

## NEWSLETTER 2.

Project ID: KA220-VET-6ABB1E4A

31.10.2022

### PROJECT CONTEXT

The EU Climate Policy Development Green Deal aims to develop a community with a smart energy program. This is to be achieved using innovative technologies, a low-carbon economy through the introduction of renewable energy systems, and an inclusive society with a strong focus on job creation to reduce poverty.

The energy turnaround as a whole cannot succeed without tapping the major energy efficiency potential, which lies primarily in the building sector.

### WEB-BASED VET MODULES IN THE ENERGY EFFICIENCY OF INTELLIGENT BUILDING

**MODULE 1 Checking, maintaining, and adjusting the energy-efficient modes of operation of modern automated BMS (building management systems)**

**Topic 1: What is a modern BMS?**

- 1.1: About this unit
- 1.2: Building Management System (BMS)

**Topic 2: Why to manage energy efficiency?**

- 2.1: About this unit
- 2.2: Energy Management

**Topic 3: Where are the potentials for an energy efficient operation of buildings**

- 3.1: About this unit
- 3.2: Potentials for an energy efficient

**MODULE 2 Energy efficient lighting technologies in buildings**

**Topic 1: Lighting fundamentals**

- 1.1. Introduction
- 1.2. Electromagnetic and visible spectrum
- 1.3. Photobiological impact of light on human
- 1.4. Basic photometric quantities and dependencies



- 1.5. Luminous efficacy
- 1.6. Color Rendering Index (CRI)
- 1.7. Correlated Color temperature (CCT)

**Topic 2: Lamps**

- 2.1. Introduction
- 2.2. Principle of operation, parameters and characteristics of the lamps
- 2.3. Comparison of the parameters and characteristics of the lamps

**Topic 3: Luminaires**

- 3.1. Introduction
- 3.2. Luminaire classification

**Topic 4: Lighting control and regulation equipments**

- 4.1. Introduction
- 4.2. Ballasts, Starters, Capacitors for HID lamps
- 4.3. LED drivers
- 4.4. Control gears for different type of lamps. Circuits
- 4.5. Energy- saving equipments

**Topic 5: Indoor lighting design and maintenance**

- 5.1. Introduction
- 5.2. Standards on the recommendations for the level of indoor lighting
- 5.3. Choice of the Color characteristics of light sources

**Topic 6: Photovoltaic systems for lighting**

- 6.1. Introduction
- 6.2. Structure
- 6.3. Principle of work
- 6.4. Storage batteries for PV-LED system

**Topic 7: Course project on lighting design**

- 7.1. Introduction
- 7.2. Lighting requirements for activity areas and 3D modeling of the elements in the room
- 7.3. Choice of indoor luminaires
- 7.4. Determination of the maintenance factor and the required number of luminaires

**More about project <https://ee-vet.itstudy.hu/en/project>**

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## **MODULE 3 Installation, repair, and maintenance of small-scale photovoltaic systems in buildings**

### **Topic 1 Photovoltaic systems. – basics**

- 1.1. Sun and solar Radiation
- 1.2. Photovoltaic effect and principle of solar cells operation.
- 1.3. Types of technologies for creating PV cells.
- 1.4. A brief overview of the types of photovoltaic systems and their application.
- 1.5. Evaluation and analysis of the terrain / building based on which the PV system must be introduced.
- 1.6. Main steps and activities to be planned to realise a small PV system.

### **Topic 2 Basic components in the structure of a photovoltaic system.**

- 2.1. Components of photovoltaic systems - structure, types and characteristics
- 2.2. Junction box purpose and main elements.
- 2.3. Connecting elements and technology in the installation of a photovoltaic system.
- 2.4. The inverter's role, functional capabilities, and the different types.
- 2.5. The role of the DC load switch (DC main switch).
- 2.6. The role of the AC-side miniature circuit breakers and residual current circuit breakers.
- 2.7. PV system monitoring point: Integration into the power grid and Counting device.

### **Topic 3 Site survey and shading analysis are important elements for the proper functioning and efficiency of the PV system**

- 3.1. Devices and methods for the numerical analysis of shading in PV system construction.
- 3.2. Factors on which the shading depends and how it affects the efficiency of the photovoltaic system.

### **More about project <https://ee-vet.itstudy.hu/en/project>**

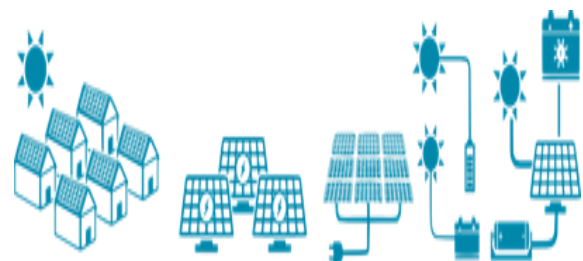
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### **Topic 4 Installation of a PV system depending on the purpose and according to the architectural features of the building.**

- 4.1. Roof-based Photovoltaic systems / Architectural types of roofs - Introduction.
- 4.2. Types of installation options for PV systems for pitched roofs.
- 4.3. Specifics of installing photovoltaic systems on building facades.
- 4.4. Peculiarities when installing light roof constructions - Glass roofs PV systems.
- 4.5. Installation of ground-based PV systems.
- 4.6. Types of Solar Trackers systems and their pros & cons.

### **Topic 5 Installation, commissioning and operation of PV systems**

- 5.1. Safety regulation during the installation and maintenance of PV systems.
- 5.2. General instructions and stages for the installation of a PV system.
- 5.3. Good and bad practices in installation activities – examples.
- 5.4. Main activities during the commissioning of a small PV system.
- 5.5. Basic rules and activities in the implementation of service and maintenance of a PV system.
- 5.6. Operational monitoring and data processing: Hardware and good practices.



## PARTNERSHIP

**PROJECT COORDINATOR:** Social CRM Research Center e. V



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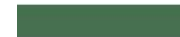
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