DELIVERABLE: D31 – D5.3

Draft of the Standardization of Training Schemes

Version: 2
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Author: FLC

Network for Using BIM to Increase the Energy Performance

Grant Agreement Number: 754016
Net-UBIEP H2020

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

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

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

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

International web page

Italian web page

Croatian web page

Slovak web page

Spanish web page

Dutch web page

Estonian web page

Lithuanian web page

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A. Deliverable Details	
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1. Context and Objectives of the Net-UBIEP project

Net-UBIEP aims at increasing energy performance of buildings by wide-spreading and strengthening the **use of BIM**, during the life cycle of the building. The use of BIM will allow to simulate the energy performance of the building using different materials and components, both to be used in the building design and/or in building design refurbishment.

BIM, which stands for Building Information Modelling, is a process that lasts for all the building life cycle from the design phase through the construction, management, maintenance, demolish. In each of this phase is very important to take into account all the energy aspects in order to decrease the environmental impact of the building during its life cycle.

To achieve this objective it is important that all the professionals and technicians who work in the building supply chain are aware of their role into collecting, managing and storing all the information required during construction, management maintenance and decommissioning of a building.

Each technician, public officer, designer, constructor, facility manager, supplier, etc., will have to understand which information they manage that could be used by any other individual during the life time of a building which goes far behind the duration of the computer who has generated it. Therefore it is important that all the different targets use the same language, the same dictionary and the same data structure. The Net-UBIEP project will reach all of them providing the motivation for implementing BIM for the advantage of all.

The expected results will be different BIM Qualification Models to tackle the problem of energy competences gap in the existing buildings sector as a whole. Each BIM Qualification Model will be composed by a BIM Training Scheme and a BIM Qualification and Certification Scheme.

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Net-UBIEP Project will increase energy performance related competences of 6 professional roles:

- BIM evaluator
- BIM facility manager
- BIM manager
- BIM coordinator
- BIM expert
- BIM user

Through project implementation, about 1,000 BIM evaluator and BIM facility managers will increase their competences with energy performance; 1,000 BIM Managers, BIM Coordinators and BIM Experts will be able to implement BIM satisfying energy performance requirements; 1,100 BIM Users will know how to read BIM model with energy requirements.

2. Purpose of this Memorandum of Understanding (MoU)

3. European area of skills and qualification

ECVET is based on a set of technical components that are all underpinned by the development of learning outcomes. This approach ensures a better understanding and comparability of qualifications and learning achievements across countries.

For the development of the BIM qualification models these technical components have been taken into account to provide to the training system with a European dimension.

Credit arrangements in European education and training (ECVET and ECTS) build upon the learning outcomes underpinning qualifications and programmes; they link to the EQF by the use of the level descriptors expressed in learning outcomes.

It is essential in implementing ECVET to ensure that learning outcomes of the qualification and units are clearly identified and described to enable mutual understanding and trust among different countries, assuring this way the process of recognition and validation of skills by common accreditations as well as a coherent implementation at national level.

Together with units, description of learning outcomes and information about the EQF level, ECVET system supports the understanding of a qualification. Thereby, the number of ECVET points allocated to a qualification, together with other specifications, indicate for example, if the scope of the qualification is narrow or broad.

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The ECVET system is a technical framework for the allocation of ECVET points to hours of training for the transfer, recognition and, where appropriate, accumulation of individuals' learning outcomes with a view to achieving a qualification. ECVET points are a numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the complete qualification.

Following the ECVET Recommendation[1] to enable a common approach for the use of ECVET points for a given qualification, the allocation of ECVET points should be based on:

- The use of the convention according to which 60 points are allocated to the learning outcomes expected to be achieved in one year of formal full time VET.

- The selection of one formal learning programme as a point of reference. It is up to the competent institutions in charge of designing qualifications to decide which specific programme will be chosen as a point of reference (e.g. the initial VET or the most common programme). For qualifications which do not have a formal learning pathway reference, ECVET credit points can be allocated through estimation by comparison with another qualification which has a formal reference context.

This way, the duration of the selected reference programme together with the "convention" on ECVET points, will give the number of ECVET points to be allocated to the qualification as a whole, and then, to its units according to their relative weight within the qualification.

The relative weight of a unit of learning outcomes, with regard to the qualification, should be established according to the following criteria or to a combination thereof:

- The relative importance of the learning outcomes which constitute the unit for labour market participation, for progression to other qualification levels or for social integration;

- The complexity, scope and volume of learning outcomes in the unit;

- The effort necessary for a learner to acquire the knowledge, skills and competence required for the unit.

The ultimate stage of ECVET arrangements is recognition and validation of the learning outcomes achieved through crediting by way of the assessment. It can be considered as part of a quality assurance process. Credit transfer and accumulation process is underpinned by ECVET documents: the **Memorandum of Understanding** and the **Learning Agreement**.

[1] Recommendation of the European Parliament and of the Council of 18 June 2009 on the establishment of a European Credit system for Vocational Education and Training (ECVET).

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For applying ECVET in the project countries to learning outcomes achieved in formal, non-formal and informal learning context particularly for this project , this MoU establishes that each participant:

- accepts each other's status as interested actors and/or competent institutions;
- accepts each other's quality assurance, assessment, validation and recognition criteria and procedures as satisfactory for the purposes of credit transfer;
- agrees the conditions for the operation of the partnership, such as objectives, duration and arrangements for review of the MoU;
- agrees on the comparability of qualification concerned for the purposes of credit transfer, using EQF to establish the reference levels;
- identifies other actors and competent institutions that may be involved in the process concerned and their functions;

4. Procedures for standardization at national level

Transfer and accumulation of learning outcomes in an ECVET partnerships: units of learning outcomes achieved in one setting are assessed and then, after successful assessment, transferred to another setting. In this second context, they are validated and recognised by the competent institution as part of the requirements for the qualification that the person is aiming to achieve. Units of learning outcomes can then be accumulated towards this qualification, in accordance with national or regional rules.

Procedures and guidelines for the assessment, validation, accumulation and recognition of units of learning outcomes are designed by the relevant competent institutions and partners involved in the training process.

Credit transfer based on ECVET and applied to learning outcomes achieved in formal learning contexts should be facilitated by establishing partnerships and networks involving competent institutions, each of which is empowered, in their own setting, to award qualifications or units or to give credit for achieved learning outcomes for transfer and validation.

The establishment of partnerships aims to:

- provide a general framework of cooperation and networking between the partners, set out in Memoranda of Understanding (MoU) through which a climate of mutual trust is established;

- assist the partners in the design of specific arrangements for credit transfer for learners.

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SPAIN	
Procedures for the accreditation and recognition of learning outcomes: Learning outcomes would be eventually recognized by the participation of the applicant in a recognition of occupational competencies process, which have been acquired by experience or non-formal training. To do so, LO must have correspondence with competencies officially included in the National Catalogue of Qualifications.	
Name and status of the body awarding the LO: Fundación Laboral de la Construcción	**Name and status of the national/regional authority providing accreditation/recognition of the LO:** Ministry of Labour and/or competent Regional Body.
Type of certification : ☒ **Official certificate** ☐ **Non official certificate** **Describe the type of certificate:** Occupational certificate **Level of the certificate (national or international)** European level: EQF 4	
Legal Basis: Royal Decree 1224/2009, 17th of July, on the recognition of occupational competencies acquired by working experience.	

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ITALY	
Procedures for the accreditation and recognition of learning outcomes: Public procedure: Learning outcomes would be eventually recognized by the participation of the applicant in a recognition of occupational competencies process, which have been acquired by experience or non-formal training. To do so, LO must have correspondence with competencies officially included in the National Catalogue of Qualifications. Private procedure: learning outcomes are defined by UNI Regulation and they will certificate by the CAB (Conformity Assessment Body). All the CABs are accredited by Accredia (National Body for the Accreditation of ODCs)	
Name and status of the body awarding the LO: *Public procedure: Regional Educational Awarding Bodies Accredited* *Private procedure: CAB (Conformity Assessment Body)*	**Name and status of the national/regional authority providing accreditation/recognition of the LO:** *Public procedure: MLPS (Ministry of Labour and Social Policies) with National Collection of Accreditations (Atlante del Lavoro)* *Private procedure: Accredia (National Accreditation Body of CABs)*
Type of certification: ☒ **Official certificate** (for both types of procedures) ☐ **Non official certificate** **Describe the type of certificate:** *Public procedure: Competence Certification* *Private procedure: Professional Profile Certification / Competence Certification* **Level of the certificate (national or international)** European level: EQF *3-6*	
Legal Basis: *Public procedure: Act 13 of the 2013/01/16* *Act 4/2013 art. 9* *Private procedure: UNI EN ISO 17024*	

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SLOVAKIA	
Procedures for the accreditation and recognition of learning outcomes: *Learning outcomes would be eventually recognized by the participation of the applicant in a recognition of occupational competencies process. To do so, LO must have reference officially included in the National System of Qualifications.*	
Name and status of the body awarding the LO: *Sector Skills Council in construction sector led by ZSPS (Association of Construction Entrepreneurs)*	**Name and status of the national/regional authority providing accreditation/recognition of the LO:** *Ministry of Education, Science, Research and Sport of the Slovak Republic*
Type of certification : ☒ **Official certificate** ☒ **Non official certificate** **Describe the type of certificate:** *Certificate on partial or full qualification* **Level of the certificate (national or international)** European level: EQF *4 (or higher depending on the qualification requirements for the particular position)*	
Legal Basis: *Act 568/2009 Coll. on lifelong learning*	

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ESTONIA

Procedures for the accreditation and recognition of learning outcomes:

Estonian occupational qualifications system forms a part of the Estonian qualifications system that links life-long learning system and the labour market.

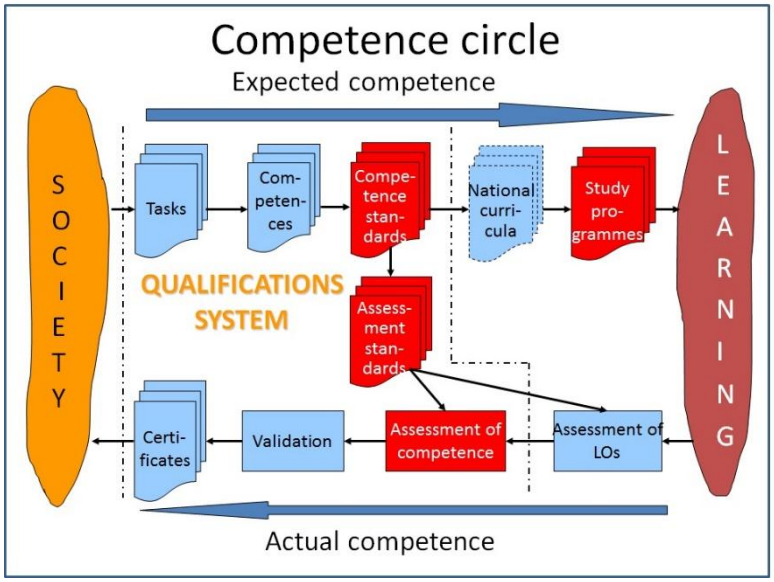

Figure 01: graphic image created into the project

The objective of the occupational qualifications system is:

- *to support the competitive edge of the Estonian workforce - Estonian workforce is competent, they have the knowledge, skills and attitudes required for successful operation;*
- *to form prerequisites that the content and quantity of studies targeted at occupational activities meet requirements of the labour market;*
- *to facilitate that the competence of individuals is appreciated and recognised, regardless where and how the studies took place;*
- *to make occupational qualifications internationally comparable.*

The following principles have been taken into account while developing the occupational qualifications system in Estonia:

- *stakeholders of the labour market are involved in all parts of the occupational qualifications system – employers, employees, the state, trainers. Agreements are based on the co-operation of various stakeholders;*
- *it follows an integrated qualifications system model;*
- *the main concept of the occupational qualifications system is competence, that means the system is based on competence both conceptually and in reality;*
- *occupational qualifications system is built and operational as a quality system.*

Awarding bodies:

Awarding body is a legal entity nominated by sector skills council. To ensure impartiality in awarding occupational qualifications, the awarding body shall set up an occupational qualification committee that shall consist of the parties interested in awarding occupational qualifications in the given field: specialists, employers, employees, trainers, representatives of professional associations and, if necessary, representatives of clients, as well as other interested parties.

In order to be granted the right to award occupational qualifications an open competition arranged

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by Kutsekoda shall be completed. A legal person or authority that has been declared a winner by a decision of a sector skills council in a public competition and that has the corresponding registration in the register of occupational qualifications may act as an awarding body.
Upon registration, the names and levels of occupational qualifications which the awarding body shall be entitled to award will be determined. The procedure for the organisation of the competition and the list of documents certifying compliance with the conditions listed in §11 (1) the Occupational Qualifications Act has been established by a regulation of the Ministry of Education and Research.

Name and status of the body awarding the LO:	**Name and status of the national/regional authority providing accreditation/recognition of the LO:**
Estonian Association of Civil Engineers *Estonian Association of Architects* *Estonian Association of Surveyors* *Estonian Association of Real Estate Managers* *Estonian Society of Heating and Ventilation Engineers* *Etc.*	*Estonian Qualifications Authority*

Type of certification :

☒ **Official certificate**
☐ **Non official certificate**

Describe the type of certificate:
Occupational qualification standard (OQS) is a document which describes occupational activities and provides the competency requirements for occupational qualifications and their levels.

OQS consists of three parts. Part A of the standard (description of the occupation) provides an overview of the nature of work, major parts of work and tasks, necessary tools, work environment, incl. the specificities of work and describes the personal characteristics and skills enhancing occupational activities. This is a source of information for a person upon selection of an occupation and shaping his or her career path. This also contains useful information for the career advisers, labour market consultants, human resources managers and trainers.

The competence requirements presented in part B of the standard serve as a basis for the assessment of the applicant for the occupational qualification. These requirements are presented as descriptions of mandatory and optional competences. Competence is an ability to perform a specific part of work or a task together with the knowledge, skills and attitudes required for that. Proceeding from the nature of the occupation, its specificity and traditions, attesting competences related to a specialization or optional competences may be the prerequisite for being awarded the occupational qualification.

Part C of the standard contains general information and references to annexes

Level of the certificate (national or international)

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European level: EQF *1-8*

Legal Basis:

Legal basis for the operation of the occupational qualifications system is specified in the Professions Act that entered into force 01.09.08. This Act provides the bases for the development, operation and quality assurance of the occupational qualifications system. Based on this act the following legal acts have been issued:

- *List of areas of occupational activity, the names of sector skills councils, the procedure for the formation and termination thereof, the organization of activities, and the procedure for appointment of representatives of institutions (regulation of the Government of the Republic);*
- *The procedure for the organization of the public competition and the list of documents certifying compliance with the conditions to be an institution awarding occupational qualification (regulation of the Government of the Republic);*
- *The statutes of the register of occupational qualifications (regulation of the Government of the Republic);*
- *The procedure for the preparation, amendment and recording of occupational qualification standards (regulation of the Ministry of Education and Research);*
- *The statute and form of the occupational qualification certificate (regulation of the Ministry of Education and Research).*

CROATIA

Procedures for the accreditation and recognition of learning outcomes:

After the development of adult education and training programs institution which developed training programs is obliged to receive positive expert opinion from the Agency for Vocational Education and Training and Adult Education. Upon receipt of positive expert opinion by the Agency, institution submits Request for approval for implementation of program to the Ministry of science and education.
More information at: http://www.asoo.hr/default.aspx?id=1249
To do so, LO must have correspondence with competencies officially included in the National Catalogue of Qualifications.

Name and status of the body awarding the LO:	**Name and status of the national/regional authority providing accreditation/recognition of the LO:**
University of Zagreb, Faculty of Civil Engineering	Ministry of science and education *(upon expert opinion by the Agency for Vocational Education and Training and Adult Education)*

Type of certification :

☒ **Official certificate**
☐ **Non official certificate**

Describe the type of certificate:
Occupational certificate

Level of the certificate (national or international)

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European level: EQF 4
Legal Basis: • Adult education act OJ 17/07 (*hrv. Zakon o obrazovanju odraslih NN 17/07*) • Regulation on standards, normative, methods and procedures of ensuring the compliance with the requirements for adult education OJ 129/08; 52/10 (*hrv. Pravilnik o standardima I normativima te načinu I postupku utvrđivanja ispunjenosti uvjeta u ustanovama za obrazovanje odraslih (NN 129/08; 52/10*)

THE NETHERLANDS

Procedures for the accreditation and recognition of learning outcomes:
In the Netherlands there are three ways of accreditation and recognition of learning outcomes.

1. Regular education till EQF level 4 (formal)
Accreditation is the process by which a educational institutes acquires the quality mark to be included in the register of recognized educational institutes. The accreditation is granted by the SBB if the edacation institute has demonstrated that it can meet quality criteria with regard to the content elements of a qualification and the supervision of the course participant. Only accredited education centers may make professional practice training places available that can be used by the educational institution for the implementation of the professional training program.

2. Post bachelor education EQF 7-8 (formal)
This accreditation is granted by CPION, There are procedures available for Post VET and Post Higher education.

3. Branche recognistion EQF 3-8 (informal)
KvINL accreditates training providers based on guidelines and ULO's issued by branche organisations and or Quality labels. To become accredited training providers fill in a self-assessment and after that an assessor performs the initial accreditation assessment.

Name and status of the body awarding the LO:	**Name and status of the national/regional authority providing accreditation/recognition of the LO:**
Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven (SBB)	*Ministry of Education, Culture and Science*

Type of certification :

☒ **Official certificate**
☐ **Non official certificate**

Describe the type of certificate:
1. Since 1 August 2015 there has been one national logo for all recognized training companies. The logo shows the proof the organization is training MBO students, whether it is an indication on paper, a sticker on your company car or a sign on your facade.

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2. CPION also has a national logo for post bachelor education

3. The logo for accreditated companies issued by KvINL

Level of the certificate (national or international)

1. European level: EQF 1 – 4
2. European level: EQF 7 – 8
3. European level: EQF 2 – 8

Legal Basis:

Supporting regulation:

Reglement erkenning leerbedrijven SBB: http://wetten.overheid.nl/BWBR0036743/2015-08-01

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LITHUANIA	
Procedures for the accreditation and recognition of learning outcomes: *Three BIM-related competences profiles are already described and presented in www.digitalconstruction.lt. BIM-related competences profiles developed by Nonprofit public institution Digital Construction, established by 13 national construction related associations and unions.* *BIM-related competences will be assessed and recognized during non-formal trainings and certification procedures managed by public institution Digital Construction. Certification model and procedures are under development (planned launch 2018, Q2-3).* *Learning outcomes (LO) will be aligned with Building Smart BIM competences profiles LO and submitted for integration to National Construction Qualification Scheme.*	
Name and status of the body awarding the LO: *Lithuanian public institution Digital Construction*	**Name and status of the national/regional authority providing accreditation/recognition of the LO:** *Ministry of Environment of the Republic of Lithuania*
Type of certification : ☐ **Official certificate** *(seeking)* ☐ **Non official certificate** *(starting)* **Describe the type of certificate:** *Professional certificate (liet. profesinis atestatas)* **Level of the certificate (national or international)** European level: EQF 4-7 Note: Lithuanian EQF levels adopted according to European EQF model: https://en.wikipedia.org/wiki/European_Qualifications_Framework	
Legal Basis: *STR 1.02.01:2017 „Statybos dalyvių atestavimo ir teisės pripažinimo tvarkos aprašas“ (eng. Certification and legal recognition procedure for construction professionals)* *BIM-related competences profiles will be presented for integration in existing certification scheme described by legal act.*	

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5. Organisations signing the Memorandum of Understanding

Organization 1 – ENEA (IT)	
Country	Italy
Name of the Organization	**ENEA**
Address	Via Anguillarese 301, 00123 Roma
Telephone	0039 6 30 48 6474
E-mail	anna.moreno@enea.it
Website	www.enea.it
Contact	Anna Moreno

Organization 2– CSA (IT)	
Country	Italy
Name of the Organization	**Centro Servizi Aziendale (CSA)**
Address	Via Leinì 23 – 10036 Settimo Torinese (TO) - Italy
Telephone	0039 349 620 37 00
E-mail	amministrazione@gruppocs.com
Website	www.gruppocs.it
Contact	Claudio Rosso

Organization 3 – FLC (ES)	
Country	Spain
Name of the Organization	**FUNDACIÓN LABORAL DE LA CONSTRUCCIÓN (FLC)**
Address	Cl. Rivas, 25 – 28052 - Madrid
Telephone	0034 91 398 45 00
E-mail	jgonzalez@fundacionlaboral.org
Website	www.fundacionlaboral.org
Contact	Javier González (International Projects Manager)

Organization 4 – ZSPS (SLOVAKIA)	
Country	Slovakia
Name of the Organization	**Zväz stavebných podnikateľov Slovenska (ZSPS) / Association Construction Entrepreneurs of Slovakia**
Address	Viedenska cesta 5
Telephone	+421-911-421844
E-mail	doktorfr@icloud.com
Website	www.zsps.sk
Contact	Frantisek Doktor, senior advisor Pavol Kovacik, president

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Organization 5 – Estonian Qualifications Authority (Estonia)	
Country	Estonia
Name of the Organization	**Estonian Qualifications Authority**
Address	Mustamäe tee 16, 10617 Tallinn, Estonia
Telephone	+372 679 1700
E-mail	kutsekoda@kutsekoda.ee
Website	https://www.kutsekoda.ee/en/index
Contact	Irma Estra (Irma.Estra@kutsekoda.ee)

Organization 6 – FCE (Croatia)	
Country	Croatia
Name of the Organization	**University of Zagreb, Faculty of Civil Engineering (FCE)**
Address	Fra Andrije Kacica Miosica 26, 10000 Zagreb
Telephone	+385 1 4639 316
E-mail	bmilovanovic@grad.hr
Website	www.grad.unizg.hr
Contact	Bojan Milovanović (assist.prof.) Ivana Burcar Dunović (assist.prof

Organization 13 – SBB (Netherlands)	
Country	Netherlands
Name of the Organization	**SBB**
Address	Louis Braillelaan 24, Postbus 7259, 2701 AG Zoetermeer
Telephone	+31 (0)88 338 00 00
E-mail	No e-mail: https://www.s-bb.nl/contact
Website	www.s-bb.nl
Contact	-

Organization 14 – CPION (Netherlands)	
Country	Netherlands
Name of the Organization	**CPION**
Address	K.P. van der Mandelelaan 41a, Postbus 701, 3000 AS Rotterdam
Telephone	+31 (0)10-201 42 99
E-mail	info@cpion.nl
Website	www.cpion.nl
Contact	-

Organization 15 – KVINL (Netherlands)	
Country	Netherlands
Name of the Organization	**KVINL**
Address	Bredewater 20, Postbus 7103, 2701 AC Zoetermeer
Telephone	+31 (0)79 321 79 93
E-mail	info@kvinl.nl
Website	www.kvinl.nl
Contact	-

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6. Other organisations that may endorse this MoU

State Authorities
Ministry of Education
Labour Ministry
Labour Offices
Labour Health and Safety inspections Departments
Regional and Local Authorities
County Councils
Chambers
Chambers of Commerce and Industry
Chambers of Architecture
Professional Associations and Unions
Trade Unions (Construction)
Company Representatives
Association of Construction Companies
Regional Constructors and Promoters Institutions
Education institutions
Universities
VET schools
Research Institutions
Businesses
Big construction companies
SMEs
Eco-efficient building material suppliers
Consultancies
Professionals
Managing Directors
Managers/Executives
Engineers
Architects
Employees
Installers
Maintainers
Trainers/Teachers/Instructors
Other
Technological Institutes
Construction Workers
Tenants
Owners
Building administrators

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7. Training schemes covered by this MoU

7.1. General aim of the training programme / Key competence to be acquired

The purpose of the Qualification & Training Schemes is to define the minimum requirements for the certification of competences of the different professional profiles

7.1.1. EQF level

For the different professional profiles EQF levels are defined by a set of descriptors:

- ***Knowledge***: the outcome of the assimilation of the information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study.
- ***Skill***: the ability to apply knowledge and use know-how to complete tasks and solve problems.
- ***Competence***: demonstrated ability to apply knowledge, skills and attitudes for achieving observable results.

PROFESSIONAL PROFILES

BIM MANAGER is a professional specialized in the leading and management of BIM (project)implementation, with a background in one of the following working fields: construction management, buildingmanagement, financing and procurement and architecture.

For the Net-UBIEP purpose, the profile of the BIM MANAGER is integrated with additional SPECIFIC COMPETENCES of Energy Efficiency:

- C0.MA Have basic BIM knowledge and skills;
- C1.MA Understand BIM tools;
- C2.MA Apply information management;
- C3.MA Apply procurement management;
- C4.MA Use BIM technology;
- C5.MA Analyse BIM Model.

EQF level

EQF7(or higher)
Level of knowledge: BIM MANAGER has highly specialised knowledge, some of which isat the forefront of knowledge in a field of work orstudy, as the basis for original thinkingand/or research. He has critical awareness of knowledge issues in a field and at theinterface between different fields.

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Level of skills: BIM MANAGER has specialised problem-solving skills required in researchand/or innovation in order to develop new knowledgeand procedures and to integrateknowledge from different fields into BIM modellingprocess.
Level of responsibility and autonomy: BIM MANAGER manages and transforms work orstudy contexts that are complex, unpredictable andrequire new strategic approaches. Hetakes responsibility for contributing to professional knowledge and practice and/or forreviewing the strategic performance of teams.He may be a Project Manager (at organizational levelor at project level) as well or supportthe project Manager in charge.

BIM COORDINATOR is a professional specialized in the integration of different models, with backgroundin one of the following working fields: construction management, architecture, building management, structuralengineering, mechanical engineering, electrical engineering.

For the Net-UBIEP purpose, the profile of the BIM COORDINATOR is integrated with additional SPECIFICCOMPETENCES of Energy Efficiency:
C0.CO Have basic BIM knowledge and skills;
C1.CO Understand BIM tools;
C2.CO Apply information management;
C3.CO Apply procurement management;
C4.CO Use BIM technology;
C5.CO Analyse BIM Model.

EQF level

EQF7(or higher)
Level of knowledge: BIM COORDINATOR has highly specialised knowledge,some ofwhich is at the forefront of knowledge in a field of work or study, as the basis for originalthinking and/or research. He has critical awarenessof knowledge issues in a field and atthe interface between different fields.
Level of skills: BIM COORDINATOR has specialised problem-solving skills required inresearch and/or innovation in order to develop newknowledge and procedures and tointegrate knowledge from different fields.
Level of responsibility and autonomy: BIM COORDINATOR manages and transformswork or study contexts that are complex, unpredictable and require new strategicapproaches. He takes responsibility for contributing to professional knowledge and practiceand/or for reviewing the strategic performance of teams.He works in staff with BIM Manager, BIM Information manager, Project Manager or similarfigures.

BIM EXPERT-SPECIALIST is a professional specializedin the production and checking of BIM Models,with background in architecture, mechanical engineering (including plumbing), electrical engineering andstructural engineering.

For the Net-UBIEP purpose, the profile of the BIM EXPERT-SPEIALIST is integrated with additionalSPECIFIC COMPETENCES of Energy Efficiency:

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C0.ES Have basic BIM knowledge and skills;
C1.ES Understand BIM tools;
C2.ES Apply information management;
C3.ES Apply procurement management;
C4.ES Use BIM technology;
C5.ES Analyse BIM Model.

EQF level

EQF 6(or higher)
Level of knowledge: BIM EXPERT-SPECIALIST has advanced knowledge of afield of work or study, involving a critical understanding of theories and principles.
Level of skills: BIM EXPERT-SPECIALIST has advanced skills, demonstratingmastery and innovation, required to solve complex and unpredictable problems ina specialised field of work or study.
Level of responsibility and autonomy: BIM EXPERT-SPECIALIST managescomplex technical or professional activities or projects, taking responsibility fordecision-making in unpredictable work or study contexts. He takes responsibilityfor managing professional development of individuals and groups.

BIM MODEL EVALUATOR is professional responsible forthe alignment between the BIM Model and thepre-set contract objectives, with background in oneof the following working fields: architecture, structuralengineering, mechanical engineering (including plumbing), electrical engineering, construction engineering.

For the Net-UBIEP purpose, the profile of the BIM MODEL EVALUATOR is integrated with additional SPECIFIC COMPETENCES of Energy Efficiency:
C0.ME Have basic BIM knowledge and skills;
C1.ME Understand BIM tools;
C2.ME Apply information management;
C3.ME Apply procurement management;
C4.ME Use BIM technology;
C5.ME Analyse BIM Model.

EQF level

EQF 5(or higher)
Level of knowledge: BIM MODEL EVALUATOR has comprehensive, specialised,factual and theoretical knowledge within a field ofwork or study and an awarenessof the boundaries of that knowledge.
Level of skills: BIM MODEL EVALUATOR has a comprehensive range ofcognitive and practical skills required to developcreative solutions to abstractproblems.
Level of responsibility and autonomy: BIM MODEL EVALUATOR exercisesmanagement and supervision in contexts of work or study activities where there isunpredictable change. He reviews and develops performance of self and others.

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BIM USER includes the set of customers, clients, contractors, producers and other project informationusers.

For the Net-UBIEP purpose, the profile of the BIM USER is integrated with additional SPECIFIC COMPETENCES of Energy Efficiency:
C0.US Have basic BIM knowledge and skills;
C1. Not applied;
C2.US Apply information management;
C3.US Apply procurement management;
C4.US Use BIM technology;
C5.US Analyse BIM Model.

1.1. EQF level

EQF 3(or higher).
Level of knowledge: BIM USER has knowledge of facts, principles, processesand general concepts, in a field of work or study.
Level of skills: BIM USER has a range of cognitive and practical skills required toaccomplish tasks and solve problems by selecting and applying basic methods,tools, materials and information.
Level of responsibility and autonomy: BIM USER takes responsibility forcompletion of tasks in work or study. He adapts ownbehaviour to circumstancesin solving problems

7.2 Learning outcomes

Target groups:

1. Public Administrations
2. Professionals
3. Technicians
4. Owners

Within the framework described, upon successful completion of the training programme, trainees should be able to:

Public administrations

- PA.LO1. identify the advantages of using BIM during the construction, management, maintenance and refurbishment of nZEB or of existing buildings because of the decrease of the life cycle cost in order to support communities. See and overcome barriers with the purpose to have a successful adoption of BIM, communicating value, benefits and investments associated with it. Incorporate information about BIM, staying up to date on

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BIM trends, current developments and new directions and evaluating new BIM related technologies;

- PA.LO2. ensure compliance with BIM standard, using code checking software to verify the respect of them and to list the requirement for automatic code checking and managing software e-permit;
- PA.LO3. establish requirements for the management, coordination and preserving of data related to energy performance during the lifecycle of the building in the Common Data Environment, knowing the importance of the respect of the information requirements through all the supply chain, evaluating the completeness of the information delivery plan and ensuring the storage of the models for the future. Define the methodology for BIM maturity levels;
- PA.LO4. use open standard formats for information sharing in the Common Data Environment, read the 3D model using viewers and identify various participants and roles in the sustainable construction project. Use quality checking software in order to verify the respect of requirements;
- PA.LO5. define performance indicators depending on the use of the building, climate zone, influence on the global environment during its whole lifecycle and manage and analyze data for thecalculation of nZEB energy performance. Define the Quality Assurance monitoring methodology with measurable Quality Assurance criteria as part of the contract and measure and analyze the defined Quality Assurance input data for the definition and management of performance gaps;
- PA.LO6. develop the handover strategy and evaluate if there are differences between "asbuilt" and the final BIM Model.

Professionals

- PR.LO1. identify advantages of using BIM during the construction, management, maintenance and refurbishment of nZEB or of existing buildings because of the decrease of the life cycle cost. Evaluate related BIM technologies, current BIM standards and new BIM trends;
- PR.LO2. evaluate economic / quantity take off in the decrease of the life cycle cost of the building, 5D cost estimation, RoI for refurbishment works establishing organization / project budgets and costs;
- PR.LO3. develop a 4D functional, volumetric and planning layouts with the definition of site utilization planning, the track for the effectively distribution of appropriate spaces and related resources, integrating life cycle concepts in different project phases, in order to set-up organized management systems;
- PR.LO4. identify requirements for the management of data in the Common Data Environment for any other professional involved in the design process, understanding the various participants and roles in the sustainable construction project and giving support on BIM tools to employees. Ensure the respect of the information requirements and of

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Information Delivery Manual through all the supply chain, manage data within the information model, keep records of implementation, monitor outcomes, ensure that the information provided is kept intact and not manipulated for any future use and transfer the BIM information model to the final use;

- PR.LO5. conduct feasibility studies, make digital production, design / 3D modelling of graphic and non-graphic information, develop the library of elements of a building needed for Common Data Environment, validate models, create a project visualization for users and reviewers. Federate different 3D models in order to verify the presence of interferences, applying quality management and coordinating team members of different disciplines. Consider 7D performance indicators while designing nZEB or refurbishment work depending on various technologies, their benefits versus costs, the use of the building, climate zone, etc.;
- PR.LO6. identify the requirements for nZEB in terms of RES (Renewable Energy Sources), energy saving installations, 6D sustainability requirements, communicating BIM design goals. Integrate different RES (Renewable Energy Sources) systems into buildings without clash detection, with knowledge on interplay between all aspects of building design, building use and outdoor climate, sustainable energy system, building energy demand and renewable energy production. Define sustainability of materials in tender documents and select companies with experience in those technologies;
- PR.LO7. conduct risk management, disaster planning (including planning of future climate changes), troubleshooting problems related to BIM systems, solving of the main critical points for obtaining nZEB and consequent modification of BEP;
- PR.LO8. produce a maintenance plan and a maintenance manual for the buildings plants in order to transfer management information to Owners;
- PR.LO9. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building;
- PR.LO10. use a laser scanning for the producing of a point of cloud or a photogrammetry of existing buildings for their refurbishment, modelling, comparing and evaluating of new facilities and related systems and for the development of a 3D model in Reverse Engineering;
- PR.LO11. make technical supervision and verify the respect to predefined BIM standards, technical requirements and legislation (with code checking), being able to use the relative software and to establish quality management of BIM projects;
- PR.LO12. produce a correct decommission of the building and provide to recycle any part, in the respect of local, national and international laws.

Technicians

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- TE.LO1. identify and/or digitalize non-graphic elements related to the executed installation in order to send them to the modeler. Read the technical schema and the installation requirement from a BIM model, understanding how to check the main critical points in the model in order to ensure the correct installation of the technology. Correctly provide, when request, information on the actual installation, use, maintenance, recycling and decommissioning of equipment helping in the updating of the BIM Model in order to ensure its completeness;
- TE.LO2. list several stakeholders who participate in the sustainable construction project, distinguishing their role and needs and contributing to the construction of a strong working team;
- TE.LO3. distinguish between different RES (Renewable Energy Sources) solutions and technologies, identifying the sustainability requirements, advantages and disadvantages according to climate zone, building uses and the global environment. Use passive measures such as sustainable construction materials (less prone to failures and without maintenance costs and requirements) in order to achieve the energy performance. Select products that fit specifications and demands on given quality aspects, avoiding interferences with other technologies installed in the building thanks to the measure and analysis of the realized performance and with the definition and management of performance gaps;
- TE.LO4. provide maintenance information to preserve the foreseen energy performance, assuring the completeness and correctness of the maintenance plan in according of measurement planned of installed technology, being able to manage and analyze data;
- TE.LO5. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building.

Owner

•OW.LO1. evaluate a plan for Return of Investment (RoI) distinguishing between different mechanisms for financing energy efficiency measures, underlining advantages for using BIM;

•OW.LO2. evaluate the selection made by designers on energy efficiency solutions in practical way, taking into consideration the impact of relevant government program and regulation. Collaborate with other stakeholders in order to understand needs of customers and produce better energy savings;

•OW.LO3. understand the global environmental impact of different building products during the whole life cycle of the buildings;

•OW.LO4. identify which information and requirements are necessary for a better management and maintenance of the building, understanding the importance of the completeness of the

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information delivery plan of the supply chain. Ensure that the information provided is kept intact and not manipulated by any future used;

•OW.LO5. evaluate the completeness and correctness of a maintenance plan in order to preserve the foreseen energy performance making systems inspections according to national legislation. Identify performance gaps and indicate to Professionals the need to take actions on abnormalities in order to assure compliance with energy performance certificates;

•OW.LO6. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building;

•OW.LO7. identify several participants and their roles in the sustainable project during the design, construction, refurbishment, maintenance, recycling of new and existing buildings, training them for the correct maintenance and management of the process;

•OW.LO8. apply quality Building Management Systems (BMS) measuring and analyzing the actual performance with a consequent adjustment of foreseen analysis. Recognize the need for the development of an appropriate Data Security Risk Management.

8. Training contents

Training courses consist on the following structure depending on the different target group.

Technicians

0. Introductory Module–Basic BIM knowledge and skills

0.1 Introduction: what is BIM?

0.2 BIM Glossary

0.3 Advantages and value of using BIM for different uses

0.4 Open BIM tools and standard format

0.5 The CDE (Common Data Environment)

1. Module 1–Diffuse BIM

The Module 1 is not compulsory for this Target Group

2. Module 2–Apply information management

2.1 Principle of data management in the CDE (Common Data Environment)

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2.2 The identification of non-graphic information for the BIM Model

2.3 The maintenance plan in EPC (Energy Performance Contracting)

3. Module 3–Apply procurement management

3.1 Selection of materials and products with BIM

3.2 Training on Energy Efficiency

3.3 The identification and collaboration among stakeholders

4. Module 4–Use BIM technology

4.1 Sustainable construction sector

4.3 Laser scanning technology

5. Module 5–Analyse the BIM Model

5.1 Simulation techniques and energy and lighting analysis

5.2 BIM for handover and maintenance

Professionals

Introductory Module–Basic BIM knowledge and skills

0.1Introduction: what is BIM?

0.2 BIM Glossary

0.3 Advantages and value of using BIM for different uses

0.4 Open BIM tools and standard format

0.5 The CDE (Common Data Environment)

0.6 The BEP (BIM Execution Plan)1. Module 1–Diffuse BIM

1.1 Return of investments

1.1.1 Organization dimension of BIM ROI

1.1.2 Stakeholder dimension of BIM ROI

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1.1.3 Maturity dimension of BIM ROI

1.2 Strategies for a BIM diffusion

2. Module 2–Apply information management

2.1 Principle of data management in the CDE (Common Data Environment)

2.2 3D Model of graphic and non-graphic information

2.3 The maintenance plan in EPC (Energy Performance Contracting)

2.4 The "as built" BIM Model for improving the energy performance of buildings

3. Module 3–Apply procurement management

3.1 Quality tender and contracts, guarantees and Change Management

3.2 Green Procurement

3.3 Selection of materials and products with BIM

3.4 Training on Energy Efficiency

3.5 The identification and collaboration among stakeholders

4. Module 4–Use BIM technology

4.1 Sustainable construction sector

4.2 Automatic model checking

4.2.1 Code checking

4.2.2 Clash detection

4.3 Information maturity index

4.4 4D and 5D BIM technologies

4.4.1 4D Phase Planning

4.4.2 5D Cost Estimation

4.5 Laser scanning technology

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5. Module 5–Analyse the BIM Model

5.1 BIM for quality management

5.2 Simulation techniques and energy and lighting analysis

5.3 Technical supervision of construction works

5.4 BIM for handover and maintenance

Owners

0. Introductory Module–Basic BIM knowledge and skills

0.1 Introduction: what is BIM?

0.2 BIM Glossary

0.3 Advantages and value of using BIM for different uses

0.4 Open BIM tools and standard format

0.5 The CDE (Common Data Environment)

1. Module 1–Diffuse BIM

1.1 Return of investments

1.1.1 Organization dimension of BIM ROI

1.1.2 Stakeholder dimension of BIM ROI

1.1.3 Maturity dimension of BIM ROI

1.2 Strategies for a BIM diffusion

2. Module 2–Apply information management

2.1 Principle of data management in the CDE (Common Data Environment)

2.2 The identification of non-graphic information for the BIM Model

2.3 The maintenance plan in EPC (Energy Performance Contracting)

2.4 The "as built" BIM Model

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3. Module 3–Apply procurement management

3.1 Quality tender and contracts, guarantees and Change Management

3.2 Green Procurement

3.3 Training on Energy Efficiency

3.4 The identification and collaboration among stakeholders

4. Module 4–Use BIM technology

4.1 Sustainable construction sector

4.2 4D and 5D BIM technologies.

4.2.1 4D Phase Planning

4.2.2 5D Cost Estimation

5. Module 5–Analyse the BIM Model

5.1 Simulation techniques and energy and lighting analysis.

5.2 BIM for handover and maintenance

<u>Public administration</u>

0. Introductory Module–Basic BIM knowledge and skills

0.1 Introduction: what is BIM?

0.2 BIM Glossary

0.3Advantages and value of using BIM for different uses.

0.4 Open BIM tools and standard format

0.5 The CDE (Common Data Environment)

0.6 The BEP (BIM Execution Plan)

1. Module 1–Diffuse BIM

1.1 Return of investments

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1.1.1 Organization dimension of BIM ROI

1.2 Stakeholder dimension of BIM ROI

1.3 Maturity dimension of BIM ROI

1.2 Strategies for a BIM diffusion

Module 2–Apply information management

2.1 Principle of data management in the CDE (Common Data Environment)

2.2 The "as built" BIM Model

Module 3–Apply procurement management

3.1 Quality tender and contracts, guarantees and Change Management

3.2 Training on Energy Efficiency

3.3 The identification and collaboration among stakeholders

4. Module 4–Use BIM technology

4.1 Sustainable construction sector

4.2 Automatic model checking

4.2.1 Code checking

4.2.2 Clash detection

4.3 Information maturity index

4.4 4D and 5D BIM technologies...4.4.1 4D Phase Planning

4.4.2 5D Cost Estimation

Module 5–Analyse the BIM Model

5.1 BIM for quality management

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9. Assessment, recognition

By signing this Memorandum of Understanding we confirm that we have discussed the procedures for assessment, documentation, validation and recognition and agree on how it is done.

10. Validity of the MoU

This Memorandum of Understanding is valid from the end of the project until five years later, may be renewed in subsequent updates of the project or in a new one.

11. Signatures

(to be done at the end of the project).

12. References

- Recommendation of the European Parliament and of the Council of 18 June 2009 on the establishment of a European Credit system for Vocational Education and Training (ECVET).
- Royal Decree 1224/2009, 17th of July, on the recognition of occupational competencies acquired by working experience- Spanish legislation
- *Act 13 of the 2013/01/16* – Italian legislation
- Act 4/2013 art. – Italian legislation
- UNI EN ISO 17024
- Act 568/2009 Coll. on lifelong learning – Slovakian legislation
- Reglement erkenning leerbedrijven SBB: http://wetten.overheid.nl/BWBR0036743/2015-08-01 - Dutch legislation.
- STR 1.02.01:2017 „Statybos dalyvių atestavimo ir teisės pripažinimo tvarkos aprašas“ (eng. Certification and legal recognition procedure for construction professionals) – Lithuanian legislation.

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