RĒZEKNES TEHNOLOĢIJU AKADĒMIJA

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KA2 – Cooperation for Innovation and the Exchange of Good Practice
KA220-VET Cooperation partnerships in vocational education and training
Project Nr. 000029591

IMPROVING THE EFFICIENCY & ATTRACTIVENESS OF VOCATIONAL EDUCATION/TRAINING OF ELECTRICIANS

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EE VET
ENHANCING YOUR SKILLS

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CONCEPT FOR A VET MODULE "PHOTOVOLTAIC INSTALLATIONS"

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Concept for MODULE

(Photovoltaic Installations)

CONTENT:

1. **Introduction**
2. **Common goal**
3. **Beneficiaries**
4. **Methodology**
5. **Module architecture**
6. **Contents of the blocks**
7. **Conclusion**

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1. Introduction

- **The strategy for the development of the EU aims to transform it into an intelligent community through innovative technologies implementation, a low-carbon economy through Renewable Energy Systems RES involvement and inclusive society with a strong emphasis on job creation and poverty reduction.**

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1. Introduction

- **Solar energy fits perfectly into the European strategy for a green deal. Our EE-VET project aims to create and offer adequate, advanced education and training in photovoltaic systems, which will be widely used in the construction / green industry pilot in 5 EU countries Bulgaria, Germany, Latvia, Lithuania and Hungary.**

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2. Common goal

- The common goal of our three modules, including the one Latvia needs to develop, is to overcome the current lack of electrical engineering skills for energy efficiency and new green construction technologies for energy production. The other aspect of our primary goal is to create and implement training adequate to the demand in the human resources market in Europe.
- For example, my module should:
  - Responses to the growing demand for new electricians working with solar installations in the current construction industry in the five partner countries.
  - To allow unemployed or active workers to improve their skills in installing and maintaining solar installations, respectively.
- I think in developing this module the specifical aim is:
  - Strengthening the exchange of knowledge and practices between education and training institutions and the labor market in this professional field.

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How do I personally see my work on the development of the module "Education and training in photovoltaic systems"?

- ✓ It should aim to design and provide demand-oriented vocational and educational training in response to the objectives set by EU Directive 2010/31 / EU on energy-efficient buildings: all new buildings by 2020 should be nearly zero energy.

I plan the following results in the development of the module:

- ❖ Development of 3 main training parts of the module for installers of photovoltaic systems;
- ❖ Innovative teaching method;
- ❖ Complete training material available online (for trainees and trainers);
- ❖ Online assessment method;
- ❖ Certification of training;
- ❖ Roadmap for the official recognition of training until 2027;
- ❖ Network of VET providers implementing training in 5 EU countries.

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3. Beneficiaries

- Vocational Training institutes providing training in PV energy installation field.
- Unemployed electricians, electrical installers.
- Specialized trainers of vocational courses in the PV sector.
- Companies engaged in the PV sector.
- Employed electricians willing to upgrade their skills.
- Training centers for adults and continuous training.
- Policy makers in the field of education and training.
- Unemployed youngsters with lower secondary educational attainment.

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4. Methodology

First stage:

Define the criteria to use to find best practices in innovative teaching methods.

In this task, we have defined the characteristics and criteria that a best practice must meet concerning the needs and specifications of the project and considering various aspects, including:

- **The methodology used must be innovative and use the characteristics of e-learning, inverted classroom, blended learning and ubiquitous methodology.**
- **The training tools used: training simulators, training videos, video conferencing, infographics, graphics, etc.**

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4. Methodology

Second stage:

Objectives to establish criteria to be used to select best practices from teaching methods.

- **After defining the criteria for determining what is good practice, they should be sent to the other project partners to evaluate them and give their opinion on the defined criteria.**
- **The contribution received from the partners will be considered to update the original document and to create the final version.**

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4. Methodology

Third stage:

Verify and validate the matrix e-learning education system.

- ✓ **Having defined the matrix system, it must be verified and validated. The document will be sent to the rest of the task´s partners to evaluate it and contribute their views.**
- ✓ **The input received from the partners will be considered to update the document and to create the final version.**

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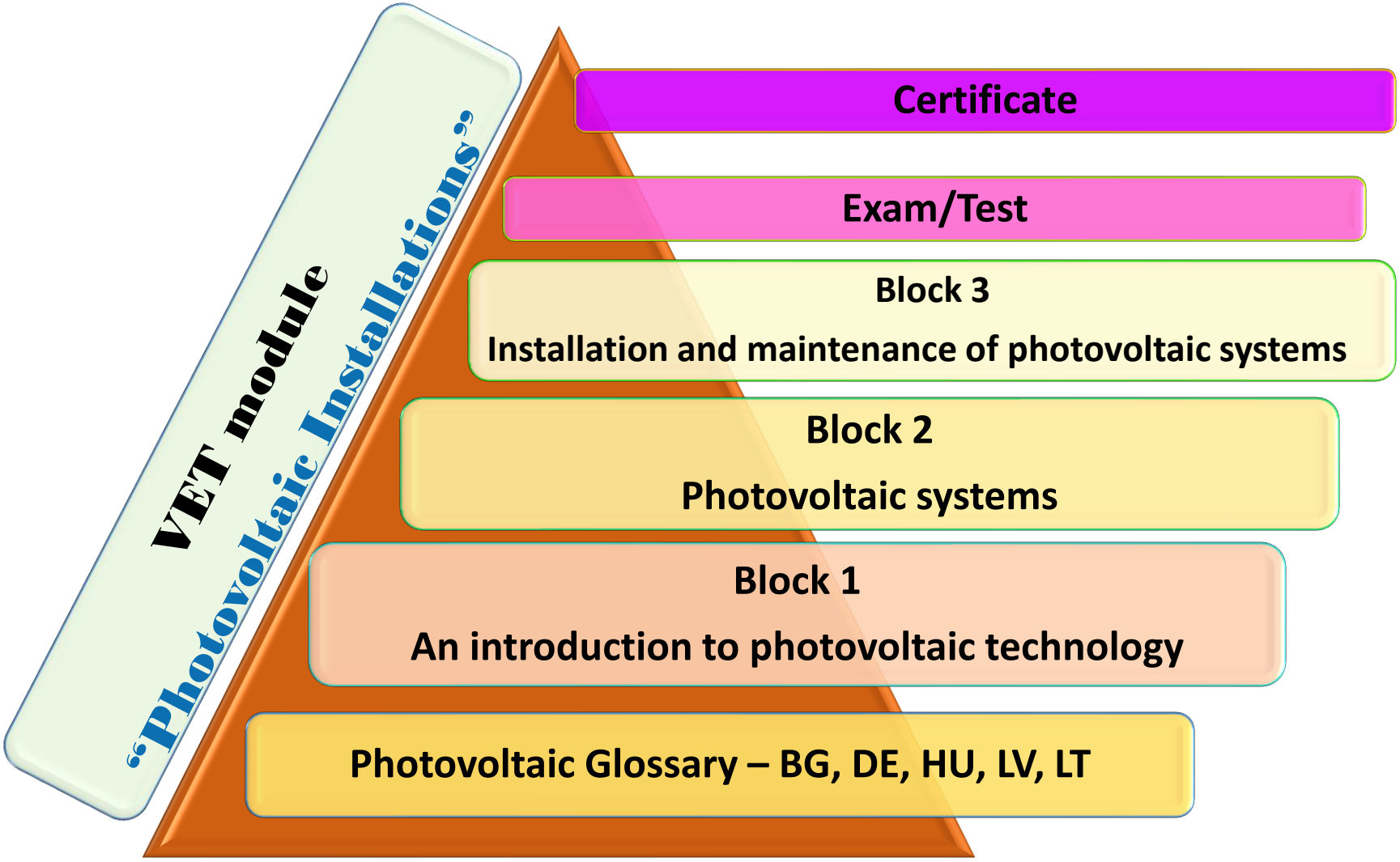
5. Module architecture



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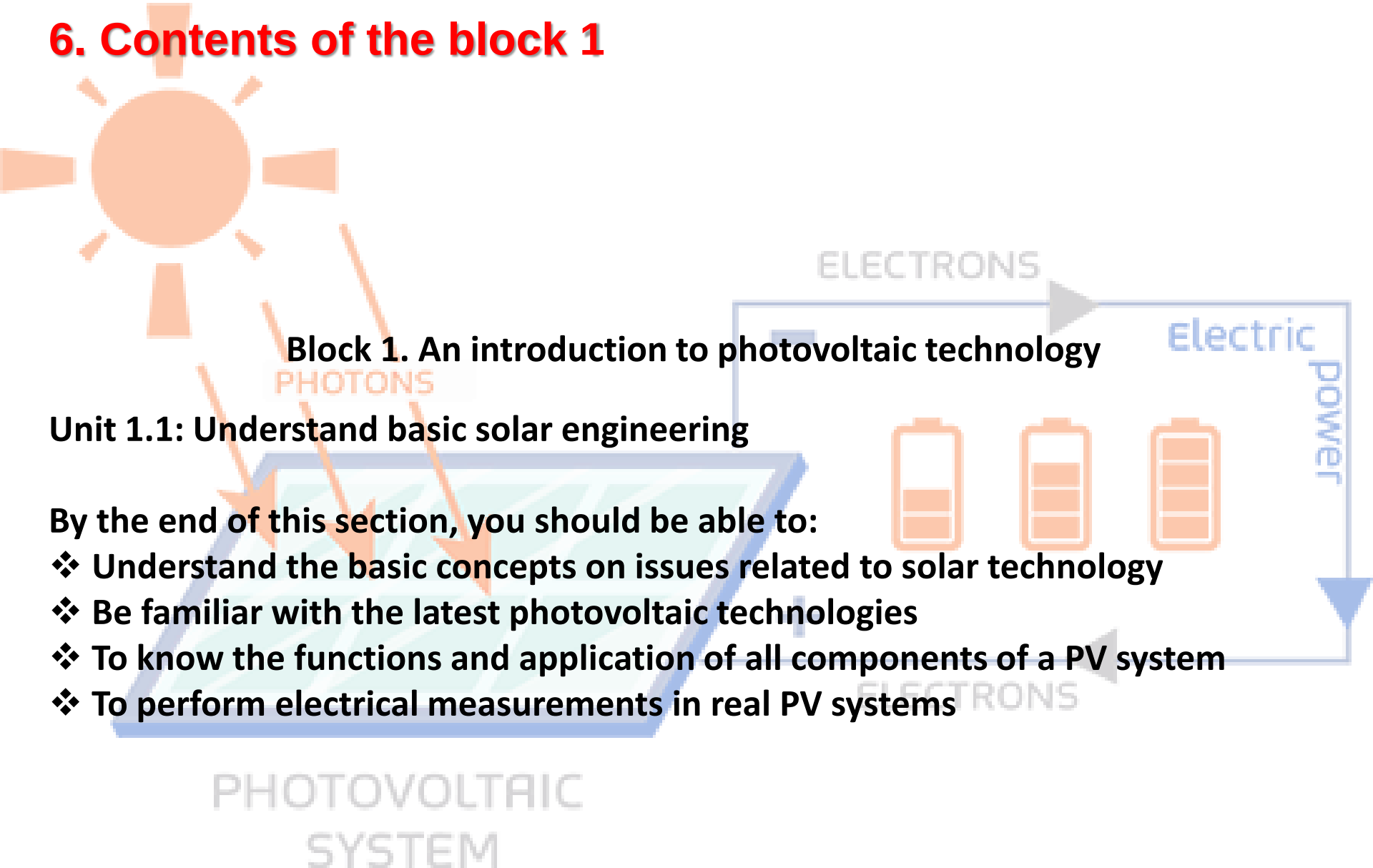
6. Contents of the block 1



Block 1. An introduction to photovoltaic technology

Unit 1.1: Understand basic solar engineering

By the end of this section, you should be able to:

- ❖ **Understand the basic concepts on issues related to solar technology**
- ❖ **Be familiar with the latest photovoltaic technologies**
- ❖ **To know the functions and application of all components of a PV system**
- ❖ **To perform electrical measurements in real PV systems**

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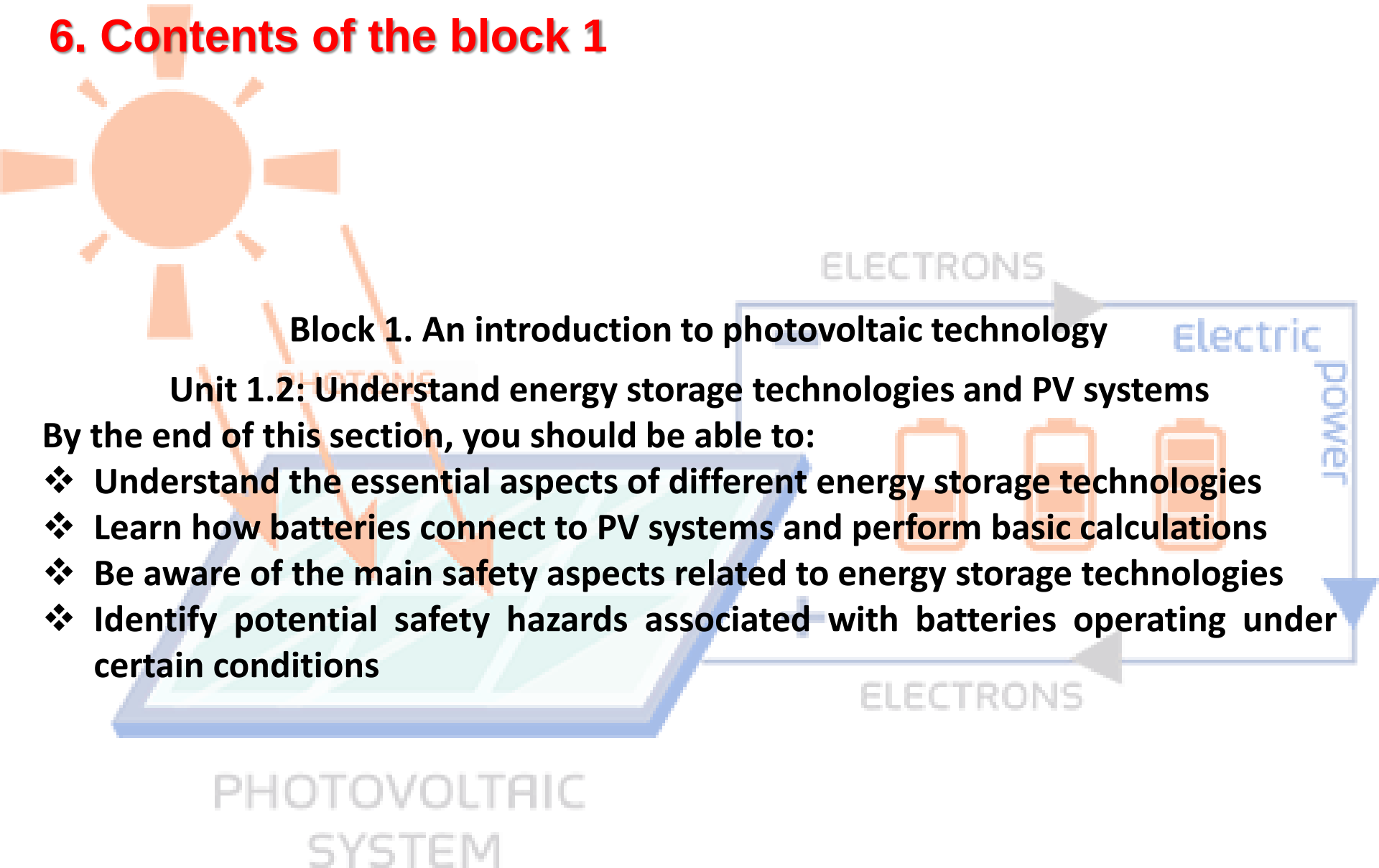
6. Contents of the block 1



Block 1. An introduction to photovoltaic technology

Unit 1.2: Understand energy storage technologies and PV systems

By the end of this section, you should be able to:

- **Understand the essential aspects of different energy storage technologies**
- **Learn how batteries connect to PV systems and perform basic calculations**
- **Be aware of the main safety aspects related to energy storage technologies**
- **Identify potential safety hazards associated with batteries operating under certain conditions**

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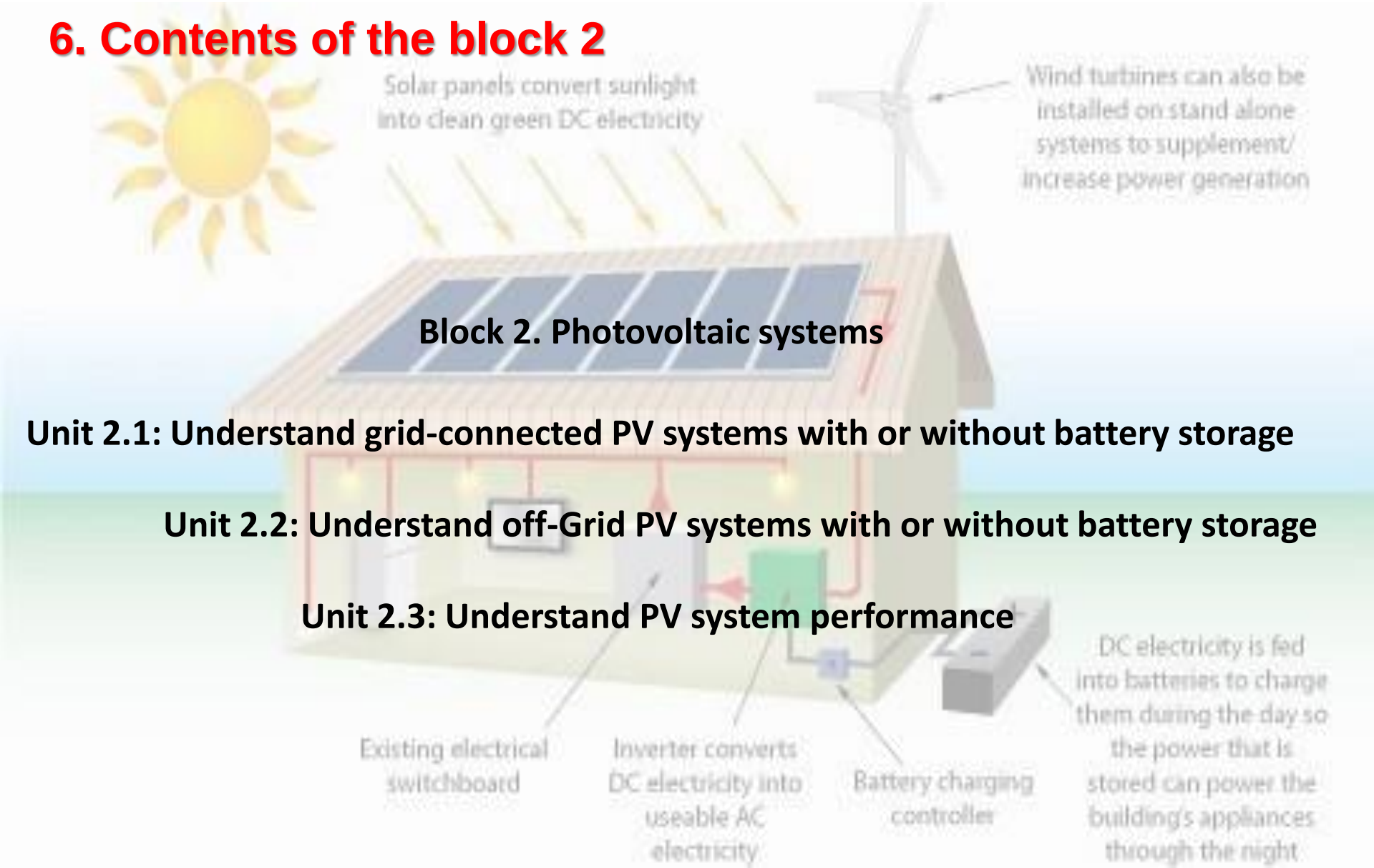
6. Contents of the block 2



Block 2. Photovoltaic systems

Unit 2.1: Understand grid-connected PV systems with or without battery storage

Unit 2.2: Understand off-Grid PV systems with or without battery storage

Unit 2.3: Understand PV system performance

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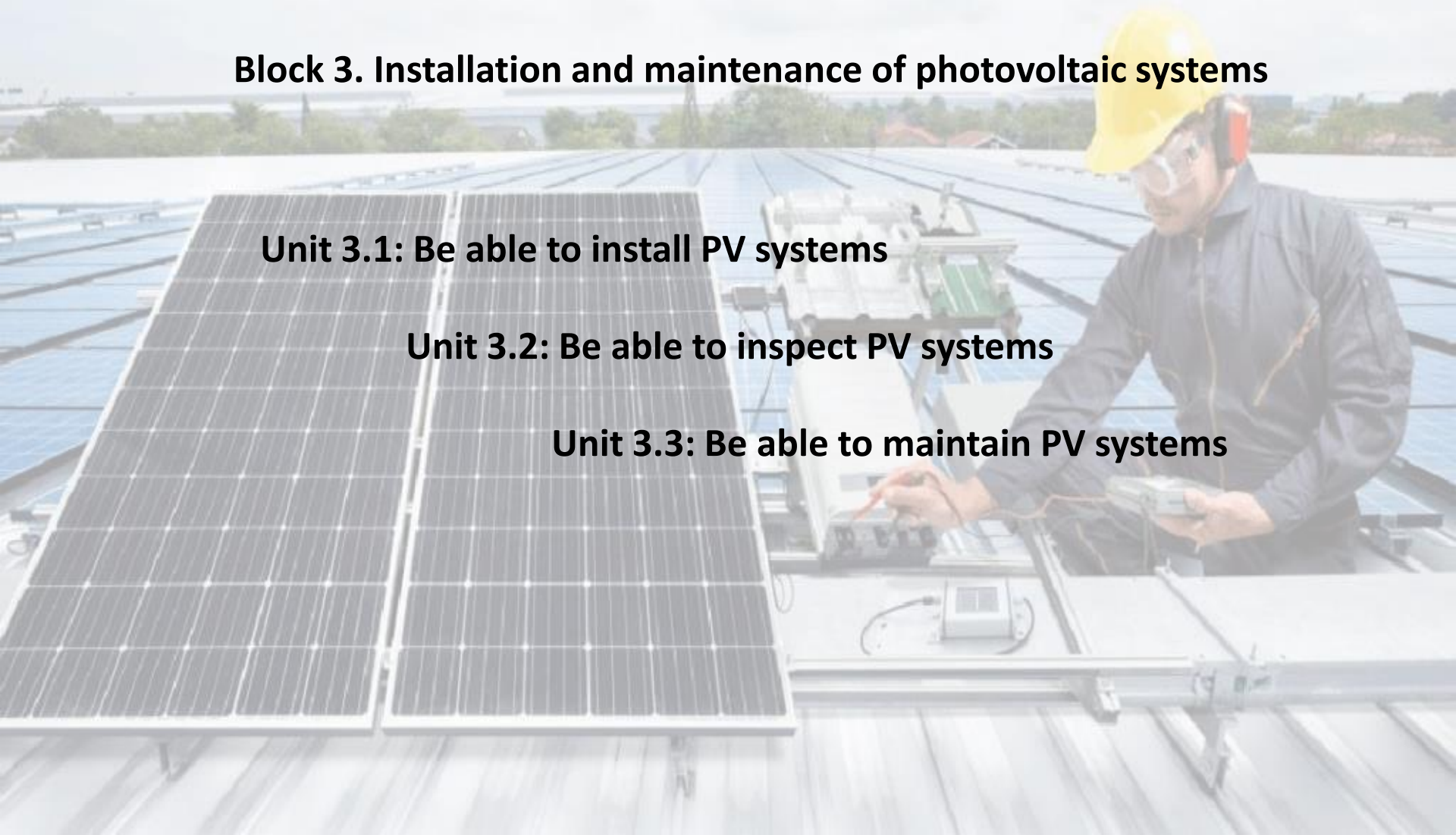
6. Contents of the block 3



Block 3. Installation and maintenance of photovoltaic systems

Unit 3.1: Be able to install PV systems

Unit 3.2: Be able to inspect PV systems

Unit 3.3: Be able to maintain PV systems

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6. Contents of the block 3

Block 3. Installation and maintenance of photovoltaic systems

Skills, Knowledge and Competencies

Educational content	*Skills and Knowledge*	*Competencies*
• Work Safety	Safe working, safety equipment, shock preventions, site-specific hazards, safe &correct use of equipment	Working according to safety plan for self and the team personals.
• Installation Plan	Understanding technical drawings, documentation, tools and safety plans. Visual inspection and selection of required correct tools and equipment.	Leadership, smartness, technical understanding and proper working methods.

6. Block 3

Block 3. Installation and maintenance of photovoltaic systems
Skills, Knowledge and Competencies

Educational content	*Skills and Knowledge*	*Competencies*
• Installation of Electrical Components	Electrical hazards, grounding system, circuits, system instrumentation and battery components. Wiring, labelling and termination and sealing of electrical circuit.	Implementing all essential electrical circuits for PV installation.
• Installation of Mechanical Components	Able to install Equipment base, Mounting system, PV Modules, Structural attachments, Weather sealings and Final assembly.	Implementing all essential mechanical actions for PV installation.
• Connections of PV System – Grid and Stand Alone	Understanding of necessary parameters of the system categories.	Ability to make appropriate decisions and solutions.
• Mounting Systems & Building Integrations	Understanding of necessary parameters mounting and integration of PV Systems.	Ability to make appropriate decisions and solutions.
• PV System Completion	Comprehending the last stages on-site and documentation.	Testing accuracy, functionality and efficiency of the system. Completion of documentation. Inspection for linkages, unexpected problems.
• Checklist	Able to confirm all true parameters of PV systems.	Checking all parameters of PV System.

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7. Conclusion

SHORT COURSE IN PV INSTALLATION &DESIGN

The essential training objective of this course is to provide the entry-level photovoltaic installer/ technician with fundamental technical knowledge on photovoltaics so that the technician may acquire and advance in design, installation and servicing responsibilities as the market for photovoltaic power.

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THANK YOU FOR YOUR ATTENTION!

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