



WP 3: Development of the structure of the module

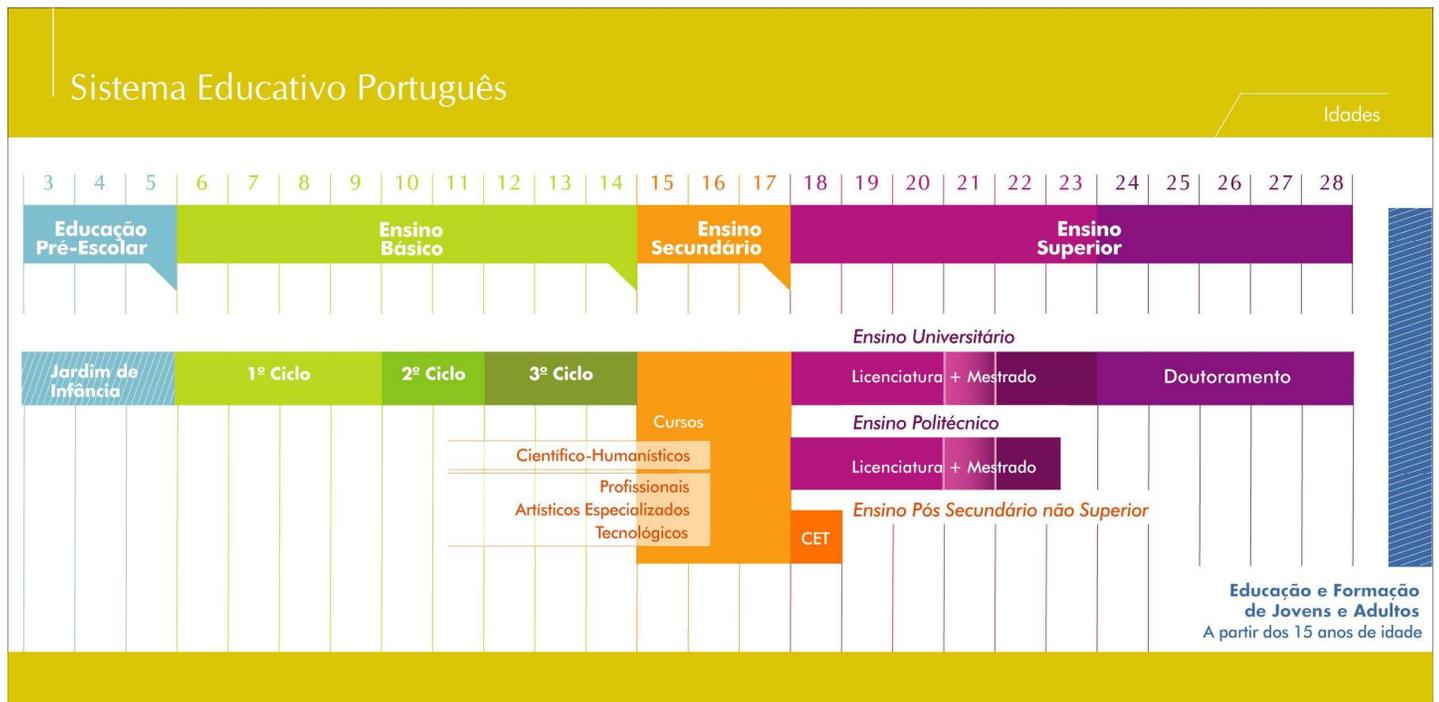
Desk research

The objective of this task is to:

- Describe the national formal educational and training systems
- Research and analyze the existing national certificates which are relevant for the service and maintenance of photovoltaic installations and the training that leads to that certification,
- Prepare a brief **summary** on the national certificates (per partner country)

Please give us your inputs on the following subjects

1. General description formal education and training system



This project has been funded with support from the European Commission. 1

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The Portuguese **Education System** follows the model laid down in the Basic Law of the Education System, published in Law no. 46/86, of 14 October. It is organized into three differentiated subsystems: pre-school education; school education, which covers (basic, secondary and higher education) and extra-school education (multiple initiatives of a formal and non-formal nature aimed at complementing previously-acquired school qualifications and/or making up for gaps and deficiencies).

I. Pre-School Education

It is destined to children with ages between 3 and the entry into compulsory education (Basic-Education admission age). Although attendance is optional and of the parent's responsibility, it belongs to the Portuguese State to assert and support (financially) the existence of a pre-school education net (governed by a set of rules and general norms) and because of that public garden-cares are free.

II. Basic Education

Basic education is compulsory and free, it has a duration of 9 years, divided between the ages of 5/6 and 14/15. It's organized into 3 sequenced cycles:

1st Cycle: 4 year duration (up till the 4th form), ages from 6 to 10. In this cycle, education is comprehensive and aims to develop basic skills in Portuguese, Mathematics, Environmental Studies and Artistic Expressions.

2nd Cycle: 2 year duration (5th and 6th forms), ages from 11 to 13. In this cycle the teaching is organized by disciplines and interdisciplinary areas of study.

3rd Cycle: 3 year duration (7th, 8th and 9th forms), ages from 12 to 15. In this cycle the teaching is organized by disciplines. The main objectives of this cycle are the development of knowledge and skills necessary for entry into employment or further study.

In the basic education is compulsory to learn two foreign languages, among English, French, German and Spanish.

III. Secondary Education

Secondary education has 3 year duration (10th, 11th and 12th forms), is not compulsory and it can be accessed by all that finished basic-education profitably. Ages between 15 and 18 years old.



To access any course of secondary education students must have completed compulsory education or possess an equivalent qualification. It's organized into different forms, either targeted for further studies or to the world of work. The curriculum of secondary level is a benchmark of three academic years and comprises four types of courses:

- Scientific-humanistic courses: designed primarily for further education at higher education;
- Technology course: designed for students who wish to enter the labor market, allowing also to pursue studies in specialized technology courses or higher education;
- Specialized art courses: designed to ensure artistic training in specialized areas of visual arts, audiovisual, dance and music, allowing entry into the world of work or further education courses in post - secondary or even higher education;
- Vocational courses: intended to provide entry into the world of work, also providing further education courses in post - secondary or higher education. They are organized by modules in different training areas.

Students who have completed this level of education is assigned a secondary education diploma. The technological, artistic and skilled professionals provide even a vocational qualification at level 3.

IV. Education Post-secondary non-tertiary

The technological specialization training courses provides specialized training courses in different areas of technology, allowing insertion into the world of work or further study at university level. Training held on technological specialization training courses has credits in the college where the student is admitted.

Successful completion of a course of technological expertise provides a degree of technological specialization and level 4 of qualification and may also provide access to a certificate of competence.

V. Education and Training for Youngsters and Adults

Education and training of youngsters and adults offers a second chance to individuals who left school early or who are at risk of leaving, and also to those who had no opportunity to go there when young and to those who are also seeking to school for issues of professional or personal development from the perspective of lifelong learning.



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In order to provide new ways to learn and progress appears the "New Opportunities Initiative" which defines as a main objective to extend the minimum training reference to the 12th grade.

The different forms of education and training of young people and adults allows a school and/or professional certificate as well as further studies at post-secondary or higher education.

Education and training of young people and adults take the following forms:

- System for Recognition, Validation and Certification of Competences acquired throughout life, through formal, informal and non-formal education, allowing students to obtain a dual academic and professional certification. The training received provides access to better jobs and better perspective of lifelong education. This system takes place in specific Centres for New Opportunities, spread throughout the country;
- Education and Training Courses for students aged 15 and over;
- Adults Education and Training Courses and Modular Training to students over 18 years;
- "Short-term Actions S@ber +" for students over 18 years;
- Recurrent education in primary and secondary education for students aged 15 or over 18 years for primary and secondary, respectively;
- National System of Learning, the responsibility of the Institute of Employment and Vocational Training for young people aged 15 years.

VI. Higher education

Higher education is structured according to the Bologna Principles and aims to ensure a solid scientific training, cultural, artistic and technology that qualifies students for professional activities and cultural development of capabilities in design, innovation and critical analysis.

In Portugal is organized in a binary system: the university and polytechnic education, administered by public institutions of higher education, private or cooperative.

To apply for access to higher education, students must meet the following requirements:

- Have successfully completed a course in upper secondary education qualification or equivalent;
- Have carried out the necessary entrance exams for the course you wish to attend with a rating least 95 points;
- Meet the pre-requisites (if applicable) for the course they are applying.



Entrance to each higher education institution is subject to *numerus clausus*.

Students over 23 who have no qualifications for higher education can be accessed through specific tests to prove their ability to attend the course they are applying. These examinations are organized by the respective higher education institutions.

In higher education are awarded the following academic qualifications: First degree (*degree*) Master's degree (*Master*) and PhD (*Doctor*).

The university and polytechnic institutions confer graduate degrees and master's degrees. The doctorate *degree* is conferred only by universities.

In polytechnics, the studies leading to a *degree* involving six semesters that correspond to 180 credits. In the universities, the cycle of studies leading to a *degree* usually has a duration of 6 to 8 semesters, which corresponds to 180 or 240 credits. The course of study leading to a Master's degree lasts three to four semesters, which corresponds to 90 or 120 credits. The doctoral degree is awarded to those who have passed courses in the doctoral program, when applicable, and successfully defended the thesis.

Institutions of higher education may also teach the post-secondary education not more, for specialized training.

Fees are set by the institutions of higher education, between a minimum and maximum value, according to the type of courses.

2. Description of existing national certificates in the solar Photovoltaic area

In the Portugal the certification for solar photovoltaic area can be done by any VET organization who is formally accredited to give this training course.

The training course is regulated by the National Qualification Body (ANQ) and in the end of the training course the students graduate as Photovoltaic Installer.

A. Profile General Description:

Schedule, organize and run the installation, maintenance and repair of solar photovoltaic systems, in accordance with the rules, safety regulations and rules of good practice applied.



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B. Main Activities:

- Schedule and organize the work to be carried out.
- Run the installation of photovoltaic solar systems, ensuring compliance with rules, regulations of safety and rules of good practice applied.
- Run the repair of photovoltaic solar systems, ensuring compliance with rules, regulations of safety and rules of good practice applied.
- Ensure the maintenance of solar photovoltaic systems, in accordance with maintenance plans defined and carry out tests after intervention in order to ensure its proper functioning.
- Provide technical assistance to customers, advising on the different options and clarifying doubts about the operation of photovoltaic solar systems.
- Reporting and complete technical documentation relating to their activities.

3. Description of existing training courses in the solar Photovoltaic area

| | |
|----------------------------|---|
| Duration | 1225 hours |
| Course structure | 33 different training modules |
| Course design and planning | <ol style="list-style-type: none"> 1. Metrology-introduction 2. Metrology-techniques and instruments 3. Materials technology 4. Mechanics of materials 5. Manufacturing processes 6. Corrosion 7. Pneumatics and hydraulics 8. Environment, safety, hygiene and health at work-basic concepts 9. Company 10. Quality and reliability 11. Work preparation, planning and budgeting 12. Maintenance management-introduction 13. Project management |



| | |
|--------------------------------|--|
| | <ol style="list-style-type: none"> 14. Technical drawing-introduction to CAD, geometric design and descriptive geometry 15. Technical drawing-representation and parts 16. Technical drawing-binding elements and schematic drawing 17. Technical drawing-notions of construction drawing 18. Sawmill bench-elementary operations 19. Elementary operations-machining 20. Connection processes 21. Electricity 22. Industrial electrical installations 23. Switchboards 24. Automations-introduction 25. Maintenance of bodies and equipment 26. Thermodynamics 27. Energies 28. Solar energy 29. Photovoltaic solar systems 30. Solar photovoltaic modules 31. Photovoltaic solar system project-selection and sizing 32. Photovoltaic solar system project-construction 33. Photovoltaic solar system project-installation |
| Number of locations | 20 VET Centers |
| Number of students (2008/2009) | --- |
| Teaching material | Done by each trainer. |
| Examinations | Done in the end of each module |
| EQF Level | 4 |