



---

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

---

Grant Agreement: 600946-EPP-1-2018-1-IE-EPPKA2-KA

# **Learning Unit 9**



Co-funded by the  
Erasmus+ Programme  
of the European Union



## BUILDING ENERGY MODELLING (BEM) DESIGN AND EXPORT

<b>EQF</b>	7	<b>Target</b>	Project manager Consultant Designer Specialist in green building
<b>Description</b>			

The following learning unit will teach you how to develop a Building Energy Model (BEM) and how it affects the design of nZEB buildings. BEM grants advantages to thermomechanical and energy performance fields. Export properties and functionalities will be explained to deliver a BEM to an energy simulation tool. Considering the knowledge acquired in this training you will speed up your work, be able to prevent future needs and provide a preventive solution.

### Objectives

- Generate a Building Energy Model (BEM) and evaluate its positive impact on the workflow of nZEB design.
- Design and export a Building Energy Model (BEM) considering nZEB requirements and parameters.
- Generate a Building Energy Model (BEM) of existing buildings to rehab them into nZEB buildings.

### Generic competence

- Ability to apply construction procedures, methodology and planning techniques.
- Proactive, anticipatory and change-oriented behaviour.
- Cognitive and practical skills to perform tasks related to the process of designing energy saving buildings.
- Advanced skills and good practices in the realization of nZEB buildings.
- Advanced skills evaluating the influence of each parameter on the energy demand of the building.
- Knowledge of the design, analysis and construction of building works.



- 
- Spatial vision skills and knowledge of graphic representation techniques through computer-aided design applications.

### Specific competence

- Anticipate the future need to create an energy model of the building.
- Utilise the technology to drive sustainability reporting and testing.
- Understand effects software has to workflows and what mapping needs to occur to ensure project coordination and collaboration.
- Quality checking procedures for design standards and compliance within BIM.
- Utilise the model and technologies to assist with value engineering testing and validation procedures.
- Utilise the technology to drive systems analysis for performance-based solutions.
- Understand integrated design processes and concepts
- Understand interdisciplinary teamwork towards common goals
- Assess systems related to building function and architecture
- Design and engineer passive energy measures and energy reduction systems to reach nZEB.
- Design of an architectural sustainable building (including sustainable and flexible floorplan)
- Evaluate the integrated design

### Recommended learning methodology

#### Methodology

The recommended methodology for the course would be Gamification, is based on the application of elements of games (non-playful context), in order to influence the behaviour of people from the stimulation of their motivation.

In addition, another recommended methodology would be Design Thinking. A methodology that considers innovation as a holistic approach, where students through technology and their own interests or training needs converge through an action plan



---

designed by themselves. It is based on finding the most original solution to a real problem given by the teacher, and for which the students will have to analyse the situation, establish hypotheses, and foresee possible impacts of the action.

## **Method**

The recommended methods will be based on individual work and the adaptation to Self-learning.

### **Recommended assessment methodology**

The recommended evaluation will be the creation of a portfolio with the projects worked on during the course and the completion of written tests.

---