal-project.eu/>

Secondly, some ongoing projects that BIMERR will cooperate are:

#### **BIM4EEB – January 2019**

The project envisions to develop a BIM management system with a toolkit that will boost the semantic interoperability between software and stakeholders involved in the renovation field. This new tool is expected to be a robust and attractive tool to both the designers in the early stages of designing phase and the construction companies when carrying out the work and services during retrofitting. Strong engagement with end-users is foreseen to ensure matching the expectations of the market and maximizing the value of the developed BIM tool.

Read more in this link: <https://cordis.europa.eu/project/rcn/220004/factsheet/en>

#### **BIM4REN – November 2018**

The project focuses on empowering BIM tools integration into the construction sector. To achieve this, subject matter experts have been invited to join the consortium and provide innovate but adequate processes, methodologies, and hardware tools. Read more in this link: <https://cordis.europa.eu/project/rcn/218345/factsheet/en>

#### **SPHERE – November 2018**

The project aims at developing a digital system that will bridge together the designing side with the manufacturing and construction side within a project. In addition to this, a web-platform is foreseen to be created to allow large data collection and, through its synchronization feature, to facilitate handling and processing of that heavy loaded information. Ultimately, an improvement and optimization on the building's energy design, construction and energy performance coupled with reduced construction costs, is expected.<sup>1</sup>

Table 9, presents further similar projects that BIMERR will seek cooperation with:

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<sup>1</sup> SPHERE: <https://cordis.europa.eu/project/rcn/218344/factsheet/en>



**Table 9: Relevant projects H2020-EEB-2017 and H2020-NMBP-EEB-2018**

Project acronym	Project Title	Commencement date
<b>ENCORE<sup>2</sup></b>	Energy aware BIM cloud platform in cost-effective building renovation context	January 2019
<b>BIM-SPEED<sup>3</sup></b>	Harmonized building information speedway for energy-efficient renovation	November 2018
<b>BIMplement<sup>4</sup></b>	Setting up a large scale and flexible qualification methodology integrating technical, cross-craft and BIM related skills and competences	September 2017
<b>BIM4REN<sup>5</sup></b>	Building Information modelling-based tools & technologies for fast and efficient renovation of residential buildings	October 2018
<b>BIM4EEB<sup>6</sup></b>	BIM based fast toolkit for efficient renovation in buildings	January 2019
<b>SCORES<sup>7</sup></b>	Self-consumption of renewable energy by hybrid storage systems	November 2017
<b>NewTREND<sup>8</sup></b>	New integrated methodology and tools for retrofit design towards a next generation of energy efficient and sustainable buildings and districts	September 2015
<b>STUNNING<sup>9</sup></b>	Sustainable business models for the deep renovation of buildings	October 2017
<b>ReCO2ST<sup>10</sup></b>	Residential retrofit assessment platform and demonstrations for near zero energy and CO2 emissions with optimum cost, health, comfort and environmental quality	January 2018
<b>HEART<sup>11</sup></b>	Holistic energy and architectural retrofit toolkit	October 2017
<b>RenoZEB<sup>12</sup></b>	Accelerating energy renovation solution for zero energy buildings & neighborhoods	October 2017
<b>REZBUILD<sup>13</sup></b>	Refurbishment decision-making platform through advanced technologies for near zero-energy building renovation,	October 2017

## 2.6.7 LIAISON WITH PROFESSIONAL COMMUNITIES AND NETWORKS

The BIMERR's ambition is to develop a BIM toolkit, ready to be incorporated into the renovation and construction building market. It is therefore of utmost importance to create channels with the right partners who have the ability and the knowledge to take up the new

<sup>2</sup> ENCORE: <https://cordis.europa.eu/project/rcn/102094/factsheet/en>

<sup>3</sup> BIM-SPEED: <https://cordis.europa.eu/project/rcn/218590/factsheet/en>

<sup>4</sup> BIMplement: <https://cordis.europa.eu/project/rcn/210066/factsheet/en>

<sup>5</sup> BIM4REN : <https://cordis.europa.eu/project/rcn/218345/factsheet/en>

<sup>6</sup> BIM4EEB: <https://cordis.europa.eu/project/rcn/220004/factsheet/en>

<sup>7</sup> SCORES: <https://cordis.europa.eu/project/rcn/211751/factsheet/en>

<sup>8</sup> NewTREND: <https://cordis.europa.eu/project/rcn/198365/factsheet/en>

<sup>9</sup> STUNNING: <https://cordis.europa.eu/project/rcn/211144/factsheet/en>

<sup>10</sup> ReCO2ST: <https://cordis.europa.eu/project/rcn/213424/factsheet/en>

<sup>11</sup> HEART: <https://cordis.europa.eu/project/rcn/211645/factsheet/en>

<sup>12</sup> RenoZEB: <https://cordis.europa.eu/project/rcn/211310/factsheet/en>

<sup>13</sup> REZBUILD: <https://cordis.europa.eu/project/rcn/211313/factsheet/en>

technology and apply it in their business fields. Towards this ambition, it would be encouraged that BIMERR could create liaisons with organizations and associations such as:

At a **European** level:

- AEEBC : The association of European Experts in Building and Construction
- FIEC : European Construction Industry Federation
- EuroACE : The European Alliance of Companies for Energy Efficiency in Buildings
- ACE : Architects' Council of Europe
- EAAE : The European association for Architectural Education
- CICA : Confederation of International Contractors' Association
- EBC : European Builders Confederation
- EIC : European International Contractors

And at **domestic** level:

- CEOE : Confederation of Employers and Industries of Spain
- BDA : Association of German Architects
- ASBC : Austrian Sustainable Building Council
- ALA : Association of Professional Architects
- CIC : Construction Industry Council
- SADAS-PEA : Greek Association of Architects
- Polish Association of Building Managers

## **2.6.8 PROMOTIONAL AND DISSEMINATION MATERIAL**

In line with the obligations regarding dissemination of results and achievements, appropriate dissemination material will be distributed in the various events in which the partners participate or via social media. Following the project's progress and the relevant results, the kind of dissemination material that will be shared between the target audiences, will be identified accordingly. The production of promotional and dissemination material will be in accordance with the scope of specific targeted messages for each target group.

It is of high importance to use this material coherently to achieve a better understanding and accessibility by the stakeholders.

More specifically, the following dissemination material will be developed:

- **Project's logo**

A unique project logo has been developed for the BIMERR project in accordance with the project's objectives and characteristics. The logo is a visual presentation of buildings with small pixels.

- **Project's graphic identity**

The main principle followed throughout the project is consistency with the branding design. The colors used for the templates, presentations and other materials are the ones used in the BIMERR logo.

- **Brochure**

It will present the project's objectives and information about the project's implementation.

- **Roll-up banners**

They will promote the project's progress and results during events and conferences.

- **Poster**

It will facilitate the project's visibility in events and conferences.

- **Leaflet**

Leaflets will be developed throughout the project's duration showcasing the project's important achievements

- **Press release**

Press release will focus on the most significant project's outcomes.

- **Newsletter**

Information about the project's progress, news and events will be shared among the interested stakeholders with the use of newsletters.

### 3. UPDATED DISSEMINATION AND COMMUNICATION PLAN

#### 3.1.1 COMMUNICATION OBJECTIVES AND CORRESPONDENCE WITH TARGET GROUPS

As referred also in deliverable 10.2, for a communication plan to be effective, communication needs to be goal driven. It is an absolute necessity for the success of the project, to further analyze the communication objectives described in chapter 2.3.2 and present them in relation to targeted actions and timeline. The following table presents the BIMERR communication objectives and their correspondence with the relevant target groups:

<div>Communication Objectives</div> <div>BIMERR Target Groups</div>	COMM. OBJECTIVE 1	COMM. OBJECTIVE 2	COMM. OBJECTIVE 3	COMM. OBJECTIVE 4	COMM. OBJECTIVE 5	COMM. OBJECTIVE 6
Architects	■	■	■		■	■
Engineers	■	■	■		■	■
Construction Companies	■	■	■		■	■
Building Residents / Energy Consumers	■	■	■	■	■	■
Technological Platforms	■	■	■		■	■
Professional Association & Initiatives	■		■		■	■
Scientific Community	■					■

Table 10: BIMERR Communication Objectives –Target Groups Correspondence

In the following tables, the communication objectives are presented along with an analysis and a detailed description of actions:

Communication Objective 1	Increase the <b>visibility of BIMERR</b> by providing universally comprehensible information to the public about the project goals and results.		
Sub-Objective 1.1	Increase the visibility of BIMERR by providing universally comprehensible information to the public about the project goals.		
Sub-Objective 1.2	Increase the visibility of BIMERR by providing universally comprehensible information to the public about the project results.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M01	End Month	42
Action	Increase constantly the visibility of BIMERR by using all the relevant communication means		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		

**Description of action:** To effectively and widely communicate the goals and results of the BIMERR project, several communication means are set in place. As described in the relevant section, the communication means to increase the visibility of the BIMERR goals and results will be:

- Project' s dedicated website
- Social media
- BIMERR partners' social media
- Press releases, newsletters, videos.
- Participation and presentation of the project in other networks and groups
- In-house presentations to existing clients / collaborators and brainstorming for further extending the BIMERR solutions to other applications and markets
- Appropriate material (e.g. brochure, case studies, stories, documents)

More specifically, different networking events will be set in place to increase the visibility of BIMERR. Prior to these events, an event will be created on the social media to attract the targeted groups. In these events, especially on Facebook, every possible user that will "attend" or "is interested on the event" will be contacted directly with a private message, offering him

Communication Objective 1	Increase the <b>visibility of BIMERR</b> by providing universally comprehensible information to the public about the project goals and results.
<p>more details about the event from the BIMERR webpage. In addition to that, through the Twitter and LinkedIn channel, it will be attempted to create groups of people that are interested in BIM. This can happen through various hashtags such as #BIM or #AEC. It is very important to communicate in every group a different message that can engage their interest on BIMERR. As example, the engagement of energy consumers will be achieved through messages about the reduced cost of the BIM solution etc. In the review of this document, detailed messages, and actions like the above will be incorporated in this detailed action plan.</p>	
<p><b>Expected Outcome:</b> As described, the communication of the BIMERR project will be carried out through various tools in order to constantly increase the visibility of BIMERR. The expected outcome of this process will be the continuous promotion of BIMERR goals and results with the eventual engagement of all target groups.</p>	
<p><b>Constrains &amp; important milestones:</b> Communication Objective 1 is directly linked with the Milestone 7 "Public Awareness, Dissemination and Engagement Planning" in M06 and Milestone 11" Project Website Launch" in M06. The direct link with these core project Milestones shows the importance of this communication objective for the entire success of the BIMERR project.</p>	

Communication Objective 2	Create a <b>user’s community that will provide insights and detailed feedback</b> during the development of the project.		
Responsible Partner	MERIT		
Engaged Partners	MERIT, CERTH, UPM, Hypertech, Xylem, CONCAT, BX, FER.		
Start Month	M01	End Month	M42
Action	Living Lab Activities		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> One of the main innovations of BIMERR is the use of Living Lab workshops. With these actions BIMERR aims to establish an open innovation 2.0 and value co-creation framework by involving the end-users and stakeholders during the development of the BIMERR project. To guarantee the success of the events and to attract more attendees, there is a need for active and targeted communication with users that are possibly interested			

Communication Objective 2	Create a <b>user's community that will provide insights and detailed feedback</b> during the development of the project.
to participate. As first step, a database of different target groups will be created, providing contacts for different end-users and stakeholders of BIMERR. The creation of such a database is essential for the successful attraction of these users to attend the BIMERR communication and dissemination activities.	
<b>Expected Outcome:</b> From the participation of end-users and stakeholders in the development of the project, it is expected to involve them in the requirement definition activities, as well as in the evaluation of BIMERR results. The goal of this process is to create a user community that will constantly provide expertise and feedback during the development of the project.	
<b>Constrains &amp; important milestones:</b> The Communication Objective 2 is directly linked with the Milestone 7 "Public Awareness, Dissemination and Engagement Planning" in M07. This objective is directly linked with the Living Lab Activities.	

Communication Objective 3	Communicate <b>tangible results and success stories</b> coming from the projects validation activities.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M20	End Month	M42
Action	Effective communication of the produced tangible results and success stories of BIMERR.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> The effective and coherent communication of tangible results and success stories of BIMERR is essential. With this action, BIMERR partners will create a strong and simple message/success story to reproduce about the success of BIMERR project. Thus, this action will take place after the delivery of first version of the BIMERR platform for pre-validation. Once tangible results of BIMERR are produced, the BIMERR consortium will produce different videos from the demo sites presenting the final product and explaining to the possible users why the BIMERR solution fits their needs. The promotion of success stories through these videos is crucial in order to circulate the messages with greater impact. The			

Communication Objective 3	Communicate <b>tangible results and success stories</b> coming from the projects validation activities.
diffusion of messages presenting success stories and tangible results will take place through the project's social media channels, website, and various events. A possible action will be the communication with relevant journalists or media in related field, to circulate and promote the BIMERR success stories.	
<b>Expected Outcome:</b> The expected outcome of this action is to create of a simple message for the success of BIMERR project. By having a tangible result and success stories about the impact of BIMERR, the success of the communication strategy will be increased.	
<b>Constrains &amp; important milestones:</b> The Communication Objective 3 is directly linked with the Milestone 7 "Public Awareness, Dissemination and Engagement Planning" M06 and Milestone 11" Project Website Launch" in M03.	

Communication Objective 4	Increase <b>awareness and enhance societal perception</b> on how Research and Innovation can tackle emerging challenges and positively impact the society, while increasing visibility and information flow on the vital role of Horizon 2020 and EU funded research.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M01	End Month	M42
Action	Communicate the importance and the impact of the Horizon 2020 project.		
Targeted Group	General public		
<b>Description of action:</b> Through several communication channels, as well as through domain-related events, the importance of Horizon 2020 projects will be highlighted. During the participation in various events, synergies with other projects will be established to maximize the communication impact on society while increasing the visibility and the information flow. Tweets and posts on Facebook will constantly underline the importance of Horizon 2020 EU funding in the implementation of the project as well as in cooperation and synergies with other relevant projects.			
<b>Expected Outcome:</b> From the presentation of BIMERR in various events, it will be attempted to highlight the importance of EU funded research and of Horizon 2020 projects. The			



importance and positive impact of Horizon 2020 EU funded research on the society, will be promoted through the BIMERR website and the social media channels. Finally, in every action of BIMERR a disclaimer about the Horizon 2020 EU research funding and the EU support in this particular project will be incorporated, in order to achieve this communication objective.

**Constrains & important milestones:** The Communication Objective 4 is directly linked with the Milestone 7 “Public Awareness, Dissemination and Engagement Planning” in M06 and Milestone 11” Project Website Launch” M03. This objective will complement the actions for public awareness about the EU funding of the BIMERR project.

Communication Objective 5	Promoting and demonstrating the <b>societal and economic benefits</b> generated by the BIMERR project to a wide range of audiences outside the core project target groups.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M20	End Month	M42
Action	Creation of a simple and comprehensive message for the societal and economic benefits of BIMERR solution.		
Targeted Group	General public		

**Description of action:** As mentioned in the Communication Objective 3, a comprehensive and simple message will be prepared. The aim is to construct a message that is capable to demonstrate the societal and economic benefits of BIMERR in a wide range of audiences. To succeed, various social media channels will be used with a combination of a video presenting the tangible results of the BIMERR solution. For the successful communication of this objective similar Actions with the other objectives will take place. Promotion of the economic benefits for the users is an essential part of the BIMERR’s successful communication. Videos shall be created through automated tools, promoting the benefits of BIMERR with a simple and comprehensive way. These videos can be circulated through social media channels of BIMERR and other media such us online blogs and journals.

**Expected outcome:** After the creation and presentation of the relevant video in social media, which will highlight the societal and economic benefits of BIMERR, the reach in audiences outside the core project target groups will be achieved. Once a concrete and effective message is created, it will be communicated also with other means such as press-releases, leaflets, posters etc.

**Constrains & important milestones:** The Communication Objective 5 is directly linked with the Milestone 7 “Public Awareness, Dissemination and Engagement Planning” in M06 and

Milestone 11" Project Website Launch" in M03. This objective will complement the actions for general public awareness of the BIMERR project.

Communication Objective 6	<b>Complement the dissemination activities</b> of the BIMERR project.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M01	End Month	M42
Action	Any communication action will complement and reinforce the dissemination activities of the BIMERR project.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> As described above, communication actions will complement and assist all the dissemination activities of the project. Through the communication channels of BIMERR, every dissemination action will be promoted. The promotion of scientific publications can be done with a Facebook post and a comprehensive tweet. Every dissemination result can have greater impact to users outside of the target groups, if the message is well explained, simplified, and promoted through the broader communication channels.			
<b>Expected Outcome:</b> With the support of the communication actions, the outreach and impact of dissemination activities will be higher and will eventually increase the overall promotion of the BIMERR results.			
<b>Constrains &amp; important milestones:</b> The Communication Objective 6, is directly linked with the Milestone 7 “Public Awareness, Dissemination and Engagement Planning” in M06 and Milestone 11” Project Website Launch” in M03. The main goal of this objective is to support and complement all the dissemination actions in order to increase the dissemination and engagement planning.			

### 3.1.2 DISSEMINATION OBJECTIVES AND CORRESPONDENCE WITH TARGET GROUPS

An integral part of the effective communication of the project results, is the dissemination within appropriate channels. The effective dissemination of the project's outcomes (e.g. concept, scientific results, tools, methodologies) is crucial for the general success of the project.

In section 2.3.3 of the Dissemination and Communication Plan, the Dissemination objectives were articulated and analyzed. Moreover, after the definition of the objectives the correspondence with the selected target groups is the following:

**Table 11: BIMERR Dissemination Objectives –Target Groups Correspondence**

Dissemination Objectives BIMERR Target Groups	DISS. OBJECTIVE 1	DISS. OBJECTIVE 2	DISS. OBJECTIVE 3	DISS. OBJECTIVE 4	DISS. OBJECTIVE 5
<b>Architects</b>	■	■	■	■	■
<b>Engineers</b>	■	■	■	■	■
<b>Construction Companies</b>	■	■	■	■	■
<b>Building Residents / Energy Consumers</b>	■	■		■	
<b>Technological Platforms</b>	■	■	■	■	■
<b>Professional Association &amp; Initiatives</b>	■	■	■	■	■
<b>Scientific Community</b>	■	■	■		■

Dissemination Objective 1	Raise <b>awareness and social engagement</b> for the BIMERR project goals and activities in target communities via appropriate methods.		
Responsible Partner	MERIT		
Engaged Partners	All partners		
Start Month	M01	End Month	M42
Action	Attract relevant target communities towards the BIMERR project by raising awareness with relevant tools and appropriate dissemination actions.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		

**Description of action:** The main goal of this action is to engage the appropriate target groups by using the proper dissemination tools and methods. Such tools, as described in previous sections, can be the participation in relevant events & conferences, publications and other dissemination activities. In order to attract visitors in these activities, a database with the contact details of targeted users will be created in order to support the co-creation methodology of Living Lab.

**Expected Outcome:** The expected outcome of these actions is the active dissemination of the BIMERR results and outcomes through various activities. With targeted actions the dissemination objective of raising awareness and increasing the social engagement will be achieved.

**Constraints & important milestones:** The Dissemination Objective 1 is directly linked with the Milestone 7 "Public Awareness, Dissemination and Engagement Planning" in M06 and Milestone 11 "Project Website Launch" in M03.

Dissemination Objective 2	Encourage the <b>involvement of end-users and stakeholders</b> , through the utilization of Living Lab Workshop, in all phases of the project implementation by using a "User-Centric Design Approach" of dissemination. In this objective is very important to establish and maintain adequate channel with all type of users involved in the living lab workshops or with the completion of questionnaires.		
Responsible Partner	MERIT		
Engaged Partners	MERIT, CERTH, UPM, Hypertech, Xylem, CONCAT, BX, FER.		
Start Month	M01	End Month	M42
Action	Involvement of end-users and stakeholders through the use of Living Lab Methodology.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> This dissemination action is directly linked with the second communication objective about the involvement of participants in the establishment of open innovation 2.0 and the value co-creation framework by involving the end-users and stakeholders during the development of the BIMERR project.			

**Expected Outcome:** The participation of end-users and stakeholders in the development of the project, will involve them in the requirement definition activities of the project, as well as in the evaluation of BIMERR results. The goal of this process is to establish and maintain an adequate communication channel with all the Living Lab participants in order to better disseminate the BIMERR results and outcomes.

**Constrains & important milestones:** Encourage the **involvement of end-users and stakeholders**, through the utilization of Living Lab, in all phases of the project implementation by using a “User-Centric Design Approach” of dissemination. In this objective is very important to establish and maintain adequate communication channel with all type of participants involved.

Dissemination Objective 3	Ensure <b>the diffusion of all the scientific and technological results</b> generated in BIMERR project within and beyond the project’s consortium.		
Responsible Partner	FIT/HYPERTECH		
Engaged Partners	All technical partners		
Start Month	M01	End Month	M42
Action	Diffusion of scientific and technological results		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> Publications in scientific journals and conferences relevant to the research and innovation activities will attract the scientific communities directly or indirectly in the scope of BIMERR. Until M12, at least 4 scientific papers will be published to better diffuse the scientific and technological outcomes of BIMERR.			
<b>Expected Outcome:</b> The dissemination actions will reinforce the diffusion of the scientific and technological results in the scientific community, foster cross-project cooperation and provide a fundamental verification of soundness of project results.			
<b>Constrains &amp; important milestones:</b> The Dissemination Objective 3 is directly linked with the Milestone 7 “Public Awareness, Dissemination and Engagement Planning” in M06 and Milestone 11” Project Website Launch” in M03.			

Dissemination Objective 4	Effective BIMERR Dissemination activities implicitly and explicitly contribute to the timely support of the <b>exploitation strategy</b> of the BIMERR project.		
Responsible Partner	MERIT		
Engaged Partners	MERIT, Ubitech, Suite5, Hypertech, Xylem, GU, ConKAT, BOC, BX, EXE, NT, FER		
Start Month	M06	End Month	M42
Action	Dissemination Planning as a parallel support strategy to Exploitation Plan.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> All the dissemination actions will be closely related to the objectives and scope of the Exploitation Strategy of the project. All the dissemination actions will aim to increase the visibility of the BIMERR solution in the market and to support the Exploitation plan of the BIMERR project.			
<b>Expected Outcome:</b> The dissemination activities through the development of the project, as well as the post-project dissemination activities will assist the effective and successful Exploitation Strategy of the BIMERR project.			
<b>Constrains &amp; important milestones:</b> The Dissemination Objective 4 is directly linked with the Milestone 7 “Public Awareness, Dissemination and Engagement Planning” in M06.			

Dissemination Objective 5	<b>Cooperation with other projects</b> in the domain of Energy Efficiency Buildings and Building Information Modelling.		
Responsible Partner	FIT/MERIT		
Engaged Partners	All partners		
Start Month	M01	End Month	M42
Action	Synergies and cooperation with other projects in the relevant fields.		
Targeted Group	AEC Industry, Building Residents/Energy Consumers, Scientific, Technological and Business Communities		
<b>Description of action:</b> For BIMERR partners, previous industrial and scientific experiences are essential for the development of the project. Moreover, partners participating in relevant			

projects will be engaged to establish synergies and links with other projects. Common dissemination actions will be co-organized to increase the outreach of the project's results.

**Expected Outcome:** The aim of synergies and cooperation with other projects in the domain of Energy Efficiency building and Building Information Modelling is to encourage the smooth knowledge transfer and experience sharing between BIMERR and other projects.

**Constrains & important milestones:** The Dissemination Objective 5 is directly linked with the Milestone 7 "Public Awareness, Dissemination and Engagement Planning" in M06. Its ultimate goal is to increase the synergies and the cooperation with other projects in relevant field to multiply the dissemination impact.

### **3.1.3 UPDATED DETAILED DISSEMINATION AND COMMUNICATION ACTION PLAN**

In this section the detailed plan of how the dissemination and communication strategy will be carried out, and the dissemination and communication activities, with their respective implementation time plan, will be described. This plan is an update of the plan presented in deliverable 10.2 "Bimerr dissemination and communication plan and associated material 1", which was submitted in month 6 of the project.

The following Table 12 shows a detailed plan of dissemination and communication actions which are planned to be carried out within the framework of the project is. This plan is analyzed with specified target per phase of the project and will constitute the basic guideline for all dissemination and communication activities during the project lifetime:

In comparison with the plan drafted during the first six months of the project, in this plan the quantified targets are presented as one merged table, and not separated in two different tables for dissemination and communication. The reason for that, is that the metrics, as provided by the means of verification, cannot be practically distinguished in those two categories. For example, in the initial plan, the metrics for the visits on the website was presented separately for dissemination and communication, but practically, it is not possible to identify and categorize the values provided by website analytics. Thus, in this plan, one cumulative quantified target for dissemination and communication is presented, combining the quantified

targets both for dissemination and communication. From those results a percentage will concern dissemination and another share communication objectives.



**Table 12: Dissemination and communication Key Performance Indicators per project phase**

<b>DISSEMINATION AND COMMUNICATION SCOREBOARD</b>							
<b>Key Performance Indicators</b>							
<b>Dissemination Mechanism</b>	<b>Description</b>	<b>Target Value for Phase I (M1 - M12)</b>	<b>Target Value for Phase II (M12 - M18)</b>	<b>Target Value for Phase III (M18 - M30)</b>	<b>Target Value for Phase IV (M30 - M42)</b>	<b>Total target value</b>	<b>Means of Verification</b>
Living labs	Nr of events	3	3	3	3	12	Archives on organized events
Project website	Nr of unique visitors	700	800	1200	1300	4000	Google analytics
	Average duration of visits	2 min	3 min	3 min	>3 min	2.5 min	
	Nr of page views	3000	2000	2500	3500	11000	
Social Media (Twitter, Facebook, LinkedIn)	Nr of followers	100	100	250	300	750	Social Networks' built-in analytics
	Nr of posts	20	30	40	50	140	
	Nr of retweets/reposts/comments	20	30	60	60	170	
Scientific publications	Nr of unique publications	1	2	5	6	14	Enumeration of all published articles

Participation in fora and thematic events	number of events	4	6	8	10	28	Nr of attendances in events
Contributions to standards	nr of events/workshops/presences	0	0	2	3	5	attendance to events
Liaison with Professional communities and networks	Nr of events/workshops/telcos /presentations	0	1	3	3	7	attendance to events
Presentations in other networks and groups	Nr of presentations	1	2	5	7	15	Archives of presentations participation
In house presentations to existing clients and brainstorming for extending BIMERR solutions to other applications and markets	Nr of organized events	2	2	3	4	11	Archives of in-house events
Promotional Content and Dissemination Material (leaflets, brochure, roll-up, poster, press-release and newsletter)	brochure	1	0	1	0	2	Enumeration of published material
	newsletter	2	1	3	4	10	
	Press release	2	2	3	3	10	
	poster	0	1	1	1	3	

	roll-up	1	0	1	0	2	
	leaflet	0	0	1	1	2	

In the following tables an analysis of the specific communication and dissemination tools with the related target groups is provided:

**Table 13: Communication tools for each target group**

Communication Instruments Target Group	Website	Twitter	LinkedIn	Facebook	YouTube	Press Release	Newsletter	Brochure/ Leaflet/ Printed Material
Architects	✓	✓	✓	✓	✓	✓	✓	✓
Engineers	✓	✓	✓	✓	✓	✓	✓	✓
Construction Companies	✓	✓	✓	✓	✓	✓	✓	✓
Building Residents / Energy Consumers	✓	✓	✓	✓	✓		✓	✓
Technological Platforms	✓	✓	✓	✓	✓	✓	✓	✓
Professional Association & Initiatives	✓	✓	✓	✓	✓	✓	✓	✓

Scientific Community	✓	✓	✓	✓	✓		✓	✓
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Table 14: Dissemination tools for each target group

Dissemination Instruments Target Group	Website	Social Media	Living Lab	Scientific Publications	Fora & Thematic Events	Conferences	Cooperation with Other Projects	Professional Communities and Networks	Dissemination Material
Architects	✓	✓	✓		✓	✓	✓	✓	✓
Engineers	✓	✓	✓		✓	✓	✓	✓	✓
Construction Companies	✓	✓	✓		✓	✓	✓	✓	✓
Building Residents / Energy Consumers	✓	✓	✓				✓		✓
Technological Platforms	✓	✓		✓	✓	✓	✓	✓	✓
Professional Association & Initiatives	✓	✓		✓	✓	✓	✓	✓	✓

Scientific Community	✓	✓		✓		✓	✓		✓
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## **4. UP TO DATE PROGRESS OF COMMUNICATION AND DISSEMINATION ACTIVITIES**

### **4.1 DESCRIPTION OF IMPLEMENTED ACTIONS AND ASSOCIATED MATERIALS UNTIL M06**

As presented in D10.2, within the period M01-M06, the initial dissemination and communication actions had already been implemented. The design and development of the BIMERR website had been finalized and the project's accounts in social media (Facebook, Twitter, and LinkedIn) had been created. The branding design had been finalized. A unique logo was created, where the use of green and blue colour implies the eco-friendly and forward-thinking character of the project, combined with the harmony and simplicity of the BIMERR philosophy. Moreover, the use of violet implies the innovative character of the project.

From the activities, press releases were produced in 3 different languages (English, Polish and Spanish) to increase the communication flow. Thus, relevant social media and website posts was circulated to foster the dissemination and communication impact.

Moreover, the graphic identity of the project had been developed. All project templates and PowerPoint presentations were created in consistent with the branding design. The colours used for these templates and presentation of other materials are the ones used in the BIMERR logo.

The project brochure had been also finalized providing a detailed and non-technical overview of the project, aiming at a wider target audience. There is a page with a brief summary of the project and a page on the objectives, the BIMERR methodology, the scope and the expected impact. Focus was given on the use of pictures to make it attractive to the audience.



Figure 13: BIMERR Brochure (1/2)



Figure 14: BIMERR Brochure (2/2)



**Figure 15: BIMERR Roll-up**

In addition, 3 roll-up banners have been designed but they are not yet finalized. Discussions between partners are being carried out to decide on the most suitable banner for the needs of the project.

Following the dissemination methodology agreed at the beginning of the project, the BIMERR was engaged twice with the public to raise awareness about both the scope and vision. It was presented on a lecture session at the Harvard Graduate School of Design on the 3<sup>rd</sup> April 2019, where the Project Coordinator from FIT discussed the approach of the BIMERR project, the use of smart glasses and multitude of other tools to enrich the BIM models in order to stimulate and optimize the renovation process and achieve reduction of construction/renovation costs.

The second opportunity to disseminate the project during the first 6 months since the kick-off meeting, was a press-release by Budimex. Both an internal press-release and external



publications based on the press-release were published. Shared content was prepared in Polish and kept the key messages clear and brief, in order to engage the public with the main goals of the project, the BIMERR tools, the pilot sites and the overall list of partners. No scientific publications have been published in this period, as the project was still in an initial phase and no actual results have been produced so far. In the near future, scientific findings generated all along the project will be communicated and disseminated to the right audience.

Under the Living Lab Methodology, various dissemination actions have been taken place until M06. As part of the Living Labs Methodology, several tools such as templates and questionnaires have been produced by the partners, and subsequently used by the pilot participants in the context of the Living Labs Methodology for interviewing the targeted user groups during especially organized workshops.

BIMERR Living Lab activities are developed from a very early stage of the project implementation (user requirements phase) up to the pilot evaluation phase to engage the target groups in the project. These activities aim to establish an iteration and open collaboration process that will accelerate collaborative knowledge generation and integration, technology customization and validation against real market and user needs, as well as end-product definition and go-to-market strategy creation.

As part of Living Labs Methodology, targeted Living Lab workshops are organized together with the involvement of the definition of various interaction and collaboration mechanisms in order to take advantage of the participation of key construction stakeholders. As described in the Grant Agreement and the DoA, Living Lab workshops will be performed (further to other planned engagement and training activities). The aims of the Living Lab workshops are:

- to raise awareness, engagement, and acceptance of renovation stakeholders, including also the preparation and distribution of appropriate material
- to involve end-users in the requirement definition activities of the project
- to involve stakeholders in the evaluation of BIMERR results

The initial planning is to organize several workshops in various countries. The first Living Lab workshop concerned the collection of requirements from stakeholders and was hosted in M05 in Poland (BX), under the support of MERIT as Dissemination and Exploitation Manager.

At this stage, more activities in the context of Living Lab Methodology have been produced, namely templates and questionnaires for interviewing the target user groups as well as the initial design and planning for the future training activities.

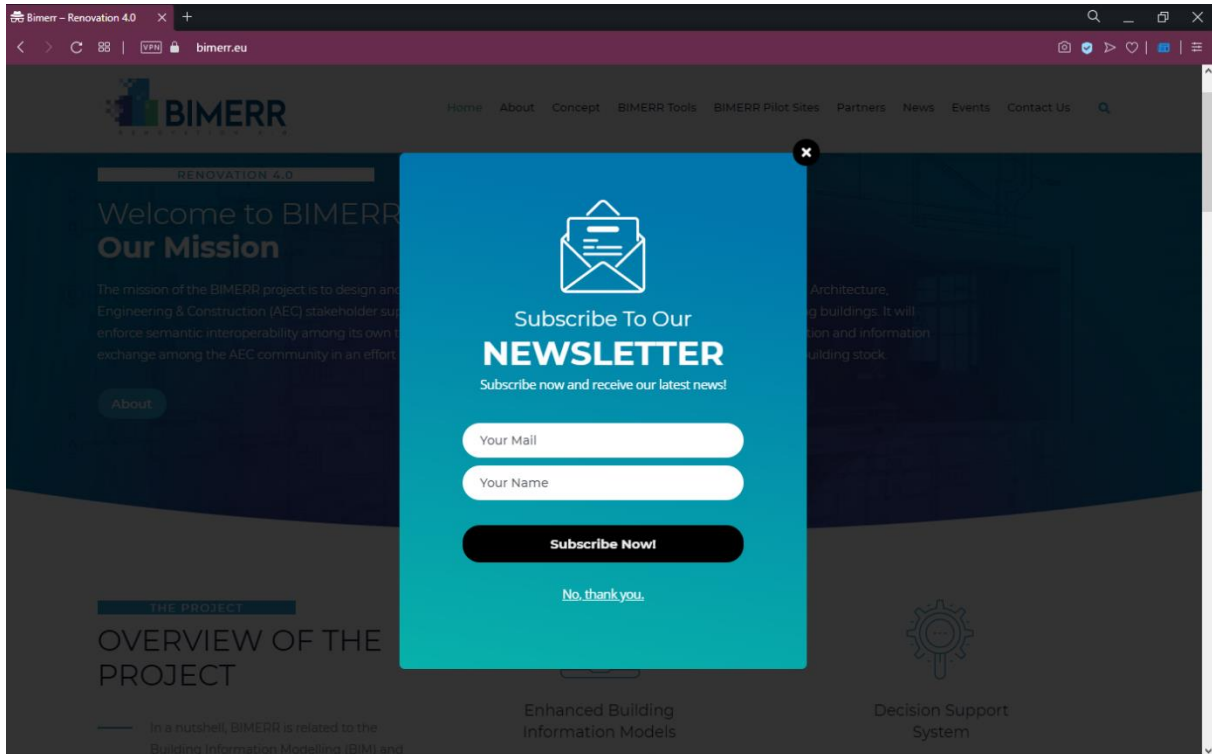
As mentioned in the chapter of Living Lab Methodology, a detailed Living Lab Database is under construction in M06. This Database will include the contact details, the function and the location of several end-users and stakeholders that are participating in the project. Responsible for providing details of the end-users and stakeholders are all partners. This database will be completed in the upcoming months.

## **4.2 DISSEMINATION AND COMMUNICATION IMPLEMENTED ACTIONS M06-M18**

During this period, the dissemination and communication actions were executed according to the continuous updated dissemination and communication plan. The only deviation had to do with some actions from month 15 (March 2020) to month 18 (June 2020), that had to be cancelled or postponed because of the health crisis due to the COVID-19 outbreak which resulted to cancellation or postponement of all the organized events that included physical presence of the participants.

### **4.2.1 PROJECT WEBSITE**

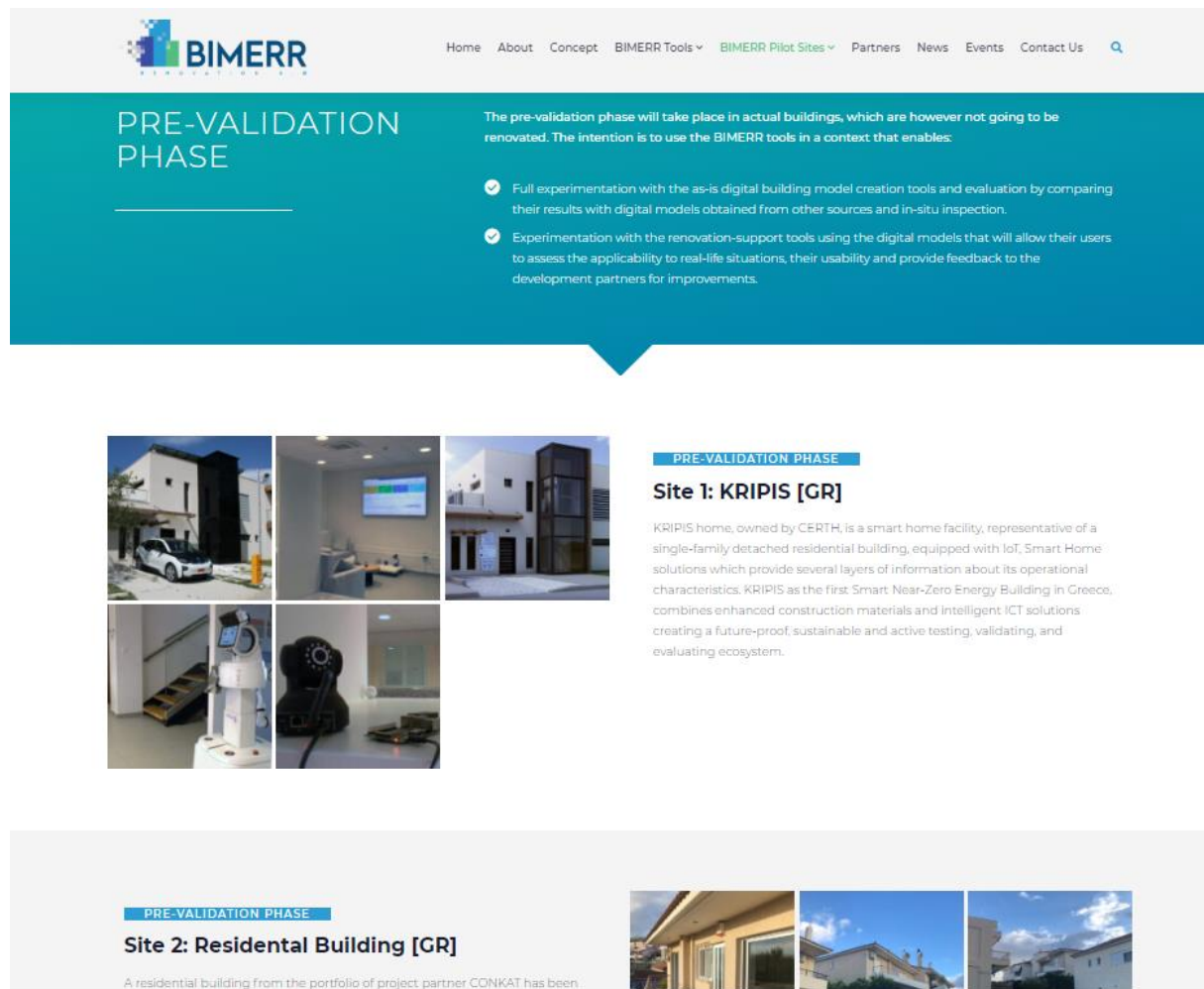
Regarding the project website (<https://bimerr.eu>), during this period, it was updated in a regular basis. As seen in the following Figure 16 an option to allow the visitor to subscribe himself to the project newsletter was added. This option appears as a popup during the first visit at the project website homepage and provides the visitor the option to register or skip for later.



The screenshot shows the BIMERR website with a newsletter registration form overlay. The form is titled "Subscribe To Our NEWSLETTER" and includes a subtext "Subscribe now and receive our latest news!". It features two input fields: "Your Mail" and "Your Name", followed by a "Subscribe Now!" button. A link "No, thank you." is also present. The background of the website shows the "Welcome to BIMERR" section and the "OVERVIEW OF THE PROJECT" section.

**Figure 16: Newsletter registration form of the website**

Moreover, during this period the "BIMERR pilot sites" section of the website was updated. Details about both the pre-validation and validation sites were added, as provided by the relevant pilot partners, as presented in the following Figure 17.



**Figure 17: Screenshot from the “BIMERR Pilot Sites” website part**

For the pre-validation sites the description added, was:

- **KRIPIS home [GR]**

“KRIPIS home, owned by CERTH, is a smart home facility, representative of a single-family detached residential building, equipped with IoT, Smart Home solutions which provide several layers of information about its operational characteristics. KRIPIS as the first Smart Near-Zero Energy Building in Greece, combines enhanced construction materials and intelligent ICT solutions creating a future-proof, sustainable and active testing, validating, and evaluating ecosystem.”.

While the images shown in Figure 18, was also added to help the visitor visualize the pilot site.



**Figure 18: Images of KRIPIS home pre-validation, added on the website**

- **Residential building [GR]**

"A residential building from the portfolio of project partner CONKAT has been selected, as the second pre-validation site. Based on testing needs, during the project implementation, access to building will be provided whereby audits, surveys, and digital model population activities (e.g. scanning and/or walkthroughs using AR



glasses) will take place for testing purposes. The selected building is in the north-east suburbs of Athens built in 2000. It belongs to a building complex consisting of one ground floor and two floors having 9 separate apartments, 3 on each floor. The selected apartment is on the second floor with South East orientation”.

While the images shown in, was also added to help the visitor visualize the pilot site



**Figure 19: Images of Conkat pre-validation, added on the website**

For the validation sites the description added, was:

- **Multi-family residential building [ES]**

The Spanish pilot site is a residential building built in 1960, located in a neighbourhood called Otxarkoaga, in the suburbs of Bilbao. This neighbourhood is a corner stone of a larger rehabilitation program called Opengela (2019-2022), which is a project that looks to spread urban regeneration in the Basque Country, creating neighbourhood offices which provide advice and support to the neighbourhood community. The building is 15 storeys high with 60 apartments that serve as social housing. The main objective of the renovation measures that will take place, is an improvement of the energy class, from G to C. To reach that objective, 5 main intervention types are anticipated:

- Improvement in thermal insulation

- Improvement of the accessibility
- Improvement of the ACS and heating installations (Viability study of the incorporation of renewable energies).
- Energy monitorization
- Improvement of fire protection system



**Figure 20: Images of Spanish validation site, added on the website**

- **Multi-family residential building [PL]**

The Polish pilot site is a residential building (social housing) built in 1995 located in a district called Praga Południe, close to industrial areas and railway sidings, in an average distance from the Warsaw city center. The building, which will be used as pilot, is an L-shape residential and 4-storey building with a basement floor. The main objective of the renovation measures is an improvement of the energy class of the building. To reach that objective, the following main intervention types are anticipated:

- Improvement in thermal insulation

- Roof renovation and insulation
- Verification of the condition of the windows, replacement of the old or damaged ones
- Insulation of basement rooms
- If the budget allows installation of photovoltaic panels
- If the budget allows installation of devices and sensors optimizing energy consumption



**Figure 21: Images of Polish validation site, added on the website**

In addition, the update of the section “BIMERR tools” of the website is finalized in month 18, from input received from technical partners, after a request from the dissemination manager. The description for each tool that is added on the website, along with relevant pictures and the responsible partner, is:

- **BIMERR Interoperability Framework (BIF).** The main scope of the BIMERR Interoperability Framework (BIF) is to ensure seamless and secure data exchange among the individual BIMERR tools and applications, in order to supply them with all the up-to-date building information they need for their operation and for which they are authorized. BIF utilizes mechanisms that enable semantic and syntactic interoperability, while enforcing access control policies to prevent any illegitimate



building data exchange. The BIMERR Interoperability Framework (BIF) consists of four components, namely: 1) the Building Semantic Modelling component, that performs semantic modelling, mapping and annotation of various building-related data models, 2) the Building Information Collection & Enrichment component, which is responsible for ingesting and effectively managing the building-related data, 3) the Building Information Query Builder component, which manages information queries from the BIMERR applications, and 4) the Building Information Secure Provisioning tool that delivers the populated models to the requested application or tool in the appropriate manner upon resolving the related access policies. BIF has direct interfaces (i.e. data exchanges through APIs) both between its main components and with the other BIMERR tools that store the appropriate information; while any data exchanges with sensors/external systems is via the BIMERR middleware which comprises the communication backbone.

- **BIMERR Renovation Decision Support System (RenoDSS).** RenoDSS provides an accurate estimation of the energy, cost, and environmental impact trade-offs of alternative renovation scenarios. The estimation of post-renovation energy consumption is based on energy data models, structural and geometrical properties of the building, materials, HVAC systems, residents' usage profile, as well as weather data. RenoDSS also takes the environmental impact of the renovation and the interaction with surrounding buildings into account. All KPIs and details of possible renovation scenarios are shown in an intuitive user interface which enables the renovation designer to select the optimal renovation scenario in terms of costs, energy consumption, and environmental impact. It retrieves all input data from the BIMERR Interoperability Framework (BIF) and provides output data via the BIF to selected BIMERR components (e.g., PWMA).
- **Process & Workflow Modelling and Automation toolkit (PWMA).** PWMA provides a set of tools to design, verify, simulate, execute, monitor and analyze the reconstruction process. It orchestrates the tasks of the reconstruction process and provides UI for all the key stakeholders of the process to cover all phases of the reconstruction. The tool interacts with the other BIMERR components thanks to the interaction with the BIF (BIMERR Integration Framework), providing models and workflow execution logs.

- Scan- to-BIM.** The Scan-to-BIM Tool is a software solution for the (semi-)automated generation of as-is Building Information Models of existing buildings from reality capture data (mainly 3D point clouds and pictures). The tool deploys innovative data processing techniques, including machine learning, to deliver IFC models that can be meaningfully used for assessing building energy performance assessment and planning refurbishment. The tool is developed using open-source technology and manipulates data in open formats (e.g. E57 and IFC). It receives digital documentation data from the site, by means of terrestrial laser scanners and photographic cameras. The outputted IFC model along with the input data is then stored in the BIMERR Interoperability Framework (BIF).
- Augmented Reality enabled In-situ Building Feature Annotation (ARIBFA).** The ARIBFA tool will be responsible for presenting BIM 3D visualisations and spatially annotated information on site during the renovation process to architects, contractors and building managers through an Augmented Reality (AR) interface. The main functionalities covered by ARIBFA involve the localization of the user in an indoor environment, based on which will be overlaid on top of the physical location of the building. Using object recognition methodologies, elements to be changed or worked upon during the renovation will be highlighted in the AR visualization, as well as Health and Safety annotations and designated work areas as defined in the daily work schedule. The main integrations of ARIBFA with other components include the 3D registration and tracking of the 3D model of the building design coming from the Scan-to-BIM component and the daily work schedule coming from the PWMA component. Access to the BIM models and Annotations are provided by the BIMERR Interoperability Framework as well as H&S notifications.
- Profiling Resident Usage of Building System (PRUBS).** The accuracy of a 3D zonal-type simulations based on widely used simulation engines (e.g EnergyPlus) is highly affected by the level of detail of its input data, where recent studies have shown that the occupant behaviour data consist the major cause of uncertainty in the building energy performance estimation results. Hence, having a deeper understanding and properly modelling the occupant behaviour have been of paramount importance within IEA EBC Annex 66, where data, methods and models have been developed and applied to understand and reduce the gap between simulated and measured building energy

performance by representing occupant behaviour in a standardized XML schema (obXML). PRUBS leverage the outcomes of Annex 66, adopting obXML as its populated data model, and applying Machine Learning algorithms on IoT data streams provided by a sensor network that will be designed and installed to the pilot sites, generates occupant behaviour profiles that mimic the inhabitants' actions. These profiles are subsequently used to project the building system (e.g. heating/cooling) utilization boundaries that lie within the comfort zone of the residents. For the occupant behaviour models training IoT streams data are requested. To receive the IoT streams data model, the PRUBS communicate with the BIMERR Middleware, which is in charge of the buildings sensorial data handling. As mentioned above, the PRUBS' output contains data-driven occupant behaviour models that populate an obXML file. That file is sent to BIMERR Interoperability Framework to be properly enriched and linked with other data, so that it can be used by the Building Energy Performance Estimation (BEPE) component of RenoDSS.

- Building Information Collection Application (BICA).** The Building Information Collection Application (BICA) is a smartphone application enabling building residents to provide complementary information (such as notes and photos) to the already recorded building information in the BIM, thus accelerating the overall collection of data required for the initial renovation scenario modelling process. Through BICA's UI, residents' can provide their input spontaneously on their home indoor/outdoor areas, or at the request of the building surveyors/engineers, in order to enrich the pre-designed as-is BIM model with energy related equipment, their characteristics, building's weak points, and other related hidden components within the building (pipes, cables, etc.) that they might be aware. In addition, through BICA, residents and owners can view health and safety (H&S) instructions related to the ongoing renovation processes within the building issued by the H&S managers, while they can also create new H&S issues, when they spot a possible H&S issue/hazard in the on-building-site. The BICA tool receives the building's BIM model from the BIMERR Interoperability Framework (BIF), in collaboration with the Building Semantic Modelling component (for just the semantic model) and the Building Information Secure Provisioning component (for the populated BIM model in accordance with the applicable BIM data access policies). The BICA app also receives data from the smartphone's image storage. Other

data is submitted by the resident through the BICA app. Upon collection of the resident's input, it is forwarded to the other BIMERR components/applications through BIF. The collected data is ingested by the Building Information Collection & Enrichment component through the APIs and wrappers of the BICA application. Data exchanges between BICA and other BIMERR components happen through the BIF.

- **BIMERR ontology network.** The BIMERR ontology network represents the semantic models that describe the different aspects of building renovation processes (e.g. energy efficiency, occupancy, building information models, etc.). Such models are defined following a modular approach, that is in the shape of a network, in which each domain (KPI, materials, building, etc.) could be reuse independently. The ontology network is implemented in OWL (Web Ontology Language) and available in different formats at <https://bimerr.iot.linkeddata.es/>. The BIMERR ontology network is aligned with the BIMERR data model used in the BIMERR Interoperability Framework (BIF) as backbone for the interoperability between BIMERR tools. Such alignment between the BIMERR ontologies and the BIMERR data models is ensured through a respective converter. The BIMERR ontology network is also used to generate the BIMERR knowledge graphs where externa data openly available are available and semantically annotated.
- **Building Energy Performance Estimation module (BEPE).** The utilization of Building Energy Performance Estimation (BEPE) simulation has gained significant attention recently that stems from its capability to accurately predict the energy performance of building sector under specific conditions. Among a wide range of calculation methodologies, the 3D zonal-type simulation approximation (e.g. EnergyPlus) is frequently used in many envisaged and practical use scenarios, as it manages to strike a balance between accuracy and computational complexity. However, 3D zonal-type BEPE models' preparation suffers from two major drawbacks: (1) the models' preparation is a very time-consuming process due to the difficulty to collect relevant information, often requiring more time than is available due to project's deadlines, and (2) it is a non-standardized process that produces BEP simulation models whose results can significantly vary from one modeler to another according to their experience. Within BIMERR, Industry Foundation Classes (IFC) files are used to streamline and expedite the collection of such information, while our BEPE approach introduce a methodology to automatically translate IFC to EnergyPlus input data, making the BEPE

simulation modelling process much more expedient and less vulnerable to modelling errors. BEPE module, as a component of the RenoDSS, is responsible for estimating the building energy performance before and after the renovation interventions under examination. It enables the RenoDSS user to explore various what-if scenarios, quickly run energy models (or simulations) to estimate the energy performance and fine-tune the interventions in order to explore the trade-offs. The BEPE module must be able to: (1) retrieve a notification/trigger message from RenoDSS that the data model for the baseline or a specific renovation scenario meets the BEPE module input data requirements and is stored in the data repository; (2) retrieve this data and apply a transformation process to populate the input data file of EnergyPlus; (3) given the input data file of EnergyPlus and the EPW of the building's location, invoke the EnergyPlus execution, output of which will be the energy KPIs; and (4) when the simulation run is finished, generate a JSON file as an output message (to be listened by the RenoDSS) that contains the energy KPIs values for the specific renovation scenario. All above consist the functional requirements of the BEPE module, highlighting the fact that it only interacts with the RenoDSS.

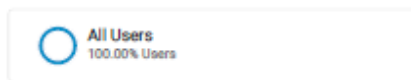
- **Building Information Secure Provisioning Tool (BISP).** The Building Information Secure Provisioning Tool aims to provide data protection, confidentiality and integrity for every dataset that is requested through the BIF. In this context, the following requirements of the BIMERR system must be taken under consideration: a) the potential users (data providers and data consumers) of the BIMERR framework, as well as their datasets, can be registered to (or removed from) to the BIMERR platform any time, requiring a dynamic mechanism of controlling data access and being agnostic to the underlying datasets respecting the relevant access policies of each party, b) the BIMERR platform must handle the access policies applied by each party and respond to any level of complexity they might by defined, c) address the need of interoperability of the BIF and provide the requested data to the format that is supported by the relevant data consumer. This component receives the query data from the Query Builder and consequently takes over and handles the access control procedures and the formulation of the query response. Once the response is ready, either the raw data of the query response or the well-defined query identifier will be sent to the Query Builder from where it can be viewed through the component's UI (for the different

stakeholders) or retrieved through its API (for future use by the BIMERR applications). Moreover, BISP interacts with the renovation-support tools in order to supply them the requested information structured in the requested manner.

#### 4.2.1.1.1 Project website analytics

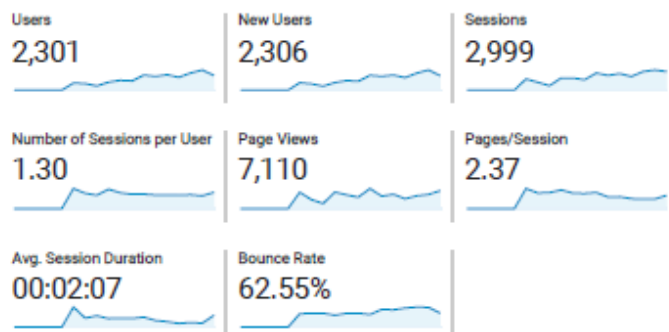
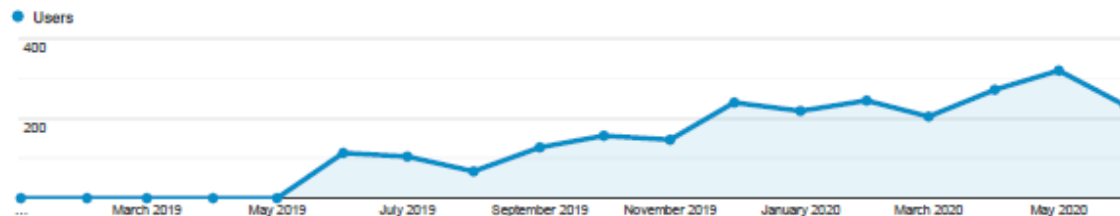
In the following Figure 22, the analytics of the website for the first 18 months of the project are presented:

## Audience Overview

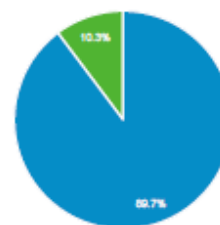


1 Jan 2019 - 22 Jun 2020

### Overview



■ New Visitor ■ Returning Visitor



Language	Users	% Users
1. en-us	1,090	47.29%
2. en-gb	318	13.80%
3. es-es	300	13.02%
4. el-gr	85	3.69%
5. pl-pl	82	3.56%
6. de-de	56	2.43%
7. "en-us"	47	2.04%
8. zh-cn	30	1.30%
9. es	25	1.08%
10. it-it	25	1.08%

Figure 22: BIMERR website analytics

#### **4.2.2 SOCIAL MEDIA**

The social media channels of the project were update with news and updates according to the feedback of partners. According to this update interval it was decided that the post KPI of the of the BIMERR social media channels in the quantified targets of Table 12, might not be reached, as it predicted a weekly update of the social media channels. Thus, in order to ensure the fulfillment of the relevant KPI, it was decided to create a social media posts timeline, in which each partner will be responsible to create a post for the social media channels each week. This procedure is analyzed in paragraph 4.3 Partners Roles. As a result, there is at least one update in the social media channels of the project each week.

In the following Figure 23 and Figure 24, screencasts of the social media updates can be seen.



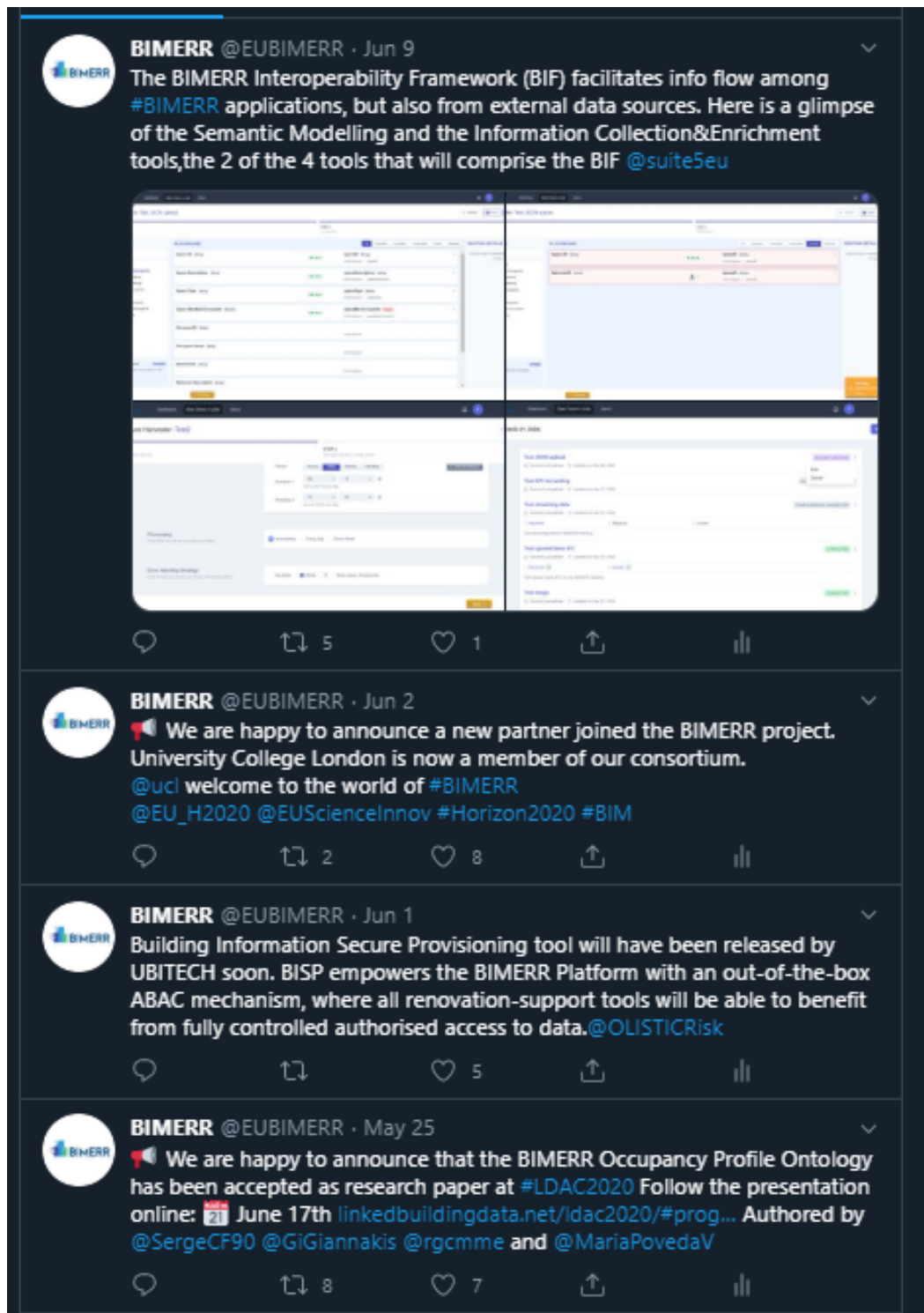
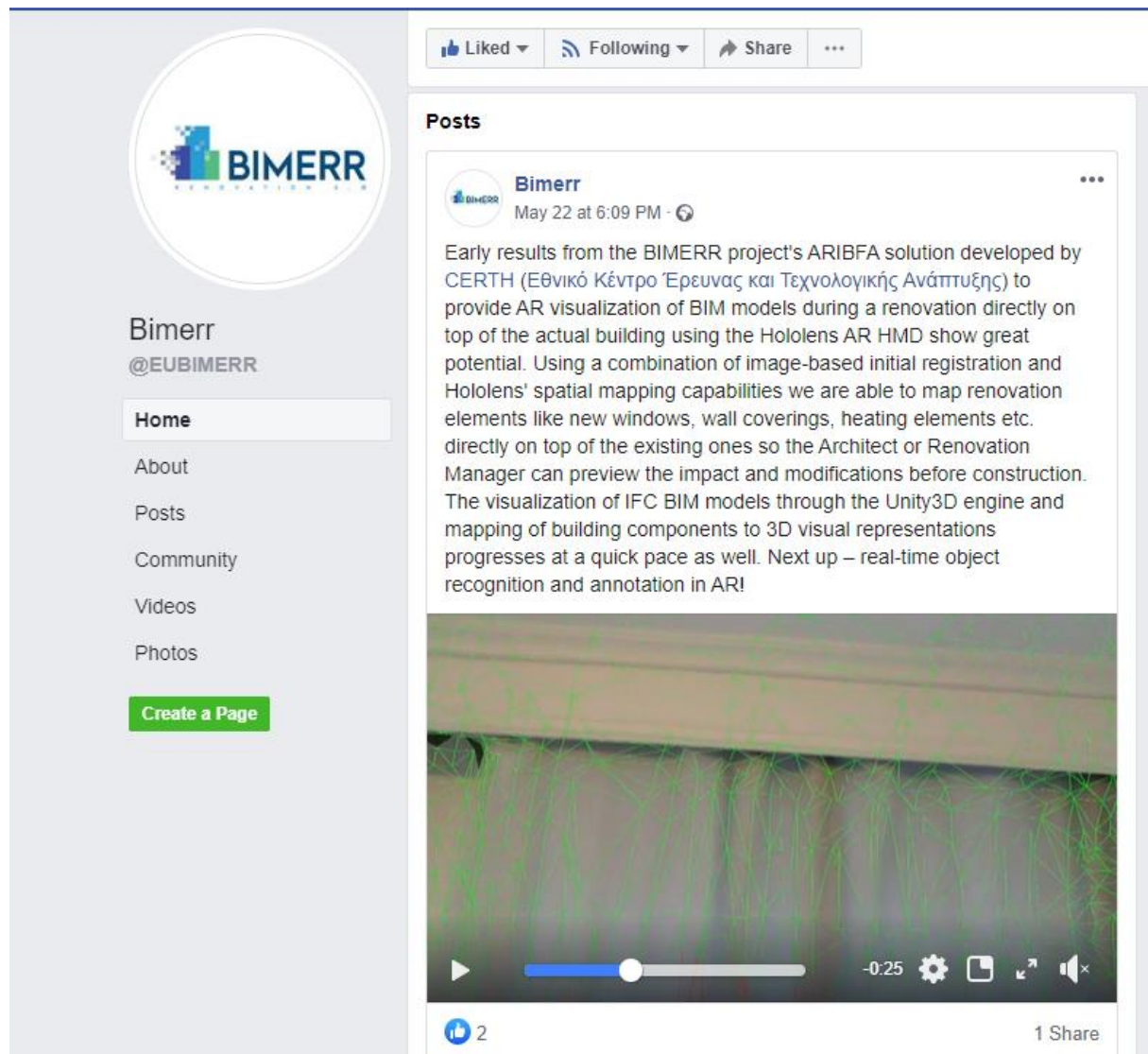


Figure 23: The project Twitter account with weekly updates.



**Figure 24: BIMERR Facebook account with updates**

### 4.2.3 NEWSLETTERS

During this period three newsletters were issued by the project. One in month 12 of the project (December 2019), one in month 17 (May 2020) and one in month 18 (June2020).

The first newsletter included general information about the project and presented the project "in a nutshell". Moreover, it provided details about the living lab activities and the latest news of the project. The format and the layout of the newsletter was common with the general

project layout and color picking. A screencast of the newsletter #1 is available in the following Figure 25, while the full newsletter can be seen in ANNEX II – Newsletter #1 (December 2019).



**Figure 25: Newsletter#1**

The second newsletter of the project included information about the BIMERR pilot sites, both the pre-validation and validation buildings, and an update about the project news. The format and the layout of the newsletter was the same as in the first one. A screencast of the newsletter

#2 is available in the following Figure 26, while the full newsletter can be seen in ANNEX III – Newsletter #2 (May 2020).



## BIMERR PILOT SITES

The BIMERR toolkit will be validated and demonstrated in 4 buildings in 3 European Member States in a 2-step approach. Firstly, a pre-validation phase will take place, and then a validation phase on real renovation sites will be executed.

### PRE-VALIDATION PHASE

The pre-validation phase will take place in actual buildings, which are however not going to be renovated. The intention is to use the BIMERR tools in a context that enables:

- full experimentation with the as-is digital building model creation tools and evaluation by comparing their results with digital models obtained from other sources and in-situ inspection.
- experimentation with the renovation-support tools using the digital models that will allow their users to assess the applicability to real-life situations, their usability and provide feedback to the development partners for improvements.

### Site 1: KRIPIS home – Thessaloniki, Greece

KRIPIS home, owned by CERTH, is a smart home facility, representative of a single-family detached residential building, equipped with IoT, Smart Home solutions which provide several layers of information about its operational characteristics. KRIPIS as the first Smart Near-Zero Energy Building in Greece, combines enhanced construction materials and intelligent ICT solutions creating a future-proof, sustainable and active testing, validating, and evaluating ecosystem.



The KRIPIS home



Figure 26: Newsletter #2

Finally, the third newsletter of the project, will be issued by the end of month 18 (June 2020), including information about the BIMERR tools and an update about the project latest project news.

#### **4.2.4 COMPLETED DISSEMINATION ACTIVITIES**

During the first 18 months of the project, the BIMERR partners participated in events and completed a series of activities, in order to promote and disseminate the project and its results. As already mentioned, during this period and due to the restrictive measures applied in Europe because of the COVID-19 outbreak, all the events organized from month 15 to month 18 of the project had to be cancelled or postponed. As a result, the consortium participated only in online events during this period, while the anticipated participation in events with physical presence had to be cancelled. In the following Table 15, information about the participation of BIMERR partners in events and about the completed dissemination activities are available.

**Table 15: Completed dissemination activities**

<b>Date of activity and Responsible partner</b>	<b>Type of activity</b>	<b>Place of event</b>	<b>Description of activity</b>	<b>Material (photos, slides, leaflets, etc.)</b>
03 Apr 2019 FIT	Event participation	Harvard Graduate School of Design	Lecture on "Design as a complex system". Discussed AI in Architecture and landscape design, paying attention to the questions and opportunities it brings. In particular for BIMERR, I presented our approach of sensors, using smart glasses, and a multitude of other tools to enrich BIM models so that we can simulate and	



			optimize the renovation process and lower costs.	
13 Feb 2019  BX	Press release	Internal Press Release and external publications based on BX Press Release	<p>Press release related to the participation of Budimex in the BIMERR project.</p> <p>The project was briefly described (goals, BIMERR tools, pilots sites and all partners were listed).</p> <p>Based on this press release, many media published a short information on web/magazine. The complete list with links and impact of this information is in the attached excel file.</p> <p>Language: Polish.</p>	<a href="#">Link</a>
26 May 2019  FER	Press release	Internal Press Release and external publications based on FER Press Release	<p>Press release related to the participation of FER in the BIMERR project and its start.</p> <p>The main objective of the press release was to define and describe the project and Ferrovial's responsibilities</p> <p>Language: Spanish</p>	
05 Jun 2019  UPM	Event participation	ESWC 2019, Portoroz, Slovenia	<p>BIMERR was presented in the Project Networking session of the 16th Extended Semantic Web Conference.</p> <p>Language: English</p>	
from 17 Jun 2019 to	Event participation	Lisbon, Portugal	Organization of the Linked Data in Architecture and Construction (LDAC2019)	<a href="#">Link 1</a>  <a href="#">Link 2</a>

21 Jun 2019	UPM		workshop and participation on the summer school.  This workshop is the main physical annual meeting point for LBD working group from the W3C and a venue to discuss with sibling projects.  <a href="http://www.linkedbuildingdata.net/ldac2019/">http://www.linkedbuildingdata.net/ldac2019/</a>	
21 Jul 2019	Press release  FER	Internal Press Release and external publications based on FER Press Release	Press release related to the participation of FER in the BIMERR project.  The aim of the second press release was to present the work that has been made regarding the organization of the first Requirement meetings (Living lab activities) with stakeholders from AEC industry  Language: Spanish	
30 Jul 2019	Press release  BOC	Press Release	Online press release about the role of BOC in the BIMERR project as one among many well-renowned and high-impact research projects.  Language: English, German	<a href="#">Link</a>
01 Aug 2019	In house presentation  UEDIN	University of Edinburgh - School of Engineering	BIMERR Banner printout placed in the Institute entrance	



05 Sep 2019  BOC	Other network s	Developme nt Space	Development space for BIMERR has been set up. Development spaces on ADOxx.org provide the possibility to discuss and share development resources with the community. Such spaces are available for different domains, projects, application scenarios and implementation aspects of modelling tools using the ADOxx metamodeling platform. Implementation resources for documentation, discussion forums, code-repositories, team environments are provided to the host of a space.	
13 Oct 2019  Conkat	In house presenta tion	Presentatio n to existing clients	In house presentation of BIMERR and its technologies to existing clients	
11 Dec 2019  UPM	In house presenta tion	COP25 Madrid	Dissemination of BIMERR goals within the UPM stand at the event through direct conversation to interested assistant. Presentation of the website in a TV and of the BIMERR brochure in an i-pad.  Language: Spanish	<a href="#">Link 1</a>  <a href="#">Link 2</a>
01 May 2020  UEDIN	Event participa tion	ISARC 2020	Abstract accepted and Full paper submitted	
31 May 2020  UPM	Event participa tion	Online	Organization of the International Workshop On Semantic Digital Twins (SeDiT 2020)	

01 Jun 2020 UEDIN	Paper submission	CIBSE Journal	Article introducing BIMERR and its objectives has been sent to the CIBSE Journal for consideration.	
03 Jun 2020 UPM	Event participation	Online	Include BIMERR logo + description in LDAC2020 participants information sheet to be shared with all participants and online.	<a href="#">Link</a>
03 Jun 2020 UPM	Event participation	Online	Organization of the International Workshop On Semantic Digital Twins (SeDiT 2020) and Post on social media about SeDiT2020 (link to workshop website with BIMERR logo)	<a href="#">Link</a>
04 Jun 2020 BX	In-house presentation	The poster about meeting	The poster about information meeting (on platform zoom) for residents from pilot building in Warsaw (Poland).  Language: Polish	<a href="#">Link</a>
17 Jun 2020 BX	In-house presentation	The poster about meeting	The poster about information meeting (on Wiarusów Street) for residents from pilot building in Warsaw (Poland).  Language: Polish	<a href="#">Link</a>
from 17 Jun 2020 to 19 Jun 2020 UPM	Event participation	Online	Organization of the Linked Data in Architecture and Construction (LDAC2020) workshop.	<a href="#">Link</a>

#### 4.2.5 PUBLICATIONS

In the following Table 16, the publications of the project are presented:

**Table 16: BIMERR publications**

<b>Partner</b>	<b>Action</b>	<b>Title</b>	<b>Link</b>
Freddy Priyatna (UPM)	Paper published for the "Semantic Web, Volume 11, Number 1 / 2020. Special Issue 10-years Semantic Web journal."	Corcho, Oscar, Freddy Priyatna, and David Chaves-Fraga. "Towards a new generation of ontology-based data access." Semantic Web Preprint (2019): 1-8.	<a href="#">Link</a>
Maria Poveda (UPM) Serge Chavez (UPM) Raul Garcia Castro (UPM) Giorgos Gianakis (HYP)	Presentation of the accepted paper at LDAC "From obXML to the OP Ontology: Developing a Semantic Model for Occupancy Profile"	BIMERR Occupancy Profile Ontology	<a href="#">Link</a>

## **4.3 PARTNERS ROLES – PROCEDURES**

### **4.3.1 EVENTS PARTICIPATION PROCEDURE**

During the project implementation it was observed that concise directions about participation in dissemination activities should be provided to partners and create a clear internal procedure, for events participation.

Thus, it was decided that the procedure that every partner should follow for publications and participation in future events should be:

- Partners who want to participate in a dissemination event, send an email with a short description/argumentation to the PC and to MERIT.
- If MERIT does not object, the request is deemed granted.

- If MERIT objects, then the PC will have final decision (if necessary, after consulting the Technical Manager and the Scientific Manager)

#### **4.3.2 SOCIAL MEDIA POSTS TIMELINE**

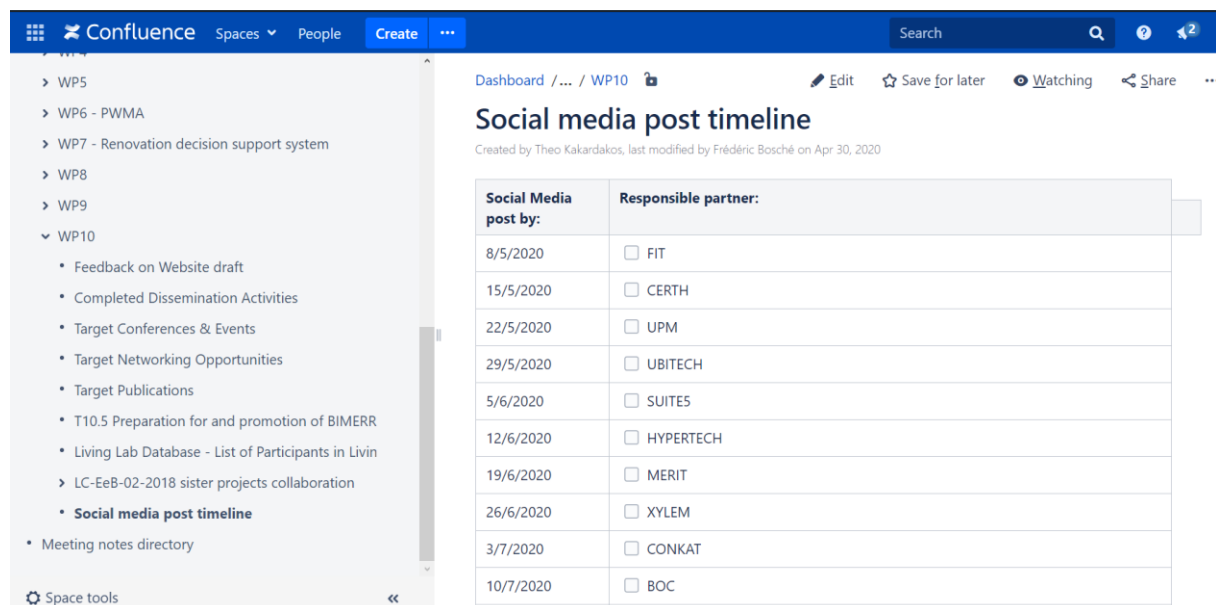
As it can be deduced by the posts KPI of the BIMERR social media channels in the quantified targets of Table 12, they should be updated in a weekly basis, in order to reach the relevant target. To this end, it was decided that all partners will be triggered to participate in this task and thus, a list with the responsible partner for the “post of the week”, has been created starting from May 8th 2020. This list has been uploaded in the confluence relevant page, under the WP10 activities in the project repository, in order to be accessed by all partners. Through this mechanism, every Friday one partner will be responsible to send a social media post to the dissemination and communication manager of the project, which will be then posted in the relevant channel. All partners will participate according to the plan, contributing periodically and seven times in total during the project lifecycle, for each partner.

Some examples of inputs that could be provided are:

- A possible post/Tweet with updates/news on the progress of the partner’s work.
- A link to a video related to the progress of the BIMERR project
- A link to a relevant article/studies or news for the BIMERR project (1-2 sentences)
- Participation in event or conference (also including photos and basic info of the event)

The messages should in any case, be short and effective in order to maximize its impact.

In the following Figure 27, a screencast of the social media post timeline, as uploaded in the confluence repository is presented. The full timeline can be found in ANNEX I



Social Media post by:	Responsible partner:
8/5/2020	<input type="checkbox"/> FIT
15/5/2020	<input type="checkbox"/> CERTH
22/5/2020	<input type="checkbox"/> UPM
29/5/2020	<input type="checkbox"/> UBITECH
5/6/2020	<input type="checkbox"/> SUITE5
12/6/2020	<input type="checkbox"/> HYPERTECH
19/6/2020	<input type="checkbox"/> MERIT
26/6/2020	<input type="checkbox"/> XYLEM
3/7/2020	<input type="checkbox"/> CONKAT
10/7/2020	<input type="checkbox"/> BOC

**Figure 27: Screencast of the social media post timeline.**

#### 4.4 ANTICIPATED ACTIONS FOR THE NEXT PERIOD

For the next period of the project, according to the dissemination and communication plan a series of actions should be implemented.

During months 18-30 of the project the content of the BIMERR website will be regularly updated and project information will be uploaded on the social media, by all partners, according to the social media posts timeline. Moreover, in the next period another three newsletters are predicted to be created, describing the progress of the project, and sharing the updates in technology development and pilot sites implementation. Those newsletters would be issued by the end of months 22, 26 and 30 of the project, and will be uploaded in the project website and distributed to all project partners and to the created mailing list. This list will be created by voluntary registration of individuals, through the newsletter registration form of the project website.

In addition, during the above-mentioned period, the second versions of the project brochure, poster and roll-up should be issued. In those versions, updated information about the development of project technologies will be included, while more detailed information about the pilot sites could be described.

Moreover, before the end of the next period, by month 30, the first version of the project leaflet should be released. This leaflet will describe the key project achievements and will promote the relevant content, as it will be used for communication purposes. Press releases will be published in regular interval, by all partners, for every important milestone or project achievement.

Finally, the participation in external events, will depend on the restrictions applied due to the health crisis. Because of the COVID-19 outbreak, all the planned events of the next months which include physical presence, are cancelled or postponed. As a result, no specific planning for such events participation could be done for the next period, while only participation planning in online events can be established. As a result, a risk has arisen regarding the specified KPI for events participation. This risk, along with the mitigation measures, will be analysed in paragraph 6 Risk Assessment. Those mitigation measures include participation in online events, which have replaced the events with physical presence during the health crisis period, and double effort from the consortium when the restrictive measures are eased, in order to reach the relevant KPI. Thus, to fulfill this target, a specific changed table has been recently created in the confluence common sharing space, in which each partner can contribute with target future events, including now also those held online. In this table partners should include a detailed description of the event and a mandatory description of the proposed activities by the BIMERR project in this event. The first version of this table is presented in the following Table 17 and will be continuously updated according to the changes caused by the different restrictive measures.

**Table 17: Proposed thematic events list**

<b>Name of event</b>	<b>Location</b>	<b>Date(s)</b>	<b>Website</b>	<b>Proposed activities</b>
8th Linked Data in Architecture and Construction Workshop	Online	17-19 June 2020	<a href="#">Link</a>	Project presentation, paper submission, publication

EU sustainable energy week	Online	22-26 June 2020	<a href="#">Link</a>	Participation in forums, presentation of the project, paper submission, publication
International Conference on Smart Design, Construction IT and BIM (ICDCB)	Online?	Postponed	<a href="#">Link</a>	Project presentation, participation in forums, paper submission, publication
International Conference On Embedded Computer Systems: Architectures, Modeling And Simulation	Samos, Greece?/ online	Postponed	<a href="#">Link</a>	Project presentation and stand/poster, participation in forums, leaflet distribution, paper submission, publication
ISARC 2020	Online	26-30 Oct 2020	<a href="#">Link</a>	Project presentation, participation in forums, paper submission, publication
EU sustainable places	Online	27-30 Oct 2020	<a href="#">Link</a>	Project presentation and stand/poster, participation in forums or workshops, leaflet distribution, paper submission, publication
BIM in Infrastructure Construction	Cologne, Germany	08-09 Nov 2020	<a href="#">Link</a>	Project presentation and stand/poster, participation in forums, leaflet distribution,

BIM & Digital Construction Summit	London, UK	18-19 Nov 2020	<a href="#">Link</a>	Project presentation and stand/poster, participation in forums, leaflet distribution, paper submission, publication
BIM World	Munich, Germany	24 - 25 Nov 2020	<a href="#">Link</a>	Project presentation and stand/poster, paper submission, publication
European, Mediterranean and Middle Eastern Conference on Information Systems (EMCIS)	Online	25 -26 Nov 2020	<a href="#">Link</a>	Project presentation and stand/poster, paper submission, publication
Digital construction week	London, UK	19-20 May 2020	<a href="#">Link</a>	Project presentation and stand/poster, participation in forums, leaflet distribution, paper submission, publication
9th Linked Data in Architecture and Construction Workshop	Lisbon, Portugal?	June 2021	<a href="#">Link</a>	Project presentation, paper submission, publication



## 5. MONITORING OF DISSEMINATION AND COMMUNICATION ACTIVITIES

### 5.1 THE MONITORING PROCESS

One of the most important factors for the success of the communication and dissemination strategy & action plan of BIMERR is the establishment of clear and evidence-based monitoring, evaluation, and follow-up framework. It is crucial for all BIMERR partners to know how to evaluate the communication and dissemination plan in the context of certain key performance indicators (KPIs).



These KPIs have to be monitored and assessed during the whole life cycle of the project and the Dissemination and Communication Manager (Merit Consulting House sprl.) is responsible for setting the rules, the guidelines and the methods for achieving the desired and pre-defined KPIs in accordance to, both the special needs of target groups and each phase (period) of BIMERR.

The whole process is continuously fed by the BIMERR target groups, whose role is essential for receiving feedback on qualitative and quantitative aspects of the informative content and the communicated message during each phase of the project. Through this procedure, any necessary improvement action will be communicated on time to all partners by the Dissemination and Communication Manager to discuss, design, update and include them to upcoming BIMERR dissemination and communication activities.

Important part of the dissemination roadmap is to monitor the effectiveness and to quantify the agreed to implemented actions. Therefore, the set of Key Performance Indicators (KPIs) is serving as the monitoring tool during reviewing of the performance of BIMERR's dissemination plan. In specific intervals, these metrics will be reviewed and where required will be updated to outline the success grade of dissemination methodology. Each individual activity will be linked to a dedicated KPI to ensure the progress of the activity and evaluate whether further action is required to guarantee success. In that way, the overall robustness is assessed, and all errors

can be spotted, analyzed and mitigated to ensure the ultimate goal of the roadmap plan. The here presented KPIs and monitoring procedure constitute an initial draft.

## 5.2 KEY PERFORMANCE INDICATORS (KPIs) DEFINITION

The key performance indicators in BIMERR are based on European Commission's requirements. They concern the following actions:

- |   |  |
|---|--|
| - Organization of conference                    | - Participation to a conference          |
| - Organization of a workshop                    | - Participation to a workshop            |
| - Press release                                 | - Participation to an event other than a |
| - Non-scientific, non-peer reviewed publication | conference or a workshop                 |
| - Exhibition                                    | - video/film                             |
| - Flyer   | - Brokerage event                        |
| - Training                                      | - Pitch event                            |
| - Social media                                  | - Trade fair                             |
| - Website                                       | - Participation in activities organized  |
| - Communication campaign (radio, TV)            | jointly with other H2020 projects        |
|   | - Other                                  |

## 5.3 KPIs MEASUREMENT TOOLS AND MEANS

To assess and review the defined KPIs, the following measurement tools have been identified:

- Website's overall analytics tool: gather data on the number of users, origin, visit duration and preferred domains over up to three months ahead.
- Twitter statistics to review the popularity of BIMERR's tweets and to measure the number of followers, the overall number of posts, the number of impressions of each post on a 28-day period and to calculate the average impressions of all posts in a four-week period.

- LinkedIn statistics to monitor the views and check the number of followers and the number of impressions of each post.
- Facebook statistics to assess the engagement with the public and get data on the number of likes, shares and followers of BIMERR's profile on a 28-day period and get an understanding on the impact of the posts in a four-week period.
- Living Lab assessment: A Living Lab assessment form will be distributed to participants in all BIMERR Living Lab activities.
- Google analytics: the Google Analytics tool is essential in monitoring and reviewing the performance of the social media platforms for both communication and dissemination purposes.

Together with its website, BIMERR has established LinkedIn, Facebook, and Twitter accounts to connect with the market and the general public, raise awareness for the project progress and share findings and results when ready to be published. The measurement and monitoring of these tools will be conducted through Google Analytics.

#### 5.4 PROGRESS TOWARDS SPECIFIED KPIs

The following Table 18 compares the dissemination and communication quantified targets of the project, as presented in Table 12 with the current performance in month 18 of the project and will be updated in the next version of dissemination and communication plan and associated material, in M30.

**Table 18: Dissemination and communication targets Vs current status**

<b>Dissemination Mechanism</b>	<b>Description</b>	<b>Accumulative Target for Phase I &amp; II (M01 - M18)</b>	<b>Status in month 18</b>
Living labs	Nr of events	6	<b>3</b>
Project website	Nr of unique visitors	1500	<b>2301</b>
	Average duration of visits	>2 min	<b>02:07</b>

	Nr of page views	5000	<b>7110</b>
Social Media (Twitter, Facebook, LinkedIn)	Nr of followers	200	<b>178</b>
	Nr of posts	50	<b>57</b>
	Nr of retweets/reposts/comments	50	<b>77</b>
Scientific publications	Nr of unique publications	3	<b>2</b>
Participation in fora and thematic events	number of events	10	<b>8</b>
Contributions to standards	nr of events/workshops/presences	0	<b>0</b>
Liaison with Professional communities and networks	Nr of events/workshops/TelCo /presentations	1	<b>0</b>
Presentations in other networks and groups	Nr of presentations	3	<b>1</b>
In house presentations to existing clients and brainstorming for extending BIMERR solutions to other applications and markets	Nr of organized events	4	<b>5</b>
Promotional Content and Dissemination Material (leaflets, brochure, roll-up, poster, press-release, and newsletter)	brochure	1	<b>1</b>
	newsletter	3	<b>3</b>
	Press release	4	<b>4</b>
	poster	1	<b>1</b>
	roll-up	1	<b>1</b>
	leaflet	0	<b>0</b>

## 5.5 PROGRESS ASSESSMENT

According to the results of dissemination and communication activities current status towards the specified targets, as presented in Table 18, it can be concluded pre dissemination mechanism:

### LIVING LABS

For this period, it was anticipated from the DCP, that 6 living lab events should have taken place in the pilot sites. In contrary, due to the restrictions applied over Europe because of the health crisis, the second round of living lab workshops on pilot sites wasn't able to be executed, since physical presence of the participants was required, according to our planning. As a result, only the first round of living lab workshops was possible to be executed. Thus, in total 3 workshops took place, and the rest 3 will be organized after month 20 of the project, when it is anticipated that the restrictive measures will have been eased. If there are still restrictive measures in place, the consortium will switch to online events for those workshops. More details about the living lab activities will be available in deliverable 10.7 which will be submitted by month 32 of the project.

### PROJECT WEBSITE

Regarding the project website data, as extracted from the analytics, the results are more than satisfactory, since the results are way above the intimate targets set for this period. The major parameter that needs to be under constant surveillance, is the average duration of visits, as it needs to be increased in the next period to 3 minutes.

### SOCIAL MEDIA (TWITTER, FACEBOOK, LINKEDIN)

About the social media accounts, the actual number of followers is slightly below the intermediate target we have set in the DCP for this period. Nevertheless, this number will very likely rise, when first results from the pilot houses are published and more concrete results of the BIMERR tools development will be available. Moreover, an internal campaign will take place between consortium partners, to trigger everyone follow the official BIMERR accounts and also

disseminate them to friends, colleagues and other relevant stakeholders. The rest quantified results of social media are above the targets, indicating that the impact of the BIMERR activity in this channel remains higher than predicted.

## **SCIENTIFIC PUBLICATIONS**

As for the scientific publications, for this first period of the project, two publications were approved while one more is under evaluation. This number is lower than the intermediate target for this period, which was to have 3 publications. This result is not considered to be a critical danger, as in this phase of the project the main technologies are still under development and no final results are available. It is expected in the next period that the number of publications will increase, and the targets will be met.

## **PARTICIPATION IN FORA AND THEMATIC EVENTS**

During this first period, it was anticipated that the consortium will have participated in 10 external thematic events or fora. Yet, during this period consortium partners participated in 8 events. The reason for this deviation from the initial plan, is that in the first half of 2020, a lot of events had to be cancelled or postponed, due to the restrictions applied because of the health crisis. To overcome this barrier, consortium partners will switch to online events and put double effort in the next period, to cover the target. Finally, as presented in Table 17, a lot of events that was organized for the second quarter of 2020, had been moved to the autumn of this year and thus, increased participation in events expected, that will cover this difference.

## **CONTRIBUTIONS TO STANDARDS**

No intermediate target was set for this period, as the project is still in the development phase and the relevant task 10.5 begins in month 18.

## **LIAISON WITH PROFESSIONAL COMMUNITIES AND NETWORKS**

For this period, it was predicted that one event should have taken place for liaison with professional communities and networks. Yet the planning had to be postponed and the arrangements to be changed, due to the health crisis. As a result, this target is expected to be covered in the next period.

## **PRESENTATIONS IN OTHER NETWORKS AND GROUPS**

Regarding the Presentations in other networks and groups, again due to the health crisis, the actual performance was lower than the intermediate target we have set. Nevertheless, in the next period double effort will be put by the consortium partners and the target is expected to be reached.

## **IN HOUSE PRESENTATIONS**

As for the in-house presentations to existing clients and brainstorming for extending BIMERR solutions to other applications and markets, the performance of the consortium partners during this period, was above the quantified target, despite the restrictions during 2020.

## **PROMOTIONAL CONTENT AND DISSEMINATION MATERIAL**

Finally, the production of promotional content and dissemination material for this period, ran according to the plan and all the material foreseen in the DCP was produced.

## 6. RISK ASSESSMENT

### 6.1 INTERDEPENDENCIES BETWEEN PROJECT WPs, OUTCOMES, DISSEMINATION AND COMMUNICATION ACTIVITIES

As referred in the risk assessment plan of this report, there is a risk of delayed development of project technologies, which may lead to deviations from the dissemination plan, since there is dependency between some actions, work packages and milestones of the project and the dissemination activities. The reason is that after the first half of the project, dissemination activities need to present some solid results of the project and hence the technologies need to be fully developed. To mitigate that risk, all interdependencies were identified in the first phase of the project, so that they can be constantly monitored, and supplementary actions can be taken timely. Those interdependencies are presented in the following Table 19:

**Table 19: BIMERR Interdependencies**

WP	Project Outcome	Time	Depended dissemination Activity
WP3	Milestone 2: BIMERR system architecture definition	M12	The system architecture must be defined on time in order to take into account its results for the 2 <sup>nd</sup> version of BIMERR dissemination and communication plan in month 18
WP4	Finalization of the BIMERR semantic interoperability framework	M18	The BIMERR semantic interoperability framework must be defined on time as its results are necessary for the 2 <sup>nd</sup> version of BIMERR dissemination and communication plan in month 18
WP5 WP6 WP7	Finalization of BIMERR tools (Scan to BIM, renovation workflow management and automation module, augmented reality app for BIM enrichment and for on-site support, process management tools, end-user app and renovation decision support system)	M23	The finalization of BIMERR tools needs to be done on time, as they will be disseminated as project outcomes and thus, need to be functional and reliable by then.



WP8	Pre-validation activities	M30	Pre-validation activities need to be completed by month 30, as predicted, in order to share the results in dissemination activities, but also use the results to organize the final workshops with the end-users and the training activities.
WP9	Validation activities	M40	Validation activities must have extracted solid results by month 40, with the scope to disseminate, in the last phase of the project, the final results and the assessment of the project technologies. Moreover, those results will be needed for the stakeholder requirement assessment and the training activities.
WP9	MS6: BIMERR validation and evaluation	M42	The BIMERR validation must be completed and relevant recommendations must be extracted and delivered on time, in order to be used for the best practice documentation.

## 6.2 RISK ASSESSMENT METHODOLOGY

The risk assessment analysis presented here has been performed according to the Risk Matrix reported in Table 20. More in detail various combinations of likelihood and severity are collected and by those the associated "judgement" of risk tolerability is extracted. The risks identified are ranked according to the expected frequency of event occurrence (likelihood) from A (practically not credible) to F (frequent) and also according to the potential associated consequences (Severity) from 1 (minimum effect) to 5 (major effect), based on the following Risk Assessment Matrix (see Table 20).

**Table 20: RISK Methodology - MATRIX**

Frequency \ Consequence	A Practically not credible	B Rare	C Unlikely	D Credible	E Probable	F Likely/Frequent
1 - Minimum						
2 - Slight		Tolerable				
3 - Medium			ALARP			
4 - Severe				Intolerable		
5 - Major						

As a result, the purpose of the risk assessment is to classify hazards as being low, medium or high, in order to identify the need for further mitigation measures and to classify effectiveness of the proposed solutions.

Following that and based on the risk ranking, the different classifications of the risks are:

- Low Risk (Green area): The level of risk is generally acceptable, and it only requires standard monitoring to prevent any future deterioration.
- Medium Risk (Yellow Region): The level of risk is generally acceptable provided that implementation of additional measures is disproportionate to the benefit gained (As Low as Reasonably Practicable principle - ALARP).
- High risk (Red Region): The level of risk in this region is not acceptable "as is" and risk control-mitigation measures are necessary to reduce risk.

### 6.2.1 RISK REGISTER AND CLASSIFICATION

According to the methodology presented above, the risks for the dissemination and communication of the project are presented and classified in the following Table 21:

**Table 21: Risk Register and Classification**

Risk Identification	Actor / WHO	Frequency	Consequence	Classification
Limited acceptance of project results by the end-users	Consortium – End users	D - Credible	3- Medium	ALARP
Delayed development of project technologies which will cause deviations in dissemination plan	Consortium	C - Unlikely	3- Medium	ALARP
Limited participation of end-users and stakeholders in the User-Centric Design approach (living labs, workshops, etc.)	Consortium – End users	E - Probable	4 - Severe	Intolerable
Low participation of audience in dissemination events	Consortium - Audience	C - Unlikely	3- Medium	ALARP
Consortium partners not participating in the dissemination activities	Consortium	C - Unlikely	2- Slight	Tolerable
Technology partners not familiar with dissemination / unable to follow dissemination due to lack of expertise	Consortium	D - Credible	2- Slight	ALARP
Low quality of dissemination material	Dissemination leader	B - Rare	3- Medium	Tolerable
Lower than expected website and social media traffic	Consortium	E - Probable	2- Slight	ALARP
Project dissemination KPI's not reached	Consortium	D - Credible	3- Medium	ALARP
Wrong identification of target audiences	Dissemination leader	C - Unlikely	3- Medium	ALARP
Incorrect usage of dissemination channels / wrong identification of dissemination channel per target audience	Dissemination leader	C - Unlikely	3- Medium	ALARP

Risk Identification	Actor / WHO	Frequency	Consequence	Classification
Incorrect main message identification per target audience and/or per dissemination channel	Dissemination leader	D -Credible	3- Medium	ALARP
A significant number of dissemination events will have to be cancelled due to restrictions applied in Europe because of health crisis or other force majeure causes	Consortium	F - Likely	3- Medium	Intolerable

### 6.2.2 RISK MITIGATION

For the risks classified as ALARP and intolerable, mitigation actions need be taken to control the risks. Those actions per risk are presented in the following Table 22:

**Table 22: Risk Mitigation**

Risk	Risk Mitigation / HOW	Responsible for risk mitigation / WHO	Timeline / WHEN
Limited acceptance of project results by the end-users	Well defined user requirements definition and baseline, along with cost-benefit validation of the solution. The Technical Manager and Dissemination and Exploitation Manager will follow up and monitor the user requirements accomplishment to ensure methodological vigilance.	Technical Manager, Dissemination and Exploitation Manager, consortium	During project duration
Delayed development of project technologies which will cause deviations in dissemination plan	The Interdependencies Between Project WPs & Outcomes & Dissemination & Communication Activities will be identified within this report and it will be monitored constantly for the "on-time" implementation by the DEM	Technical Manager, Dissemination and Exploitation Manager, coordinator	During project duration

Risk	Risk Mitigation / HOW	Responsible for risk mitigation / WHO	Timeline / WHEN
Limited participation of end-users and stakeholders in the User-Centric Design approach (living labs, workshops, etc.)	To mitigate that risk, the living lab activities of the project will begin early enough in the project, to create enough space for end-user's engagement. Moreover, the workshops will be organized by the pilot partners to maximize attendance using their already existing channels and the key construction stakeholders they already have as contacts. Finally, all project events will be hosted at an appropriate location and time in order to maximize attendance – especially by attendees external to the consortium.	Dissemination and Exploitation Manager, coordinator	During living lab activities
Low participation of audience in dissemination events	All project events are predicted to be hosted at an appropriate location and time to maximize attendance.	Dissemination and Exploitation Manager, coordinator	During project duration
Technology partners not familiar with dissemination / unable to follow dissemination due to lack of expertise	The dissemination plan described in this report will support all partners with lack of experience in dissemination and will act as a handbook for the tasks they need to carry out. Moreover, the DEM will be available to support any partner needed.	Dissemination and Exploitation Manager, coordinator	During project duration
Lower than expected website and social media traffic	The traffic of the website and social media will be constantly monitored (through Google analytics and other tools) and actions will be taken if the traffic is below target.	Dissemination and Exploitation Manager	During project duration

Risk	Risk Mitigation / HOW	Responsible for risk mitigation / WHO	Timeline / WHEN
Project dissemination KPI's not reached	The performance towards the KPI's will be constantly monitored and measures will be taken, if needed, in the 3 <sup>rd</sup> version of BIMERR dissemination and communication plan in month 30 if deviations are observed.	Dissemination and Exploitation Manager	Month 30
Wrong identification of target audiences	The target audiences will be identified early in the project and will be updated, if needed in the 3 <sup>rd</sup> version of BIMERR dissemination and communication plan in month 30, to become more accurate.	Dissemination and Exploitation Manager	Month 30
Incorrect usage of dissemination channels / wrong identification of dissemination channel per target audience	The best practices will be used towards the identification of the best dissemination channel per target audience and the performance will be constantly monitored. If changes needed, they will be implemented in the 3 <sup>rd</sup> version of BIMERR dissemination and communication plan in month 30.	Dissemination and Exploitation Manager	Month 30
Incorrect main message identification per target audience and/or per dissemination channel	The performance of the main dissemination message per audience and per channel will be constantly monitored and will be adjusted accordingly to maximize its efficiency.	Dissemination and Exploitation Manager	During project duration
A significant number of dissemination events will have to be cancelled due to restrictions applied in Europe because of health crisis or other force majeure causes	The consortium will constantly monitor the updates due to health or any other crisis. If an important number of events are cancelled the consortium will find alternative channels to disseminate and communicate the project, from online similar events. Moreover, double effort	Consortium	During project duration

Risk	Risk Mitigation / HOW	Responsible for risk mitigation / WHO	Timeline / WHEN
	will be put when restrictions are lifted, to reach the relevant KPIs		

## 7. CONCLUSIONS

The main aim of this report was to update the specific dissemination and communication action plan, and to present the activities that took place during the first 18 months of the project. In parallel, this report was aiming to specify the updated quantified targets and Key Performance Indicators (KPI's), which constitute the means of evaluation and assessment for the performed activities. In addition, a main target was to evaluate and assess activities presented in this report, towards those specified targets, providing recommended future actions and activities to improve the dissemination and communication of the project and its results.

To this end, this report tackled the targets by presenting in detail all the updates in the dissemination and communication plan, the performed activities during the first 18 months of the project, and the assessment of those activities towards the specified KPI's.

In conclusion, during the first 18 months of the project, the major anticipated activities were implemented according to the plan, excluding the deviations caused by the health crisis, that had an impact in the execution of some events, as analyzed in this report. To reduce the risk of not achieving some quantified targets, because of this, mitigation actions were presented in this report. Those include among others, participation in online events and double effort in the next period when the restrictive measures will have eased and the events will start again.

Finally, this report will be updated in month 30 of the project (June 2021) with the submission of deliverable 10.4 "BIMERR dissemination and communication plan and associated material 3", which will include the updated dissemination and communication plan, the description and evaluation of actions from month 19 to month 30 and the planned actions for the last phase of the project.



## ANNEX I: SOCIAL MEDIA POSTS TIMELINE

Social Media post by:	Responsible partner:
8/5/2020	FIT
15/5/2020	CERTH
22/5/2020	UPM
29/5/2020	UBITECH
5/6/2020	SUITE5
12/6/2020	HYPERTech
19/6/2020	MERIT
26/6/2020	XYLEM
3/7/2020	CONKAT
10/7/2020	BOC
17/7/2020	BX
24/7/2020	FER
31/7/2020	UOP
7/8/2020	UEDIN
14/8/2020	NT
21/8/2020	UCL
28/8/2020	FIT
4/9/2020	CERTH
11/9/2020	UPM
18/9/2020	UBITECH
25/9/2020	SUITE5
2/10/2020	HYPERTech
9/10/2020	MERIT
16/10/2020	XYLEM
23/10/2020	CONKAT
30/10/2020	BOC
6/11/2020	BX
13/11/2020	FER
20/11/2020	UOP
27/11/2020	UEDIN
4/12/2020	NT
11/12/2020	UCL

18/12/2020	FIT
25/12/2020	CERTH
1/1/2021	UPM
8/1/2021	UBITECH
15/1/2021	SUITE5
22/1/2021	HYPERTech
29/1/2021	MERIT
5/2/2021	XYLEM
12/2/2021	CONKAT
19/2/2021	BOC
26/2/2021	BX
5/3/2021	FER
12/3/2021	UOP
19/3/2021	UEDIN
26/3/2021	NT
2/4/2021	UCL
9/4/2021	FIT
16/4/2021	CERTH
23/4/2021	UPM
30/4/2021	UBITECH
7/5/2021	SUITE5
14/5/2021	HYPERTech
21/5/2021	MERIT
28/5/2021	XYLEM
4/6/2021	CONKAT
11/6/2021	BOC
18/6/2021	BX
25/6/2021	FER
2/7/2021	UOP
9/7/2021	UEDIN
16/7/2021	NT
23/7/2021	UCL
30/7/2021	FIT
6/8/2021	CERTH
13/8/2021	UPM
20/8/2021	UBITECH
27/8/2021	SUITE5
3/9/2021	HYPERTech

10/9/2021	MERIT
17/9/2021	XYLEM
24/9/2021	CONKAT
1/10/2021	BOC
8/10/2021	BX
15/10/2021	FER
22/10/2021	UOP
29/10/2021	UEDIN
5/11/2021	NT
12/11/2021	UCL
19/11/2021	FIT
26/11/2021	CERTH
3/12/2021	UPM
10/12/2021	UBITECH
17/12/2021	SUITE5
24/12/2021	HYPERTech
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25/2/2022	NT
4/3/2022	UCL
11/3/2022	FIT
18/3/2022	CERTH
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29/4/2022	XYLEM
6/5/2022	CONKAT
13/5/2022	BOC
20/5/2022	BX
27/5/2022	FER

3/6/2022	UOP
10/6/2022	UEDIN
17/6/2022	NT
24/6/2022	UCL

## ANNEX II – NEWSLETTER #1 (DECEMBER 2019)



### In a nutshell

BIMERR is related to the Building Information Modelling (BIM) and its main target are stakeholders from the AEC (Architecture, Engineering & Construction) field. The project has the intention to design and develop a new toolkit to support renovation stakeholders during the renovation process of existing buildings, from concept to delivery. It should comprise of various tools:

- An automated creation of enhanced building information models
- A renovation decision support system to aid the designer in exploring available renovation options through an accurate estimation of renovation impact on building performance
- A process management tool which will optimize the design and on-site construction process toward optimal coordination and minimization of renovation time and cost.
- Finally, the project is about an interoperability framework among BIMERR tools as well as with third-party legacy ICT tools in order to enable seamless BIM creation and information exchange among AEC stakeholders in an effort to enhance the rapid adoption of BIM in the renovation of the existing building stock in the EU countries, as a start.



### ABOUT THE PROJECT



## BIMERR

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 820621

Call Identifier: LC-EEB-02-2018



Building Information Modelling is a critical element in the digitalization of the construction industry, which is necessary in order to unleash huge efficiency and productivity improvements. BIMERR will design and develop a Renovation 4.0 toolkit which will comprise tools to support renovation stakeholders throughout the renovation process of existing buildings, from project conception to delivery. It comprises tools for the automated creation of enhanced building information models, a renovation decision support system to aid the designer in exploring available renovation options through an the accurate estimation of renovation impact on building performance as well as a process management tool that will optimize the design and on-site construction process toward optimal coordination and minimization of renovation time and cost.

At the heart of the BIMERR toolkit lies an interoperability framework, which will enforce semantic interoperability among BIMERR tools as well as with third-party legacy ICT tools to enable seamless BIM creation and information exchange among AEC stakeholders in an effort to enhance the rapid adoption of BIM in renovation of the existing EU building stock. The BIMERR toolkit will be validated and demonstrated in 4 buildings in 3 European Member States. Two buildings are used for pre-validation and implementation refinement and the refined BIMERR toolkit will support the actual renovation design and works in one residential building in Poland and a second one in Spain.

## LIVING LABS

The Living Lab concept is a user-centered, open-innovation environment integrating concurrent research and innovation processes within public-private-users partnership. The concept of Living Lab is based on the user co-creation approach integrating research and innovation processes. The Living Lab activities are integrated through the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artefacts in real life use cases. These specific use cases involve user communities, not only as passive observers but also as main source of formation of the final outcome of the project.

Moreover, the Methodology of the BIMERR Living Lab is based on the User Engagement concept that aims to the constant and effective engagement of the end-users to the BIMERR project. Therefore, the end-users and main project beneficiaries are collectively placed at the center of all research, innovation, demonstration and communication activities of the BIMERR project, which adopts a User-Driven Innovation Approach towards addressing emerging end-user and market needs, critical for the successful project implementation and the realization of its anticipated impacts. The main aim of the User-Driven Innovation Approach is to involve renovation professionals and building residents/owners throughout all stages of the project life-cycle, as the key enablers of the BIMERR innovation process, towards encouraging active and collaborative contributions in the development of a BIM-based ICT system to accelerate energy efficiency renovation across Europe.

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## NEWS

### LIVING LAB WORKSHOP IN SPAIN

This workshop was organized in the context of the Living Labs. On the 19th of June, in Ferrovial Agroman's offices in Madrid, and on the 12th of July in the IVE's offices (Instituto Valenciano de la Edificación), Ferrovial Agroman's Urban rehabilitation Area and its R&D Department organized two different requirements workshops in the framework of the BIMERR project.

The aim of the workshops was to lead debates and conversations about the state and need of the renovation industry. In the early stages of the project, it is indeed fundamental to gather concrete and clear information about how things are done nowadays and how the new tool should be developed to meet the requirements and needs of the end-users, so that BIMERR's effectiveness and future impact is as big as possible.



### LIVING LAB WORKSHOP IN POLAND

In May 2019, the BIMERR project workshops were held in Warsaw, Poland by BUDIMEX. The meetings were attended by representatives of selected organizations, focused around the construction industry, as well as BIM experts and construction supervision employees.

Information on the methods, tools and technologies currently used in the process of planning, implementation, as well as research on the effectiveness of thermal modernization of residential buildings are crucial for the success of the project. The aim of the workshops was to determine the expectations and needs of potential users and recipients of innovative tools, which will be the result of BIMERR's design work.



During the workshops, participants determined the most important elements of the process of energy renovation of buildings, such as: methodologies, processes, communication and information systems, currently used devices, technologies, relations between stakeholders, as well as budget for potential benefits, etc.



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Third workshop which was held in August 2019 had totally different formula. This time BUDIMEX focused on feedback from the construction site in Bydgoszcz, Poland. The construction site was related to the renovation and construction works of the building Rother Mill and Granary, which was converted in multifunctional facility. The discussion with participants were moderated based on questions from the Questionnaires. All the participants have working experience, most of them are familiar with BIM models and renovation technology.



## QUESTIONNAIRES

Apart from the Living Lab Workshops, an online questionnaire is in place in order to gather the stakeholder specifications and requirements, which will be used during the development of the BIMERR system. Those requirements will be used as a core for the open-innovation design methodology of BIMERR tools and the main target will be to meet those requirements by the end of the project, giving the opportunity to accelerate collaborative knowledge generation and technology integration against real market and user needs. One of the main characteristics of the User-Driven Innovation approach is the continuous interactions between different beneficiaries, end-users and project team members that will be encouraged to minimize deviations between expectations and final outcomes. In addition, the target is to divide the project final outcomes into intermediate marketable results.

Your contribution would be very valuable, so we are kindly asking you to complete the Questionnaire. The Questionnaire is online in a secured dedicated space at the BIMERR website in the following link – <https://bimerr.eu/questionnaire-language-selector/> and is available in English, Greek, Spanish and Polish.

*The mission of the BIMERR project is to design and develop an ICT-enabled Renovation 4.0 toolkit comprising tools for Architecture, Engineering & Construction (AEC) stakeholder support throughout the energy efficiency renovation process of existing buildings.*



## ANNEX III – NEWSLETTER #2 (MAY 2020)

BIMERR

Newsletter #2

May 2020

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### BIMERR PILOT SITES

The BIMERR toolkit will be validated and demonstrated in 4 buildings in 3 European Member States in a 2-step approach. Firstly, a pre-validation phase will take place, and then a validation phase on real renovation sites will be executed.

#### PRE-VALIDATION PHASE

The pre-validation phase will take place in actual buildings, which are however not going to be renovated. The intention is to use the BIMERR tools in a context that enables:

- full experimentation with the as-is digital building model creation tools and evaluation by comparing their results with digital models obtained from other sources and in-situ inspection.
- experimentation with the renovation-support tools using the digital models that will allow their users to assess the applicability to real-life situations, their usability and provide feedback to the development partners for improvements.

#### Site 1: KRIPIS home – Thessaloniki, Greece

KRIPIS home, owned by CERTH, is a smart home facility, representative of a single-family detached residential building, equipped with IoT, Smart Home solutions which provide several layers of information about its operational characteristics. KRIPIS as the first Smart Near-Zero Energy Building in Greece, combines enhanced construction materials and intelligent ICT solutions creating a future-proof, sustainable and active testing, validating, and evaluating ecosystem.



The KRIPIS home



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## Site 2: Residential building – Athens, Greece

A residential building from the portfolio of project partner CONKAT has been selected, as the second pre-validation site. Based on testing needs, during the project implementation, access to building will be provided whereby audits, surveys, and digital model population activities (e.g. scanning and/or walkthroughs using AR glasses) will take place for testing purposes. The selected building is in the north-east suburbs of Athens built in 2000. It belongs to a building complex consisting of one ground floor and two floors having 9 separate apartments, 3 on each floor. The selected apartment is on the second floor with South East orientation.



Conkat pre-validation house

## VALIDATION PHASE

During this phase, the entire BIMERR tools value chain will be demonstrated in two real-life renovation projects to quantify and validate their impact throughout the renovation process: from design and planning to the actual construction works. For this purpose, Budimex and Ferrovia-Agroman, have selected two sites, one in Spain and one in Poland, which will serve as the demonstration testbeds. Each site will involve a multi-family residential building. These buildings reside in two very different climatic regions, comply with diverse building codes and regulations, were built using very different construction components & tools and are equipped with different HVAC system and other building amenities.

## Site 1: Multi-family residential building – Bilbao, Spain

The Spanish pilot site is a residential building built in 1960, located in a neighbourhood called Otxarkoaga, in the suburbs of Bilbao. This neighbourhood is a corner stone of a larger rehabilitation program called Opengela (2019-2022), which is a project that looks to spread urban regeneration in the Basque Country, creating neighbourhood offices which provide advice and support to the neighbourhood community. The building is 15 storeys high with 60 apartments that serve as social housing. The main objective of the renovation measures that will take place, is an improvement of the energy class, from G to C. To reach that objective, 5 main intervention types are anticipated:

- Improvement in thermal insulation
- Improvement of the accessibility
- Improvement of the ACS and heating installations (Viability study of the incorporation of renewable energies).
- Energy monitorization
- Improvement of fire protection system

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The Otxarkoaga validation site

## Site 2: Multi-family residential building – Warsaw, Poland

The Polish pilot site is a residential building (social housing) built in 1995 located in a district called Praga Południe, close to industrial areas and railway sidings, in an average distance from the Warsaw city center. The building, which will be used as pilot, is an L-shape residential and 4-storey building with a basement floor.

The main objective of the renovation measures is an improvement of the energy class of the building. To reach that objective, the following main intervention types are anticipated:

- Improvement in thermal insulation
- Roof renovation and insulation
- Verification of the condition of the windows, replacement of the old or damaged ones
- Insulation of basement rooms



The Warsaw validation site



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## NEWS

### 5<sup>th</sup> consortium meeting

The 5<sup>th</sup> BIMERR consortium meeting took place on April 28<sup>th</sup> and 29<sup>th</sup>. During this meeting, the project partners had the chance to discuss and evaluate the progress of the project and agree on the next implementation steps. Of course, as the health and safety of all participants and of the society is a top concern for the project partners, this meeting was held online, with consortium members joining from their homes.



5<sup>th</sup> Consortium meeting held on-line

### BIMERR paper accepted

The BIMERR Occupancy Profile Ontology has been accepted as research paper at the "8th Linked Data in Architecture and Construction Workshop", which will take place from 17 to 19 June 2020. You can follow online the presentation "From obXML to the OP Ontology: Developing a Semantic Model for Occupancy Profile", by Serge Chavez-Feria, Giorgos Giannakis, Raul García-Castro, and María Poveda-Villalón, on June 17<sup>th</sup>, in this [link](#)

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