

**Education for zero energy
Buildings using Building
Information Modelling**

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07.8 Sustainability Plan

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Table of contents

1	Executive summary	4
2	Introduction	5
3	BIMzeED targeted results, stages and outcomes	6
4	Role of Consortium Partners and Supportive Key Stakeholders.....	9
5	BIMzeED as a sustainable system	12
6	Success Factors	14
7	Conclusions	15

1 Executive summary

The present document has been drafted having in mind the EU's definition of a sustainable project ¹ :
“A project is sustainable when it continues to deliver benefits to the project beneficiaries and/or other constituencies for an extended period after the Commission’s financial assistance has been terminated “.

The BIMzeED Sustainability Plan, along with the project ‘s Exploitation Plan will maximize the BIMzeED impact in the long-term, enabling the wide uptake of the trainings even after the end of the project.

The purpose of the BIMzeED Sustainability Plan is to enable the continual development of the LUs (Learning Units) and the future progression of the trainings. In the long term, the plan will also review other suitable programmes in partner and other countries to ensure the longevity and maximum impact of the learning units across Europe. In this initial analysis of the BIMzeED Sustainability Plan (M6), guidelines and recommendations to the HEIs and VETs are outlined. Through them awareness will be promoted on the possibility to update trainings using the BIMzeED training package in the construction and educational fields related to BIM and nZEB, across the EU in other HEIs and VET.

The final version of the BIMzeED Sustainability Plan will be submitted at the end of the project (M36) and it will comprise: Findings from WP2, toolkit guidelines, learning units, training resources, quality assurance guidelines and the evaluation recommendations from the trainings and content. A database of suitable HEI and VET organisations willing to consider implementing the learning units within their own systems will be available, as well as a list of suitable existing modules and programmes (on-line, blended or classroom based).

The main objectives of the Sustainability Plan include:

1. To ensure the further use of BIMzeED findings and toolkits after the completion of the project works.
2. To propose cases for exploitation of the BIMzeED outputs.
3. To suggest mechanisms, as well as development and implementation actions, for extending and improving BIMzeED outputs following the project’s end.

Hence, the sustainability plan attempts not only to provide the BIMzeED outputs beyond the end of the project (and the associated end of the EC funding), but also to enhance their functionality and increase their outreach.

¹ European Commission Directorate-General Education and Culture (2006) “Sustainability of international cooperation projects in the field of higher education and vocational training - Handbook on Sustainability”. Luxembourg: Office for Official Publications of the European Communities, ISBN: 92-9157- 477-5

2 Introduction

BIMzeED aims to improve the human-capital basis of the construction sector, acting on HEIs and VET systems in Europe. The project focuses on the training needs for the current and future construction industry with the main purpose to encourage 1) better employability 2) low-carbon growth 3) green and nZEB skills 4) increase in youth employment. The challenge of BIMzeED is to overcome skills' mismatching and improve employability in the current European construction market by improving and extending the existing skills of trainers, lecturers, construction and architecture students, SMEs, site managers, craftworkers and other experienced operatives. To maximise the impact of BIMzeED in the long-term, it is essential to further extend the use, implementation and development of the BIMzeED outputs and to propose specific actions which promote their further exploitation.

The success of this effort will be based on the following key elements: **the sustainability plan and the exploitation strategy, supported by the communication plan.** The first two, with support from the tools provided by the communication plan, will enable awareness raising of the training programmes across Europe and will ensure the commitment of the involved stakeholders to promote new opportunities through training for the construction industry in the future.

The sustainability of BIMzeED is possible because the project at all its stages promotes:

1. The involvement of the target groups in the definition of needs and the development of corresponding solutions; (WP2)
2. Better training opportunities for apprenticeships, SMEs and construction and architecture students; (WP3)
3. The creation of a competitive and recognizable e- portfolio of skills for practitioners and students in the field. (WP4)
4. Better connection and active network between HEIs, VETs/training providers and the BIM/nZEB stakeholders; (WP7)

In the long term, the Sustainability Plan will review other suitable programmes in partner and other countries to ensure the longevity and maximum impact of the learning units across Europe. In this context, consideration will be taken to review all programmes on-line, blended, classroom methods and on-site, using alternative delivery methods.

Based on the guidelines and recommendations of this integrated strategy, the training resources will be made available for use by the potential target groups (specifically students and HEIs/VETs) for exploitation, even after the conclusion of the project. This is crucial so as to ensure that relevant target groups maintain access to information and outputs, which can be extremely effective for the dissemination of the project even after its conclusion.

This initial Sustainability Plan comprises:

- An overview of the BIMzeED targeted results, stages and outcomes
- The role of Consortium Partners and Supportive Key Stakeholders
- The presentation of BIMzeED as a sustainable system
- Success Factors
- Conclusions

3 BIMzeED targeted results, stages and outcomes

BIMzeED will create new educational content and resources to address critical knowledge and skills gaps in the field of Building Information Modelling (BIM) and nearly Zero Energy Buildings (nZEB). Designed and developed in cooperation with R&D, Industry and SMEs, these new educational trainings will upskill two key targets groups 1) **VET and HEI Educators and Trainers** and 2) **SME workers, existing students and construction apprentices**. The integration of SMEs and industry within the consortium helps to strengthen employability, creativity and new employment professional pathways in the construction sector across Europe.

The sustainability strategy of BIMzeED, consists of a multi-layered approach to ensure the project's maximum impact in the long term. The communication and exploitation plans are supporting this strategy, and all together work towards ensuring that the needs of the target groups are met and the sustainability of the project's outcomes is established beyond the project's duration.



The targeted results of BIMzeED, in line with the aims of the Erasmus+ Knowledge Alliance, are to:

- Identify the benefits, knowledge and skills gap in digitalisation (BIM) and nZEB within the HEI, VET and construction sector for each partner country and across EU.
- Update the knowledge and skills of Educators, Trainers, Students and SMEs in the digitalisation transformation of BIM to achieve nZEB through provision of specific new innovative educational materials across Europe.
- Stimulate the development of new training and educational learning units, in the fields of BIM/nZEB which can be integrated into existing HEI and VET programme aligned to the EFQ
- Transfer knowledge of BIM and nZEB to existing workers to improve employability and instil interest for the youth to take up work in the industry to strengthen the competitiveness of SMEs and industry.
- Strengthen the links between VET/HEI, R&D, industry and SMEs using innovative digitalised energy efficient technologies and installations creating connected learning communities (viewing case studies, on-site site visits, industry demonstrations)
- Strengthen the employability for educators and SMEs (skilled workforce), known as business development cooperation

The project will be carried out in 5 stages allowing for a structured and sequential approach which will produce quality outcomes. The 5 stages are outlined in the following diagram:

Table 1: The 5 stages of BIMzeED- Inputs, Outputs and Indicators

BIMzeED					
Inputs	Stage		Outline	Output	Indicators
Surveys to industry, HEIs and VETs. Research of publications, papers, EU projects. Feedback from EU, National and Regional organisations	Stage 1: WP2 Gap analysis and Knowledge generation	Review current development of nZEB & BIM national & EU; Determine the use of nZEB & BIM in the current construction work market national & EU; Determine types and levels of training in nZEB/BIM at national HEIs and VETs; Determine the transferability of these trainings at EQF level in partner countries & EU	Understanding of nZEB/BIM skills shortage, mismatch in the EU construction work market	BIMzeED (Roadmap) Gap Analysis in HEIs, VET & construction industry	<ul style="list-style-type: none"> • # of skill gap areas • # of interviews/ surveys • # of other related projects
Understanding of nZEB/BIM skills shortage, gaps in existing educational programmes (VET, HEI)					
BIMzeED Gap Analysis External Advisory Board EAB Partners' expertise National Steering Groups NSG SMEs and Industry	Stage 2: WP3 Learning Units Development	Setting of LUs content with active involvement from SMEs, industry and experts; Identification and involvement of HEIs and VET target groups; Potential integration of LUs into the existing training programmes	Updating/upskilling curricula on specific nZEB/BIM on the basis of the Needs Analysis	Learning Units LUs on nZEB/ BIM themes. LUs are compatible with existing HEIs and VET programmes (EQF)	<ul style="list-style-type: none"> • Minimum 10 LUs • Scale of LUs (credits, hours, levels) • 60 programmes which could include the LUs
Stage 2 output HEI and VET skills and knowledge	Stage 3: WP4 E-learning portal	Development of the E-Training Portal	Publish curricula and content on E-Training platform for use in blended learning deliveries	E-learning portal established providing access to programmes/ LUs	<ul style="list-style-type: none"> • 90% satisfaction rate after preliminary testing
Feedback from: Target group 1 (HEI & VET trainers) Target group 2 including: 2a) Full Time students (future workers) 2b) SMEs (site managers, craftworkers) 2c) Apprenticeships	Stage 4: WP5 & WP6 Piloting and Education	Pilot e-learning portal and LUs with Target Group 1 and Target Group 2 Feedback collection Survey on potential integration in existing programmes (modules)	Pilot training for Target Group 1 & Target Group 2 Pilot on E- Learning Portal	Evaluation Reports including Target 1 & Target 2 feedback and recommendations	<ul style="list-style-type: none"> • 120 of trainers trained for Target Group 1 • 400-500 of workers for Target Group 2 • 90% Satisfaction rate by Target Groups
Contact databases, parallel initiatives, Target Group 1 and 2 contacts	Stage 5: WP7 Exploitation and Sustainability	Exploitation plan for the transfer of LUs across Europe to promote sustainability. Maintain the repository for 2 years after project end	Promotion of project trainings and activities, outcomes and outputs	Communication channels (website, social media, conferences, etc) Relevant contacts to implement the LUs across the EU	<ul style="list-style-type: none"> • # of Social Media indicators • # of attendees at training events • # of further VET and HEIs implementing LUs

Following the expected Outputs and Outcomes of each stage are highlighted:

Stage 1: The identified needs and challenges will be analysed in each partner country and at EU level and reported in a BIMzeED (Roadmap) Gap Analysis to include:

Output 1 will establish a Roadmap which will define the nZEB and BIM skills shortage and mismatch in the EU construction work market and in existing educational programmes at VETs and HEIs.

Outcome: ability to provide new innovative learning material on specific nZEB / BIM themes which respond directly to the identified gaps/needs and a clear knowledge of future needs.

Thanks to results of the Gap Analysis Roadmap, educators will have a direct and closer overview on the current construction market and its job requirements, enabling the development of future trainings in collaboration with other educational organisations around Europe.

Stage 2: Development of Training and Learning Material

Output 2: 12-16 LUs will integrate nZEB and BIM topics to be compatible with existing HEIs and VET programmes. Each LU will be developed as Open Educational Resources (OERs) in a format to facilitate all HEIs and VETs

Outcomes: LUs, will increase the chances of incorporating unique training material into the current educational programmes 2.

Within Stage 2 and in order to assist trainers and educators, a learning unit assessment methodology will be developed to ensure standardised assessment and a guide for the incorporation of training learning units into existing programmes will also be developed for short- and long-term trainings (O3.3-M20). This guide will be later on introduced into the sustainability plan.

Stage 3: E-Learning Portal

Output 3: A cost effective secure open E-Learning portal will be established with access to the LUs

Outcome: Availability of curricula and content on E-Learning platform for use in blended learning deliveries and for future use by other HEIs and VETs.

The Sustainability of the E-learning portal will be key post project so cost effective solutions which have international applications will be required. Moreover, Quality Standards will be vital to ensure that the training is presented in a professional manner and in line with relevant E-Learning standards.

Stage 4: Pilots for Trainings and E-Learning Portal

Output 4: Piloting of content via

- 1) A Train the Trainer workshop with [total 120] educators (Target Group 1) from HEIs and VETs,
- 2) Pilot LUs with Students and worker [target 400-500], (Target Group 2)

Outcomes: Upskilled HEI/VET educators and robust evaluation of LU material in practice

Stage 5: Exploitation and Sustainability

Output 5: Extensive Communication and Dissemination activities

Outcome: Increased engagement of SMEs, who make up 95% of construction market, with CPD and upskilling opportunities. Improved application of BIM/nZEB content within education and training programmes by HEIs/VETs and evolution of new programme development opportunities.

4 Role of Consortium Partners and Supportive Key Stakeholders

All BIMzeED partners have a major role providing input and insights, supporting the dissemination of the project results, participating in the project's communication tools and activities and making the most of their own dissemination networks and collaborations, all in order to ensure the sustainability of the project. It is expected from all partners to identify and liaise with local and regional interested parties, share experiences, methodologies and results, but also to engage them in the project planning, implementation and evaluation, cultivating a permanent cooperation for the use of project products in the future. To reach the specific target groups, expand the number of potential beneficiaries and eventually integrate the standardised LUs into EQF programmes, the following actions will be undertaken by all partners:

HEIs / VET

- All members of the consortium will make use of their expanding networks to reach other HEIs, VET/ training providers throughout the EU taking advantage of the database of major educational partner potentially interested in new training units.
- BIMzeED content, methodology and further exploitation opportunities will be presented at conferences, exhibitions, and peer reviews, enabling the partnership to engage with larger audiences.
- HEIs, in particular, will develop academic papers arising from the project which are likely to be presented in relevant journals following peer review approval.
- In many European countries, the regulatory framework in the construction sector is expected to introduce (or already does) BIM and nZEB requirements in the near future: those HEIs / VET that want to remain updated and connected with the construction market will be interested in the introduction of BIMzeED training.

Apprentices, students

- The LUs and methodologies are expected to be adopted afterwards by many HEIs and VET/training providers in all countries involved. All partners will continue to promote the outputs for 12 months after the project end.
- By linking the project outputs (on project website and partners websites) to websites of industry associations, networks and associate partners, the content will be accessible for an increased network of practitioners and actors.
- Each partner will use their own peer networks to promote the outputs and resources available such as at National energy conferences and events
- SMEs involved in the project during its lifetime will be encouraged to promote BIMzeED training in their professional networks to enlarge the perimeter of application. BIMzeED know-how could become an initial key requirement for new employees.

SMEs (site managers, craft workers, experienced operatives, etc.)

As people from SMEs would probably use the same channels as students to search for training, the above considerations can also be considered for this category of target group in addition to:

- The industry associations and sector organisations involved in the consortium will support the visibility of BIMzeED training using their existing tools by publishing newsletters, magazines, discussion forums for a period of 1 year after the projects end and promoting in future conferences and events.

All partners will sign an exploitation agreement, which will regulate the future use of the project products. This way, the partnership will be sustained for 24 months after the end of the project. The actions foreseen in the exploitation agreement will be directly related to the sustainability plan and will focus on:

- **The continuity of the dissemination process from all the partners of the consortium; (e.g social media output should be maintained for 1 year after the end of the project by all partners)**
- **The continuity of free access to the open e-learning courses and the definition of the partners of the consortium, who will undertake the support (e.g. project website to be maintained for 2 years after the project's conclusion, by LIT)**

Contacts with other training partners and relevant organizations, will be established following the development of a database of major educational partners and relevant organisations. All consortium partners are expected to contribute to the development of this database, with ACE having a leading role. This database will be available in the Communication Plan. It will be updated on an annual basis and will be utilised to disseminate information and support exploitation.

“Supportive“ key stakeholders:

Addressed and involved in the project are also identified “supportive“ key stakeholders (members of EBA, NSGs and Associate Partners), that include policy makers, Local Authorities, European and national construction federations, SMEs, industry providers, professional bodies, educational and training providers, as well as experts in the fields of BIM and nZEB. These stakeholders are expected to support the dissemination and the sustainability of the project even beyond its lifetime.

The 30 supportive stakeholders, part of the NSGs and EAB, will play an important role in the sustainability of the project. Apart from advising BIMzeED, they will be proactive in communicating project outcomes to their contacts, disseminating and promoting the trainings at EU and national levels. A successful dissemination of the project results guarantees the sustainability of the project beyond its life cycle.

- FIEC, representing 29 member organisations, will disseminate the information and trainings across Europe.
- 3 Local Authorities and 3 Housing Agencies will communicate the outcomes to their networks and contacts.
- 4 Industry providers (among which Saint Gobain) will outreach at EU level
- 4 Professional bodies to contribute in dissemination activities.

The outcomes of the work of NSGs and EAB will be integrated into the ongoing communication activities and will serve as focal points of interactions with the media

National Steering Groups: Key stakeholders and relevant organisations are currently being involved to form National Steering Groups in each partner country: experts, policy makers, industry partners and other relevant organisations. The NSGs will advise, review the trainings and disseminate relevant information.

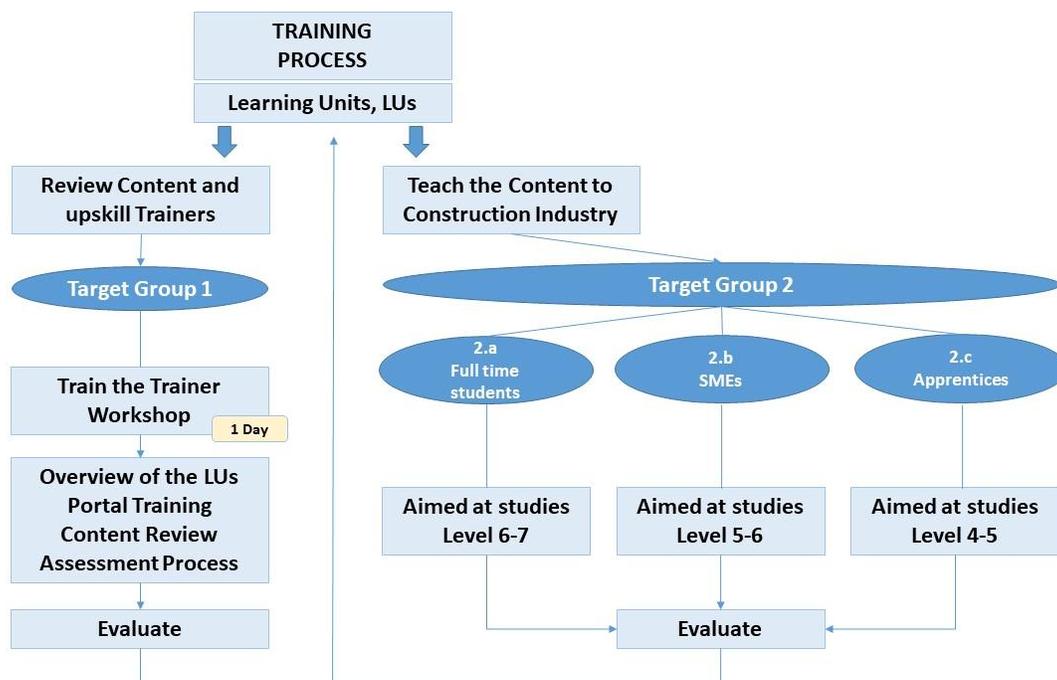
Expert Advisory Board: 13 experts and representatives from across the EU form the Executive Advisory Board. Effective communication and exchange of information with the EAB is expected to maximize the effectiveness and the impact of the project's results.

Associate Partners: The Associate Partners will be supporting the dissemination and sustainability of BIMzeED. They will be also part of the NSGs and the EAB. Among them are policy makers, Local Authorities, European and national construction federations, SMEs, industry providers, professional bodies, educational and training providers as well as experts in the fields of BIM and Nzeb. They are also potential stakeholders, multipliers and opinion leaders, also proactive in dissemination across the EU.

Tables with the supportive key stakeholders as well as with major educational partners and relevant organisations are included in the communication plan and will be regularly updated.

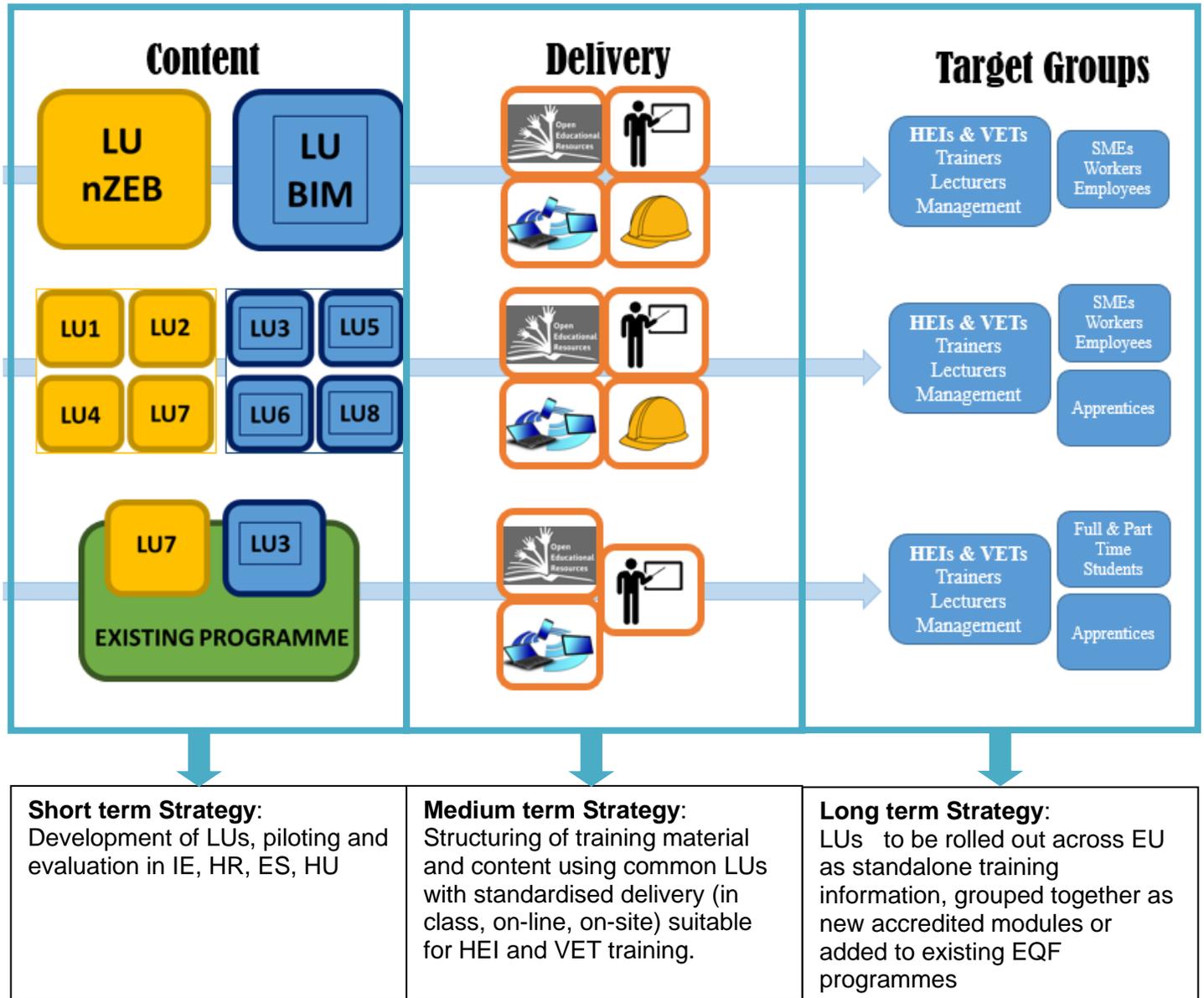
5 BIMzeED as a sustainable system

Analysis of construction relation programmes shows that BIM and nZEB are not covered in significant detail within construction related programmes. National Build Up Skills Reports from across Europe highlight the need to develop both Train the Trainer programmes in fields relevant to nZEB as well as to create dedicated programmes targeted at operatives, construction workers and site managers. Higher education and its links with research and innovation plays a crucial role in individual and societal development and in providing the highly skilled human capital and the articulate citizens that Europe needs to create jobs, economic growth, and prosperity. NZEB policies are adopted in the majority of countries, however nZEB is still perceived by the construction industry and by many SMEs as time consuming and expensive to achieve. The advantages of BIM are also not realised by the construction sector except within the professional fields at design stage and for large tender projects managed by larger construction companies. The BIMzeED project addresses these challenges by upskilling in an innovative and flexible way, not only the workforce in the areas of BIM and nZEB, but also the educators and available training programmes. Within the project, experienced HEIs and VETs collaborate with SMEs and the industry to develop a 12-16 Learning Units (LUs) developed as Open Educational Resources (OERs) for exploitation across Europe.



This flexible and innovative strategy enables early implementation by piloting standalone LUs in Ireland, Croatia, Spain and Hungary. Once the BIMzeED piloting and evaluation process is complete, these LUs will be rolled out across Europe to be used as standalone training information, grouping together to be used as new accredited modules or added to existing EQF accredited construction and environmental programmes.

In this way, a **short, medium- and long-term strategy** is determined to ensure the sustainability of the trainings and the future skill development of trainers and workers in the construction sector.



BIMzeED will structure the training material and content using common LUs with flexible standardised delivery suitable for HEI and VET training. The initial training content will include nZEB related subjects with BIM maturity. The training content will be developed and delivered in a Blended Learning format supported by an E-Learning portal, and once finalised the LUs will be made available as Toolkits to potential students, HEIs, VETs and SMEs.

6 Success Factors

The overall sustainability of BIMzeED will be defined in relation to whether the outputs and activities continue even after the end of the EU funding. In any case, the partnership will be sustained for 24 months after the end of the project and the project partners will comply with what is foreseen in the exploitation agreement.

Below is a list of factors that can ensure or hinder BIMzeED project's sustainability:

Project level factors:

- The quality of the project outputs in meeting academic, professional and social needs
- The involvement of consortium members and key stakeholders, and in particular, their sense of ownership and motivation
- The effective management of the consortium
- The active participation of the direct target groups
- The capacity for securing adequate resources for continuation.

Context-level factors:

- Academic/ institutional support (integration of outputs in university strategy and stability of academic staff)
- National support (whether national priorities match with the project's outcomes)
- Socio-economic support/ recognition

The above factors cannot be easily assessed. However, the already defined qualitative and quantitative indicators can be used to evaluate the outcomes of BIMzeED, following the completion of each of the five identified stages of the project (Table 1).

7 Conclusions

This report has presented the overall strategy and foreseen actions for the sustainability of BIMzeED project and the maximisation of its impact. Ensuring the sustainability of BIMzeED is not a one-time effort to take place towards the end of the project. The necessary steps/actions described in the strategy have to be followed during all stages of the project. This document should be consulted throughout the project lifespan until a final version of it is published in M36, providing further guidance to the consortium partners.

In order to ensure BIMzeED's sustainability, effective dissemination should be performed by all partners, using the project's communication instruments described in the Communication Plan (O7.1).

Moreover, all partners will continue the dissemination process (Social Media outputs) for 1 year after the project's conclusion, while LIT will commit to ensure the continuity of free access to the open e-learning courses for 2 years after the end of the project.

This way, the BIMzeED Sustainability Plan, along with the project's Exploitation Plan will maximize the BIMzeED impact in the long-term, enabling the wide uptake of the trainings even after the end of the project.