

List of modules in each country 1/2

Buildings Electrician	MODULE	SPAIN	LITHUANIAN	POLAND	ITALY
	1.	<ul style="list-style-type: none"> 1. Low voltage electrical lines in buildings and public equipment 2. Underground lines to buildings and public equipment 	General electrician works	Basics of electrotechnics and electronics	TCI skills
	2.	<ul style="list-style-type: none"> 3. Electrical switchboards in buildings 4. Fully controlled mechanical processes in buildings 	Installation of lightning networks	Mechanical techniques of manufacture	Safety D.lg 81/03
	3.	<ul style="list-style-type: none"> 5. Electric machines in buildings 	Electric arc welding	Electroenergetic svstem	Reading of the electrical technical design
	4.	<ul style="list-style-type: none"> 6. Photovoltaic solar energy installation in buildings 7. Public address systems and intercom in buildings 	Installation of control devices	Apparatuses and devices in electrical installations	Electrotechnic theory

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List of modules in each country 2/2

Buildings Electrician	MODULE	SPAIN	LITHUANIAN	POLAND	ITALY
	5.		Installation and tuning of engines	Electrical machines and power drives	Electrical techniques
	6.			Electrical installations	Electric plans
	7.				Theory and technic of the solar photovoltaic plant
	8.				Practical construction of solar thermal plants

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Commonalities

P=Poland

I=Italy

S=Spain

L=Lithuanian

M= Modul

Table that appears on each box the first letter of a country and a number of module.

If this box is green, has points in common with the module which compares

If this box is red, has not points in common with the module which compares

The color corresponds to the points in common that each module with other modules.

Buildings electrician		S	S	S	S	L	L	L	L	L	P	P	P	P	I	I	I	I	I	I	I	
		M1	M2	M3	M4	M1	M2	M3	M4	M5	M1	M2	M3	M4	M1	M2	M3	M4	M5	M6	M7	M8
S	M1																					
S	M2																					
S	M3																					
S	M4																					
L	M1																					
L	M2																					
L	M3																					
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I	M1																					
I	M2																					
I	M3																					
I	M4																					
I	M5																					
I	M6																					
I	M7																					
I	M8																					

Synthesis of the synergies on a Spanish base:

- FEVEC will provide all the training contents in **BLACK**
- FEVEC and rest of partner will provide the training contents in **RED** – according to the name specified at the end of the line

Module 1 ES : Low voltage electrical lines in buildings and public equipment & underground lines to buildings and public equipment

- ESM1(points 1-6), planning, installation, connection, testing of circuits, drafting of reports, answer official questionnaires and maintenance. Necessary to obtain authorizations from competent bodies (ESM1.5). Specifically states in ESM1.3: public illumination points, power plugs and connection points to buildings.
- LTM1 (points 1-6), use of technical documentation, tools & equipment, fitting works, complex works). Interesting point 3 ISO tolerances (quality assurance by international standards). Does not mention detailed patterns like Spain in ESM1.3.
- PLM1 (1-9). Basic procedures as in the other modules. Mentions also scope regarding electrical machines, systems and equipment (like ESM1.3).
- ITM1 (1-8). At this point it seems that Italian modules 3-8 are the equivalent for M1 of the other specialties in the sense of introduction. ITM2 will deal with security issues and ITM1 is delighted to research of information through Internet. At this point we cannot make a linear comparison with the Italian contents in module 1.
- **Respect safety rules in PLM1.7 (in compliance with the fire protection and health safety rules), also PLM1.9 (choose labour clothing and personal protection measures) [PZPB]**
- **Risk prevention also mentioned in LTM1.2 (with regard to health and safety measures) [VILNIUS]**

Environmental Skills:

- Not present, only mention to respect of safety

Module 2 ES: Electrical switchboards in buildings & fully controlled mechanical processes in buildings:

- Preparation of the workplace as well as switchboard connection and maintenance.
- The scope of work mentioned is rather limited (switchboards) in ESM2 if comparable with LTM1.1 (assembly of eternal wiring...public illumination points, power plugs, electric meters) and PLM1.1 (make electrical connections of cables, junctions, terminals in aerial and cable lines).
- **Safety is mentioned in a more detailed way in PLM1.1 (compliance with fire protection...environmental protection rules) [PZPB]**

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- ITM2 ranges on EIP (Equipment for Individual Protection), especially ITM2.7 and .8 [**Formedil**]
- PLM2.4 has also an extension on cable typology (electric, LAN, alarm, telecommunications, CCTV, emergency, aerial). [**PZPB**]

Environmental Skills:

- Estimate the use of materials
- Waste management

Module 3: Electric machines in buildings

- Preparation of works and gathering of materials, later installation, tests for performance and maintenance and repairs.
- ESM3 points out the installation and set up of dynamic and static electrical devices and equipment, electric machines in buildings.
- ITM3 speaks about symbology/decoding capacities [**Formedil**]
- LTM3 comments about steel welding. LTM3.2 makes references to H&S issues [**VILNIUS**]
- PLM3 is focusing on the communication importance for a correct output (liaison with site management and with contractors, PLM1.1, 1.2). Also H&S measures commented in PLM3.5 [**PZPB**]

Environmental Skills:

- Gathering of equipment and tools for work

Module 4: Photovoltaic solar energy installation in buildings & public address systems and intercom in buildings:

- In this module the Spanish ESM4 addresses specific installations in buildings like photovoltaic solar energy and public address systems and intercom, ESM4.1, 4.2, 4.3 (electrical security systems) with the introduction of ICT as a tool for consumption measurement.
- It is also stated that it is very important to reach “the necessary level of power supply”.

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- LTM4 references to installation of control devices, LTM4.1 (control switches and magnetic starters) [VILNIUS].
- PLM4 and ITLM4 have a different approach, PLM4 concentrates on administrative tasks PLM4.2 (report accident), PLM4.3 (progress report). [PZPB]
- ITM4 focuses on electro-technical theory, ITM4.1 (laws of physics), ITM4.2 (scale measurements and dimensions, ITM4.5 (chemistry of elements), ITM4.6 (electrology). [Formedil]
- Environmental Skills: None
- Use of measurement tools for proper energy supply (energy efficiency), for example ICT.

Module 5

- ESM5 is not existing, neither the Polish PLM5. At this point we can only compare LTM5 and ITM5.
- LTM5 makes reference to installation and tuning of engines. LTM5.2 (installation and connection of electrical engines), LTM5.3 (grounding), LTM5.4 (installation and maintenance of pumps and ventilators).
- ITM5 makes reference to electrical techniques (still focusing on knowledge of general aspects), ITM5.1 (peculiarities), ITM5.2 (sizing), ITM5.4 (connections). This content can however be found in other modules such as ESM (1-4), PLM(1-2) and LTM (1-5).

Environmental Skills:

- ITM5.10 (Gain competence on components choice), understandable from a Eco-product point of view.

Module 6-8

- **Only ITM is mentioned: ITM6 (Electric plans), ITM7 (Theory and technique of solar photovoltaic plants) and ITM8 (Practical construction of solar thermal plants). However, it can be assumed that those modules are more related to training (traineeship) and that find similarities for example in the Spanish module development which is always more general. [FORMEDIL].**
- **In regards to solar panels installations we find synergies between ITM7 and ESM4. Solar thermal is mentioned only in ITM8.**
- **Quality: ESM1.1 - ITM3 - ITM4 – ITM5 - IMT6 [FORMEDIL]**

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Qualification, ICT and environmental culture in the construction sector



SUGGESTED GENERAL SPECIFICITIES TO BE INCLUDED ON GENERAL LEVEL IN ALL BUILDING ELECTRICIAN SKILLS:

- Estimate the use of materials (embodied energy) and with an LCA perspective.
- Waste management (also in relation with resource efficiency and CO2 emissions reduction).
- Knowledge about efficient lighting in private housing and public buildings (LED, ICT based measuring and control)
- Knowledge about Eco-Labels for products (Switchboard related to HVAC, etc) also in relation with new construction methodologies.

OTHER REFERENCES OR NEWS RELATED THAT MAY BE USED:

-CEDEFOP, [Cyprus: Promoting Green Skills in the Cyprus Economy \(2010-2013\)](#) (ReferNet),” During the period January-October 2011, the HRDA organized 72 initial training programs to provide green knowledge and skills for occupations such as solar photovoltaic installers, building electricians, cooling and air conditioning systems technicians, plumbing and heating systems technicians and energy management and renewable energy sources for mechanics, with the participation of around 400 persons and an estimated budget of €1,8m (related also the EU Build Up skills scheme from IEE-EACI).

-CEDEFOP-OECD, celebrated an event on Green Skills on 27th Feb. 2012, It would be interesting to follow its output. “The [Green Skills Forum](#) is an opportunity to gather the latest insights on (1) what firms, trade unions and other organizations are already doing to foster the potential of green growth through skills development activities; (2) how strategies for green skills are integrated with other areas of workforce development and (3) tools and directions for further research.”

-In 2010, CEDEFOP issued a tender on “Green skills and environmental awareness in vocational education and training” that was awarded to the Institute for Employment Studies (IES) in UK.

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