



DELIVERABLE: D15.A – D3.2.A

Requirements for Learning Outcomes for Target Groups

Version: 1
Date: 05/04/2018

WP Leader: CSA – Centro Servizi Aziendale
Author: CSA – Centro Servizi Aziendale

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 N° 754016.

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

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

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

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



International web page



Italian web page



Croatian web page



Slovak web page



Spanish web page



Dutch web page



Estonian web page



Lithuanian web page



The PUBLIC
ADMINISTRATION is
expected to:

L01. identify the advantages of using BIM during the life cycle of the building seeing and overcoming barriers with the purpose to have a successful adoption

L02. ensure compliance with BIM standard, using code checking software to verify the respect of them and to list the requirement for automatic code checking

L03. establish requirements for the management, preserving of data related to energy performance in the CDE

L04. Use open standard formats and read the model with viewers and quality checking software

L05. define performance and analyze data for the calculation of nZEB. Define the QA monitoring methodology

L06. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union





- 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 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 the calculation 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 "as built" and the final BIM Model.

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union





The PROFESSIONAL is expected to:

L01. Identify advantages of using BIM, evaluating related technologies, standards and trends

L02. evaluate economic / quantity take off in the decrease of the life cycle cost of the building with 5D cost estimation

L03. make a 4D phases planning, integrating life cycle concepts in different project phases, in order to set-up organized management systems

L04. identify requirements for the management of data in the CDE, ensuring the respect of the information requirements and of Information Delivery Manual. Manage those data

L05. produce and manage digital data for the design of nZEB and consider 7D performance indicators for the analysis of data

L06. select energy efficiency solutions (and their suppliers), integrating different RES systems into buildings without clash detection

L07. conduct risk management and disaster planning, troubleshooting problems related to BIM

L08. produce a maintenance plan and a maintenance manual for the buildings plants in order to transfer management information to Owners

L09. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building

L010. use Reverse Engineering methods for the definition of models of existing buildings for their refurbishment

L011. make technical supervision and verify the respect to predefined BIM standards, technical requirements and legislation (with code checking)

L012. produce a correct decommission of the building and provide to recycle any part, in the respect of local, national and international laws

LEARNING OUTCOMES



The PROFESSIONAL is expected to:



- 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 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.;

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union





- 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.

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union





The TECHNICIAN is expected to:

L01. identify the advantages of using BIM during the life cycle of the building and evaluate related BIM technologies

L02. list several stakeholders who participate in the sustainable construction project, distinguishing their role and needs.

L03. distinguish between different RES solutions and technologies and select products that fit specifications, avoiding interferences with other technologies installed

L04. provide maintenance information to preserve the foreseen energy performance, assuring the completeness and correctness of the plan

L05. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building

LEARNING OUTCOMES



The TECHNICIAN is expected to:



- 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;

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union





L01. evaluate a plan for Return of Investment (RoI) distinguishing between different mechanisms for financing energy efficiency measures

L02. select energy efficiency solutions, taking into consideration the impact of relevant government program and regulation and customer's needs

L03. understand the global environmental impact of different building products during the whole life cycle of the buildings

L04. identify which information and requirements are necessary for a better management and maintenance of the building

L05. evaluate the completeness and correctness of a maintenance plan in order to preserve the foreseen energy performance

L06. evaluate the completeness of the handover strategy and verify the correspondence between the "as built" and the final BIM model of the building

L07. identify participants and their roles in the sustainable project, training them for the correct maintenance and management of the process

L08. apply quality Building Management Systems (BMS) and Data Security Risk Management

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme of the European Union





- 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 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.

LEARNING OUTCOMES



Co-funded by the Horizon 2020 programme
of the European Union

